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MINISTÉRIO DAS PESCAS

South West Indian Ocean Fisheries Governance and Shared Growth in Mozambique (SWIOFish)

SWIOFish Mozambique (PROJECT -- P132123)

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK (ESMF)

Draft

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LIST OF ACRONYMS

ADNAP	National Administration for Fisheries
AFD	French Development Agency
CAADP	Comprehensive Africa Agriculture Development Program
CBNRM	Community-Based Natural Resource Management
CPS	Country Partnership Strategy FY12-15
DA	District Administration
DCC	District Consultative Council
DNA	National Directorate for Water
DNE	National Directorate for Energy
DNPO	National Directorate for Planning
DNAPOT	National Directorate for Land Planning
DNPA	National Directorate for Environmental Promotion and Education
DPA	Provincial Directorate of Agriculture
DPCA	Provincial Directorate for the Coordination of Environmental Affairs
DPPF	Provincial Directorate of Planning and Finances
DPP	Provincial Directorate of Fisheries
DPOPH	Provincial Directorate of Public Works and Housing
EA	Environmental Assessment
EDM	Electricity Company/Electricidade de Moçambique
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EP	Fisheries School
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
FAO	Food and Agriculture Organization
FFP	Fund for Fisheries Development
FIPAG	Urban Water Supply Asset Fund
FMP	Fisheries Master Plan/Plano Director das Pescas 2010-2019
GDP	Gross Domestic Product
GOM	Government of Mozambique
IDA	International Development Association
IDPPE	National Institute for the Development of Small-Scale Fisheries
IIP	National Institute for Fisheries Research
INAQUA	National Institute for Aquaculture Development
INIP	National Institute for Fish Inspection
IOC	Indian Ocean Commission
MAE	Ministry of State Administration
MF	Ministry of Finance
MICOA	Ministry for the Coordination of Environmental Affairs
MINAG	Ministry of Agriculture
MISAU	Ministry of Health
MOPH	Ministry of Public Works and Housing
MP	Ministry of Fisheries
MPA	Marine Protected Areas
MSME	Micro Small and Medium Enterprises
NAPA	National Adaptation Program of Action
NCSD	National Commission for Sustainable Development
NEMP	National Environmental Management Program
NEPAD	New Partnership for Africa's Development
NGO	Non-Governmental Organization
PARPA	Action Plan for the Reduction of Absolute Poverty
PCU	Project Coordination Unit

PDD	District Development Plans (Plano Distrital de Desenvolvimento)
PDUT	District Land Use Plan
PEPA	Environmental Quality Standards of Mozambique Projects
PF	Process Framework
PLPP	Provincial level project personnel (with monitoring responsibilities)
PPU	Provincial Project Unit
PQG	Government Five Year Plan
PRS	Poverty Reduction Strategy
SDAE	District Services of Economic Activities
SDMAS	District Services of Women, Social Affairs and Health
SDPI	District Services of Planning and Infrastructure
SWIOFC	South West Indian Ocean Fisheries Commission ()
SWIOFP	South West Indian Ocean Fisheries Program
ToR	Terms of Reference
UCA	Coordination and Support Unit
UNDP	United Nations Development Program
VMS	Vessel Monitoring System
WB	World Bank
WHO	World Health Organization

TABLE OF CONTENTS

List of Figures

List of Graphs

List of Tables

List of Annexes

EXECUTIVE SUMMARY

Introduction

This document forms the Environmental and Social Management Framework (ESMF) for the **South West Indian Ocean Fisheries Governance and Shared Growth in Mozambique (SWIOFish Mozambique**). It outlines the main principles and perquisites to be followed by the Government of Mozambique in the implementation of the World Bank and AFD supported **SWIOFish Mozambique** Program.

The focus of the support will be on the two main pillars of the Government's Plano de Acção de Redução da Pobreza/Poverty Reduction Strategy (PARP, 2011-14) (i) increasing fisheries (and agricultural) production/productivity; and (ii) employment through targeted interventions to strengthen the dynamism of the small producers and the private sector to drive economic growth and accelerate job creation through fisheries and associated value chain.

The program will be implemented over a period of 6 years. Most of the physical interventions of the Program will target the following geographical areas (i) Cabo Delgado Province in the districts of Palma, M. Praia, Macomia, Quissanga, Pemba; (ii) Nampula Province in the districts and localities of Memba, Nacala, I.Moçambique, Mogincual (Namige), Angoche, Larde, Moma; (iii) Zambezia Province in the districts and localities of Cuassiane(Pebane), Pebane, Zalala(Nicoadala), Quelimane, Chinde; (iv) Sofala Province I the districts and localities of Maciamboza(Cheringoma), Sambazóo(Muanza), Njalane(Cidade da Beira), Praia Nova(Cidade da Beira), Nova Sofala(Buzi), Chiloane(Machanga): and (v) Maputo Province, Marracuene District (Macaneta) including Maputo Port itself, in the country's capital.

One of the program components will deal with investments in infrastructures comprising (i) investments in rehabilitation or upgrading of fishing ports, landing sites, fish markets, laboratories and applied research assets, training facilities and social facilities for fisher associations and women's groups, and (ii) larger infrastructure and assets, including investments in strategic fishing port/landing facilities, fish chilling facilities at airports, including investments in improved enforcement capabilities.

Working closely the GOM and its supporting partners, i.e. the World Bank, AFD and others will ensure that the strategic interest of inclusion, diversification, creation of employment and income generating opportunities are created around the planned interventions in the program area. Priority infrastructure will be identified, planned and built and training, capacity building and demonstration activities will be carried out. This will be complemented by the strengthening of the enabling

environment as well as the adoption of adequate measures for intervention monitoring and evaluation.

Project Components

The project will have four main components with the following preliminary allocation of funds:

1. **Component 1: Improved governance of fisheries**. Focusing on actions to be taken by the public sector, this component will deal with the sustainable use of the resources with the aim of improving economic outcomes.
2. **Component 2: Increased fisheries contribution to country economies**. This component will primarily target the private sector as well as public investments that are critical to a profitable private sector. The ultimate objective is to increase economic benefits generated by the private sector in harmonious collaboration with the public sector
3. **Component 3: Cost-effective regional collaboration**. This component will target activities that add value through regional collaboration through the support to the function and activities of regional collaborative institutional and mechanisms.
4. **Component 4: Program management and coordination**. This component will deal with cross-cutting human and institutional capacity building embedded in each program component.

The program's physical interventions will be in the form of:

- Quays;
- Major improvements to fishing harbors or development of new marinas in the form of:
  - Rehabilitation or upgrading of fishing ports, landing sites, fish markets, laboratories and applied research assets, training facilities and social facilities for fisher associations and women's groups;
- Larger infrastructure and assets such as:
  - Strategic fishing port/landing facilities (Maputo, Beira, Quelimane Nacala and Angoche);
  - Fish chilling facilities at airports, and
  - Possible investments in improved enforcement capabilities.
- There will also be construction/rehabilitation of office/conference buildings/facilities to host permanent headquarters for the SWIOFC.

The Ministry of Fisheries (MF) will be responsible for Program implementation and will coordinate Program activities to be executed by its directorates/departments as well as MF subordinate institutions, namely:

- International Cooperation – DCI;
- Fisheries Economy and Policy – DNEPP;
- Fisheries Surveillance – DNFP;
- Fisheries Technology and Equipment – DTEP;
- National Directorate of Fisheries Administration (ADNAP);
- National Institute for Fisheries Research (IIP);
- National Institute for Development of Small-Scale Fisheries (IDPPE);
- National Institute for Aquaculture (INAQUA);
- National Institute for Fisheries Inspection (INIP);
- Fisheries Development Fund (FFP); and
- The fishing port management bodies where the four ports are currently structured as four state-owned companies under the Ministry, and should soon be integrated under one unique Fishing Port Agency).

A National Program Steering Committee (NSC) involving representatives of the Ministry of Fisheries, the Ministry of Planning and Development, and the private sector will be responsible for overseeing the program and providing guidance in association with Bank supervision. On an ad hoc basis observers will be invited to participate in relation to specific issues. A National Management Unit (NMU) to work as the secretariat for the NSC, will be established.

Development Context

SWIOFISH happens at a time when Mozambique is experiencing high economic growth rates situated above 7% and continues to be one of the fastest growing economies in Africa and the world. In recent times vast reserves of coal, gas and other minerals have been discovered and are beginning to be exploited. The ongoing developments have the potential to radically change the structure of Mozambique's economy and society at the same time that pose serious challenges to the country's capacity to embark on an inclusive economic growth in line with the on-going poverty reduction strategy, i.e. PARP III (2011-2014).

However, despite the remarkable ongoing growth progress, the country continues to be among the world's poorest. The country ranks 185th of 187 countries on the 2013 United Nations' human development index (HDI)

The country's economy is characterized by a very small number of mega projects on the one hand, and the family and informal sector, on the other, which encourages imbalances in development and affects diversification of production and access to the benefits of the development by a significant proportion of the population.

One of the biggest challenges is the promotion of equity in development. Among other aspects the poverty reduction strategy is aimed at addressing imbalances in development, particularly with respect to the diversification of production and access to the development benefits by a significant proportion of the population. Significant investments in infrastructure such as roads, water supply and sanitation as well investment in the adding of value to the primary sectors of the economy where the majority of the country's population is active (i.e. agriculture and fisheries) should continue to play a vital role in the stabilization and gradual elimination of imbalances. In this context strengthening micro, small and medium size enterprises (MSMEs) is seen as key to changing the prevalent situation.

More than 70% of the population relies upon subsistence agriculture and fisheries for their livelihood with women being the majority. Agriculture and fisheries are the key sectors in the country's development strategy. The poverty reduction strategy focuses on (i) increased agrarian and fisheries production; (ii) promotion of employment; (iii) human and social development; (iv) governance; and (v) macroeconomic and fiscal management. The five provinces and specific areas that define the project area are rich and diverse in terms of the receiving physical, biological and socioeconomic environment. Interventions need to be adequately planned, implemented, monitored and evaluated to ensure that such environment is not adversely affected.

World Bank Safeguards Policies and GOM Regulations

The objective of the ESMF is to ensure that relevant World Bank Safeguards Policies and GOM environmental and social regulations are strictly adhered to. The Project has triggered four of the World Bank's 10+2 Safeguards Policies, namely, Environmental Assessment (OP/BP 4.01), Involuntary Resettlement (OP/BP 4.12), Natural Habitats (OP/BP 4.04) and Physical Cultural Resources (OP/BP 4.11), as well as adhered to the World Bank Group General Environmental, Health and Safety Guidelines (EHS), and the applicable Agribusiness/Food Production EHS Guidelines from April 2007. The ESMF has made provision to address potential concerns afferent to both OP/BP 4.04 (Natural Habitats) and OP/BP 4.11 (Physical Cultural Resources). A Process Framework (PF) has been prepared to satisfy the Involuntary Resettlement (OP/BP 4.12)

Safeguard Policy requirements. The latter document has been prepared separately and should be used together with this ESMF.

The Project will also be implemented in light of the GOM reform in the environmental sector in terms of: (a) adherence to and adoption of a series of international and regional environmental protection and conservation conventions and protocols; (b) approval of a significant set of legislations with direct and indirect implications to environmental and social protection; (c) creation of specific public institutions and/or strengthening of existing institutions dedicated to both environmental and social management in the country.

Both WB safeguards policies and GOM regulations will be applied to ensure that potential negative environmental and social impacts on important resources such as land, soils, water, biodiversity (including fish), vegetation, local communities and the society at large are adequately managed and positive impacts are enhanced.

Subproject Formulation and Selection

As part of the ESMF a social and environmental screening process will help (i) determine which construction or rehabilitation activities are likely to have potential negative environmental and/or social impacts; (ii) determine the level of environmental and social work required, including whether an ESIA/ESMP or a freestanding ESMP will be required or not; (iii) determine appropriate mitigation measures for addressing adverse impacts; (iv) incorporate mitigation measures into the subprojects financed by SWIOFish Mozambique; (v) facilitate the review and approval of the construction and rehabilitation proposals; and (vi) provide guidance for monitoring environmental and social parameters during the implementation and operation of subproject activities.

Given the multi-sector character and complexity of the project, and to ensure appropriate implementation and monitoring of social and environmental issues, the ESMF recommends the recruitment of (i) Social and Environmental Safeguard Specialists as part of the National Management Unit (NMU) that will work as the secretariat for the NSC and (ii) a Communication Officer with a good knowledge of environmental and social safeguards to timely liaise with the provincial safeguards specialists. These will work closely with MICOA at both central and provincial levels and be responsible for the proper handling of Environmental, Social and Communication dimensions of the project throughout its life cycle. These staff will be trained by WB Safeguards Specialists, and in close collaboration with MICOA.

Environmental and Social Management Plans (ESMP)

Where relevant, site specific Environmental and Social Impacts Assessment (ESIA) with a costed Environmental and Social Management Plan (ESMP) or just an Environmental and Social Management Plans (ESMP) will be prepared so that the Project **(i) avoids activities** that could result in adverse environmental and social impacts on resources or areas considered as sensitive; (ii) **prevents the occurrence** of negative environmental and social impacts; (iii) **prevents any future actions** that might adversely affect environmental and social resources; (iv) **limits or reduces the degree**, extent, magnitude or duration of adverse impacts by scaling down, relocating, redesigning elements of the project; (v) **repairs or enhances affected resources**, such as natural habitats or water resources, particularly when previous development has resulted in significant resource degradation; (vi) **restores affected resources** to an earlier (and possibly more stable and productive) state, typically 'background / pristine' condition; and (vii) **creates**, **enhances or protects** the same type of resources at another suitable and acceptable location, compensating for lost resources.

Moreover, the ESMF includes standard Environmental and Social Clauses (ESC), which will be included in all bidding documents and in the various contracts (contractual clauses) for the design, construction and appropriate operation of the interventions to be adopted for simple subprojects.

Contractors for simple projects will be responsible for the implementation of these Environmental and Social Clauses during construction and will need to recruit qualified staff, responsible for environment/social and health and safety issues, to do this. Contractors for more complex subprojects will need to prepare and implement their own Environmental and Social Impacts Assessment (ESIA) and associated Environmental and Social Management Plan (Contractor ESMP). Contractors will need to employ qualified environmental/social, health and safety specialist(s) for this purpose. In all cases the Supervising Engineer will be required by contractual arrangement to supervise the adequate implementation of the Environmental and Social Clauses and the Contractor ESMPs. Once reviewed and cleared by ASPEN (the Africa Regional Safeguards Advisory Unit) the ESMF will be publicly disclosed both in-country and at the InfoShop prior to the project appraisal.

Process Framework (PF)

A separate Process Framework (PF) has been prepared to be used along with this ESMF. The ESMF and PF will also be reviewed and cleared by ASPEN and then publicly disclosed both in-country and at the InfoShop prior to project appraisal.

Training and Capacity Building

Extensive training and capacity building will be carried out in order to prepare relevant institutions at the various levels to plan, implement, monitor and evaluate the different aspects involved in sound environmental and social management as elaborated in this ESMF in particular, and in the PF.

Based on needs identification a specific institutional and human capacity building program for environmental and social management, as well as human health and safety will be developed as part of the **SWIOFish Mozambique** Program. In addition to the Ministry of Fisheries beneficiary institutions will be the Ministry for the Coordination of Environmental Affairs (MICOA), especially at its provincial and district levels, relevant line ministries at its provincial and district levels (e.g. agriculture, public works, energy, health, education, MMAS and MPD, etc.), including local authorities (e.g. municipalities and others such as CSOs). The details of the capacity-building program and the institutions to be supported at provincial and/or local level, still have to be developed.

Practical ways of reaching out to all target groups will need to be devised for training and capacity needs assessments as well as for delivery of the training. The "*Learning by Doing*" approach will be given utmost priority.

Monitoring

Monitoring will also be fundamental to ensure that the objectives set forth in the ESMF/PF and the ESIAs/ESMPs/RAPs are being achieved satisfactorily and where there are nonconformities, timely corrective action can be taken. **SWIOFish Mozambique** Program Management Team will have the overall responsibility for coordinating and monitoring implementation of the ESMF.

Estimated Budger for the Implementation of the ESMF for SWIOFish Mozambique Program

The total cost of preparing and implementing ESMF, and the ESIAs/ESMPs under this document stands at **US$ 850,000** (eight hundred fifty thousand American Dollars).

SUMÁRIO EXECUTIVO

1- INTRODUCTION

This document forms the Environmental and Social Management Framework (ESMF) for the **South West Indian Ocean Fisheries Governance and Shared Growth in Mozambique (SWIOFish Mozambique**), a program through which the World Bank (WB) and the AFD will support the Government of Mozambique (GOM) to sustainably increase the competitiveness of country's fisheries sector as a way of ensuring that the sector realizes its recognized potential of creator of employment and wealth and as a crucial contributor to the diversification of the economy.

As the name of the program indicates it has a regional dimension that will basically target enforcement, biodiversity and ocean health activities in the South West Indian Ocean around which there has already been regional consensus developed under SWIOFP. However, this ESMF will be mainly confined to Mozambique and try to ensure that activities to be developed under the program in this country are conducted in a manner that is environmentally and socially sound and adhere to the best practices recommended by both, the donors and the Mozambican authorities.

The planned support is expected to address the three fundamental pillars of Mozambique's Strategy to Reduce Poverty (PARP, 2011-2014) that consist of (i) increasing agricultural (and fisheries) production/productivity; (ii) increasing employment through targeted interventions to strengthen the dynamism of the private sector to drive economic growth and accelerate job creation; and (iii) good governance. Emphasis will be given to the engagement of the private sector and to the investment necessary to increase productivity and employment. Since it is acknowledged that institutional strengthening is a key area the intended support will focus on improving public sector capacity, improvement of the country's investment climate, tracking and timely adaptation to economic trends in the sector, as well as efforts to align public investments and activities with private initiatives at all levels of the country's political and administrative organization, namely at national, provincial and district levels.

The program will be implemented over a period of 6 years, with the first year being dedicated to preparation, and it is expected to contribute significantly in meeting important development objectives embraced by the GOM in terms of diversifying the economy and making it more inclusive. This will be fundamental in a context in which it is increasingly acknowledged that the country's economy is becoming polarized by having a small number of big enterprises on one hand and a wide number of informal SMEs, mostly micro enterprises, on the other hand. This fuels imbalances in development and hampers access to the benefits of the development by a significant proportion of the population[1]. Significant investments in critical areas that contribute to adding value to primary goods in agriculture and fisheries should continue to play a role in this process of stabilization and gradual elimination of imbalances as should the creation of a business environment in which SMEs can become competitive, grow and diversify.

From north to south the geographical areas with potential for implementing most of the physical interventions of the Program include (i) Cabo Delgado Province in the districts of Palma, M. Praia, Macomia, Quissanga, Pemba; (ii) Nampula Province in the districts and localities of Memba, Nacala, I.Moçambique, Mogincual (Namige), Angoche, Larde, Moma; (iii) Zambezia Province in the districts and localities of Cuassiane(Pebane), Pebane, Zalala(Nicoadala), Quelimane, Chinde; (iv) Sofala Province I the districts and localities of Maciamboza(Cheringoma), Sambazóo(Muanza), Njalane(Cidade da Beira), Praia Nova(Cidade da Beira), Nova Sofala(Buzi), Chiloane(Machanga): and (v) Maputo Province, Marracuene District (Macaneta) including Maputo Port itself, in the capital of the country. These areas have been identified as important fisheries growth poles in Mozambique and have been benefiting from a series of other interventions. In many cases the

[1] Carlos Nuno Castel-Branco (2008) "The Mega Projects in Mozambique: What Contribution to National Economy?" Civil Society Forum on Extractive Industries, Natural History Museum (Maputo), 27 and 28 November 2008.

program will try to strengthen such interventions and contribute to realize the potential of these areas to carry out innovative fisheries activities.

In light of the prevailing socioeconomic development imbalances it is generally accepted in Mozambique that if concrete measures are not adopted and put in place there is the risk that social tensions with the potential to degenerate into unrests will be continuously increased.

Among other interventions one of the program components will deal with investments in infrastructures. This will be divided into two phases in which the first will focus on small/medium scale infrastructure and undertake the planning for a potential phase two of investments which would see larger infrastructure and fleet adjustments being made. In general infrastructure development will go for (i) investments in rehabilitation or upgrading of fishing ports, landing sites, fish markets, laboratories and applied research assets, training facilities and social facilities for fisher associations and women's groups, and during the second phase for (ii) larger infrastructure and assets, including investments in strategic fishing port/landing facilities, fish chilling facilities at airports, including investments in improved enforcement capabilities.

The development of the above-mentioned infrastructure in particular but also other interventions will have positive and negative implications on the receiving natural and socioeconomic environment. In line with the GOM and WB principles and guidelines related to environmental and social management, such interventions should be designed, implemented and operated in such a way as to avoid causing harm to both the natural and social environment.

The Environmental and Social Management Framework (ESMF) is meant to be a guide to the screening of the proposed Project interventions (sub-projects) to ensure that they do not affect negatively the natural and social environment. The ESMF is particularly relevant in a situation where there program interventions are not yet clear and details, as is the case of the program at this stage. The ESMF outlines a number of principles, which include:

- A systematic procedure for participatory screening for sub-project sites and sub-project activities for environmental and social considerations;
- A step-by-step procedure for predicting the main potential environmental and social impacts of the planned sub-project activities;
- A typical environmental and social management plan for addressing negative externalities in the course of sub-project implementation (planning, construction and operation);
- A step by step monitoring and evaluation system for implementation of mitigation measures;
- An outline of recommended capacity building measures for environmental and social planning and monitoring of the sub-project activities; and
- A budget to ensure that the Project has adequate resources to meet its own interests, especially financial resources for the preparation and implementation sub-projects ESIAs, ESMPs and RAPs

The ESMF basic principles and requirements will be applied throughout the entire Program life cycle.

2 PROJECT DESCRIPTION

2.1 Project Components

The Program Development Objective (PDO) is to improve the management effectiveness of selected priority fisheries at regional, national and community level. Overall, the program intends to build the capacity and leadership required and address core economic governance issues to establish a well-founded basis for shared economic growth based on fisheries and aquaculture. It will do so by supporting the improvement of the management of the most economically important fisheries, improving co-management of the small-scale fisheries, and facilitating public and private investments to increase the contribution of fisheries to national economies. In short the program comprises the following components:

5. **Component 1: Improved governance of fisheries**. Focusing on actions to be taken by the public sector, this component will deal with the sustainable use of the resources with the aim of improving economic outcomes.
6. **Component 2: Increased fisheries contribution to country economies**. This component will primarily target the private sector as well as public investments that are critical to a profitable private sector. The ultimate objective is to increase economic benefits generated by the private sector in harmonious collaboration with the public sector
7. **Component 3: Cost-effective regional collaboration**. This component will target activities that add value through regional collaboration through the support to the function and activities of regional collaborative institutional and mechanisms.
8. **Component 4: Program management and coordination**. This component will deal with cross-cutting human and institutional capacity building embedded in each program component.

He highlights of each component and respective subcomponents can be summarized in the following manner:

Component 1: **Improved governance of fisheries**. The support to the implementation of core policy instruments through development of comprehensible fisheries policies informed by sound economic rationale and development trajectory, sustained by human and institutional capacity building will be materialized through the following subcomponents and actions:

- **Sub-component 1.1: Management of priority fisheries** (including aquaculture), by prioritizing the most economically and socially important fisheries and the design and/or implementation of small-scale fisheries co-management and accompanying legal and institutional arrangements within the framework of the FMP. This will include: (ii) implementation of the FMP by clearly articulating the process, costs, financing, inputs and trade-offs required to achieve the desired results. This entails building the capacity to map, finance and implement the main ways to reach strategic FMP outcomes; (ii) preparation and implementation of strategic development and management plans for targeted fisheries, aquaculture and associated marine livelihoods, including review and updating of the approaches to marine spatial management. Target fisheries include (but are not be limited to) shrimp fisheries, reef and high value demersal (snapper, grouper) fisheries, lobster and sea cucumber fisheries and fisheries using specific gears, the interaction between small and large-scale shrimp fisheries, between commercial and recreational fisheries; and value chain models for aquaculture; (iii) preparation and/or updating legislation and administrative modalities for the industrial, small scale and recreational fisheries, and for the associated port, trade and fiscal and tourism aspects of fisheries and for regional collaboration on tuna; (iv) Evaluation and adaptive management of the co-management framework for the sector covering structure, status, functioning, efficiency, financing, community mandate and relationships with local and fisheries authorities and other stakeholders (e.g. ANC – National Agency for Conservation). The ultimate objective is to promote the optimal

sharing of marine resources between economic and social development sector (i.e. tourism, fishing, aquaculture, etc.); (v) review and improvement of the registries of fishing vessels, gears or fishers for codification of fishing rights and responsibilities; (vi) promotion of good practices to reduce destructive fishing in the project area, and particularly around Marine Protected Areas (MPA); (vii) Capacity development and leadership training at all levels with particular attention to analyses of the fishery and marine economy and responsible fishing industry leaders.

Under this subcomponent attention will also be given to the development of sustainable fisheries through co-management and establishment codification of tenure and rights fostering enhanced community co-management through an iterative and participatory monitoring and evaluation process designed to disseminate best practices and including support to the institutional and legal arrangements and community-level registries of fishing vessels and rights.

- **Sub-component 1.2: Improving the performance of public institutions and assets**, to bring them to the required level to provide effective basic fisheries services and infrastructure, and improved information for policies and decisions. It will deal with the performance of quays, landing sites, public fish markets, informal markets, laboratories and sanitary certification institutions, and the MCS systems and assets. Work will be geared towards the improvement of services, maintenance, financing and management. Under this subcomponent capacity development and leadership training for both public and private actors will be provided including ensuring linkages to other major initiatives such as on tourism, piracy, competitiveness and direct foreign investment. There will be short, medium and long-term training, leadership training, technical assistance, workshops and preparation of policy and economic studies and advisory services to SMEs. The activities will include: (i) development of effective sector management including capacity for planning, budget control, accounting, procurement, decentralized functions, improved transparency and anti-corruption measures and establishment of targets and programs for effectiveness of fisheries institutions and public services in the sector; (ii) improved business plans and operational practices for public institutions, including the fishing ports, sanitary control authorities, public fish markets, small-scale quays and landing sites and the co-management institutions; (iii) establishment of a cost-effective MCS capability for offshore and coastal fisheries, including VMS (Vessel Monitoring System) and AIS (Automatic Identification System), community compliance, country inputs to regional MCS collaboration, capacity to apply Port State measures, improved capacity of the justice system, and specific technical training for staff of the agencies involved; (iv) capacity development and leadership training at all levels, including for parliamentary and community fisheries dialogues and decision making; (v) investments in MCS equipment, including hardware, software, security and legislation to meet regional requirements for VMS and regional collaboration on MCS.
- **Sub-component 1.3: Establishment of a dashboard of environmental, social and economic indicators** to track the progress of the sector towards achieving country policy and planning goals, and to provide a basis for adaptive management and adjustment of policies and programs. Under this subcomponent a strong economic dimension in management and monitoring of fisheries using a results-based approach directed at specific measurable governance, economic and environmental outcomes, including food security, will be established. Sector performance trends would be reflected through economic indicators such as balance of payments, contribution to GDP and distribution of the value added, enterprise profits and economic rents in key fisheries, contribution to employment and, public revenue, credit delivery and repayment, and investments in value chain enhancement and trend in the value of the natural capital. This will be linked to a 'Doing Business in Fisheries' profile and scoring of the investment climate backed by a program of actions to improve the investment climate. The statistical system to be developed includes: (i) Establishment of and/or improvement of fisheries information systems (i.e. catch statistics, resource appraisal (state of the main fish stocks), vessel registers and fisher

registers, GIS of fishing communities and fishing grounds, market price information, surveys of employment and incomes in fisheries and of fish consumption (aligned with other national surveys where relevant); (ii) Establishment of models[2] to assess the economic contribution and local value added from extractive fisheries, aquaculture and marine tourism; (iii) establishment of a publicly available web-based and newsletter and Dashboard of key indicators of the state of the fisheries sector based on the information system and with particular attention to stakeholder incomes, profitability and public revenues from the key fisheries; (iv) capacity building, coordination and process management. The institutional investments would include making effective use of new legal instruments for long-term fisheries and aquaculture concessions and implementation of the sector's governance and anti-corruption plan.

Component 2: Increased fisheries and aquaculture contribution to country economies. This component would be aimed at addressing the constraints that affect the performance of the private sector such as a weak investment and business climate, infrastructure, business advisory services and credit. There will be public investments to facilitate and support private investments in sustainable fisheries and aquaculture. The funding will be in two phases: the first to improve the sector investment climate and finance, or facilitate viable investments already at an advanced planning stage; and prepare the analyses and organize the financing for proposed investments with a longer time horizon for financing under Phase Two. Phase Two will finance the additional investments planned under the First Phase. Most of the tasks under this component, i.e. analyses, preparation of financing packages and credit facilitation, and measures to improve the sector investment climate will be undertaken through a technical assistance contract with a competent financial institution working under the technical supervision of the PMU and the overall guidance of the Ministry. This component will comprise the following sub-components:

- **Sub-component 2.1: Improved business and investment climate**. To undertake the analyses required to identify and address the critical constraints to business and trade and develop an action program to improve the fisheries business opportunities and investment climate in the form of (i) preparation of a "Doing business in fisheries' assessment of the business and investment climate with a program of actions to improve business opportunities in fisheries and aquaculture; (ii) capacity development and leadership training at all levels, including for businesses and business associations with an emphasis on practical solutions to the constraints to business development.
- **Sub-component 2.2: Support for socially, economically and environmentally sustainable community and enterprise development and investments** to address the constraints to business and create a favorable investment climate through facilitating access to credit, one-stop-shop investment and advisory services, preparation of models and feasibility studies for bankable and sustainable projects and by identifying co-financing opportunities. The activities under this subcomponent include: (i) implementation of the actions to improve business opportunities and competitiveness and reduce business vulnerability identified under the previous subcomponent; (ii) private investments facilitated through assistance in preparation of the feasibility studies, access to credit, co-financing and credit or other guarantees consistent with national and World Bank guidelines, and assistance with licensing, land, water or other concessions and arrangements with communities and potential out growers; (iii) development of sustainable artisanal value chains where enhanced community co-management has been achieved. Among other support will be given for the replacement of environmentally damaging gears or practices with more sustainable harvesting gears and practices; (iv) support for development of new fisheries e.g. use of anchored FADs with accompanying tenure and maintenance arrangements; substitution of destructive gears, or gears with unwanted by catch; for fishing industry associations and for reduction in post-harvest physical and financial losses through training in fish handling and processing, improved logistics and dissemination of price information via SMS and/or radio and initiatives to match supply with demand; and

[2] With linkages to the WAVES Partnership: www.wavespartnership.org/

establishing arrangements for possible retention and offloading of by catch from industrial fleets and use of wastes for aquaculture or other value added production; (v) development of materials for primary and secondary school syllabus on sustainable use of marine and coastal resources and related business practices and training of teachers and community leaders, youth leaders and leaders of women's groups; (vi) marking of protected areas and navigation hazards, provision of facilities for marine communications and safety at sea, for emergency response and weather forecasting and maritime security for the fishing industry

- **Sub-component 2.3: Investment in strategic infrastructure** will cater for investments in small/medium scale infrastructure and undertake the planning for potential Phase Two investments in larger infrastructure and fleet adjustments. Under Phase Two there will be funding for viable larger infrastructure, such as development of quays, major improvements to fishing harbors or development of new marinas, including: (i) investments in rehabilitation or upgrading of fishing ports, landing sites, fish markets, laboratories and applied research assets, training facilities and social facilities for fisher associations and women's groups; (ii) planning for development and use of larger infrastructure and assets, including investments in strategic fishing port/landing facilities, fish chilling facilities at airports, and possible investments in improved enforcement capabilities. Strategic fishing ports are Maputo, Beira, Quelimane, Nacala and Angoche. Existing technical studies for the rehabilitation of the fishing ports will be updated where needed. Investments under this subcomponent will be dependent on clear economic justification based on profitable industrial and semi-industrial fleet operations and on implementing effective management policies.

Component 3: Cost-effective regional collaboration. The regional component will support activities which provide regional value added or where country collaboration is essential to achieve mutual goals or reduce management costs. This Component will mobilize resources from on country financing and grant financing from the GEF, the DGF and other sources, including WWF parallel financing. It will promote regional cooperation on fisheries, including reduction in illicit fisheries activities and improved management; establish technical capacity to monitor threats to the marine environment, and facilitate regional fisheries knowledge exchange and human resource development. Main subcomponents include:

- **Sub-component 3.1: Trans boundary marine resources and challenges** to support collaboration on trans boundary living marine resources including formal arrangements on joint actions for selected fisheries, vulnerable species, habitats and ecosystems of regional importance; and address shared challenges, such as piracy, illicit fisheries activities, and securing coastal state benefits from marine resources. In the specific case of Mozambique, specific attention will be directed to: (i) engagement with other coastal countries in the development of minimum terms and conditions of access to the tuna fisheries and related efforts to increase coastal state benefits Collaboration on MCS, including co-financing of offshore patrols in the waters of other regional countries subject to agreements and operating protocols, as may be agreed and financed; (ii) support to EAF management plans, in particular those developed under the South West Indian Ocean Fisheries Project (SWIOFP), including actions to conserve vulnerable species such as turtles, sharks, seabirds and iconic species, notably coelacanth and to protect critical habitats such as coral reefs, mangroves and coastal wetlands; effective management of by-catch, including reduction in unwanted by catch; (iii) management of other trans boundary stocks and fisheries including fisheries for coastal pelagics, lobster, shrimp and shared demersal stocks; (iv) collaboration on biosecurity issues.
- **Sub-component 3.2: Sustainable regional institutional arrangements**. Under this subcomponent further development and consolidation of sustainable institutional arrangements for regional fisheries collaboration through development of the SWIOFC and associated regional institutions, including the programming and financing of an agreed regional work program, continuation of priority activities emerging from SWIOFP and formulation of common approaches in global and regional for a, will be provided. It will include: (i) support for establishment of a permanent headquarters for the SWIOFC, which

is hosted by Mozambique. This will consist of construction of offices and conference facilities, office equipment, transport and communications facilities and housing; (ii) support to regional processes, such as the SWIOFC Secretariat, Regional Program Steering Committee (RPSC), SWIOFC Working Groups, and regional meetings; and their integration into SWIOFC agenda to avoid fragmentation and duplication; (iii) Assistance with legal, financial and other covenants as required to establish a functional SWIOFC Secretariat in Mozambique; (iv) support for regional MCS centers, including the SADC Regional MCS Center in Maputo.

- **Sub-component 3.3: Knowledge generation, exchange and capacity development**, which will focus on scientific, socio-economic, trade and governance priorities with a particular emphasis on co-management, tuna fisheries, marine tourism and building competitive businesses. Synergies with other regional initiatives including those supported by Southern Africa Development Community (SADC), NPCA (formerly NEPAD) and the Partnership for African Fisheries (PAF), EAF Nansen Program, SWIOFC and the International MCS Network, will be built.

Component 4: Program management and coordination. Under this component country implementation of the Program and coordination of the regional component through the National Program Steering Committee (NPSC) and the Program Management Units (NMU), will be supported. NPSC will have a supervisory role over the funds provided to Mozambique while the NMU will be responsible for the day-to-day management of the country-implemented investments of the Program. Technical assistance and operating costs for the NMU to be embedded in the Ministry of Fisheries and support the operation of the NPSC will be provided. The NPSC will be formed by representatives of the Ministries of fisheries, finance and/or planning and the fishing industry. In each country the Program will support the following: (a) establishment of the NMU, in terms of furniture, security of the premises, computers, printers, communications equipment and vehicles as may be required; (b) operating costs for the NMU, including salaries of Program Coordinator, Finance Officer, Procurement officer, M&E specialist, Environmental and Social Specialist and support staff, as needed; (c) local and international long and short-term consultant staff; (d) operating costs of the NPSC and any technical committees required; (e) auditing activities; and (f) mid-term review and final evaluation.

2.3 Anticipated sub-Project types under the Project

Physical interventions will be in the form of:

- Quays;
- Major improvements to fishing harbors or development of new marinas in the form of:
  - Rehabilitation or upgrading of fishing ports, landing sites, fish markets, laboratories and applied research assets, training facilities and social facilities for fisher associations and women's groups;
- Larger infrastructure and assets such as:
  - Strategic fishing port/landing facilities (Maputo, Beira, Quelimane Nacala and Angoche);
  - Fish chilling facilities at airports, and
  - Possible investments in improved enforcement capabilities.
- There will also be construction/rehabilitation of office/conference buildings/facilities to host permanent headquarters for the SWIOFC.

Although a significant number of the above-mentioned interventions are already at an advanced stage of planning a consultative and participatory process will be adopted in their finalization to ensure that the various classes of stakeholders are informed about them and get the opportunity to express their views and concerns. These views and concerns will be taken into consideration in the final siting, design, implementation and operation of the facilities. Hosting provinces and districts

will review their strategic development plans and ensure that relevant plans and projects become part of the Program.

The project will also deal with the soft aspects aimed at contributing to ensure that the receiving natural and social environment is used in a sustainable manner. At the regional level these will focus on (i) collaboration on trans boundary living marine resources; (ii) joint actions for selected fisheries, vulnerable species, habitats and ecosystems of regional importance; and (iii) addressing shared challenges, such as piracy, illicit fisheries activities, and securing coastal state benefits from marine resources. In Mozambique focus will be on: (i) engagement with other coastal countries in the development of minimum terms and conditions of access to the tuna fisheries and related efforts to increase coastal state benefits, including co-financing of offshore patrols in the waters of other regional countries; (ii) support to EAF management plans including actions to conserve vulnerable species such as turtles, sharks, seabirds and iconic species, and to protect critical habitats such as coral reefs, mangroves and coastal wetlands; effective management of by-catch, including reduction in unwanted by catch; (iii) management of other trans boundary stocks and fisheries including fisheries for coastal pelagics, lobster, shrimp and shared demersal stocks; (iv) collaboration on biosecurity issues.

2.4 Sub-project activities ineligible for funding

Sub-projects not eligible for funding include those that:

- Involve the significant conversion or degradation of critical natural habitats;
- Are in locations that are ecologically sensitive such as critical habitats such as coral reefs, mangroves and coastal wetlands and other unique habitats;
- Are located in gazetted national parks, conservation and/or protected areas, controlled fishing areas;
- Involve activities already covered by other sources of financing or are already included in other national, regional public development programs and where financing has been secured;
- Involve sub-projects which need large-scale land acquisitions from communities;

Clear selection criteria for the collaboration with investors will be developed with the objectives to minimize the environmental impacts as well as risks of significant social impacts, such as loss of assets by local people and other local entities.

3 PROJECT IMPLEMENTATION ARRANGEMENTS

3.1 Institutional Arrangements

The Ministry of Fisheries (MP) will be responsible for Program implementation and will coordinate Program activities to be executed by its directorates/departments as well as MF subordinate institutions, namely:

- International Cooperation – DCI;
- Fisheries Economy and Policy – DNEPP;
- Fisheries Surveillance – DNFP;
- Fisheries Technology and Equipment – DTEP;
- National Directorate of Fisheries Administration (ADNAP);
- National Institute for Fisheries Research (IIP);
- National Institute for Development of Small-Scale Fisheries (IDPPE);
- National Institute for Aquaculture (INAQUA);
- National Institute for Fisheries Inspection (INIP);
- Fisheries Development Fund (FFP); and
- The fishing port management bodies where the four ports are currently structured as four state-owned companies under the Ministry, and should soon be integrated under one unique Fishing Port Agency).

A National Program Steering Committee (NSC) involving representatives of the Ministry of Fisheries, the Ministry of Planning and Development, and the private sector will be responsible for overseeing the program and providing guidance in association with Bank supervision. On an ad hoc basis observers will be invited to participate in relation to specific issues.

There will be a National Management Unit (NMU) to work as the secretariat for the NSC. The NMU will have a Core Management Team and a Technical Team. The Core Management Team will consist of the following professionals:

- National Program Coordinator (consultant);
- Procurement Specialist (UGEA);
- Financial Management Specialist (DAF);
- Monitoring & Evaluation Expert (in-house from DNEPP);
- Environmental and Social Safeguards Specialist (in-house); and
- Program Economist.

The NMU will be supported by an Administrative Assistant (consultant) and it will be integrated within a Directorate of the Ministry.

A development finance institution contracted to address the economic analyses, feasibility studies, co-financing, credit and institutional and economic performance monitoring components over the course of the Program will also be hired to assist the NMU and to undertake capacity building.

The Technical Team will be determined by the prioritized requirements for Program implementation and will be structured to address the changing circumstances in the course of Program implementation. It would be recruited either directly or as part of a technical assistance contract with a development finance institution.

Additional coordination mechanisms which might be required to address issues arising from the involvement of a number of agencies in the execution of the Program activities will be specified in the financing agreement. The following will be taken into consideration:

- The NSC would require a formal link with the Ministry of Fisheries Consultative Council (Conselho Consultivo), which would receive regular reports on the Program and ensure iterative linkages with the Fisheries Master Plan (FMP);
- The Directorate of the Ministry of Fisheries to host the program (TBA) will oversee the day-to-day NMU activity;
- Each of the institutions dependent on the Ministry would appoint a Focal Point for the Program and the Focal Points would jointly form a technical advisory group for the NMU. The minutes of the technical advisory group, duly annotated by the NMU, will be provided to the NSC and the Consultative Council;
- The Program activities of the dependent institutions will have an agreed geographical focus to benefit from synergies and clustering of skills and support and to avoid dispersion of efforts.
- Efforts will be made to avoid duplication of administrative, financial and logistic processes at the provincial level either by different institutions or projects operating in the province or area.

3.2 Financial Management, Disbursements and Procurement

Program accounting, reporting, and auditing functions will be centralized at the NMU. Program financial reports will be consolidated by the NMU and submitted to the National Program Steering Committee, and subsequently to the Regional Program Steering Committee that will submit them to the Bank as part of Program progress reports.

Program funds will be deposited by IDA in a Designated Account (DA) at the Bank of Mozambique. Based on the cash needs and approved budgets of the project, funds will be transferred into the government's single treasury account, CUT. Subject to the overall control of the NMU and satisfactory fiduciary arrangements, some funds will be used directly by the implementing agencies (e.g. IIP, or IDPPE). The dependent institutions and implementing agencies will liaise with the NMU to ensure efficient procurement and avoid duplication of effort in terms of administration and logistics. At the provincial level the activities will be part of a common integrated approach by the dependent implementing agencies.

The program will use transaction based disbursements (Statements of Expenditure – SOEs) through the use of the Advance disbursement method. It may also make use of other disbursement methods/procedures such as (i) Reimbursement disbursement method, whereby the Bank reimburses the GoM for eligible expenditures pre-financed using its own resources; (ii) Direct Payment method, by which at the borrower's request, the Bank makes direct payments to suppliers and contractors from the Credit account; (iii) the Special Commitment method, whereby the Bank will issue special commitment to commercial banks for payment of eligible expenditures

The Ministry of Fisheries and accredited subordinate institutions will use the SISTAFE and CUT and a consolidated SISTAFE account will be prepared at Ministry level. IFAD and Nordic projects will have made the SISTAFE fully operational in the Ministry by Program initiation and current delays in procurement resolved.

The NMU will enhance the current Program management capability within the Ministry of Fisheries through a full matching set of Program coordination, planning, tendering, procurement, financial management and technical staff training. The Program will be supported by nominated focal points in each implementing agency working as a technical advisory group and by provincial coordinators as the may be. A dedicated procurement officer will be part of the PMU and a detailed Program Implementation Manual will be prepared to specify the modalities for both domestic and foreign procurement and payment procedures. The procurement processes will be in line with the governance and anti-corruption plan of the Ministry and there will be training and monitoring of procurement officers in the subordinate institutions.

3.3 Monitoring & Evaluation

The Program will use the *Dashboard* and *Doing Business* activities to monitor impacts in addition to the regular monitoring of disbursements and outputs. These will require substantial investment in information systems.

M&E function will be embedded in the Program and will serve not only to track the Program but as the knowledge backbone (drawing lessons learned) of the sector used for policy and planning purposes at country level. The information system will have a regional and community base and feedback would be generated not only at Program and country level, but also at community and fishery scale, making the system a knowledge tool rather than simply a Program monitoring requirement. The specific Program impact indicators will be tracked in the Dashboard and the existing baselines will be further verified during the Program inception period.

A first step in the M&E process will be to implement, under Component 1, the fisheries statistics master plan and develop the core economic tracking modules to deliver an economic dashboard for the sector. The second and concomitant step will be to link the dashboard to the milestones of the Fisheries Master Plan and to the performance indicators and deliverables of the dependent institutions and major projects.

Specific results of the Program will be tracked through the enhanced fisheries statistical system and dashboard. In addition to conventional recording and analysis of capture fishery and aquaculture production, catch per unit of effort, imports, exports, and fish prices, this would include close tracking of the economic performance of a representative sample of private sector operators and tracking of credit performance both by lenders and borrowers. As part of the economic dashboard, initial 'green accounts' would be established to reflect the changing value of the natural capital - the fish stocks. Selected '*Doing Business*' indicators and actionable governance indicators (taken from the WBI Governance Indicators) complemented by key sector indicators will be used to inform the dashboard, the Ministry, the private sector and the Program oversight. Specific linkages will be made to the FMP through attention to fish food supply, sector balance of payments, private sector performance and employment. Rather than duplicating effort in monitoring the artisanal fisheries, the Program will use the core ProPESCA indicators, where necessary supplemented with tracking of resource and co-management performance.

Monitoring and evaluation of outcomes and results during implementation will be in line with standard World Bank procedures. The NMU will collect and present data and reports for quarterly review by the TTL and bi-annual review by the National and Regional Project Steering Committees together with the World Bank supervision missions. Discussions during supervision missions related to institutional capacity building, financial viability, technical reviews and site visits will also be effective means of monitoring progress. The progress reports will be published and will be accessible to managers and decision makers. The AFD will adopt the World Bank procedures.

4 DEVELOPMENT CONTEXT IN MOZAMBIQUE AND THE PROGRAM AREA

To better understand some of the issues that will determine the (final) design, environmental licensing, implementation and management of the project planned interventions, it is important to briefly make notes of the development context in the country in general, and the program areas and fisheries sector in particular.

4.1 General Country Development Context and Project Relevance

SWIOFISH happens at a time when Mozambique is experiencing economic growth rates of an annual average situated above 7%3 in real terms and continues to be one of the fastest growing economies in Africa and the world, with reduced inflation, which, due to sound macro-economic policy management.

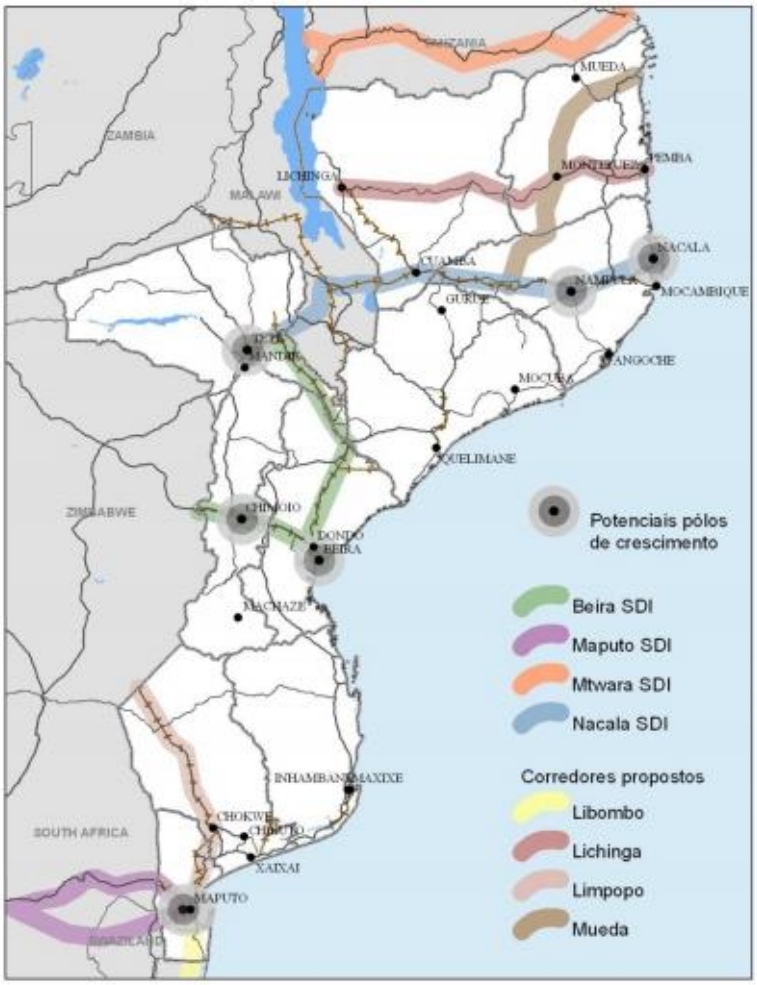
In the last few years, extensive reserves of coal, gas and other minerals have been discovered and are beginning to be exploited. The current and future developments associated with mineral resource exploitation have the potential to radically change the structure of Mozambique's economy and society at the same time that pose serious challenges to the country's capacity to embark on an inclusive economic growth as espoused by the approved and on-going poverty reduction strategy or PARP III (2011-2014). These developments also further compound the existing challenges of promoting sustainable development as they will exacerbate the needs for human and institutional capacity for management of traditional and new sectors of the economy such as water, agriculture and forests, mining, fisheries, tourism, energy, transport (roads/bridges, airports and ports), tourism, etc. and their inter relationships including the recent challenges related with climate change adaptation and mitigation. Some of these sectors are directly related with fisheries development and also translate into additional challenges to this sector.

Mozambique has a total area of approximately 800,000 km^2 and a population of 20.4 million inhabitants (INE, 2007) of which over 64% continue to live in rural areas, with more than 60% living in coastal regions. Its GDP per capita is now estimated at USD 590[4], significantly below the average for developing countries in sub-Saharan Africa (USD1,424) and very close to the average for low-income countries worldwide (USD 581). The country is bordered to the east by the Indian Ocean, with which it forms a border of more than 2,700 km that is a major port of entry and exit of goods to the country itself and the hinterland countries bordering Mozambique, namely South Africa, Swaziland, Zimbabwe, Malawi and Zambia. To the north, the country is bordered by Tanzania, which also has direct access to the Indian Ocean. This geographic positioning of the country's ports has resulted, from the colonial period, in the development of three important corridors in the east-west direction and vice versa, meant precisely to serve neighboring countries. These are the corridors of Maputo, Beira and Nacala, which have railway lines as one of their main components. Other components of the corridors are highways, power transmission lines and communications (see Figure 1).

[3] The World Bank estimates that Mozambique's economic growth averaged 8.1% over the period 1995–2010 (WB, 2013)

[4] It was estimated at USD 318 inn 2012 (Ernest & Young, 2013).

Figure 1: The main development corridors in Mozambique



Source: World Bank (2010)

After about a decade of centralized economy and just over 16 years of armed conflict from the mid-1990s, the accelerated growth rates that the Mozambican economy has been recording are supported by high levels of assistance from Development Partners. They result from the efforts in the field of macroeconomic policy management and strengthening the enabling environment for promotion of domestic and foreign private investment. Notwithstanding the effects of external shocks with negative impacts on the economy and society, the country tends to register high rates of economic growth, which is accompanied by a climate of political and macroeconomic stability with average inflation rates in the order of a single digit. Economic growth has been driven by (i) foreign direct investment in mega projects[5] and operating large-scale high-value agricultural products such as cotton, sugar and tobacco, (ii) the favorable agricultural growth at the family sector level, and (iii) infrastructure rehabilitation projects, including roads.

However, despite the remarkable ongoing growth progress, the country continues to be among the world's poorest and heavily dependent on foreign aid. On the 2013 United Nations' human development index (HDI), Mozambique ranks as the 185th of 187 countries. A number of institutional constraints and other constraints continue to obstruct the delivery of basic services (e.g. water supply, sanitation, education and health services) and there are many challenges that remain. In 2010, MPD data indicated that between 2002-3 and 2008-9 there was a slight increase in

[5] e.g. Aluminium Smelter (Mozal), gas exploration (SASOL), Moma heavy minerals and coal in Tete province for a number of actors.

the incidence of poverty (consumption), which rose from 54.1% to 54.7%. Rural poverty has been the worst although in recent years urban poverty is increasingly becoming a serious concern.

The Government is in the process of implementing a second set of structural reforms that will take advantage of the prevailing macroeconomic climate. The main targets of these reforms are: (i) the public sector, (ii) fiscal policy, (iii) governance and, (iv) the business environment, including the creation of an enabling environment for the establishment and development of small and medium-sized enterprises (SMEs).

More recent analyses have highlighted the fact that the Mozambican economy is characterized by a very small number of mega projects on the one hand, and the family and informal sector, on the other. This encourages imbalances in development and particularly with respect to the diversification of production and access to the benefits of the development by a significant proportion of the population[6]. Among other things, investments in infrastructure such as roads, ports, water supply and sanitation, energy, telecommunications, etc. should continue to play a role in this process of stabilization and gradual elimination of imbalances.

Strengthening small and medium size enterprises (SMEs) is seen as key to changing the prevalent situation.

SMEs (both formal and informal) represent about 98.6% of all enterprises, employing 43% of the workers and accounting for 76% of the total sales. Trade and service sectors form the bulk of business units, with commerce and retail businesses accounting for close to 60%, restaurants and accommodation 20% and manufacturing less than 10%. Most of these SMEs typically grow informally and as a reaction to immediate market deficiencies.

Studies show that despite the SMEs' importance in national economic development and poverty alleviation they lack growth perspectives, due in part to the entrepreneurs' and workers' poor education and training skills, cumbersome regulations, high cost of credit and poorly developed basic socioeconomic infrastructure.[7] As a result, local entrepreneurs tend to diversify into a large number of relatively small and uncompetitive businesses rather than grow promising small businesses into large ones that could reach out to more people and offer more income generation opportunities (job creation, gender mainstreaming, etc.).

In 2007, the government approved the "Strategy for the Development of Small and Medium Size Enterprises in Mozambique." The strategy underscores the central role SMEs are expected to play as drivers of employment, competitiveness, diversification and innovation, including SMEs' role in mobilizing social resources. The strategy relies upon three major pillars:

- Improve the business environment for SMEs
- Strengthen SMEs' technological and management capacities (capacity building)
- Give strategic support (e.g. to exporters and high-tech firms, etc.)

The reduction of transaction costs for SMEs is also given high priority. Among other provisions, the strategy introduces the notion of a 'negative licensing system', which means that any SME that applies for a license is automatically licensed unless the competent authority explicitly objects the application for justified reasons. It also advocates simplification of the arbitrary inspection and tax systems. The subsequent "Strategy for Improving the Business Climate", approved in 2008, deals with these issues in more detail.

[6] Carlos Nuno Castel-Branco (2008) "The Mega Projects in Mozambique: What Contribution to National Economy?" Civil Society Forum on Extractive Industries, Natural History Museum (Maputo), 27 and 28 November 2008.
[7] M. Krause and F. Kaufman, "*Industrial Policy in Mozambique*", 2011.

Another aspect that needs to be addressed in the Mozambican economy has to do with the fact that due to historical factors a significant number of development sectors (roads, railways, energy, telecommunications, etc.) have focused mainly on serving the region in detriment of domestic needs. The largely functional corridors of Maputo, Beira and Nacala, which link Mozambique to South Africa, Swaziland, Botswana, Zimbabwe, Malawi and Zambia, respectively, are a good illustration of this phenomenon.

In addition to being continuously under improvement, these three corridors already have efficient railways and road facilities including telecommunications and energy that are in dire contrast with the only and deficient road linking the south to the north (N1) of the country. More internal roads and corridors could play a crucial role in revitalizing the domestic economy, and ultimately with tangible impacts on the regional economy as well. Agriculture and fisheries which form the basis of the national economy would benefit significantly from such domestic developments.

It is worth mentioning that there is also a growing fear from various sectors inside and outside the country that the availability of foreign investment in mega-projects in areas such as mining, power generation, petrochemicals, smelting and transport infrastructure has created easy growth options that diminish the incentive for the government to undertake the more challenging reforms that would remove structural obstacles to broad-based growth. This could also influence negatively the attention to be given to agriculture and fisheries.

Under such a context, the project is highly relevant. Focusing on the fisheries sector and through its four major components and subcomponents, and particularly those dealing with infrastructure development, linkages and general improvement of the business environment it will support government's efforts in the establishment of the necessary infrastructure network, pilot and demonstrate viable socioeconomic interventions, assist in capacity building and provide adequate monitoring and evaluation mechanisms that will benefit the project areas in particular, and country as a whole. It will also link national development efforts with those of the West Indian Ocean region in realizing the potential of the fisheries sector to boost national economy and general socioeconomic development.

4.2 Country's Reliance on Agriculture and Fisheries and Poverty Reduction

In Mozambique more than 70% of the population relies upon subsistence agriculture and fisheries for their livelihood with women being the majority. Thus, agriculture and fisheries are the key sector in the country's development strategy, which focus on poverty alleviation and is translated into 5-year government plans (PQG). The ongoing poverty reduction strategy (PARP III, 20111-14) focuses on (i) increased agrarian and fisheries production; (ii) promotion of employment; (iii) human and social development; (iv) governance; and (v) macroeconomic and fiscal management. One of the biggest challenges is the promotion of equity in development. Among other the strategy is aimed at addressing imbalances in development, particularly with respect to the diversification of production and access to the development benefits by a significant proportion of the population. Significant investments in infrastructure such as roads, water supply and sanitation as well investment in the adding of value to the primary sectors of the economy where the majority of the country's population is active (i.e. agriculture and fisheries) should continue to play a vital role in the stabilization and gradual elimination of imbalances.

At the macroeconomic level, PARP III[8] defines the main policy guidelines leading to the integration of the economic, social and environmental issues into the poverty alleviation strategy. One of the biggest challenges is the promotion of equity in development. Agriculture and fisheries are seen as the base of the economy that should be used and at the same time be assisted to (i) provide opportunities for productive employment for a large part of its population including direct access by such people to the income arising from such occupation; (ii) ensuring food security; (iii) the

[8] Poverty Reduction Action Plan 2011-2014

diversification of food production and a series of productive sectors and sub-sectors (e.g. industry, trade, tourism, etc...); (iv) improve the balance of payments through a reduction in imports and increase in exports, etc.

Mozambique has a wealth of natural resources to rely upon to promote the development of the above-mentioned primary sectors of its economy. Current estimations, and according to an AFD study (AFD, 2009), are that 49% of the country's total wealth is natural capital, as opposed to 24% in the other sub-Saharan African countries. Existing resources, which include fisheries, can serve as a platform for economic growth and poverty alleviation. Due to its current level of socioeconomic and technological development the country relies heavily on its natural resource base.

The subsistence and well-being of the majority of people depend largely on access to land, water resources, forestry products, fisheries, mineral resources and other natural resources. At present more than half of the Mozambican population, respectively, lies below the national poverty line. About 64% of Mozambicans live in rural areas. Mozambican ecosystems are also highly vulnerable.

Fisheries, forests and mining sectors offer a series of concrete examples of opportunities that do not match their potential profitability through national revenues. The economic implications of the potential gaps and failures of the sector policies and regulatory approaches are very significant[9]. The government is certainly abdicating significant revenues with unclear benefits, while not inducing an efficient use of resources. This also applies to fisheries resources including to those situated in the program areas.

4.2.1 The Fisheries Sector

More specifically the fisheries sector contributes significantly directly and indirectly to poverty alleviation and socioeconomic development in general. At 2%, the direct contribution of the sector to the GDP might be moderate, but it has a considerable weight in food security and particularly access to animal protein (i.e. 50% of animal protein consumed in the country) by a significant proportion of the country's population in rural and urban areas, balance of payment, public revenues, employment and gender equity. Around 850,000 households, or about 20% of the population, rely on fisheries for part of their income and a larger proportion relies on fishing for subsistence and food security.

The country's coastline of about 2,700 km, is divided into three zones, each with differing ecological conditions, two large bodies of inland water (Lake Niassa and the Cahora Bassa dam lake) and small lakes and rivers scattered throughout the country. The distribution of fishery resources is dependent on these differing conditions: in the estuaries and bays small pelagic fish, soft bottom demersal fish, abundant crustaceans, bottom demersal species and some large pelagic fish in the vicinity of the near-shore islands, tilapia, catfish (Niassa) and tiger-fish, tchenga are found in the in the large inland water bodies as well as catfish and tilapia in Cahora Bassa.

Of the 130,000 tons of annual marina catches 91% are in the hands of artisanal fishing, 2% semi-industrial for local consumption, and 7% industrial fishing. The industrial catch, consisting mostly of crustaceans for export, represents about 52% of the total value, while artisanal fishing is situated around 42%, and the remaining 6% comes from semi-industrial fishing.

There are indications[10] to the effect that, if effective measures are taken, economic rents from the shrimp fishery could be increased by about $30 million per year. Linking sustainable community

[9] Mozambique: Economic Analysis of Natural Resources Sustainability. The World Bank, 2005.

[10] IIP, ADNAP, Ministry of Fisheries. 2011. Report on the possible conversion of the Sofala bank shrimp fishery to a TAE/ ITE management system. November 2011; Agence Française de Développement 2009. Enhancing National Economic Welfare from Mozambican Fisheries - Policy and Management Implications. Discussion Paper.

fisheries to urban markets, industrial growth poles and export markets can strengthen rural employment and growth.

Notwithstanding the potential of the activity fishing communities are among the most vulnerable, isolated and marginalized. Some of them are landless and situated in the front line of climate change, subject to flooding, erosion, changes in fish resource distribution, extreme weather events and sea-level rise.

The sector as a whole faces a number of threats such as weak management of the significant shrimp fisheries combined with rising fuel prices and reduced demand for high value shrimp which translate into the decline of the sector's economic performance in recent years. The concentration of the shrimp fishing into two majority foreign-owned industrial companies has impacted on the distribution of benefits from the fishery, eliminating smaller and economically less robust Mozambican operators. The number of artisanal fishers involved in marine fisheries doubled[11] from 2002 to 2007 leading to overexploitation of artisanal fisheries. Declining terms of trade, low, or negligible domestic value added to fish products and recent outbreaks of farmed shrimp diseases that contribute to weak sector growth. The prevailing unattractive business climate including poor access to investment capital and credit translate into low private sector investment, and with real interest rates in the order of 18-30 percent and a weak network of rural and micro-credit organizations, financing sustainable fisheries and aquaculture remains a challenge.

Threats extend to piracy by Somali vessels and possible pollution by mineral and petroleum explorations and extraction. The megaproject growth poles attract commercial investments with expected high short-term returns, while the finance for the longer-term investments required in fisheries and agriculture remains elusive – partly attributable to "Dutch disease".

In line with what happens in other sectors of the economy there is increasing interest from SMEs in 'semi-industrial' fisheries for snapper, tuna, swordfish and other high-value species. About 80 percent[12] of the rural fisheries labor is fishing (harvesting); less than 10 percent is processing and marketing, while over 80 percent of artisanal fish production is taken to market on foot. This offers significant opportunities for women to add value to the harvests. Moreover, a rapidly expanding tourist industry offers opportunities for diversification of the coastal economy along Mozambique's 2,700 kilometers of coastline and related coastal lakes, lagoons and wetlands which harbor a rich diversity of wildlife.

The government has developed a Fisheries Master Plan (2010-2019) to deal with most of the constraints that interfere negatively with the realization of the sector's potential and to boost such a potential.

The FMP grouped the major issues affecting the sector in the following manner:

i. The supply of fish products to the population is low and uneven throughout the country;
ii. Industrial fisheries, aquaculture and small-scale fishing are not contributing all they could to the country's economic and social development, i.e. the fight against poverty;
iii. The sector's contribution to the Balance of Payments has not reached its potential and communities of small-scale artisanal fishermen and aquaculture farmers are still poor;
iv. Simultaneously, the public administration of fisheries does not have the necessary capacity to eliminate these problems and address other crosscutting issues both within the sector (Environment, Lake and Marine Conservation Areas) and outside it (Governance, HIV/AIDS and Gender).

[11] Some of the increase may be attributable to an expansion of the statistical cover.
[12] IDPPE, 2011. Resultados do inquerito sobre as condições de vida nas comunidades pesqueiras. Resultados preliminares.

The FMP is aimed at addressing six main issues:

i. Restructuring the industrial and semi-industrial shrimp fishing fleets;
ii. Diversification and growth of industrial and semi-industrial fisheries production;
iii. The growing role of private initiative as the engine driving national development and the corresponding reduction in State intervention in the productive sphere;
iv. Construction of a Fisheries Public Administration focusing on policies and strategies, development plans, fisheries legislation, creation of an economic environment favourable to investment and conflict arbitration;
v. Improved standard of living for artisanal fishermen
vi. Human resource development

The vision for the development of the sector acknowledges that in the years to come artisanal fisheries, which is the most significant in terms of volume and contribution to the economy will continue to be undertaken by forms of artisanal subsistence. However, the same has to be increasingly linked to the country's markets, and integrated into communities where social services have made substantial progress.

It is also anticipated that there will be relative progress in the types of commercial artisanal fishing in defined fishing centers, closely linked to domestic markets and increasingly to regional markets with more services that complement fishing (maintenance, marketing, financial services, ice supply, conservation, etc.), consequently providing greater quality and variety of fishing products, encouraging a greater concentration of artisanal fishing and therefore higher incomes for all stakeholders. This should take place within a framework of greater environmental stability where the role of local initiative for development and the administration of artisanal fisheries will be progressively strengthened. This vision about development is not unique of the fisheries sector. It also applies to agriculture and other primary sectors of the economy.

The FMP is informed among other by the following strategies and medium to long term planning instruments in the sector and related sectors:

- Aquaculture Development Strategy in Mozambique aimed at ensuring that aquaculture potential is used to the full and sustainably, respecting the environment and promoting economic and social development by creating a sustainable, competitive and diversified aquaculture. It should be said that the country has a strong aquaculture potential which is presently underutilized. SWIOFISH will also contribute to promoting this subsector;
- Development plan for Small-Scale Aquaculture
- Fisheries Research Development Strategy
- Management Plan for the Sofala Bank Shrimp Fisheries (not yet approved)
- National Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing, which is aimed at obtaining knowledge about the extent and impact of its occurrence in the most important or most vulnerable national fisheries

The main objectives of the FMP are to achieve:

- A stronger sector contribution to improving food security and nutrition in fish for the population;
- Improved living conditions for artisanal fishing and small-scale aquaculture communities;
- Increased contribution by industrial and small-scale fisheries and aquaculture to achieving the country's economic and social development objectives, and
- An increased net sector contribution to greater equilibrium in the country's balance of payments;

The development of fisheries infrastructures and other infrastructures aimed at adding value to the industry is given particular importance. Among other these infrastructures include:

- ports, fishing quays and wharves;
- public markets for selling fish products that are part of marketing circuits, whether the first point of sale or sale to the consumer;
- experimental and training/extension centers dedicated to aquaculture

In addition to offices and conference rooms these are the infrastructures to be rehabilitated and/or constructed under the program, which justify the preparation of the ESMF.

5 - PROGRAM TARGETED AREAS

5.1 Location

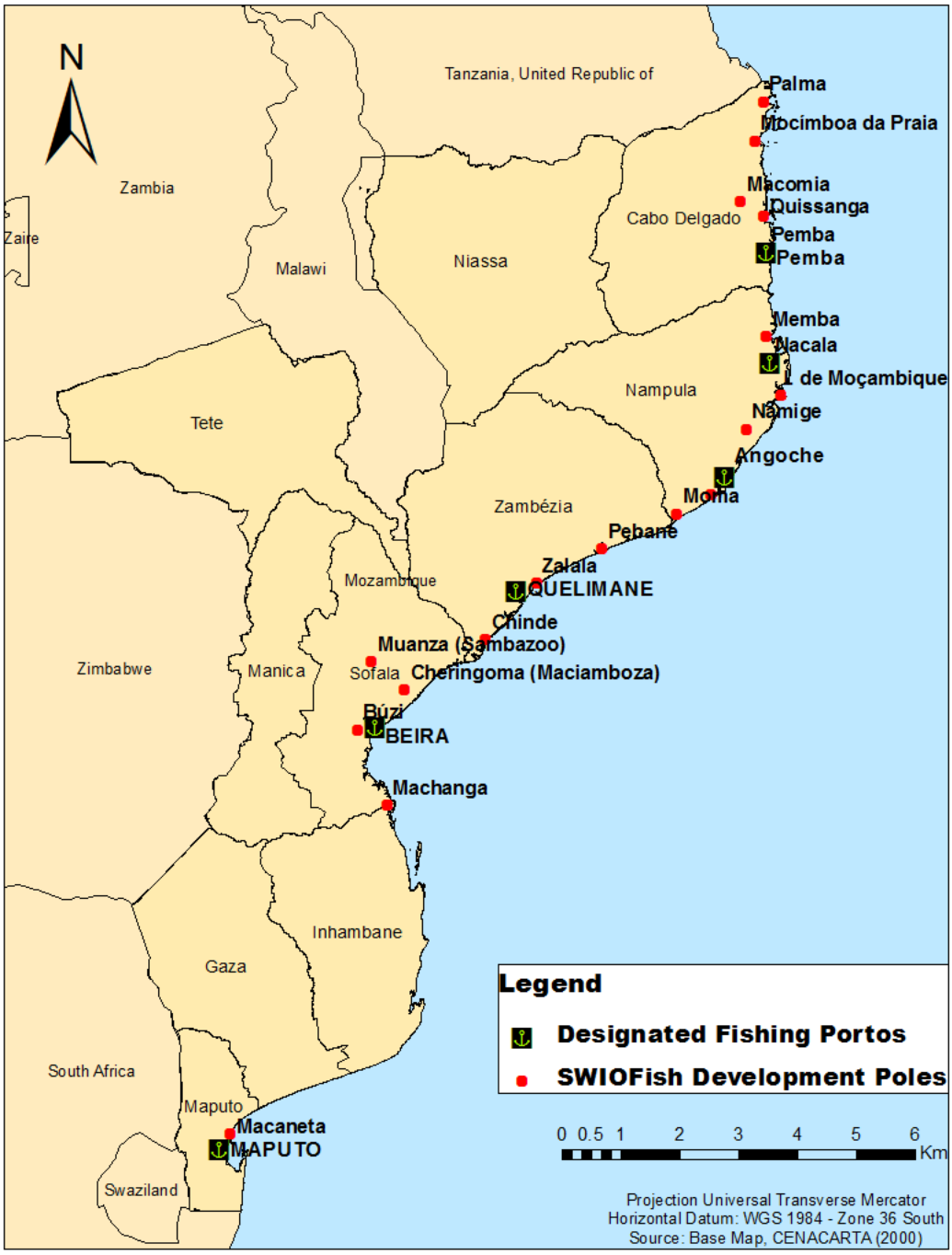
In broad terms the program area comprises five Mozambican provinces and three major fisheries clusters in the three northern, central and southern regions, namely: (i) Cabo Delgado and parts of Nampula provinces (i.e. Nacala and Ilha de Moçambique) that form the northern cluster; (ii) parts of Nampula (Angoche), Zambezia and Sofala Provinces that form the Sofala Bank cluster; and (iii) Maputo Province forming the southern cluster. More specifically areas where SWIOFISH program activities are likely to happen comprise:

Table 1: Program areas

Provinces	Districts/Localities Likely to be SWIOFISH Development Poles
Cabo Delgado	Palma, Mocimboa da Praia, Macomia, Quissanga, Pemba
Nampula	Memba, Nacala (inclding its port), Ilha de Moçambique, Mogincual (Namige), Angoche (including its port), Larde, Moma
Zambézia	Pebane (Cuassiane), Zalala (Nicoadala), Quelimane (including its port), Chinde
Sofala	Cheringoma (Maciamboza), Muanza (Sambazóo), Cidade da Beira (Njalane and Praia Nova), Buzi (Nova Sofala) Machanga (Chiloane)
Maputo	Maputo Port and Macaneta

The map below is a graphic representation of the geographical distribution of potential areas for SWIOFish Program.

Figure 2: SWIOFish Map in Mozambique



As already indicated the port of Maputo, Beira, Quelimane, Nacala and Angoche have a strategic position in the fisheries sector and program.

The Maps below are an attempt of illustrating the three main clusters covered by the program.

Figure 3: The northern cluster

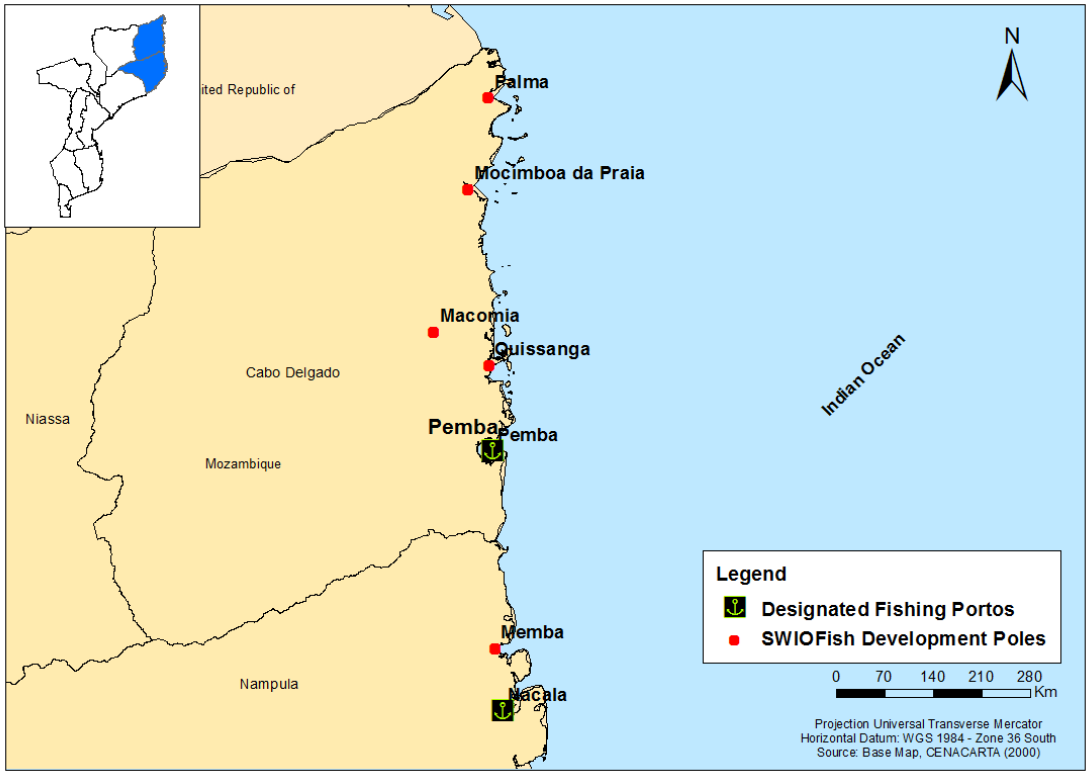


Figure 4: The Sofala Bank cluster

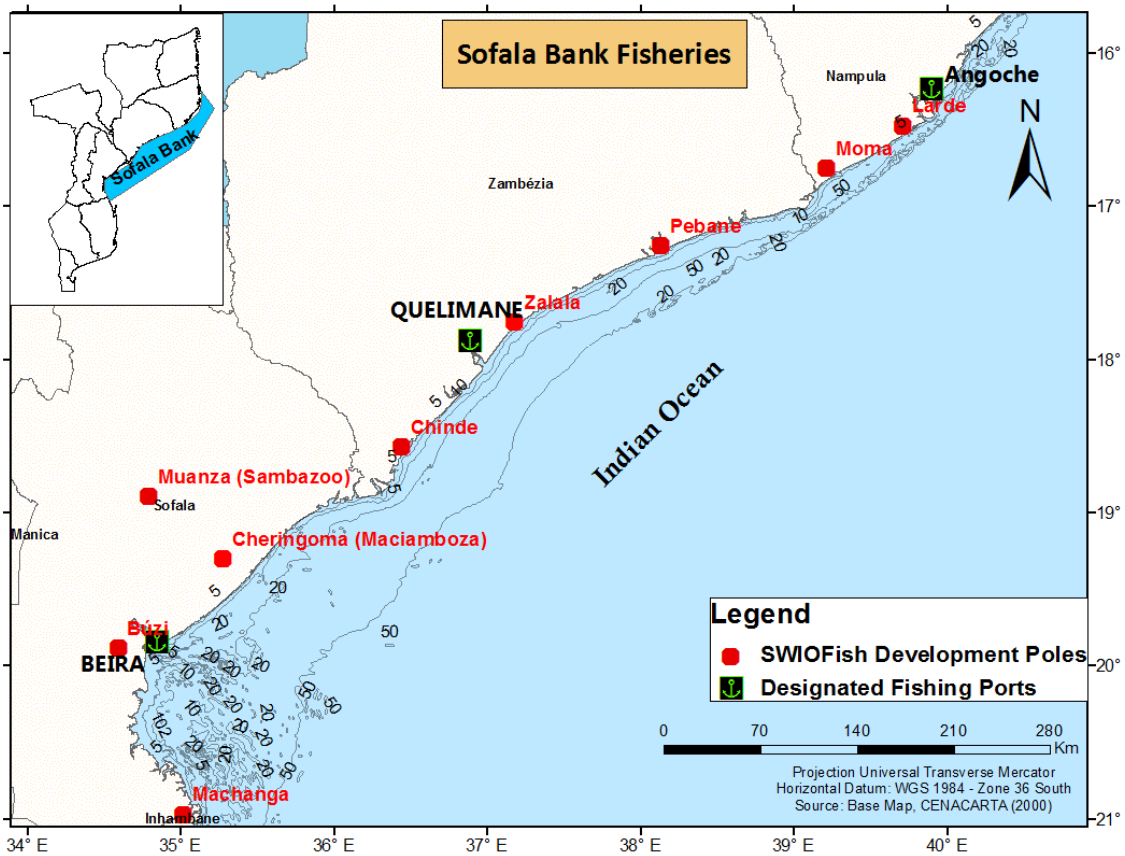
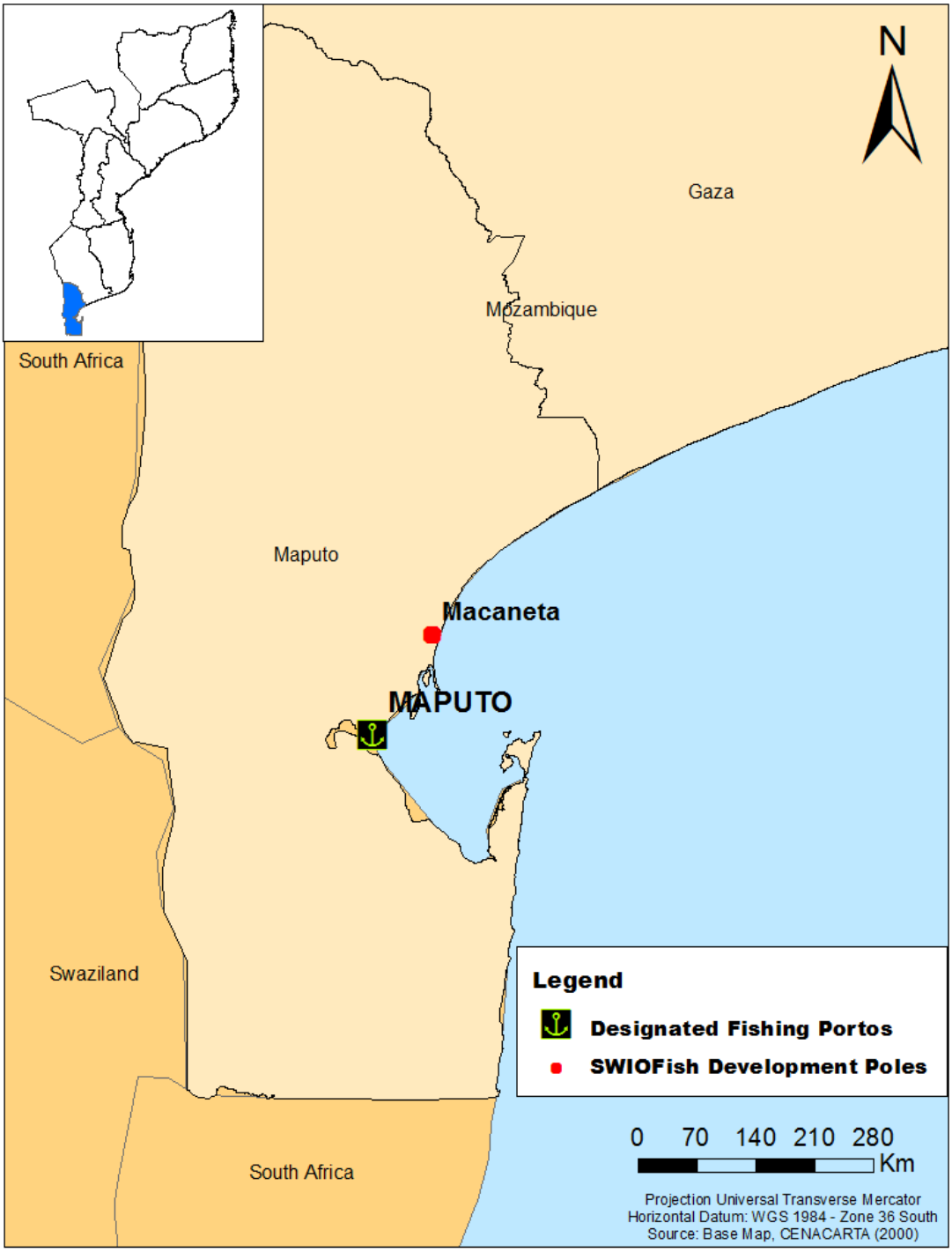


Figure 5: The southern cluster



These initial definitions of the program boundaries, which were drawn on the basis of areas known as having potential to develop the kind of fisheries envisaged by the program, may be refined as more specifications about main areas of intervention become known.

5.2 Physical Environment

The country's long coastal line of about 2,700 km comprises natural different conditions from up North in Cabo Delgado Province to Maputo Province, in the South. In terms of water bodies and fishing, the North-South trend of the cost creates conditions for the subdivision of the country in three main zones, each with different ecological conditions (North, Centre, South) and a separate group forming the inland water (Lake Niassa and the Cahora Bassa Dam lake and a series of small lakes and rivers scattered throughout the country). These natural conditions determine the distribution of fishery resources in these areas. For more details for types of fish in Mozambique refer to the *Strategic Plan for the Artisanal Fisheries Sub-sector (PESPA), published in* 2006,*by the Ministry of Fisheries (National Institute for the Development of Small Scale Fisheries).*

Twenty three areas have been selected for possible implementation of the program and these are located in the Provinces of Cabo Delgado, Nampula, Zambezia, Sofala and Maputo.

In Cabo Delgado Province these are Palma, Mocimboa da Praia, Macomia, Quissanga and Pemba Districts. In Nampula Province Memba, Nacala, Ilha de Moçambique and Mogincual (Namige), are being considered. In Zambezia Province, the Districts of Pebane (Cuassiane and Pebane village), Nicoadala (Zalala), Quelimane and Chinde are selected. In Sofala Province: Cheringoma (Maciamboza), Muanza (Sambazóo), Beira Town (Njalane, Praia Nova), Buzi (Nova Sofala), Machanga (Chiloane). In Maputo Province, Marracuene District (Macaneta) and the port of Maputo have been selected for this program.

The physical environment of each area has different general characteristics of the major water bodies, specific conditions for accessing the open sea, major lakes and rivers, including islands and bays. The geology, climate, hydrology and other natural characteristics are also different and will be briefly described in this subchapter.

Based on their similarities the twenty three different points with potential to accommodate the various program interventions have been grouped as a way of facilitating the analyses.

5.2.1 Cabo Delgado Province

5.2.1.1 General Descriptions

In this province the program will be mainly implemented in the following areas, with the following general characteristics:

- **Pemba City:** The district of Pemba-Metuge is crossed by four major periodic rivers. The most important body of water is the Pemba Bay, formed by salt water. Near the Pemba Bay, there are some lakes of water with few variations in depth of their beds (MAE, 1985a). There are no islands in Pemba area. Some Islands showing a North-South trend are found 30 kilometers north of the town. The access to the Indian Ocean is made from the bay entrance, formed by the southern end (Ponta Maunhane) and northern end (Ponta Said Ali).
- **Palma District:** Palma is a district of Cabo Delgado Province, its capital is the town of Palma, for which the Tunge Bay gives accesses to the Indian Ocean. The district encompasses several islands formed by the Quirimbas Archipelago, such as: Metundo, Vamizi, Queramimbi, Rongui and Tecomaji. The district also includes, in its northeast end, the "Quionga Triangle", a small territory on the right bank of the Rovuma River.
- **Mocimboa da Praia District:** Mocímboa da Praia has the town of Mocímboa da Praia as its capital, which has direct accesses to the Indian Ocean. Several Islands (that are also part of the Quirimbas Archipelago) are found in the eastern site of the capital. In 1998 the town of Mocímboa da Praia was elevated to the category of a municipality.

- **Macomia District:** Macomia is a district of Cabo Delgado province in Mozambique, with its capital in Macomia which has direct accesses to the Indian Ocean. The most important point for fishing and accesses to the Indian Ocean is the Mucojo Administrative Post. Olumbua Provocation, on the western side of Metemo Island is another point with direct accesses to the Indian Ocean and suitable for implementation of fishing project. The Quifuqui and Tambuzi Islands are the most important in this area. The Quirimbas National Park is located in this district.
- **Quissanga District:** Quissanga is a district of Cabo Delgado province in Mozambique, with its capital in Quissanga town, which also gives direct accesses to the Indian Ocean. Associated or near to the Quissanga District, there is the Ibo Island (within the District of same name). The island of Ibo District located in the east is the most favorable fishing commercial site in the area. The district includes two major islands of the Quirimbas: Mefunvo (or M'funvo) and Quisiva. Ibo Island is a small coral island located near the coast of Cabo Delgado Province in northern Mozambique.

5.2.1.2 Geology

The geology of Pemba area is characterized by two principal units: the crystalline and metamorphic rocks from mesoproterozoic and phanerozoic sediments.

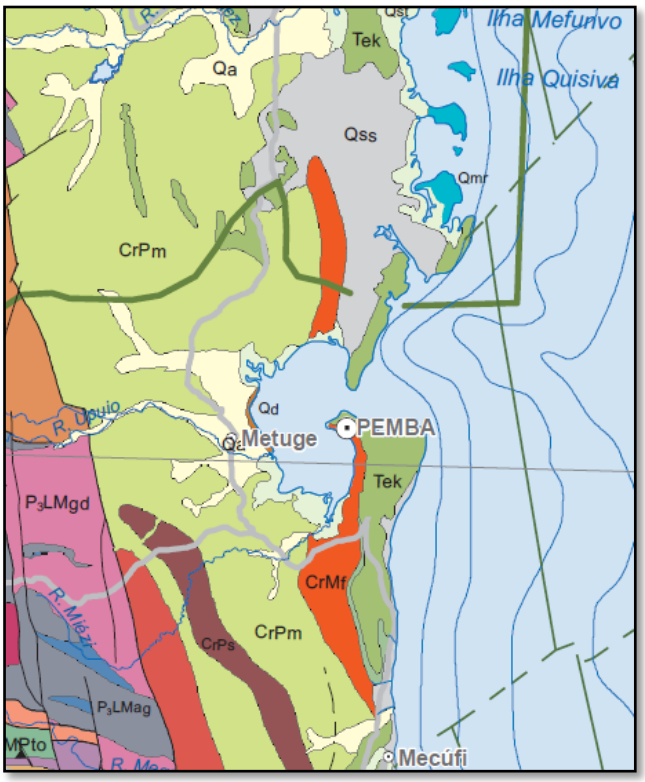
The Proterozoic rocks crops in the western portion of Pemba region, up to the West of Metuge Village and are composed of Anphibolitic, tonalitic, granitic to granodiorite gneisses. Within Proterozoic unit, biotite gneisses are also found.

To the West of Metuge Village, there are relatively linear N-S faults making contact from the crystalline proterozoic rocks and the Mesozoic to Cenozoic sediments, implying a rifted setting during sedimentation (Grantham G.H. et al. 2008).

The coastal cover rocks contain interlayered siltstones, sandstones, calcareous sandstones and calcareous from Mesozoic to Cenozoic age. These sediments have been deposited under conditions of numerous transgressions and regressions of sea levels. They include the Macomia/Pemba (sandstones and conglomerates), Mifume (marl, limestone and gypsum) and Mikidane (unconsolidated sands and conglomerates) formations.

On top of the previous units, there are several compacted and friable sediments deposited. They include the coral reefs, sub-tidal sand bars and intertidal sand flats and estuarine infill, mangrove swamps and salt flats. A simplified geological map of Pemba area is presented below.

Figure 6: Geological map of Pemba area[13]



The geology of north of Pemba is characterized by the Rovuma Basin, extending from Rovuma River to the south. Unconsolidated sands, sandstone and conglomerates of Mikidane Formation, quaternary costal sands dunes and alluvial are the most common lithology (see figures above). The islands are formed by coralline sandstones and limestone, overlapped by sand dunes and mangrove forest. The later is a product of saline estuarine.

[13] P_3LMgd- granitic to granodioritic gneiss; P_3MPto-tonalitic gneisses; P_3LMag- Amphibolite gneisses; CrMo-Macomia Formation; CrPs-Pemba Formation; Qss-Sand sheet with local gravel; TeK-Mikidane Formation; Qmr-Coral reef. Geology map extracted from the million map (Grantham G.H. et al. 2008).

Figure 7: Geological map of Palma and Mocimba da Praia region[14].

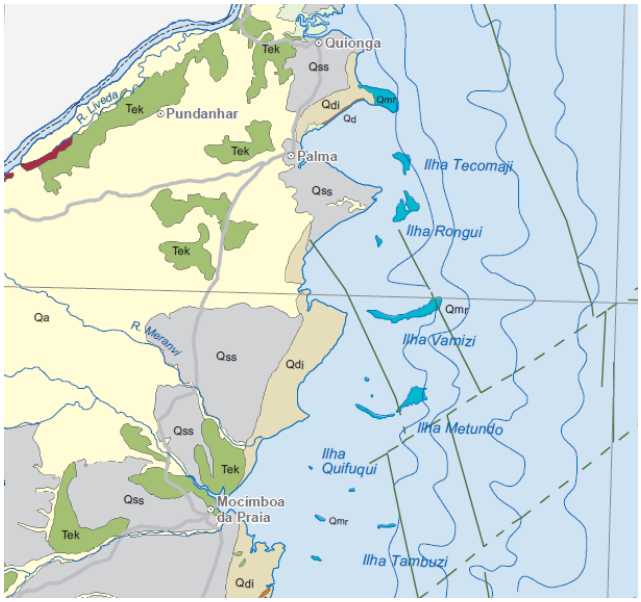
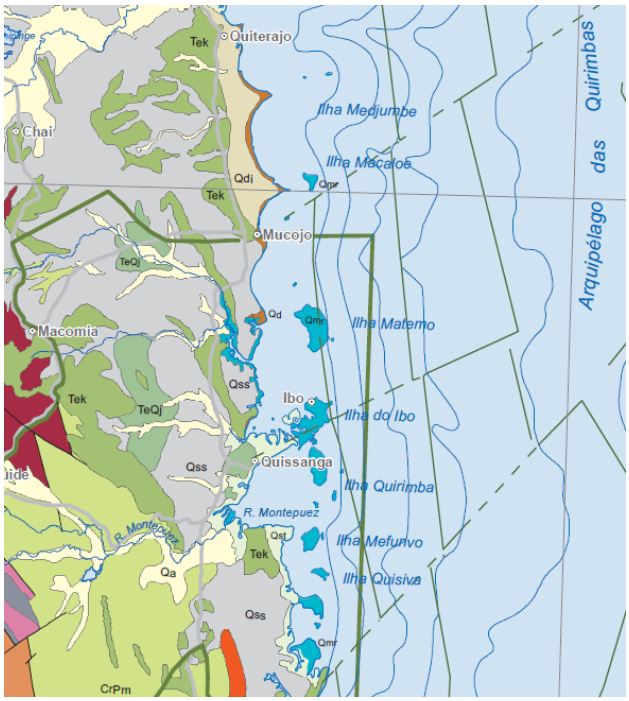


Figure 8: Geological map of Mucojo-Quissanga-Ibo Island region[15]



5.2.1.3 Soils

All Districts in the province of Cabo Delgado present poorly drained soils, which become difficult for farming. On the coast area soils are very heavy, gray and black in color with clay and poorly drained. The province is characterized by its sandy soils, moderately washed, predominantly yellow to brown-gray, either with internal sandy (ferralic sandy soils) or sandy coastal dunes (Haplic sandy

[14] CrMo-Macomia Formation; CrPs-Pemba Formation; Qss-Sand sheet with local gravel; TeK-Mikidane Formation; Qmr-Coral reef. Geology map extracted from the million map (Grantham G.H. et al. 2008).
[15] CrMo-Macomia Formation; CrPs-Pemba Formation;; Qss-Sand sheet with local gravel; TeK-Mikidane Formation; Qmr-Coral reef. Geology map extracted from the million map (Grantham G.H. et al. 2008).

soils). There are soils of the coastal dune range, sandy to sandy clay texture and showing yellowish colors (ferralic sands). Hydromorphic sandy soils in the depressions and low lands alternating with pieces of higher land occur (MAE, 1985 a).

5.2.1.4 Climate

Pemba city is used as a representative point for the rest of northern districts in the province (Source of data http://www.inam.gov.mz/)

The coastal city of Pemba and the rest of northern districts (Palma, Mocimboa da Praia, Macomia and Ibo) experience a humid semi-tropical climate with a dry winter. Temperatures fluctuate only slightly throughout the year due to the tropical location and considerable proximity to the equator and the ocean. The precipitation shows two seasons during the year: the dry and the wet season. The wet season spans from December to April and brings fairly prodigious and reliable rainfall, with the wettest month of the year typically being March at 202.2 mm total monthly precipitation on average. The dry season stretches from May to November and brings marginally cooler temperatures, sunny skies, and stupendously low rainfall, with the driest month of the year typically being September at 2.2 mm of total monthly precipitation on average. Humidity is very high during the wet season, averaging 80-90%, but is much lower in the dry season. The warmest and coolest months of the year are January/February and July, respectively.

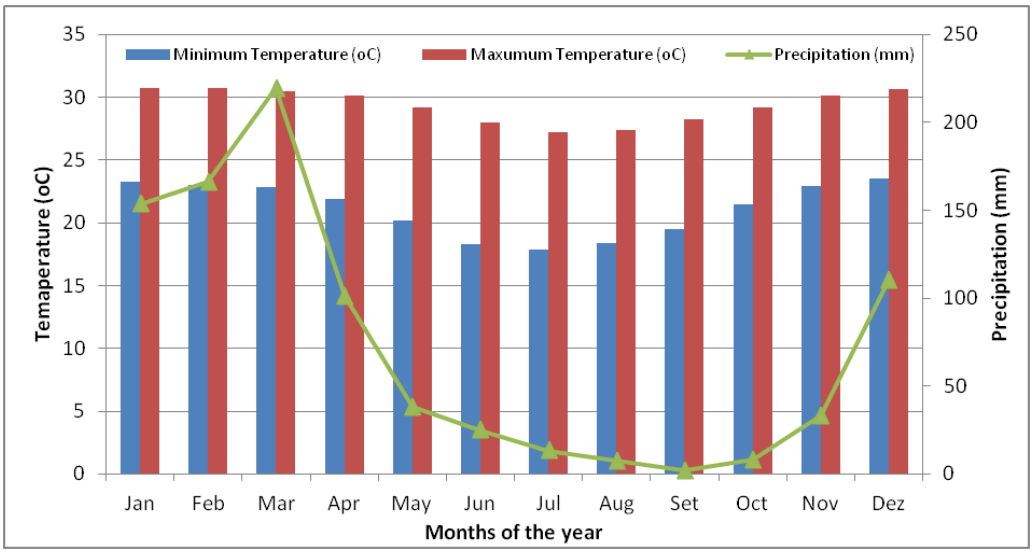


Figure 9: Average temperatures and monthly precipitation of Pemba Town.

5.2.1.5 Hydrology and availability of water

Out of the saline bay of Pemba, Miezi and Upuio Rivers flow to the Pemba bay during rainy season. The rainfall in Pemba is small and the rivers of the region are inconsistent when it rains. This problem, coupled with poor land use planning of the town may influence long term interventions that require water. There is no big reserve of superficial water in and in the vicinity of Pemba.

The uptake of water is from the field boreholes in the Metuge area. The transmission main form the source to the outskirts of the city has a total length of approximately 42 kilometers and is characterized by several intermediate reservoirs and two pumping stations. Along the pipeline, there are derivations for the villages of Metuge, Nangua, Mieze and Murrebue. The main distribution center is located near the Airport. The distribution network has a length of approximately 285

kilometers serving approximately 11,786 residential connections, 138 standpipes and operating for close to 21 hours of daily supply (http://www.fipag.co.mz; 26/04/2014).

Due to poor rainfall in this region, the water system installed in Pemba is insufficient in quantity and quality. Coupled with the rapidly growing population of the city of Pemba and surroundings, this is a serious constraint to the development of the area. Public health problems related to water in that region need serious consideration. This is further compounded by the relatively hot weather plaguing this region during the hot and wet season, the meandering relief and age of its geology, consisting primarily of highly porous and permeable rocks, favoring the underground water circulation. Salinity problems are common in the sedimentary deep aquifers.

There are no significant rivers at Palma area. Underground source is the most important option.

Injoma and Mutamba Rivers form the most important fresh water bodies in Mocimboa da Praia area. Underground water is other option to be considered, because of the probability of it being good quality due to the filtering sand and gravel located around this area.

There are no significant rivers in Mucojo area. Underground source is the most important option.

Montepuez River located south of Quissanga and Ibo is the most important fresh water body in this particular area. For the same reasons as Mocimboa da Praia water is underground water is the other option to be considered in this area.

5.2 2 Nampula Province

5.2.2.1 General Descriptions

In this province the program will be mainly implemented in the following areas, with the following general characteristics.

- **Nacala District:** Nacala Porto, one of the 23 cities existing in Mozambique, is located in the Nacala Bay. This bay has such a high depth that allows the movement of vessels 24 hours a day, being one of the most important in the eastern coast of Africa. This port is the terminal of the Nacala Corridor, served by a railway line linking the coast to Malawi and cities of Lichinga- Niassa, Nampula, Cuamba and through other districts. The city is one of 53 municipalities of Mozambique. The access to the Indian Ocean is from FernãoVeloso end and second bay (probable) found in the south of Quissimajulo. In the Nacala area there are no lakes and no islands. There are periodic rivers flowing from the in land.
- **Angoche District:** The Angoche town is located in the area of interference of deltaic environment and marine water. The main body of water is formed of salt water invading the periodic small rivers from in land. Mutivaze River is the most important water body in the Larde area. Several islands are known in Angoche area and the Koti Island is the most populated. The PugaPuga Island is the biggest and is located 30 kilometers south of Angoche. The open Indian Ocean is accessed from the Angoche Chanel. No relevant lakes area found. The small ones which can be seen from the image are salt lakes and where formed by the regression of the ocean. The program will have Larde has its main area of interest.
- **Memba District:** Memba district has as its capital the town of Memba. From this town there is a direct access to the Indian Ocean. The Memba Bay is the direct accesses to the ocean and is the termination of Mecuburi River, which flows the whole year. The Moendeze River is the second fresh water reaching the Memba Bay. No islands are recorded in the area. Memba is located a few kilometers from Nacala Velha, with a very rapid development in the recent days, because of implementation of the new coal terminal and other developing projects.

- **Mozambique Island (Ilha de Moçambique) District:** The District of Ilha de Moçambique is an island city located in Nampula province, in northern Mozambique, which gave its name to the country and was the first capital of the country. It is considered by UNESCO as World Heritage as from 1991. Currently, the city is a municipality with 42,407 inhabitants and 14,889 of those living on the island (INE, 2007). The island is about 3 km long and 300-400 m wide and is oriented towards the northeast-southwest entrance of Mossuril Bay. To the eastern coast of the island there are Goa and Sena Islands (also known as Snake Islands). These islands, as well as the nearby coast are of coralline origin. The Monapo River is the most important fresh water body, which flows a few kilometers south of the Island.
- **Mogincual District:** Mogincual is a district of Nampula Province in Mozambique, with its capital in the town of Liupo. Namige is one of the Administrative Post within this district and has a direct access to the Indian Ocean. The Nipuite and Metapa Rivers are the most important fresh water body in the area.
- **Moma District:** Moma is a district of Nampula Province in Mozambique, with its capital in the town of Moma. There is a direct access for Indian Ocean. The Ligonha is the biggest fresh water body. No islands are recorded in the area. There is one island in the area: Moma Island. Underground water should be considered as the most important source of fresh water in this area, having in consideration the saline intrusion in the most costal area.

5.2.2.2 Geology

Taking into consideration the existence of two distinct areas, the description of the geology, soils, climate, water resources and fisheries for Nampula province is subdivided into two main groups of areas/districts. The first comprises Nacala, Memba, Mozambique Island and Mogingual (Namige) and the second Angoche, Larde and Moma.

The geology of Nacala area is characterized by two principal units: the crystalline and metamorphic rocks from meso Proterozoic and phanerozoic sediments. The Proterozoic rocks crop in the western portion of the region, up to Nacala-a-Velha town and are composed of banded and migmatitic gneisses and augen granitic gneisses.

To the east of Nacala-a-Velha town there is a relatively linear N-S fault that brings together the crystalline Proterozoic rocks and the Mesozoic to Cenozoic sediments, implying a rifted setting during sedimentation.

The coastal cover rocks contain interlayered siltstones, sandstones, calcareous sandstones and calcareous from Mesozoic to Cenozoic age. These sediments have been deposited under conditions of numerous transgressions and regressions of sea levels. These sediments include the Macomia, Pemba and Matibane Formations.

On top of the previous units, there are several compacted and friable sediments deposited. They include the Topuito Formation, with the red sand ridge forming the coastal hinterland, the coral reefs, sub-tidal sand bars and intertidal sand flats and estuarine infill, mangrove swamps and salt flats. Below a simplified geological map of Nacala area is presented.

Memba area is characterized by Proterozoic terrain and a south continuation of Pemba Formation. The eastern sector of Memba is covered by quaternary interior sand dunes and Topuito Formation.

The Mozambique Island area is formed by Raised beach sand, limestone and coralline sandstone and recent dunes.

Out of the Moebase Formation, the geology of Mogincual shows many similarities with the northern districts (Mozambique Island and Nacala).

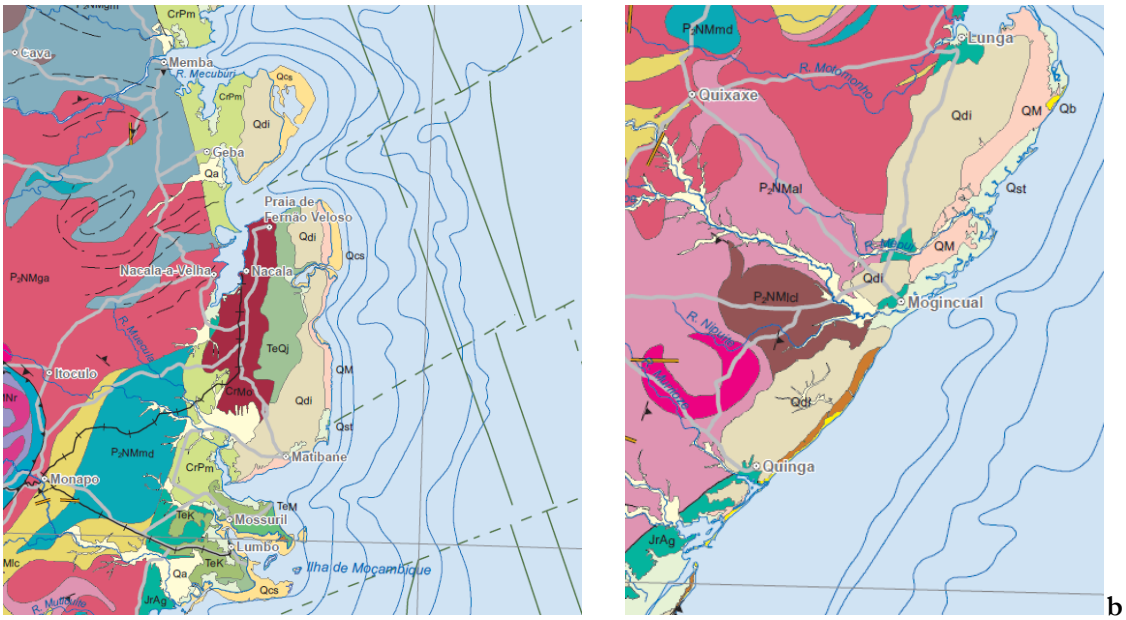


Figure 10: Geological map of Nacala, Memba, Mozambique Island (a) and Mogincual (b) areas[16]

Geology of Angoche, Larde and Moma areas

Tree terrains characterize the geology of this particular area of Nampula. The first terrain is composed of Proterozoic metamorphic gneisses (anortosites, amphibolites and other gneisses of Nampula Complex). The second terrain comprises the vulcanite dated from Jurassic age, composed of basalts and andesite of Angoche. The third and last terrain is formed by sediments from quaternary age.

The quaternary geology is characterized of Titanium Topuito Formation, sandy dunes, fluvial mudstones and interior dunes.

The Proterozoic rocks and Jurassic vulcanite are found in far NW area of the towns. For more detail see the map and legend below.

[16] P_2NMga- augen granitic gneisses; P_2NMgn- banded and migmatite gneisses; CrPMsm-Pemba Formation; CrMo-Macomia Formatio; TeQs-Quissanga Formation; QTo-Topuito Formation; QM-Eolian sand; Qsb-Sub-tidal sands; Qmr-Coral reef; Qcs- Raised beach sand; Qm- Moebase Formation. Geology map extracted from Sheet 1440 (Grantham G.H. et al. 2007).

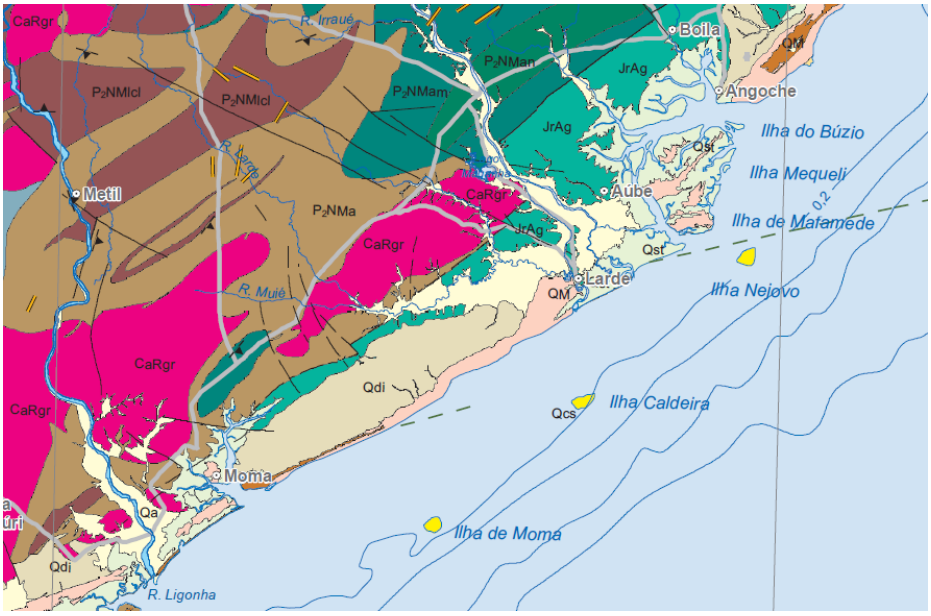


Figure 11: Geological map of Angoche area[17]

5.2.2.3 Soils

Nacala Port and other districts show soils of sandy, washed to moderately washed, mostly of yellow to brawn-grey colors. These colors are observed from the ferralic sands from inland and from friable sands of costal line (haplic sandy soils). The textures are fine, medium to coarse-grained, depending on the local of outcrop and the rock type generating the sediments. Clay soils are in the mangrove and fluvial basins (MAE, 1985c).

Soils of Angoche, Larde and Moma area

The area is characterized by the washed to moderately washed soils yellow to brownish (ferralic sands) and coastal dunes. Deposited in the depression and valleys clay and hydromorphic soils are present (MAE, 1985d).

5.2.2.4 Climate

The coastal region of Nacala and other districts mentioned above shows a dry tropical sub-humid climate. The precipitation vary from 800 to 1000 mm. Annual temperatures are shown on the table below. The average temperature is 25 ^{o}C. The region is characterized by two periods: a hot and rain period, from November to April and a cold and dry period from May to October. The figure below shows the main characteristics of Nacala Porto Climate.

[17] P2NMan- Anorthosite Gneiss.P2NMam- Anphibolite Gneiss; P3NMa- Molocue Gneisses; CaRgr- granites of Murrupula Suite; JrAg- Andesite lavas.Qa- Alluvium, sand, silt, gravel. QM- Fine to medium grained sand and pebble gravel; raised beach/dunes and tidal flats. Qb- Beach, active foredunes, intertidal flats.Qst- Alluvial mud of fluvial-marine origin - Qd- Coastal sand dune and beach sand.Qbl- Organic sediments and hidromorphic soil; beck-barrier and interdune wet land. Map extracted from the million geological of Granthan, G. et al., 2008

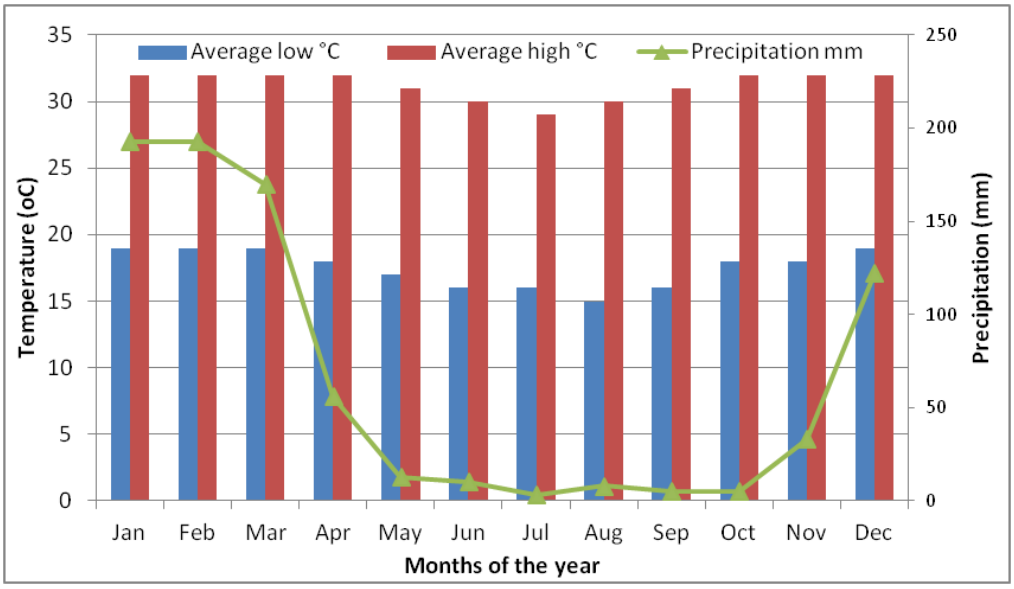


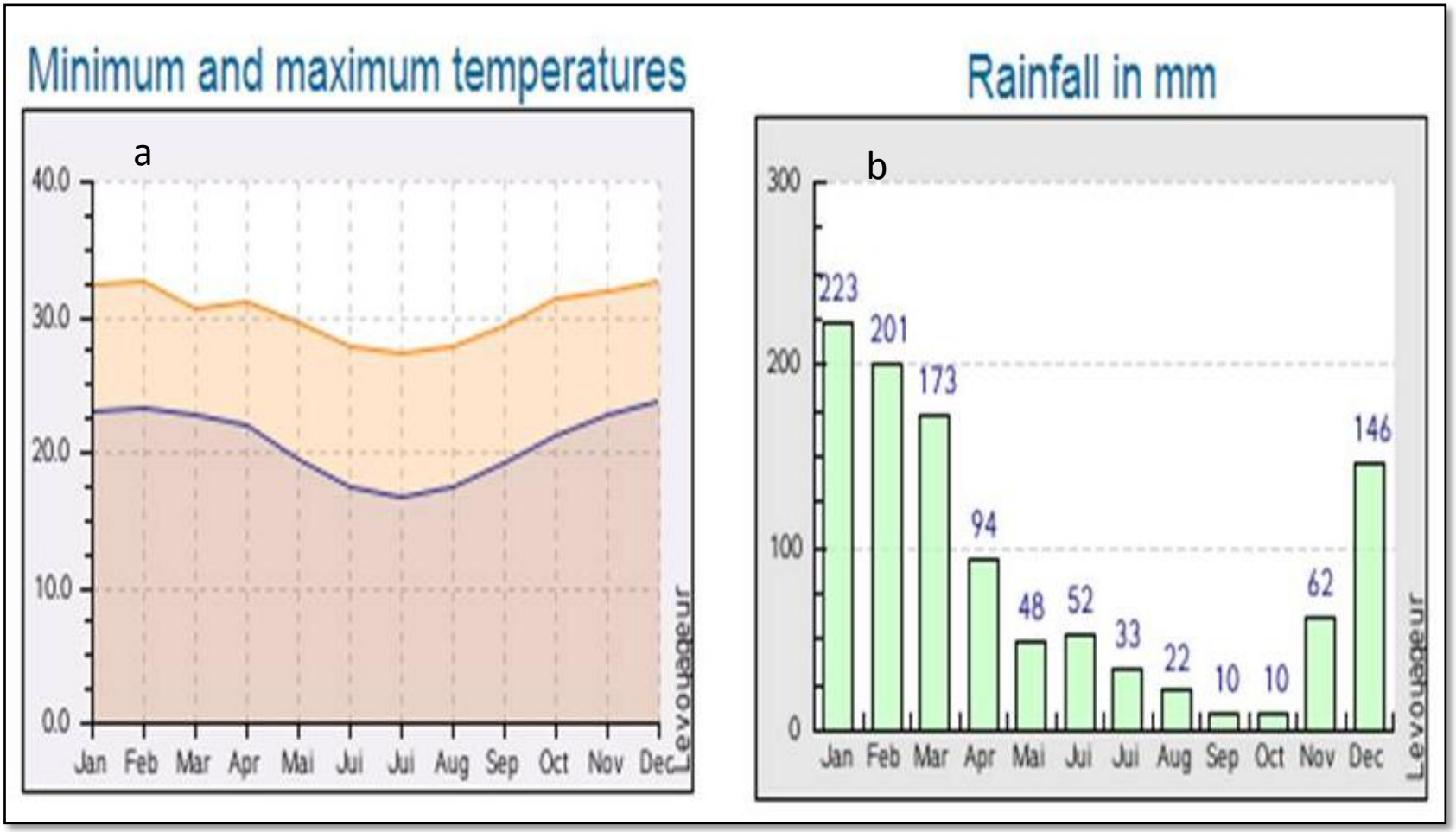
Figure 12: Average monthly temperatures and precipitation of Nacala Porto area as a reference point for Memba, Mozambique Island and Mogincual (Data from Weather base).

Climate of Angoche, Larde and Moma area

Angoche town was selected to characterize the climate of this region and has a tropical climate (sub-humid). The average annual temperature in Angoche is 25.8 °C. About 1133 mm of precipitation falls annually. The driest month is September with 10 mm. Most precipitation falls in January, with an average of 234 mm.

The warmest month of the year is December with an average temperature of 28.3 °C. In July, the average temperature is 22.2 °C and it is the lowest average temperature of the whole year. The difference in precipitation between the driest month and the wettest month is 227 mm. The average temperatures vary during the year by 6.1 °C. The figure billow shows the variation of temperature and precipitation during the year.

Figure 13: Average temperature and precipitation in Angoche town[18]



[18] These data from Angoche are considered representative of a larger region covering Larde and Moma region. Data from http://en.climate-data.org/location/52400/

5.2.2.5 Hydrology

Rainfall in NacalaPorto is limite and the rivers of the region are inconsistent when it rains. River flows do not exceed the size of the ankle. This problem, coupled with poor land use planning of the town may frustrate some long term projects that require water.

Due to poor rainfall in this region, the water stored in the current and probably future (after ongoing rehabilitation) Nacala Dam is of insufficient quantity and quality. This is a serious problem when considering that the population of Nacala Porto and Nacala-a-Velha has been growing exponentially in the last few years. If necessary measures are not taken this could result in public health problems and other problems. The extremely hot weather in this region, the meandering relief and age of its geology, consisting primarily of highly porous and permeable rocks, favors underground water circulation.

It should be mentioned that this area is part of Special Economic Zone of Nacala and many manufacturing industries and potential economic projects, including the new (future) coal port in Nacala-a-Velha area presently being implemented. Water resources should be well understood before the development of any project. As shown in the previous paragraph, superficial water is limited. There is a potential for underground water in the region. But, because of crystalline terrain in the west and limited surface (dense habited area) in the East, this underground potential is also constrained. The exploitation of underground water will be limited also because of salinity in the deeper aquifers.

Mecuburi and Moendeze Rivers are the most important water bodies in Memba bay. Because of the proximity with the Proterozoic terrain in the western area, the underground water is also limited.

The Nipuite and Metapa Rivers are the most important fresh water bodies in the area in Mogincual. No islands are recorded.

There is one island in the area: Moma Island. Taking into consideration the saline intrusion in the coastal area, underground water should be considered as the most important source of fresh water in this area.

Hydrology of Angoche, Larde and Moma area

Mutivaze River flows in the southern area of Angoche town and is the most important river. Periodic rivers such as Luazi and Mucuti are also known in the area. No drinking water is taken from these rivers.

The distribution network of drinking water has been recently extended to cover a radius of 20 kilometers from the city center. In addition to installing new fountains, the works included improvements in the main source of water catchment, located in the Malatani lagoon, and other important interventions that provide greater network pumping capacity in to increase the quality and quantity in the residential area of Nguri and Horta, the most populated localities in Angoche town.

Larde River is the most important in the Administrative Post of Larde. For the whole region, it is possible to find underground water in specific locations as there are abundant sand dunes that work as water reserves. There are considerable problems of saline intrusion in the area.

5.2.3 Zambezia Province

5.2.3.1 General Descriptions

In this province the program will be mainly implemented in the following areas, with the following general characteristics.

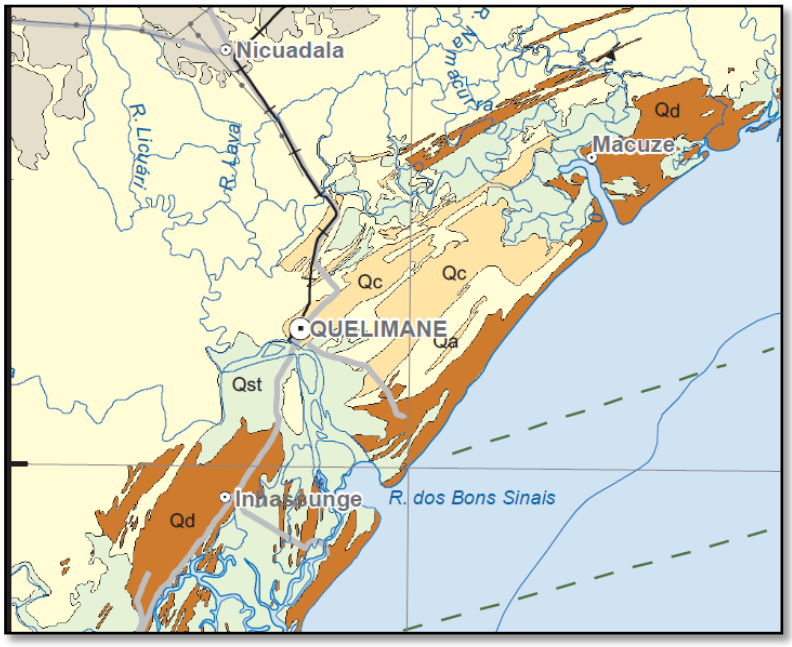
- **Quelimane City:** Quelimane is the capital and largest city of Zambezia Province and is located on estuarine environment of Bons Sinais River, about 20 km from the Indian Ocean. The city has a port, which is one of its main economic activities, and an important fishing industry. Bons Sinais River forms the major body of water in the area. There are more than five islands from Quelimane to the coast, formed by the river. The river is totally influenced by ocean water. The islands are formed, mainly, by mangrove forest and affected by severe floods during the rainy season and the river forms the unique access to the Indian Ocean. In general, Quelimane is swampy, with no significant lakes.
- **Inhassunge District:** Inhassunge is a district of the Zambezia Province, with its capital in the town of Mucupia which is situated 20 kilometers south of Quelimane. The main body of water is formed by the evolution of coast line, forming rivers influenced by the oceanic water. The district consists of one island and is crossed by several periodic rivers whose waters have very favorable properties for salt production. The increase of river water flows during the rainy periods cause the occurrence of floods. Essentially, this area comprises the region of low altitude (0-200 m above the mean sea level), and locally is almost flat (MAE, 1985b). The access to the Indian Ocean should be considered from Quelimane Port or from artisanal Linde River port, the last build by Madal Company. The Salafe River communicates with the ocean. The eastern lands are covered by mangrove forest, characterized by deep clay profile. No lakes have to be considered in this area.
- **Pebane District:** Pebane is a district of the province of Zambezia, with its capital in the town of Pebane, which has direct access to the Indian Ocean. There is a very small port which can be used as starting point in the fishing project. Muniga River is the unique fresh water body. Underground water is the secure source for fresh water, associated with the sedimentary origin of the geology of the village of Pebane. Saline intrusion must be considered before any drilling for potable water. No Islands in the area and is characterized by open sea.
- **Nicoadala District:** Nicoadala district has as its capital the small town of Nicoadala, to the west of Quelimane, at a distance of around 30 km. The district, but not the capital, has direct access to the Indian Ocean. Zalala area is the most important tourism destination in the Quelimane – Nicoadala area. Several Lodges are found there, combined with artisanal fishing in sandy beaches and widespread use of simple canoes.
- **Chinde District:** Chinde has its capital in the once important port town of Chinde, situated in one of the islands formed at the termination of Zambeze River, with direct access to the Indian Ocean. There are 3 most important islands, formed by the interaction between the ocean and Zambezi River, namely the Pambane, Timbuè and Inhanguruè Islands. This is the most fustigated area during the annual floods coming from in lands in December, January and February.

5.2.3.2 Geology

Quelimane, Zalala, Inhassunge and Chinde areas

The geology of Quelimane, Zalala and Inhassunge is formed by sedimentary formations from quaternary age. The main units are Alluvium, sand, silt, gravel; Colluvium; Coastal sand dune and beach sand; Alluvial floodplain clayey sand; Alluvial mud of fluvial-marine origin and Alluvial floodplain mud. The figure below shows the geological map of the Quelimane, Zalala and Inhassunge areas.

Figure 14: Geological map of Quelimane, Zalala and Inhassunge area[19]



The geology of Chinde is significantly similar with the one described for Quelimane area. The dominant lithology is from quaternary dune sands and fluvial and marine recent sediments, most of them accumulated from cyclical floods.

Figure 15: Geological map of Chinde area[20]

[19] Qa- Alluvium, sand, silt, gravel. Qc- Colluvium. Qd- Coastal sand dune and beach sand. Qps- Eluvial floodplain clayey sand. Qst- Alluvial mud of fluvial-marine origin. Map extracted from the million geological of Granthan, G. et al., 2008.

[20] Qa- Alluvium, sand, silt and gravel. Qc- Colluvium. Qd- Coastal sand dune and beach sand. Qps- Eluvial floodplain clayey sand. Qst- Alluvial mud of fluvial-marine origin. Map extracted from the million geological of Granthan, G. et al., 2008

5.2.3.3 Soils

Quelimane, Zalala, Chinde and Inhassunge area

As indicated in the geology section above, the coastal area of Zambézia Province is characterized by sedimentary rocks from quaternary age. The soils are sandy from costal dunes and of hydromorphic origin (mangroves and rivers). Most of the areas are wet throughout the year, facilitating the practice of agriculture (MAE, 1985e).

The Soils are characterized by the occurrence of sandy soils and sandy cover soils derived from sandstones and even soils derived from the Lagoon platform. Complementing these groups of soils, fluvial and marine effects deposit alluvium sediments in local major rivers and their tributaries.

Sandy soils generally are deep to very deep, excessively well drained, with low retention capacity for nutrients and water.

The potential for agriculture of irrigation is limited to alluvial soils, particularly those of medium to heavy texture. These soils are deep to very deep, rich in organic matter and have excellent adsorption capacity of water and nutrients, however, they may be locally and slightly salty and/or sodium rich. The fluvial and marine soils occur along the shoreline and in the estuarine plains where mangroves develop, with deep clay soils, very poorly drained, saline and sodium rich (MAE, 1985a).

In the Chinde area soils from flood lands are very frequent, because of the annual cyclical rain and water from the Zambezi and Shire Rivers.

5.2.3.4 Climate

Quelimane, Zalala, Inhassunge and Chinde

The main climate is tropical with two stations. The annual precipitation is 1428 mm around Quelimane and Inhassunge. The rain period span from November to April. The average temperature is 25 ºC. The figure shows the temperature and precipitation in Quelimane. The driest month is September with 20 mm. Most precipitation falls in January, with an average of 260 mm.

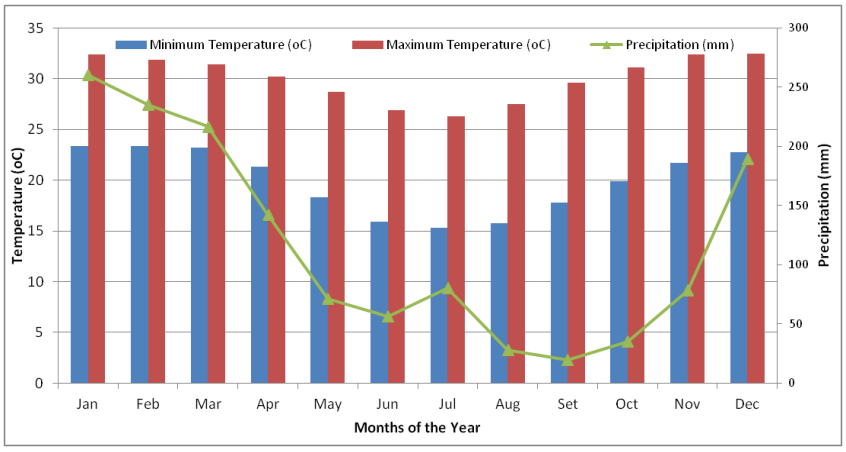


Figure 16: Average annual temperatures and precipitation around Quelimane and Inhassunge[21]

[21] It is assumed that this graphic shows the averages that are valid for the rest of the province. Data from http://www.inam.gov.mz/

5.2.3.5 Hydrology

Quelimane and Zalala area

There are several rivers around Quelimane and because of the flat terrain, all of them are influenced by tidal periods, inhibiting their use for drinking purposes. The whole area is waterlogged and the main rivers are the following: R. Chipoca, R. Maiua, R.Catuela, R. Dabada, Rio Cuácua, R. Licuári, R. Lava, Rio dos Bons Sinais and R. Namacurra.

2013 saw the conclusion of the rehabilitation of the water system for Quelimane, made of a field of boreholes in Nicoadala. With the conclusion of this project the water capacity increased from 4,800 m^3/day to 12,000 m^3/day and from 8 to 24 hours, ensuring the availability of safe drinking water to over 70,000 people. The city of Quelimane was supplied with water from Licuári through 4 holes with a total capacity of 4,800 m^3/day. The system supplied only about 8% of the population of the City of Quelimane and the population along the EN 7, between abstraction and the city of Quelimane. In parallel with this development and to improve the water quality a Water Treatment Plant was built in Licuari for the removal of iron and manganese (www.fipag.co.mz). With the commissioning of the new system and the water treatment in Licuári there will be a significant improvement in the quality, quantity and reliability of supply of potable water to the city of Quelimane and Nicoadala Village (www.fipag.co.mz).

The option for underground water in Quelimane is limited, because of limited depth of the aquifers and potential for saline intrusion.

Inhassunge area

There are several rivers around Inhassunge and because of the area's flat terrain, all of them are influenced by tidal periods, inhibiting their use for drinking purposes. The whole area is waterlogged and the main rivers are: Balue, Ianguene, Nhamirande, Membo, Salafe and Moirane.

According to MAE, 1985a, access to water seems to not be a problem for most residents in this district. The administrative post of Inhassunge has 21 wells equipped with Afridev pumps, operating throughout the year.

However, there are some areas with no manual pumps and people have to walk about 25 km to the nearest water source. Some courses have been organized for maintenance and management of the Rural Water Afridev pumps by members of the community. Efforts have also been done to improve the availability of spare parts and accessories for pumps. The option for underground water in Inhassunge is the most promising.

Chinde area

Zambezi, Inhaombe and Mapaniane Rivers are the most important fresh water bodies in the area of Chinde. Because of direct communication with the ocean, saline intrusion needs to be considered in any option for underground water.

5.2.4 Sofala Province

5.2.4.1 General Descriptions

In this province the program will be mainly implemented in the following areas, with the following general characteristics.

- **Beira City:** Beira is a city capital of Sofala Province and is one of 53 municipalities in Mozambique located in the northern margin of Pungue River. Beira used to be the second largest city in Mozambique, after the country's capital, Maputo, with a population of 431 583 habitants, according to the 2007 Census. But recent statistics point out to the fact that such position is now occupied by Nampula. The main water bodies in and around the city are Pungue and Buzi Rivers, which become salty due to the interference of the ocean. The access to the Indian Ocean is made from the Pungue Chanel. There are no islands and lakes in Beira area. Some small and seasonal islands are formed by Pungue River, west of the town. In addition to Beira port program activities are likely to be implemented in Njalane and Praia Nova.
- **Chiringoma District:** Cheringoma district has as its capital the town of Inhaminga, which has direct access to the Indian Ocean. Potential areas to accommodate program interventions in the Chirongoma District are located in Macioamboza Administrative Post, in the coastal area. No Islands area found in the area.
- **Mwanza District:** Mwanza is a district of Sofala province in Mozambique, with its capital in the town of Mwanza. The project will be implemented in the Sambazo area, were the Zambazo River flow to the Indian Ocean. No islands area present in the area.
- **Buzi District:** Buzi district has as its capital the town of Buzi, which has direct access to the Indian Ocean. The district of Buzi, located in the margin of Pungue River opposite of Beira has an area of 7409 km². Nova Sofala Administrative Post is the main focus of attention for program implementation. This area has access to the ocean and no Island is found in the vicinity. The area is part of the Sofala Bay ecosystem.
- **Machanga District:** Machanga district has as its capital the town Machanga. The district has a direct access to the Indian Ocean. The Save River is the main body of fresh water. No Islands area found in the area. Immediately to the south, there is the Village of Nova Mambone, which is likely to accommodate program activities.

5.2.4.2 Geology

Beira

The city is located on a sandy beach with a gentle slope to SE plain. The oldest rocks area assigned to the Pliocene age, Mazamba Formation. This formation of unknown thickness is dominated by arkoses sandstones, light grey to greenish, with interblended mudstones and metrics conglomerates, sometimes with calcareous and ferruginous levels and manganese concretions. The conglomerates pebbles have their origin in shell Precambrian located NW of the study area.

Overlying the Mazamba Formation is the Dondo Formation, with a thickness of less than 10m, which is attributed to Pleistocene. This formation consists of medium-grained to fine sandstones, with orange to red color, slightly consolidated, with interblended metrics clays and ferruginous concretions. These sands are frequent target of illegal extraction for building purposes in Beira and surroundings.

The erosion of Dondo formation gave the area a flattened landscape with undergrowth, which brings residual relief, with circular or elongated forms, covered with savanna forest, chopped by a complex network of drainage. On the surface, between the residual relief and main lines of water, alluvial Holocene deposits occur, resulting from the degradation of the underlying units.

The extensive floodplain of the Púnguè River consists of clays and silts, with thin metrics interblended, fluvial sand, and sands with shells of navy nature, translating the fluvial-marine dynamics. In the northern part of the area, there are sediments much less developed inland resulted from a network of small streams. In such cases water accumulates in small ponds transforming the area into a vast wetland, such as the northeast airport. During high tides, sea water can penetrate and reach these wetland areas a few kilometers offshore.

The mixture of sea with fresh water from rivers and stream discharge allows for the development of a particular ecosystem, the mangrove forest.

Along the coast between Ponta Gea and Macuti Lighthouse, there are coastal dunes and beaches, behind which there is evidence of an ancient lagoon.

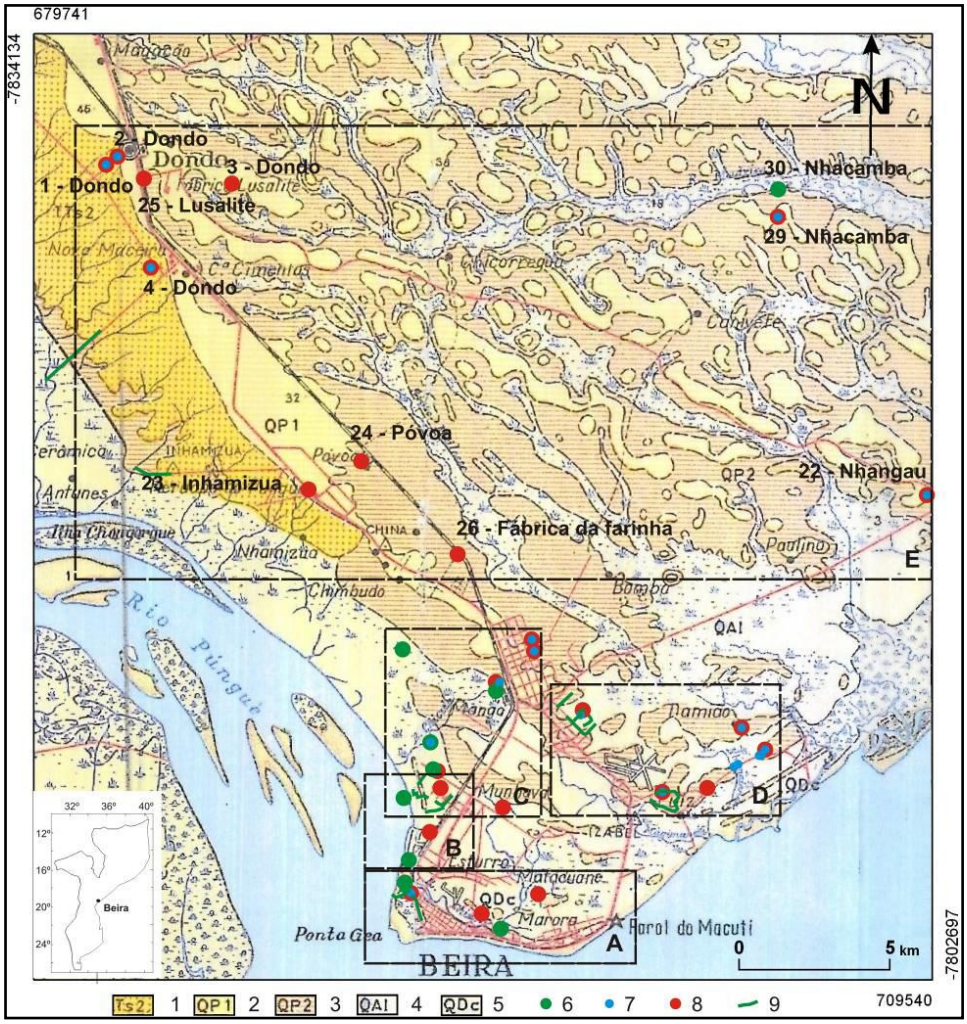


Figure 17: Detailed Geological map of Beira town and Dondo[22]

Beira was built on the dunes and marshland. The marine erosion is marked between Ponta Gea and Macuti Lighthouse. It resulted from the combined action of water flowing along the coast of NE to SW and tidal currents. The tides of 6-7 m when combined with storms reach some parts of Beira town, causing serious environmental problems.

Buzi (Nova Sofala) and Machanga areas are formed by sedimentary rocks, dominated by alluvial flood plain, influenced by Buzi and Save Rivers, respectively (see figure below).

[22] Area A - the center of Beira; Area B - Port of Beira; Area C - the Manga area; Area D – Airport; Area E - less populated and rural areas. Green Circles: sediments; Red circles soils; Blue circles: groundwater; Green lines: geophysical profiles. Geology: Ts2 - Mazamba Formation; QP1 - Dondo Formation; QP2 - eluvial deposits; QAL - fluvial sediments; QDC – Islands Barrier and coastal dunes and beaches. (Map extrated from Fernandes, J. et al., 2010).

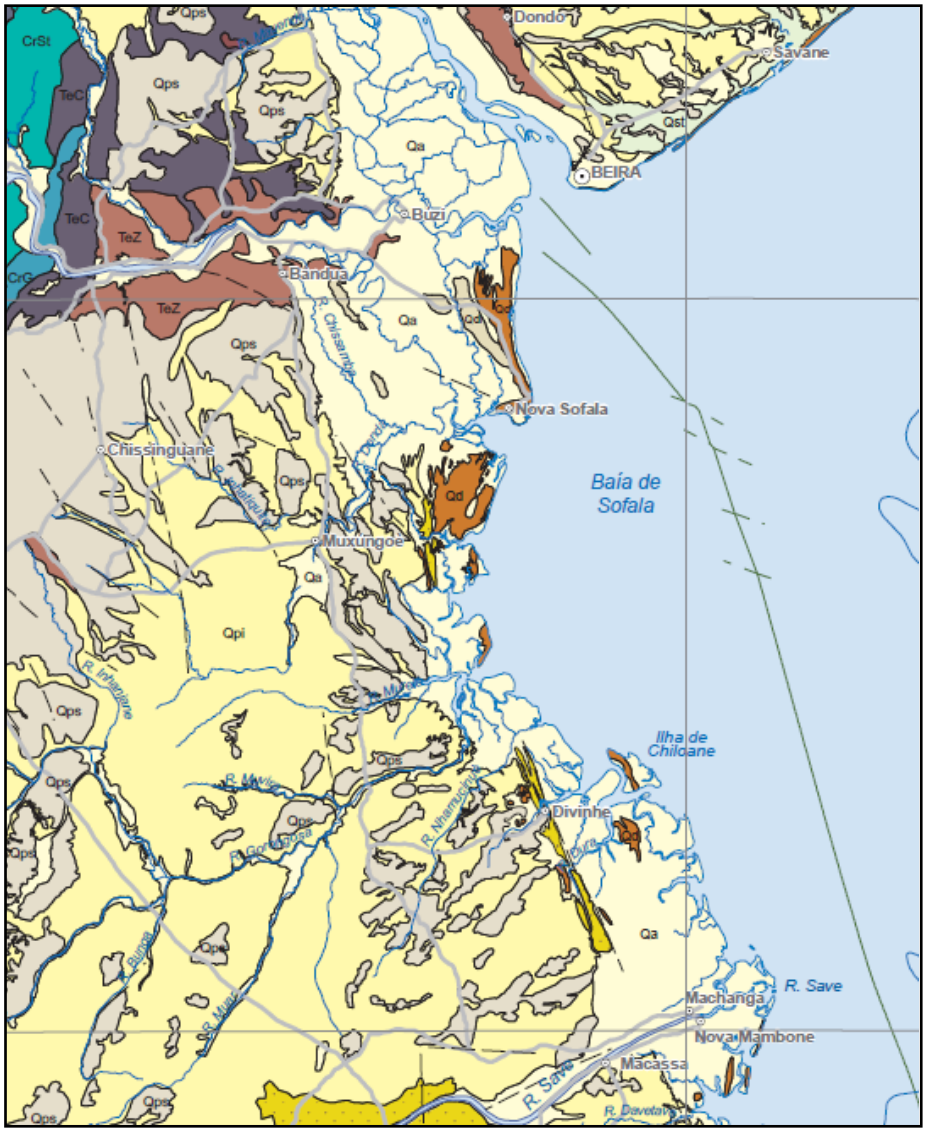


Figure 18: Geological map from Beira to Machanga area[23]

5.2.4.3 Soils

The area of Beira is characterized by two terrains: recent alluvial, with flat topography and little raised terrains, composed of sandy soil. The areas are separated by large valley zones with no decline, filled with water flowing to Púnguè River and forming lagoons along its way. There are noticeable old meanders of Púnguè River form depressions which accumulate water for the whole period of the year (MAE, 1985f).

The recent alluvial terrain is composed of soils of low depth, showing gray to black colors, medium texture and poor organic material. On the other hand, there are deep soils 70-100 centimeters, gray to black with heavy texture and clay. The last type of soils within this terrain are made of alluvial and stratified, corresponding to the cycles of flooding and dry season of the region.

[23] Qa- Alluvium, sand, silt and gravel. Qc- Colluvium. Qd- Coastal sand dune and beach sand. Qps- Eluvial floodplain clayey sand. Qst- Alluvial mud of fluvial-marine origin. Map extracted from the million geological of Granthan, G. et al., 2008

The second terrain, the relatively high terrain, shows the sandy soils, formed as consequence of sedimentation of dunes with sandy texture.

The city is located in a swampy area near the mouth of Púnguè River, and on the accommodation of sand dunes along the Indian coast

The soils of Buzi and Machanga are totally controlled by the geology. They are made of clay and sand deposited during alluvial floats. Finally at the western end, residual soils derived from Precambrian-Punch acidic rocks of granite and gneiss can be found. In general these are very deep soils rich in raw organic material and good capabilities for water and nutrients retention (alluvial soils of the Buzi and Save Rivers), low retention capacity for nutrients and water (sandy), slightly acidic (the derived from acidic rocks).

5.2.4.4 Climate

The area is characterized by rainy weather and humid tropical savanna climate, with high temperatures in summer, especially in the monsoon season between October and February. The natural vegetation is characterized by low and littoral land with mangroves. The annual mean temperature is 27 ^{o}C, with the maximum temperature during January/Febreuary (33^{o} C) and the lowest temperature are observed in July (25^{o} C). The precipitation ranges from 1000-1459 mm.

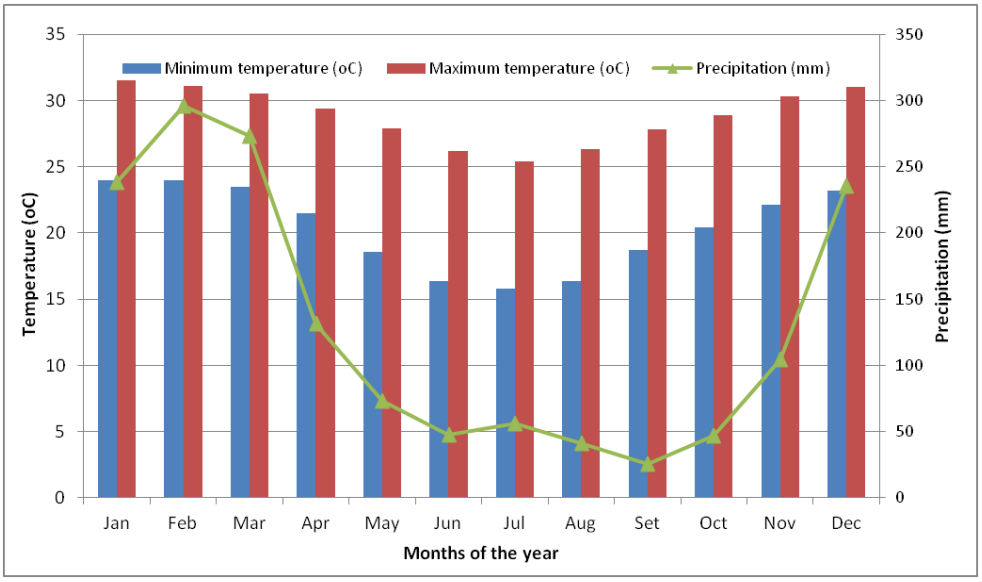


Figure 19: Average temperatures and precipitation in Beira area[24]

5.2.4.5 Hydrology

Beira

In terms of urban water supply the city of Beira gets its water from the Mafambisse Uptake Station in Púnguè River. The main reason for this is associated with tidal influence during the dry season resulting in saline intrusion in the town and the fact that there is no drinking water available from rivers in and around Beira town. Madzize, Nharirongue and Getecha Rivers, situated at the northern portion, are not permanent. Buzi River, South of Beira is also saline at its termination and is not accessible from Beira site.

[24] Data is meant to represent the average for all Sofala districts mentioned above (source of data http://www.inam.gov.mz/)

As a solution to the constraints on the water supply to the city of Beira during the dry season and in order to get best quality raw water as well as satisfy water demand dictated by population growth in the cities of Beira, Dondo and settlements around this cluster FIPAG proceeded to build a station located in Púnguè river (Dingue Dingue) about 18 km upstream of the current intake Mafambisse, where the influence of saltwater intrusion is not felt.

A set of additional work is ongoing to improve and expand the water supply to Dondo and Beira systems, highlighting the expansion of about 20 kilometers of distribution network, rehabilitation of about 48 kilometers of distribution network and rehabilitation of the another areas (e.g. Munhava).

The water supplying a great parcel of the Beira population is made apparently through groundwater. The intense exploration of the aquifers next to the sea causes a lack of balance in the interface region of freshwater and saltwater.

There are more than 400,000 habitants. In the urban area problems such as degradation of the buildings, disorderly occupation of their surroundings, scarcity of drinking water supply and unsanitary conditions in many places are identified (Fernandes, J. et al., 2010).

Buzi and Machanga

The Chissamba and Dondo Rivers are the most important at Nova Sofala area. This area has a direct access to the Sofala Bay. Underground source is difficult in this area, because of deep clay soils and influences of marine environment.

In the Machanga town, the Save River is the most important fresh water body. Because of alluvial nature of the area the second option for fresh water is the underground source. Attention must be paid to saline and clay environment.

5.2.5 Maputo Province

5.2.5.1 General Descriptions

In these two provinces, i.e. Maputo City[25] and Maputo Province the program will be mainly implemented in the following areas, with the following general characteristics.

Maputo City and Macaneta

Maputo is the capital and largest city of Mozambique, located at the Espirito Santo Estuary and Maputo Bay, which form the main water body and main access to the Indian Ocean. Other bodies of water are formed by Maputo, Tembe, Incomati and Matola Rivers. Within the area, there are some insignificant lakes along the coast line. Xefina, Portuguese and Inhaca are the most important islands in the area, with Inhaca being the most populated and situated 32 km east of the Maputo city, constituting a municipal district, the Kanyaka District. Today, Maputo has a port that is a reference in the southern region of Africa, the rest of the African continent and internationally on the Indian Ocean. After many years of relative stagnation the port has been undergoing substantial refurbishment. According to the 2007 census, the population of Maputo is situated at 1,766,184[26].

The small village and beach area of Macaneta is situated in Marracuene District, about 30 kilometers from Maputo Bay, along the coast line. Incomati River and the Indian Ocean are the main water bodies in the area.

[25] Maputo City has the status of a province.
[26] Greater Maputo comprising satellite towns around the main city.

5.2.5.2 Geology

Maputo and Macaneta area

The geology of Maputo province, presents the following geological units, from bottom to top: Ponta Maona Formation, Ponta Vermelha Formation, Machava Formation, Malhazine Formation, Congolote Formation, Xefina Formation, Intra dune Deposits, Alluvial Deposits and Beach Deposits (see geological map below).

In the southern most area there is calcareous formation called Salamanga Formation. In the western territory, the rocks are mainly from volcanic origin, composed of riolites and basalts of Pequenos Libombos, Pessene and Movene Formations

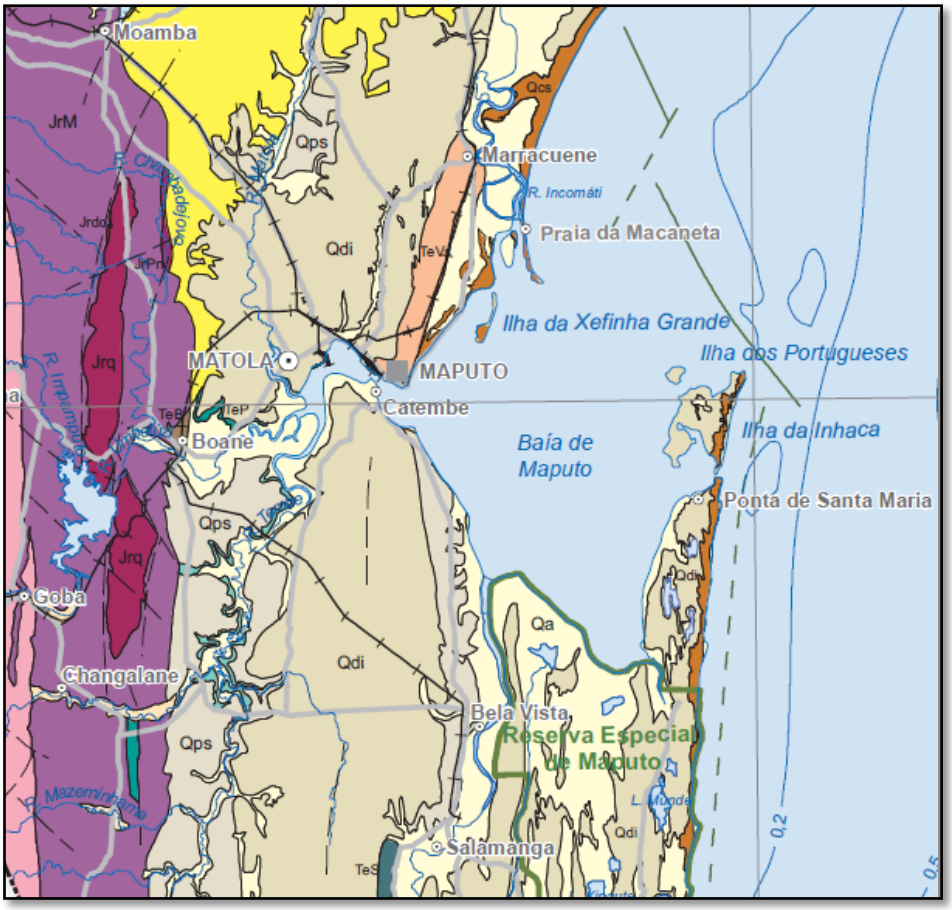


Figure 20: Geological map of the Maputo city and Macaneta area[27]

Ponta Maona Formation, presumably the oldest in this region is represented by sandstones, silts and fine bedded micro conglomerates, light pink color often impregnated with calcium carbonate, with thickness of 15-20 m and assigned to the Pleistocene age (Oliveira et al., 2012). This formation is more represented in Catembe region.

The Ponta Vermeha Formation, with estimated age of the Pleistocene - lower Pleistocene (about 2.5 million years) lays on top of Ponta Maona Formation and consists of consolidated sandstones

[27] TeVs – Ponta Vermelha Formation; TeS - Salamanga Formation; Jrq- PequenosLibombos Formation; JrPn- Pessene Formation; JrM- Movene Formation; Qa- Alluvium, sand, silt, gravel. Qc- Colluvium. Qdi- Coos astal sand dune and beach sand.Qps- Eluvial floodplain clayey sand.Qe- Aeolian sand. Map extracted from the million geological of Granthan, G. et al., 2008

and siltstones, light in color, which passes to red sandstones on top, very ferruginous, hardened, with a total thickness of around 20 m. In this formation no micro conglomerate and impregnation of calcium carbonate were mapped.

On top of previous units are found the sSandy formation, locally with impregnations of carbonates and ferruginous concentrations, with 15-20 m thickness, which was divided into two units, respectively forming the Matola Formation, in lower position, with reduced representation (clay succession occurs in the area of the city of Maputo), and the Machava Formation assigned to upper Pleistocene (given by human artifacts), which outcrops on the lower slopes of the valley of the Infulene River (Oliveira J. T.et al., 2012).

Later, sands were deposited, forming the fixed dunes, traditionally regarded as inland dunes, which in Maputo were divided into two units namely: Malhazine Formation, consisting of reddish sands, and Congolote Formation, with light sand.

The depressions between the dunes are filed with clay soils with presence of herbaceous vegetation because of freshwater in the lagoons. All units were considered to be late Pleistocene - Holocene.

In the coastal region facing Maputo bay there is accumulation of alluvial muddy and sandy (sandy or silt alluvial cones), largely associated with the Incomati river terraces, as well as actual dunes similar to Xefina Formation, both formed at Holocene period.

The Valley of Infulene and other low lying areas of this coast (zone extending between Costa do Sol and Albasini) are intensively cultivated.

5.2.5.3 Soils

This zone is today profoundly altered by human activity. Landslides and slope instability occur frequently in the formation of Ponta Vermelha.

According to the area's geology and geotechnical characteristics of the soil, they should allow infiltration of water to the lower layers. However, due to the loose nature of the soil during periods of heavy rainfall, combined with smaller surface area available for infiltration, water saturates the soil decreasing its consistency and as a consequence, this area has experienced landslides, giving way to steep slopes towards the east coast and the alluvial cones in terminal parts (Vicente, M. et al., 2006).

The area of Maputo is characterized by two terrains: recent alluvial, with flat topography and little raised terrains, composed of sandy soil. The areas are separated by large valley zones with decline, filled with water flowing in the South direction (Maputo Bay) and forming lagoons along its way. Old meanders of Incomati, Maputo and Infulene Rivers form depressions which accumulate water for the whole period of the year. Maputo, Tembe and Umbeluzi rivers flow from south to the Maputo Bay.

The recent alluvial terrain is composed of soils of low deep, showing gray to black colors, medium texture and poor organic material. On the other hand, there are deep soils 70-100 centimeters, gray to black with heavy texture and clay in size. The last type of soils in Maputo, are composed of Alluvial and are stratified, corresponding to cycles of flooding and dry season.

The second terrain, the relatively high terrain, shows the sandy soils, formed as consequence of sedimentation of dunes, with sandy/silt texture. The color vary from gray, yellowish, brownish to reddish and are directly connected to the local geology.

5.2.5.4 Climate

The climate of e Maputo and Marracuene district is rainy tropical savanna, influenced by the proximity of the sea. It is characterized by warm temperatures with an average annual value exceeding 20º C and amplitude of less annual variation at 10º C. The relative humidity varies between 55 to 75% and its precipitation is moderate, with an annual average of 500 mm in interior and 1,000 mm on the coast. The rainy season runs from October to April, with 60% to 80% of concentrated rainfall in the months of December to February.

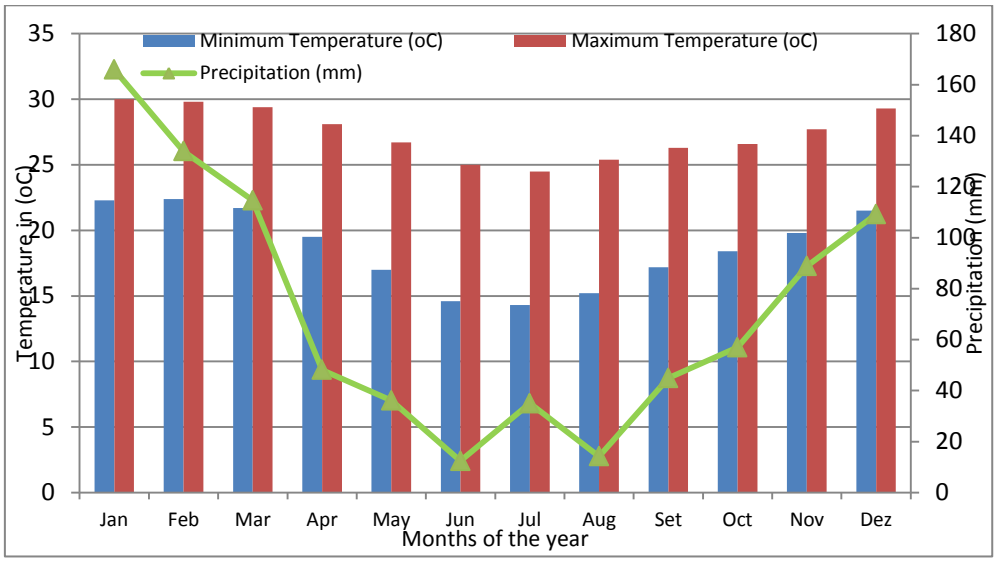


Figure 21: Maputo area precipitation and temperatures[28]

5.2.5.5 Hydrology

The non-oceanic water is formed by Maputo, Tembe, Umbeluzi, Incomati and Matola Rivers. Within the area, there are some insignificant lakes left with the development of the coast line.

Maputo River, flows from the south and ends in Maputo a Bay and serves, for a few kilometers, as a border between Mozambique and KwaZulu-Natal in South Africa. Tembe River flows from the south meeting and entering Umbeluzi River before reaching the Maputo Bay. Matola and Incomati flow from north, with the difference that Matola River ends in Maputo Bay while Incomati forms a delta at Marracuene and Macaneta area.

The Maputo Bay, which together with Incomati and Maputo rivers limits the capital, bordering on, 40 km from Maputo to Inhaca Island, is considered biological heritage of humanity. It houses admirable and magnificent multicolored corals, sea turtles, marine mammals and a range of fish species.

Infulene Valley has no potential for drinking water. This river or valley has a very important agrarian system, serving t Maputo and Matola towns.

There is a great potential for underground water exploitation in Maputo, mostly in the western side, covered with sand and silt deposits up to 80 meters deep. The eastern portion is characterized by shallow sand and marine sediments, holding salt water. The private sector is supplying more than 3000 people, against the 600 000 customers of public company Aguas de Mozambique.

[28] The information is based on normal monthly values 1971-2000. Extracted from http://www.inam.gov.mz/.

5.3 Biological Environment

Mozambique's coastline of about 2,770 km has a wide diversity of habitats, which include sandy beaches, coral reefs, estuarine systems, bays, mangroves and sea grass beds. There are four coastal eco-regions in Mozambique: the coral coast, which spans from the Rovuma river in the north to Pebane in the South (at latitude 17°20'S) comprising 770 km, characterized by dominance of limestone and corals, the swamp coast which extends from Angoche (16° 14'S) in the north to Bazaruto Archipelago (21° 10'S) in the south, with the length of 978 km characterized by occurrence of several estuaries and extensive mangrove formation. This part of the coast has the largest continental shelf and the very turbid water highly influenced by the sediment discharged by river and an intense wave action. The third eco-region is the parabolic dune coast stretching from Bazaruto Archipelago to Ponta do Ouro and beyond into South Africa (28°57'S). It has a length of 850 km. It has high parabolic dunes and north oriented capes and barrier lakes. These dunes which may attain 120 m are the highest vegetated dunes of the world. The Delta coast is the fourth eco-region observed at the Zambezi and Save River Deltas, and consists of mangrove forests and adjacent inland inundated grassland and palm woodlands.

Mozambique coast is influenced by the water from the Equatorial current which hits the east Africa at Tanzania and the coast of Cabo Delgado flowing southward. Between Mozambique and Madagascar, at Davis Ridge (off the coast of Nampula) the Mozambique channel narrows its length to 400 km and therefore the southward currents flow form cyclonic and anti-cyclonic eddies that move to the south until reaching the South African coast, they feed the Agulhas current (Hoguane). Near the shore, these eddies generate large counter currents at the right of Sofala and Maputo, forming northward oriented peninsulas, most notably the Machangulo, Inhambane and São Sebastião which were also responsible for the formation of the Archipelagos of Inhaca and Bazaruto (Lundin and Linden 1996). The tidal range pattern achieves a maximum of 6.3 m at Beira, Sofala Bank, reducing to 2m in Maputo and 3m in Cabo Delgado. In Inhambane, Zambezia and Nampula and Pemba the tidal range attains a maximum of 4 m (Lundin and Lindén 1996).

The major part of Mozambique coast has a tropical humid to sub-humid climate and the rainfall is experienced in summer between November and March. The highest recorded annual rainfall has been recorded at central Mozambique between Pebane (1209 mm) and Beira (ca. 1418 mm/yr) and the lowest along the southern sector of the coast (Maputo 775 mm). The northern section between Mozambique is frequently affected by tropical cyclones originated in the Mozambican Channel or to the east of the Channel, depending upon the atmospheric conditions. In general, the high intensity tropical cyclones are those that originate to the southeast of the Mozambican Channel. These cyclones move to the west, crossing Madagascar and, as they cross the Mozambican Channel, are fed by the hot waters that intensify them.

Mozambique is endowed with fairly rich fisheries resources, both marine and freshwater. The marine waters cover an area of about 100 000 km^2 with an exclusive economic zone (EEZ) of 200 nautical miles while inland waters cover an area of about 13 000 km^2.

The marine fisheries resources are mostly located in the two major shelves, the Sofala Bank in the center and the Delagoa Bay in the south. The main fishing areas are located at the Sofala Bank, Inhambane, Vilankulos, Chiluane and Beira.

The most important marine species include:

- Deep water crustaceans
- Crustacean (prawns, deep water shrimp, crayfish, lobsters and crabs)
- Marine finfish (demersal and pelagic species mainly grouper, snapper, emperor and sea bream also high migratory tuna species of yellow fin, big eye and albacore, swordfish and shark)
- Cephalopods and Molluscs (squid, octopus, sea cucumbers, bivalves)

The most valuable stocks of prawn, demersal fish and kapenta, have been assessed to be highly or fully exploited while the remaining including large and small pelagic are lightly exploited or underutilized in remote areas along the coast. Prawns are the most important species for the fishing sector in Mozambique and are caught primarily in the Sofala Bank area. Deep-water prawn fishing is still not well developed.

Marine fisheries account for more than 90% of Mozambican total fish production. In average, the annual catch from marine resources is about 120,000 tons of which 80% are caught by artisanal fishers. The main marine resource comprises of crustaceans (prawns, deep water shrimp, crayfish, lobsters and crabs), marine finfish (demersal and pelagic species mainly grouper, snapper, emperor and sea bream also high migratory tuna species of yellow fin, big eye and albacore, swordfish and shark) and cephalopods and mollusks (squid, octopus, sea cucumbers, bivalves). Inland water bodies include Lake Niassa/Malawi, the third largest in Africa and third deepest worldwide, the manmade Cahora Bassa Lake and a great number of rivers. Lake Cahora Bassa and the Mozambican part of Lake Malawi provide fishing-related livelihood to about 20,000 people. A total of about 10,000 tons of small pelagic are caught, processed and marketed from Lake Cahora Bassa each year, of which 4,000 tons is caught by artisanal and small-scale fishers. Inland fisheries are dominated by small pelagic - kapenta, tilapia and carps and are the most important freshwater species harvested for human consumption.

The small-scale and artisanal fisheries in Mozambique play a significant role in the national economy. The sector accounts for about 80% of the total marine catches. The artisanal fisheries consist of individuals or small groups of fishermen with very weak economic power. They make use of non-motoric fishing vessels/boats of 3-8 m in length. They use beach seine, gillnet and long line to catch fish. The sector also consists of fish collectors and divers. It is estimate that the number of fishing boats and canoes are approximately 15,000, of which 3% are equipped with engines, using beach seine and gillnet fishing gears. In general, the marine artisanal activities take place along the entire coastline, but have special relevance in the provinces of Nampula, Zambezia, Sofala, Inhambane and Maputo. Except for Inhambane the other four provinces are within the program area to which Cabo Delgado is added.

The main objective of this section is to briefly describe the Mozambique marine and coastal environment with more emphasis to the fisheries resources in the three designated SWIOFish program clusters, namely: Northern Cluster (comprising Cabo Delgado and Nampula Provinces); Sofala Bank Cluster (Zambézia and Sofala Provinces) and Southern Cluster (Maputo Province).

5.3.1 Cabo Delgado

Cabo Delgado province is bordered by 425 km of the Indian Ocean. The rich fishery resources of this province are subject to human exploitation, and its abundance is tied to the ecological conditions of the area (Santana Afonso *et al.* 2001).

Rodrigues *et al.* (2000) indicate that over 50 genera of corals have been reported from the reefs along the Quirimbas Archipelago. Quirimbas Archipelago has 32 islands, and perhaps the best of all of them is "Ibo Island", with historic interest, natural beauty and magnificent beaches", which was in the past an important commercial center

Coral biodiversity can be high, specifically around the islands, with 125 coral species in 42 genera from 14 families being reported in the Vamizi Island area. Palma Bay is a generally clear water environment with low turbidity levels. Temperatures and salinity are typically around 30°C and 35 practical salinity units (PSU) respectively. Surficial sediments are mainly sand or muddy sand. Sediment transport rates are small in the bay, due to the benign wave climate (Impacto, 2013).

The table below shows the Fisheries resources and practices in Cabo Delgado. Reference is also made to the main ecosystems where these resources are found.

Table 2: Fisheries resources in Cabo Delgado (IIP) and IDPPE (2009)

District	Ecosystem Features	Key Resources	Fishing gear
Palma	Sandy and rocky beaches with seagrass; estuaries; mangroves and some islands; Intertidal zone.	Pelagic species, such as (*Rastrelliger kanagurta*); Hemiramphidae, Carangidae, Clupeidae families and invertebrates (oysters).	Trawling Gillnet Cages Line Longline Encircling nets Others
Mocímboa da Praia	Two estuaries: Mocímboa headquarters and Luxete; Some islands and coral and rocky areas. A great extension of mangrove stands where the Ulo-Luxete extension is highlighted. Some sandy beaches with seagrass. Intertidal zone.	Small pelagics Families: Lethrinidae (fish thief), Scombridae (saw fish), Siganidae (rabbits); invertebrates (oysters) Rock Lobster (*Panulirus* spp.) And shrimp (Peneaidae);	Trawling Gillnet Cages Line Encircling nets Others
Macomia	Two estuaries (Darumba and Quiterajo); Islands and some coralline and rocky beaches and some sandy, both with seagrass. Intertidal zone.	Small pelagics Families: Lethrinidae (fish thief), Scombridae (saw fish), Clupeidae (mackerel), Carangidae, Clupeidae, invertebrates (oysters)	Trawling Gillnet Cages Line Others
Quissanga	Estuaries: Quissanga headquarters, Mahate and Arimba with a large expanse of mangrove; Intertidal zone.	Pelagic and small demersal Invertebrates (oysters), shrimp (*P. Monodon*) and mangrove crab;	Trawling Gillnet Cages Line Longline Encircling nets Others
Pemba-Metuge	Bay and estuary (Pemba Bay); Intertidal zones; Mangrove.	Fish (Lethrinidae, Siganidae, Carangidae Leognidae, Paralepididae), Shrimp (Penaeidae), Crab mangrove, Cephalopods, Lobsters	Trawling Gillnet Cages Line Others
Pemba	Bays and Estuary (Pemba Bay); Intertidal zones; Coralline and rocky areas (part of Wimbe, Natite, Maringanha and Chuiba); Mangrove (Muxara); Intertidal zone.	Fish: Lethrinidae, Siganidae, Carangidae and Clupeidae Leognidae; Shrimp (Penaeidae), mangrove crab, Serranidae, Scombridae, Cephalopods, Lobsters; Invertebrates.	Trawling Gillnet Cages Line Encircling nets Others

5.3.2 Nampula Province

Nampula province has 18 districts, of which 8 are located in the coast. The southern districts of Moma and Angoche, which are very rich in fisheries resources, are within the Sofala Bank. Artisanal fishing is practiced in all marine coastal districts as well as in many rivers and fresh water bodies that occur in the province. The intensity of fishing activity and gear used is related to the ecological conditions of each district.

The main species accessible for fishing trawl and gillnets to the beach surface are captured before the size of first sexual maturation, which could jeopardize the future replacement of springs. The species *Sillago sihama*, *Thryssa vitrirostris*, *Thryssa setirostris* and *Upeneus vittatus* captured by trawling to the beach in the district of Moma, in addition to being young, experience significant declining in their average size.

The table below shows the fishery resources, fishing gear and main ecosystems by district in the Nampula Province.

Table 3: Fishery resources, fishing gear and main ecosystems by district

District	Ecosystem Features	Key Resources	Fishing gear
Memba	Bays and estuaries: areas stand out in Memba, under the influence of Lurio and Mecuburi Rivers; Mangrove.	Pelagic fishes Coralline species Demersal fishes Families: Lethrinidae (fish thief), Scombridae (saw fish), Siganidae (rabbits).	Trawling Gillnet Cages Line Longline Encircling nets Others
Nacala-a-Velha	Sandy substrate.	Small pelagics Families: Lethrinidae (fish thief), Scombridae (saw fish), Siganidae (rabbits) Rock Lobster (*Panulirus* sp)	Trawling Gillnet Cages Line Longline Encircling nets
Nacala Porto	Sandy and coralline substrates.	Small pelagics Families: Lethrinidae (fish thief), Scombridae (saw fish), Serranidae (groupers) Invertebrates (eg, mussels, oysters)	Trawling Gillnet Cages Line Longline Encircling nets
Ilha de Moçambique	Rocky and coralline substrates.	Small and large pelagics. Families: Lethrinidae (fish thief), Scombridae (saw fish), Siganidae (rabbits), Haemulidae (stone fish), Mulidae (Mullets).	Trawling Gillnet Cages Line Longline Encircling nets
Mongicual	Rocky substrates and other areas with seagrass beds, with little influence of rivers; Lagoons covered by mangroves.	Pelagic fishes Demersal fish	Trawling Gillnet Line Encircling nets
Angoche	Sandy substrate, estuarine, and under the influence of Mutomoti Meluli rivers. Mangroves.	Sharks Demersal fish Pelagics Swrimp Crabs Cephalopods	Trawling Gillnet Cages Line Longline Encircling nets
Moma	Sandy substrate, estuarine, under the influence of Mutomoti, Meluli Ligonha and rivers. Mangroves.	Small pelagic Shrimps Large pelagic Crabs Cephalopods	Trawling Gillnet Cages Line Longline Encircling nets

5.3.3 Zambezia Province

To the west the province is bordered by the Indian Ocean (DPPZ, 2009). The province's rich fishery resources are subject to human exploitation, with its abundance tied to the ecological conditions of the area. Artisanal fishing is practiced in all coastal districts, both in the open ocean and estuaries, as well as in fresh water bodies that occur in the province.

There is a tendency of catching the fish in sizes close to the first sexual maturity or below this length. The table below summarizes the fisheries resources per district in Zambézia Province

Table 4: Fisheries and fisheries gears in Zambézia Province.

District	Ecosystem Features	Key Resources	Fishing gear
Pebane	Pelagic environment; Estuaries: areas in Pebane headquarters Cuassiane Trebuane and under the influence of Muniga, Molocue and Ligonha rivers; Mangrove; Intertidal zones; Islands and coralline and rocky areas (Ilhas primeiras).	Invertebrates: mangrove crab, shellfish and rock lobster (*Panulirus* spp.)Vertebrates (fish).	Trawling Surface Gillnet Bottom Gillnet Line Longline Other
Nicoadala	Pelagic environment; Estuaries under the influence of Bons Sinais, Namacurra river; Intertidal zones.	Pelagic and small demersal.	Trawling Surface Gillnet Bottom Gillnet Line Other
Quelimane	Estuaries (estuary of the Bons Sinaiss River); Mangrove.	Pelagic and small demersal invertebrates: Crustaceans (crab and shrimp) and mollusks (bivalves).	Trawling Surface Gillnet Bottom Gillnet Line Other
Chinde	Estuaries (Zambezi River); Intertidal zones; Mangroves.	Small pelagic species of Clupeidae (sardines), Carangidae (scads), Mulidae (mullets), Penaeidae (shrimp).	Trawling Surface Gillnet Bottom Gillnet Line

5.3.4 Sofala Province

Sofala Province located in the central region of the country, is bordered by the Indian Ocean to the east and has a stretch of coastline of about 330 km. The coastal districts of the province where artisanal fishing activity is active are Marromeu Cheringoma, Mwanza, Dondo Beira, Buzi and Machanga (Pereira *et al.*, 2007).

Sofala Bay constitutes the southern part of the Sofala Bank, representing the largest continental platform of the east African coast and is located in the central region of Mozambique between the latitudes 16° S and 21° S. The distance between the coast and the break in the platform is almost 80 nautical miles. The average depth of the platform in this region is approximately 20m (Consultec 2007).

The morphology of the Sofala Bank coastal zone is characterized by sandy banks and most are interlinked with mangrove swamps fringes. These environments are associated with the main rivers of the region, and may also occur to a lesser extent due to the small tidal channels (Consultec 2007). The Central and Northern regions of the Sofala Bank have a flat bottom characterized by the presence of muddy sediments (Consultec 2007).

Sofala Bay is a system of shallow waters, whose average depth does not exceed 10m. The bottom topography is characterized by active sedimentary movement: high amount of sediment discharge coming from the Pungue and Buzi Rivers associated with a dominant tidal energy that creates intense sedimentation or erosion zones (Consultec 2007).

Near the mangroves, on the landward side, there are extensive areas covered by *Sporobolus virginicus*. Tree species such as *Hibiscus tiliaceus* and *Peltophorum pterocapum* are common, along with bushes such as *Pluchea* sp (Consultec 2007).

The relevant terrestrial fauna is associated with the mangroves and dune areas. Within the urban perimeter the diversity of birds reduces to just the domestic sparrow (*Passer motitensis*) and the freckled raven (*Corvus albus*). Therefore, numerous swamps, mangroves and the areas influenced by tides that encircle the city provide an adequate habitat for bird diversity including long-legged birds and sea swallows (Consultec 2007).

The most predominant intertidal fauna with the most commercial value are clams. According to Bata study (2006), the most important species, *Meretrix meretrix*, can be found along the sand banks at the Púngue mouth in front of the Commercial Port.

The environmental characteristics described here are therefore relevant to the potential of existing fish stocks and the different associated fisheries, the most productive areas in terms of fishing activity between Beira and the Save River and between the Zambezi and the Moma district (Fischer *et. al.*, 1990).

The marine system extends along the coast and comprises continuous sandy dunes, and sandy beach strips, that most of the time are interspersed with small depressions or permanently inundated depressions (zones inundated by the sea) and part of the Sofala Bay (Consultec 2007). The estuary system is characterized by deltaic river regions consisting of Mangrove plains and a low swampy coast; regions influenced by the tides, and part of Sofala Bay. The fluvial system is associated with hydrology and the network of natural drainage in the area being studied is dominated by the Ucarranga, Buzi, Pungue and Savane Rivers (Consultec 2007).

The coastal zone is, from a geodynamic viewpoint, relatively complex because it has formations derived from active accumulation processes, from recent filling (alluvium and colluviums), alongside cleared surfaces and eroded terraces. It makes up part of a diverse system of humid lands, with marine, estuarine and fluvial systems being of note (Consultec, 2007).

The table below summarizes, by district, major bodies of water and/or existing ecosystems as well as information of fishing craft and their fisheries resources.

The large estuary and Buzi and Pungué Rivers, protected system and of great important to the development of shelter and different species system, may be more affected by fishing pressure and trawl chicocota compared to other systems or regions most exposed to the coast, mainly because this would entail a number of trawls, not counting the chicocota, which is more than twice as many as in other regions;

Other regions and fisheries gears that show a scenario of great fishing pressure are Machanga, Beira, Dondo, Mwanza and Buzi. With the exception of *Arius dussumieri*, most of the species are captured in sizes or below the size of sexual maturity.

The trawl gear and chicocota possibly have impacts at the level where the substrates are practiced, which may be enhanced by the use of inappropriate meshes; many species, especially the *T. vitrirostris*., *shrimp P. indicus* and *A. dussumieri*, are captured in these three fisheries, and the *A. dussumieri* is also the target of hand line fishing tackle; the exploitation of these species by various fishing gears increases the impacts they suffer and can lead to some of the scenarios noted in the assessment tables.

Table 5: Fish resources and artisanal fisheries practiced in Sofala[29]

District	Ecosystem Features	Key Resources	Fishing gear
Machanga	Bays and estuaries, areas under the influence of the Save River; Mangroves; Intertidal zones	Shellfish (shrimp Penaeidae, fine shrimp, mangrove crab, pelagic crab); Shellfish (especially groups of bivalve clams and oysters) cephalopods; Small pelagics (ocares, anchovies, sardines, Magumba); Pelagic (jacks, mackerel, machopes, saws) Demersal soft bottoms (croakers, macujanas, ribbon fish, catfish, mullet, stone fish, croakers, stingrays); Benthic (flounder, sandpits)	Trawling Gillnet Cages Line Longline Encircling nets
Búzi	Bays and estuaries: under the influence of Buzi and Pungué Rivers; Mangroves; Intertidal zones; Inland waters;	Crustaceans (shrimp, fine shrimp, mangrove crab); Shellfish (especially groups of bivalve clams) cephalopods; Small pelagics (ocares, anchovies, sardines, Magumba); Pelagic (jacks, mackerel, machopes, saws) Demersal soft bottoms (croakers, macujanas, ribbon fish, catfish, mullet, stone fish, stingrays); Benthic (flounder, lenges, cobblers, sandpits)	Trawling Gillnet Cages Line Longline Encircling nets
Beira	Bays and estuaries: under the influence of Buzi and Pungué Rivers; Mangroves; Intertidal zones; Inland waters;	Crustaceans (shrimp, fine shrimp, mangrove crab); Shellfish (especially groups of bivalve clams) cephalopods; Small pelagics (ocares, anchovies, sardines, Magumba); Pelagic (jacks, mackerel, machopes, saws) Demersal soft bottoms (croakers, macujanas, ribbon fish, catfish, mullet, stone fish, stingrays); Benthic (flounder, lenges, cobblers, sandpits)	Trawling Gillnet Cages Line Longline Others
Muanza	Bays and estuaries (Sengo estuary); Intertidal zones; Mangroves;	Crustaceans (shrimp, fine shrimp, mangrove crab); Shellfish (especially groups of bivalve clams) cephalopods; Small pelagics (ocares, anchovies, sardines, Magumba); Pelagic (jacks, mackerel, machopes, saws) Demersal soft bottoms (croakers, macujanas, ribbon fish, catfish, mullet, stone fish, stingrays); Benthic (flounder, lenges, cobblers, sandpits)	Trawling Gillnet Cages Line Longline
Cheringoma	Bays and estuaries (Nhamissembe river estuary) And Zambezi Pungué, Zuni, Chiniziua, múcua, Zangoé rivers; Coast with dunes Intertidal zones; Mangroves;	Pelagic fish and demersal crustaceans	Gillnet Cages Longline

[29] (Paula e Silva, 2000; Tenreiro de Almeida, 2006; Pereira et al, 2007;. IDPPEa, b, 2009).

5.3.5 Maputo Province

The characteristic ecosystem of the area is partly described as estuarine, where end some important rivers such as Incomáti north, Umbelúzi, Matola and Tembe and Maputo River west to south. These rivers stimulate biological productivity of the Bay due to its discharge regime as well as by the presence of seagrass and mangroves not only on its banks, providing high levels of nutrients. As a result, the bay supports abundant populations of fish, crustaceans and mollusks (Paula e Silva *et al.*, 2000).

In Maputo, artisanal fishing is practiced in all the coastal districts both in offshore and in various courses and fresh water bodies that occur in the province. However, it is more pronounced at Maputo Bay. The area covered by the fishing activity is limited by the districts of Marracuene, Maputo City and Catembe; and the Inhaca and Portuguese islands, Machangulo Peninsula in Eastern area, approximately 686 km^2 in total.

According to the latest census, Maputo Bay has 34 fishing centers the total number of fishermen in these centers is estimated at about 4,500 mostly using the arts gillnet, trawl and hand line (IDPPE, 2009) .

Table 6: Fisheries and fisheries gears in Maputo Province

District	Ecosystem Feature	Key Resources	Fishing gear
Maputo-cidade	Bay and estuary	Pelagic Family: Clupeidae (sardines), Penaeidae (Shrimp), Portunidade (pelagic crabs), Sciaenidae (Croakers), Sillaginidade (hake), Haemulidade (stone fish), Engraulidae (Ocares)	Trawling for beach Trawling to board Surface Gillnet Bottom Gillnet Handline Longline Encirclement Other gear
Matola	Estuary	Pelagic Family: Clupeidae (sardines), Haemulidae (stone fish), Mugilidae (mullets), Penaeidae (shrimp), Sciaenidae (croakers)	Trawling for beach Surface Gillnet Bottom Gillnet Cage Handline Other gear
Inhaca	Bay and offshore	Pelagic Family: Clupeidae (sardines), Penaeídade (Shrimp), Sillaginidae (hake), Carangidae (mackerel), Haemulidade (Fish stones), Rock Lobster (Palunirus sp), Portunidade, Sciaenidae (croakers), Letrinidade (thieves), Lutjanidae (snappers), Mugilidae (mullets), Siganidae (rabbits) Demersal: Sparidae (seabream)	Trawling for beach Surface Gillnet Bottom Gillnet Handline Cage Encirclement Other gear
Marracuene	Offshore, Bay, Mouth of the rivers	Pelagic: Family: Carangidae, Clupeidae, Cynoglossidae (flounder), Haemulidae, Hemiramphidae (sock needles), Sphyraenidae (barracudas). Demersal: Sciaenidae, Sparideos; Squid, Cuttlefish Shrimp: Penaeidae	Trawling for beach Surface Gillnet Bottom Gillnet Handline Other gear

(Source: IDPPE, 2009).

5.4 Socio-economic Situation

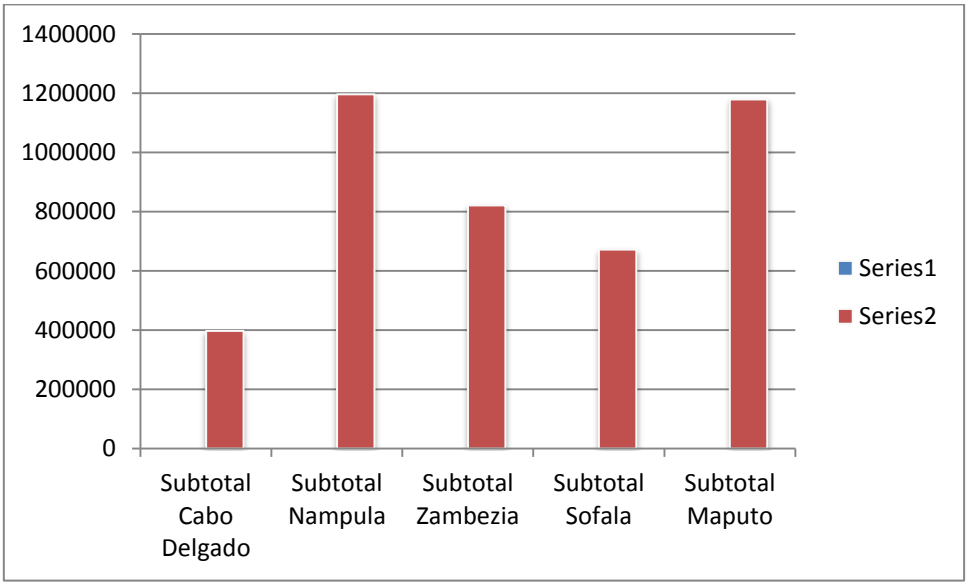
As shown in Table 7 (below) the entire targeted program area represents roughly 4,266,450 inhabitants, i.e. approximately 21% of the overall country's population, in 2007. People living in the country's coastal areas represent close to 60% of the population. A significant number of these people have in one way or the other strog relations with salt water fisheries.

Table 7: Total potential population in the program area

Province	City/District	Inhabitants
Cabo Delgado	Pemba	141.316
	Palma	48.318
	Mocimboa da Praia	90.421
	Macomia	79.825
	Quissanga	37.771
Subtotal Cabo Delgado		**397.651**
Nampula	Nacala	206.449
	Angoche	276.471
	Memba	229.821
	Ilha de Mocambique	42.407
	Mongicual	129.969
	Moma	310.690
Subtotal Nampula		**1.195.807**
Zambezia	Quelimane	193.343
	Inhassunge	91.196
	Pebane	185.333
	Nicoadala	231.850
	Chinde	119.898
Subtotal Zambezia		**821.620**
Sofala	Beira	431.583
	Cheringoma	20.795
	Mwanza	15.306
	Buzi	159.614
	Macanga	44.784
Subtotal Sofala		**672.082**
Maputo	Maputo City	1.094.315
	Marracuene/Macaneta	84.975
Subtotal Maputo		**1.179.290**
TOTAL		**4.266.450**

The graphic below shows that in terms of population within the program area Nampula comes in the dominant position, followed by Maputo (combining the province and the city of Maputo) and Zambezia.

Graph 1: Distribution of people in the program area by province



Most of the people in the concerned districts live in the coastal areas and those to be directly targeted by the program are mostly concentrated in urban areas (cities and towns) with a small number livng in typical rural areas.

A few common traits of the people living in urban and rural areas respectively highlight the following:

Urban areas

Mozambique's urban areas grew considerable in the last three decades as a combination of the natural rural emigration to the urban areas but also due to the war that lasted for approximately sixteen years (1976-1992). In 2011 it was estimated that close to 35% of the country's population lived in urban areas. For various reasons the growth (unprecedented) has not been accompanied by adequate implementation of key public services with a view to achieving an adequate quality of life. The daily life of most cities and towns has been marked by rapid occupation of the territory, with a predominance of the informal sector and other business activities, which have created serious structural problems relating to deficiencies in basic infrastructure.

Among other things urban development has not been accompanied by the necessary land use planning which has resulted in an almost chaotic occupation of spaces including the spaces surrounding the roads, ports and other facilities where the legal protection of reserved areas is not followed. It is normal to see these areas being encroached by walls, pavements, including structures and temporary buildings that are used to trade in a range of household products, building materials and motor vehicle parts, structures used as workshops for the manufacture/maintenance of a variety of goods. Due to the weak development of the agriculture and industry sectors and the consequent limitation of job opportunities, reliance on informal trade has become, for some years, an increasingly important subsistence activity for many families in Mozambique particularly in urban centers. This forms one of the faces of urban poverty.

Due to inadequate and/or total lack of drainage systems; coastal protection and sanitation the coastal cities and towns are even worse and subject to serious problems such as physical erosion, regular floods, widespread diseases and other socioeconomic problems. This is further compounded by extreme weather events associated with global climate change.

Rural areas

It is in the rural areas that poverty is more prevalent in Mozambique, with women and vulnerable groups (households headed by women, the elderly, children and people with disabilities) being the hardest hit by this phenomenon. In those areas and in many parts of Mozambique a vicious cycle made of natural conditions, lack of capital and adequate financial services, production technologies and services responsible for development and dissemination of such technologies, poor marketing systems and other factors that define the environment in which local economic activities are carried out, explain the prevalence of the subsistence economy. The economy is based on direct and integrated exploitation of natural resources, with very little transformation. Plant and animal production, forests and fisheries are integrated in a single economic system of multiple relationships. These are combined to guarantee the survival of the individuals, the families and the communities. Notwithstanding the weight of other sectors in the family economy agriculture tends to be the dominant economic activity, followed by fisheries.

Some of the aspects that define the practice of agriculture in the area, which are typical of the so-called "family sector" are:

- Cultivation of very limited areas: 0.5 to 1 ha is the common size of most of the farms in the project area[30].
- Use of farming technologies that are rudimentary: cultivation is primarily undertaken using hoes and virtually no external inputs, such as improved seed, fertilizers and chemicals are used[31].
- Over the years the family sector farmers have developed livelihood strategies oriented towards minimising risk through crop diversification, which takes place in a variety ways including:
    - Growing several crops and the dominance of intercropping;
    - Preferring to grow two or more consecutive crops rather than just one of a longer cycle, even if the potential total yield is higher for the latter, to obtain advantage of moisture availability during the short rainy season; and
    - Growing crops in as many diverse environments (topography/relief/soil) as possible, e.g., in sandy flat areas, in medium textured alluvial deposits of slopes (transition zones), in the fine textured dark colored soils of the river beds (dambos) and in open valleys and alluvial soils.

This results in a combination of plots on different soil types and in different crop preferences, each with different fallow and cropping patterns.

Diversification is also extended to embracing a multitude of activities across sectors, including fisheries, in detriment of specialization that would lead to elevated production and productivity.

As said small-scale and artisanal fisheries play a significant role in the country's economy. It represents close to 80% of the total marine catches. Artisanal fisheries consist of individuals or small groups of fishermen with very weak economic power. They make use of non-motoric fishing vessels/boats of around 3-8 m in length. They also use beach seine, gillnet and long line to catch fish. Fish collectors and divers are yet other important ways of practicing this activity. It is estimated that the number of fishing boats and canoes reach approximately 15,000, of which 3% are equipped with engines, using beach seine and gillnet fishing gears. Most of the marine artisanal activities take place along the entire coastline.

[30] The informal character of agriculture and animal production, which are dominant economic activities in the project-related areas, explains the present land use and land tenure patterns. Ancestral laws establish the distribution and use of land by existing families. Lineage plays a crucial role in the process. Each family and groups of families do their best to secure enough land and to have direct access to areas for housing, fauna, forests, pastures, fertile grounds and water.

[31] Due to the monopolistic structure of the market for these products, they are rather very expensive in Mozambique.

A few more details about the socioeconomic situation in the program area are presented below.

5.4.1 Cabo Delgado Province

Cabo Delgado Province is approximately 82,625 km² in size, including 4,758 km² of waters. The province is located in northeast of the country, between latitudes 10° 29'and 14º 01' South and longitude 35º 58' and 40° 35'east. The province has the following geographic boundaries: to the north, the Rovuma river forms a natural border with the United Republic of Tanzania, in the south, the Lúrio River, separates it from the province of Nampula; west (successively from north to south) Lugenda rivers, Luambeze, Street-ca and Mewo, separated with Niassa Province, the eastern side with Indian Ocean.

Cabo Delgado in inhabited by three main ethnic groups, namely Makonde, Macuas and Mwani. The biggest urban center is Pemba, which in the last few years has become an important tourist center and a historical city situated on the bay with the same name. Pemba bay, with 50km2 of magnificent inlets and beaches that start at Sagal Beach, Pecado, Maia Via, Wimbe and Marringanha Beach, after which there are many kilometers of beaches from Chiuba to Mecufi, is the third largest in the world and the biggest in Africa.

To the North of Cabo Delgado, along the 200 Km of coastline, extends the Archipelago of Quirimbas. It has 32 islands, including "Ibo Island, with interest history, natural beauty and magnificent beaches", which was in the past an important commercial center. The Archipelago of Quirimbas has been defined as conservation area.

In more recent times, Cabo Delgado in addition to having been emerging as an important tourism destination it has become the center of oil and gas exploration area. There is now enough evidence to the effect that along the coast of Cabo Delgado province the Indian Ocean holds one of the largest gas reserves in the world, which has the potential of drastically changing the face of the province and the country in general.

The districts and administrative posts and other localities in this province that have the potential of hosting program interventions can be briefly described as follows:

- **Pemba City:** Pemba City is situated on the eastern side of Pemba Bay and is part of the 53 municipalities existing nationwide and capital of the Cabo Delgado Province. According to the 2007 census the town has a population of 141,316 habitants.
- **Palma District:** The 2007 Census showed a population of 48,318. Covering an area of 3,493 km², population density reaches 13.83 inhabitants per km².
- **Mocimboa da Praia District:** In 1998 the town of Mocímboa da Praia was elevated to the category of a municipality. The 2007 Census showed a population of 90,421. Covering an area of 3548 km, population density reached to 25.49 inhabitants per km².
- **Macomia District:** The 2007 Census showed a population of 79,825. Covering an area of 4,049 km², population density reached 17.3 inhabitants per km².
- **Quissanga District:** The 2007 census indicated a population of 37,771. Covering an area of 2,061 km², population density reached 18.33 inhabitants per km². Associated or near to the Quissanga District, there is the Ibo Island (within the District of same name). The island of Ibo District located in the east is the most favorable fishing commercial site in the area. The district includes two major islands of the Quirimbas: Mefunvo (or M'funvo) and Quisiva. Ibo Island is a small coral island located near the coast of Cabo Delgado Province in northern Mozambique.

Fishing activities in Pemba area and northern districts

After agriculture fishing industry is the second largest economic activity in the entire province of Cabo Delgado.

Artisanal fishing is practiced along the coast of Cabo Delgado province and according to the last census conducted by the National Institute of Development of Small Scale Fisheries (IDPPE), this region has 61 inland fishing centers and 136 in marine waters, involving about 14,261 fishermen. The main fish gears used are trawling along the beach, gill nets, long line fishing, hand line and cages, besides fishing with spear/harpoon gun (IDPPE, 2009).

Fisheries are one of the contributors to the provincial economy. This is attributed to Cabo Delgado being a coastal province with numerous islands located along the coast, which have proved to be a base for the establishment of fishing centers and the development of fishing activity. The Province has the potential to develop tourism activities, due to its marine, coastal and inland game resources diversity. Industrial tuna fishing occurs in the Exclusive Economic Zone (EEZ) close to the territorial waters of Palma District. Industrial and semi-industrial fisheries by Mozambican operators occur far south of Cabo Delgado Province.

A small-scale fishery is the only subsector of fisheries industry activities contributing to the economy of the province. Other fisheries subsectors are active south of the province and, in terms of commercial activities, industrial tuna fishing takes place beyond 12 nautical miles with no direct contributions to the provincial economy.

Small-scale fishery and fishing industry-related activities are an important part of the provincial population's livelihood activities, especially for those living on the coastal areas – even though its contribution to the provincial economy is low at 6.4 percent. The majority of small-scale fisheries participants are artisanal subsistence fishermen who fish for household consumption (thereby playing an important role in food security for those involved) and sell the surplus locally. Only a small number of artisanal fishermen are more market-oriented, using more appropriate boats, technology and labor.

Fisheries Production, Market and Conservation

Most of the small-scale fishing is undertaken for household consumption, and surplus is usually sold to neighbors and at local markets. According to the Fisheries Research Institute, catches in Cabo Delgado have grown from 11,558t in 2009 to 18,059t in 2011, partially because two additional fishing gears (4) were monitored in 2011. Thus, catch levels by artisanal fishers that use fishing gear in the province seem to be relatively stable during this period, despite more steady growth in the use of beach seine nets (from 5,909t in 2009 to 7,033t in 2011) and surface gill nets (from 2,582t in 2009 to 3,586t in 2011). Statistically, hand line fishing remains the fishing gear with a higher fish effort and lower catch rate (13kg/day).

Some of the major challenges facing artisanal fishers seeking to be more market-oriented are the poor road network for fish marketing, and lack of refrigeration to transportation of fresh fish. Accordingly, most fish is dried or smoked as a means of preservation.

In Palma District, some 21 percent of women are artisanal subsistence fishers, indicating that they already play an important role in ensuring food security for families, as well as generating income. Artisanal fishing is practiced by the communities along the coast and along inland waterways, where catches are used for consumption as well as for sell.

Cabo Delgado Province has no nationally registered industrial and semi-industrial fishing activities. Nationally, industrial and semi-industrial fishers focus on shallow-water shrimp, deep water shrimp and line fishing.

According to a report from the fisheries sector (Fenessy *et al.*, 2011), in 2010 there were two industrial and 27 semi-industrial line fishing vessels targeting demersal fish (bottom fish) along the Mozambican coast. All these were national vessels, which reported a total catch of 626t in 2010. The catch was comprised of slinger (*Chrysoblephus puniceus*), the sea breams (*Polysteganus*

coeruleopunctatus, *Cheimerius nufar*), king mackerel (*Scomberomorus commerson*), groupers (*Epinephelus sp.* and others) and grunters (*Pomadasys kaakan*), among other demersal and pelagic fish species. The industrial and semi-industrial sector supplies both the domestic and southern African (mainly South African) markets. These fishers are based mainly in southern Mozambique, a considerable distance from Cabo Delgado Province and Palma District.

Figure 22: A typical fish market in Pemba[32]

Industrial tuna fishing is allowed along the east coast of Cabo Delgado, under the framework of the fisheries partnership agreement between the European Union (EU) and the Republic of Mozambique. This commercial activity has little impact on the Cabo Delgado economy, as the licenses are issued by the Ministry of Fisheries at central government level and the catches remain offshore. The countries covered under the terms of the protocol include Spain, Portugal, France, Italy and Greece, and the main species caught by the EU vessels is tuna. The agreement sets a quota for catches by EU boats of 10,000t of fish per annum.

5.4.2 Nampula Province

With an area of 81.606 km² Nampula province had 3,985,285 inhabitants in 2007 (INE) of which 51% were women. This is the most populous province of Mozambique. The province has an annual population growth of 2.5% and a population density of 50 inhabitants per km², the second highest in the country, after the city of Maputo. About 41% of the population is concentrated in the districts of Moma, Monapo Angoche Mogovolas, Eráti, Memba, Nampula Rapale, Nacala and Nampula City. The latter concentrates 12% of the total population of Nampula.

The City of Nampula is the third largest city after Maputo and Matola. Due to its unifying role of business activities in the north of the country it is also known as the "the Northern Capital". Nampula province represented, in 2007, nearly 8% of the country's GDP and is projected that by 2020 this proportion will remain constant. The province of Nampula has some of the major business centers in the country and the northern region.

[32] In certain cases fish is sold door to door in baskets.

The districts and administrative posts and other localities in this province that have the potential of hosting program interventions can be briefly described as follows:

- **Nacala District:** Nacala Porto, is one of the 23 cities existing in Mozambique. It is one of 53 municipalities of Mozambique. According to the 2007 Census, Nacala has a population of 206,449 habitants. Nacala Porto and Nacala-a-Velha, at the north have been growing in importance in the last few years because they are the terminal and starting point of the important development Corridor of Nacala. "Nacala Development Corridor" was launched jointly by the Governments of Mozambique , Malawi and Zambia in 2000 to improve and extend the economic growth of the area of influence of the railway line and the road linking the coast in Mozambique, Nacala with Malawi and Zambia. Traditionally the Corridor includes beyond - Mandimba Nacala Road (N13) also the port of Nacala , the railway line between Nacala and Entre- Lagos (between Cuamba and Lichinga) and Lake Niassa, all located in Mozambique , as well as the railway line which covers the southern and some central districts in Malawi for example: Ntcheu , Dedza , Alima , Dowa , Lilongwe and Mchinji as well as some land adjacent to Lake Malawi. Recently, with the discovery and exploration of huge deposits of coal in Tete/Moatize there are concrete plans to extend the Nacala Corridor to also integrate the province of Tete and comprise at least one railway line with of more than 900 km. Is expected to start functioning from 2014-15. This and other development initiatives have fuelled intense investments in Nacala area which has also been declared Special Economic Zone. The area is experiencing unprecedented growth with a strong potential to assist in the materialization of the various intentions related with the reactivation of the fisheries sector.
- **Angoche District:** The 2007 census indicated a population of 276,471 residents.
- **Memba District:** Memba district has as its capital the town of Memba. The 2007 census indicated a population of 229,824 residents. With an area of 4,555 km², the population density was about 50.46 people per km².
- **Mozambique Island (Ilha de Moçambique) District:** The District of Ilha de Moçambique is an island city located in Nampula province, in northern Mozambique, which gave its name to the country and was the first capital of the country. It is considered by UNESCO as World Heritage as from 1991. Currently, the city is a municipality and according to the 1997 census, the municipality has 42,407 habitants, and 14,889 of those living on the island. It has been growing has an important tourism center.
- **Mogincual District:** The 2007 census indicated a population of 129,969 residents. With an area of 4274 km², the population density was about 30.41 people per km².
- **Moma District:** The 2007 census indicated a population of 310,690 residents. With an area of 5677 km², the population density was about 54.73 people per km².

Fisheries activities in the province in general

Nampula province has 18 districts, of which 8 are located in the coast. Artisanal fishing is practiced in all marine coastal districts as well as in many rivers and fresh water bodies that occur in the province. The intensity of fishing activity and gear used is related to the ecological conditions of each district.

Fisheries activities in this region are common, with involvement of local community (as artisanal), licensed companies up to illegal international fishers.

The Institute for Development of Small-Scale Fishing is implementing various activities in this area. These include the financing of small projects, sale of fishing and supply of materials, rehabilitation of fish saline processing and storage. Sports fishing activities have also been reported in this area.

In Memba, Mozambique Island and Mogingual (Namige) areas there are artisanal fisherman. The implementation of this project can be seen as crucial for the newly developing region of Nacala Corridor. The southern region of Nampula Province is recording a rapid development because of

mining operations in Angoche and Moma including those occurring in Tete that see the excellent sea natural conditions in Nacala as the preferable option to export their production. Thus, it is to be expected that the area will become a good consumer center for a diversity of primary goods, including fish.

There are 180 fishing centers in Nampula province (IDPPE, 2004). And according to the latest census IDPPE (IDPPE, 2007), about 140,000 people, representing 40% of the total nationwide, are involved in the fishery sub-sector in the province. Of these, 57,780 are fishermen without boats and conventional gear.

The districts further south (Angoche and Moma), because they belong to the Sofala Bank basically have a sandy substrate with large continental plate. The bottom characteristic is estuarine (sedimentary) due to the influence of Mutomoti, Meluli and Ligonha rivers that flow into. This sub-region has several species of mangroves (Baloi, *et al.*, 2004), while districts further north (Mogincual, Mossuril, Mozambique Island, Nacala-Porto, Nacala-a-Velha or Memba) have coral reefs, rock, mangroves and estuaries are mostly surrounded by rocks (Fischer at al. 1990).

The coastal currents system along the Mozambique Channel is extremely dynamic, and there is a number of persistent vortices that induce strong currents from north to south, and countercurrent systems in the opposite direction (Segtnan, 2006; Lutjeharms, 2007).

Angoche, Larde and Moma area

Economic activity includes agriculture and commercial and artisanal fishing. A Chinese-owned company operating in Angoche, in Nampula Province, is expected to invest 20 million dollars in strengthening the fleet of fishing vessels from 8 to 20. The investment will include the construction of new facilities and acquisition of a new fish conservation system. The old company, Pesca Norte, which was recently reactivated, after about a decade of stalemate due to financial difficulties, houses a conservation capacity of 70 tons of fish. This is one of the major operating companies in the area. There are artisanal fisherman in the Angoche area. Since 2002, the Artisanal Fisheries Project in Sofala Bank has supported important work to improve basic living conditions and incomes of poor fishing communities. In addition to strengthening specific activities of the sector in itself, the project built health centers, schools, wells and roads linking the fishing communities and consumer centers (from http://www.ruralpovertyportal.org/documents 27/04/2014).

Fishing is practiced in artisanal, semi-industrial and industrial scheme. Fishing in these areas (Angoche, Larde and Moma) is more geared for the shrimp to the detriment of other species and valuable resources constituted by lobster, squid, octopus and crab.

There are two fishing companies in the district of Angoche namely Pesca Norte (operating with 8 vessels trawling shrimp) and Mawipi Fisheries (still in formation).

Fisheries Production, Market and Conservation

The density of resources is higher in the southern districts of the province (Mogincual, Angoche and Moma), relative to districts farther north (Mossuril, Island of Mozambique, Nacala-Porto, Nacala-a-Velha and Memba). The pattern of dominance of households in catches changes between different periods in gillnet catches in the district of Moma and surface gillnets in Nacala-a-Velha, Nacala-Porto, Mossuril and Moma. However, it is difficult to say that it was only due to fishing.

Figure 23: Fish marketing in Nacala – Naherengue.

Identification of fish of different fisheries ground in locations away from the coast can reduce the current pressure exerted by the trawl fishery to the beach in the coastal region, a zone of reproduction and growth. This action requires adaptation to water trawl aboard the trawling and improving existing fishing units (motorization of vessels) to ensure autonomy at the sea.

Effective compliance with current periods of closed season for artisanal fishing can promote the replacement of springs. Supporting existing community-based organizations (CCP s), until the structural and functional sustainability, may eventually aid in fisheries management, at least locally.

5.4.3 Zambezia Province

Zambezia is the second most-populous province of Mozambique and it is located in the central coastal region south-west of Nampula province and north-east of Sofala. It has a population of 3,85 million (INE, 2007). The provincial capital is Quelimane in and around which a significant part of SWIOFish activities are likely to be concentrated.

The province has a total area of 103,478 km², much of it drained by the Zambezi River.

Agricultural products include rice, maize, cassava, cashews, sugarcane, coconuts, citrus, cotton and tea (the latter is concentrated in Gurue, which used to be the tea capital in Mozambique). Fisheries in the province have shrimp has the main species and the province has a strong potential for aquaculture.

In spite of its strong potential the province has been relatively neglected in the last few years in terms of being recipient to development initiatives. In fact the MPD report of 2010 of increased incidence of poverty showed that Zambezia has been one of the hardest hit by this phenomenon.

The districts and administrative posts and other localities in this province that have the potential of hosting program interventions can be briefly described as follows:

- **Quelimane City:** Quelimane is the capital and largest city of Zambzzia. The 2007 Census recorded 193,343 residents.

- **Inhassunge District:** Inhassunge is a district of the Zambzzia Province, established at the Mucupia town and situated 20 kilometers south of Quelimane. The 2007 Census showed a population of 91,196 residents.
- **Pebane District:** The 2007 census indicated a population of 185,333 residents. With an area of 10,182 km², the population density was about 18.20 people per km².
- **Nicoadala District:** Nicoadala district has as its capital the small town of Nicoadala, to the west of Quelimane, at a distance of around 30 km. The 2007 census indicated a population of 231,850 residents. With an area of 3,392 km², the population density was about 68.35 people per km².
- **Chinde District:** Chinde has its capital in the once important port town of Chinde, situated in one of the islands formed at the termination of Zambeze River. The 2007 census indicated a population of 119,898 residents. With an area of 4,403 km², the population density was about 27.23 people per km².

Fisheries activities

Quelimane, Zalala, Inhassunge and Chinde area

The most known company in the area has been Aquapesca. A French company farming shrimp located in Quelimane, which has been in operation since 1994. The production of shrimp covers the complete cycle in the company from playback until harvesting and packaging for export. There are approximately 300 workers on the farm. The company is in the process of returning its assets for public management and INAQUA is currently planning to restructure the whole area in a modality that is likely to combine different categories of operators ranging from the family sector to commercial operators.

Fishing communities in Inhangome, Inhassunge and Zalala where the men are the most prominent fishers have been showing considerable resilience in the development of their activities. Among other they are faced decline of fishery resources. In the area small-scale aquaculture could be an option for ecologically and socially adequate livelihood and local people seem to know how to manage the various aspects that affect their main source of income.

The introduction of motorized means in artisanal fisheries in the area so that small traders can reach more distant places with more abundant resources is one of objectives of government.

Illegal artisanal fishing occurs in the region of Quelimane, practiced by local populations for the purpose of satisfaction of daily needs and food diversification.

In Quelimane there is an important fishing port, which, for various reasons, is mostly being utilized below its potential capacity.

In the Chinde area, only artisanal operations are reported. The fishing activity can be done in the Zambezi River and Indian Ocean. The implementation of the fishing program in the area can be associated with the supply to the emerging market in Tete region, formed around coal mining operations nowadays, as Chinde is the nearest point to and from the ocean.

Fisheries Production, Market and Conservation

The income generated by demersal resources is relatively larger than pelagic. The tendency of demersal income over time shows some oscillation, which highlights the years 2000, 2003 and 2007 as being the ones that have a peak performance for many families considered. Overall the Ariidae family of which the most important species is *Aruis dussumieri*; *Leiognathidae* with the species *Gaza minuta*, *Secutor insidiator* and *Leiognathus equulus*; *Haemulidae*, species *Pomadasys kaakan*, are those registered has the most important in relation to catch per unit effort (CPUE) meaning the number of individual .

Figure 24: Dry fish in Zalala

The trawl gear to the beach over the 10 years (1998-2008), was one that was less selective; contributes most to the total annual catch, which was decreased although not significantly; contributed more in terms of fishing effort, which has grown significantly over time; and its income has fallen so also not significant.

Figure 25: Docking station in Quelimane[33]

[33] Non-operational due to the damaged gate.

It is recommended to reduce trawl nets, improve its selectivity, prohibit their use in estuaries and eradicate mosquito nets; promote the sustainable use of fishing gears such as hand line, long line and gillnets following the technical specifications published by the fisheries sector responsible for fisheries technology. Special attention should be taken in terms of short-term action strategy to districts that are already having serious problems of juvenile capture.

5.4.4 Sofala Province

With an area of 67,753 km² and a population of 1,642,920 (INE, 2007 census) Sofala is one of the central provinces of Mozambique, which has the City of Beira as its capital. Its population density stands at 24.3. The province is names after the ruined port of Sofala.

Sofala province is where the Port of Beira is located. Before the decline of the Zimbabwean economy this was the second most important port in the country in terms of cargo volume handled annually.

Beira, the heart of the central region, is the second city of Mozambique and an economic centre of regional importance. Its port plays an integral role linking central Mozambique to Zimbabwe. The commercial importance of Beira has been emphasized in regional planning by the establishment of the Beira Spatial Development Initiative. The city is easily and closely linked to Dondo (about 30 km through EN6). However, Beira City is not linked to the National Highway North-South (EN1). The later road (EN1) passes through Inchope approximately halfway between Chimoio and Beira. The road from Beira to Mutare and through to Harare is in relatively good condition and is being upgraded to highway standard as part of the Beira SDI program.

The districts and administrative posts and other localities in this province that have the potential of hosting program interventions can be briefly described as follows:

- **Beira City:** Beira is a city capital of Sofala Province and is one of 53 municipalities in Mozambique located in the northern margin of Pungue River. Beira used to be the second largest city in Mozambique, after the country's capital, Maputo, with a population of 431 583 habitants, according to the 2007 Census. But recent statistics point out to the fact that such position is now occupied by Nampula.
- **Chiringoma District:** Cheringoma district has as its capital the town of Inhaminga. According to the 1997 census, the district has 20,795 habitants and an area of 8,739 km², hence resulting in a population density of 2.4 m / km².
- **Mwanza District:** Mwanza is a district of Sofala province in Mozambique, based in the town of Mwanza. According to the 1997 census, the district has 15,306 inhabitants and an area of 5731 km², hence resulting in a population density of 2.7 m / km ².
- **Buzi District:** Buzi district has as its capital in the town of Buzi. It has an area of 7409 km² and a population of 159,614 habitants, according to the results of the Census of 2007, resulting in a population density of 21.5 inhabitants/km². The population census in 2007 represents an increase of 11.5% compared to 143 152 inhabitants recorded in the 1997 Census.
- **Machanga District:** Machanga district has as its capital the town Machanga. According to the 2007 census, the district has 44,784 habitants and an area of 4,657 km², resulting in a population density of 9.6 m/km².

Fisheries activities

Beira, Buzi and Machanga area

According to the Ministry of Fisheries (http://www.mozpesca.gov.mz) Sofala bank extends from Angoche (16 ° 30 south) to the Save River (21 ° 00 S) in a track away from the coast of about 40 km and an area of approximately 50,000 km². The main feature of this area is shrimp production.

Despite the obsolete state of facilities, the City of Beira has a fishing harbor. The Mozambican government has recently raised 120 million dollars for the reconstruction of the fishing port of Beira.

The presence of the vessel inspection in the area inhibits somehow illegal activities. The concentration of industrial and semi-industrial vessels in the port facilitates the control, which is not applicable for small-scale fishing that is scattered along the coast.

In the area of Buzi and Machanga, only artisanal fishing operations are reported. The implementation of the program and other similar initiatives are likely to lend new dynamics to this subsector of the industry. New gas prospects have been discovered in the area. The area has very important resources of limestone, which can bring a cement plant[34] and other industries into the area and create a potential market for marine products. Regionally, the area has daily connections by air, road and railway with big cities in Mozambique and the southern African region.

Fisheries Production, Market and Conservation

Fishing is mostly commercial in nature as assessed by the importance of complementary activities such as fish processing and marketing involving nearly 3,000 participants (IDPPE, 2009). However, as livelihood activity recollection is highlighted (perhaps except in areas where there is a market, as in the case of Beira) and the capture of fine shrimp.

In Sofala, trawling to the beach support a considerable level of fishing where a decreasing income was registered (CPUE) over time in Buzi (with initial values of about 125 kg / net.day and 50 kg / net.day and Beira, where a decreasing trend in catch was observed in the period 2001-2003 (between 450 and 550 kg) compared to lower values (between 100 to 300 kg) in the period 2004-2009 while yields (CPUE). Machanga stands out in the year 2004 with average catches of around 65 kg and 2008 with catches of 74 kg and average yields of 54 kg / net.day.

It is recommended to reduce fishing pressure by improving the selectivity of net and/or the identification of periods closed season; improvement of the selectivity of the nets can be made taking into account the different characteristics of the (most captured) target resources over a lifetime.

Highlighting the aforementioned gears in Beira and Buzi, actions to avoid increasing the number of trawls and chicocota or until replacement by other fishing gears (which may perhaps focus the effort to other areas, for example furthest from the coast / bay) should be considered. The chicocota can be experienced and expanded to remote areas of estuarine regions; Introduction of more longline units in Mwanza is discouraged.

5.4.5 Maputo City and Province

Besides being the capital Maputo City is the largest city in Mozambique. It is located in the south on the western shore of Maputo Bay. Except for the Indien Ocean on the east the capital is entirely bordered by districts of Maputo province including Marracuene district, on the north, which is of interest for the program because of Macaneta. To the northwest and west, Maputo City is bordered by the city of Matola, to the west, by the District of Boane; to south, by the District of Matutuíne. In the independent Mozambique the city was elevated to the status of a municipality with autonomous elected government from 1988 after having been given the status of a province in 1980, which still stands.

In accordance with the 2007 Census the City of Maputo has an area of 347.69 km and a population of 1,094,315 inhabitants, which equates to a density of 3.147, which is by far the highest in the

[34] There is already one such a factory in Dondo (30 km from Beira).

country. The city is divided into seven municipal districts which in turn are subdivided into neighborhoods.

Because of its national importance due to the fact of being the political and administrative capital and even the country's economic hub as well as its geographic location close to the regional countries like South Africa, Swaziland, Zimbabwe and Botswana, Maputo city is an important point of confluence of people, businesses and interests.

Marracuene is a district in the northern side of Maputo city situated at about 30 km from the capital. In the last few years due to rapid urban growth the capital of Marracuene district, which has the same name as the district, is becoming increasingly integrated with the capital of the country and forming part of the Greater Maputo Area, which, according to a series of sources (e.g. FIPAG) today represents close to 2.0 million people and will represent more than 4.0 million by 2035 (FIPAG, 2011). The small village and beach area of Macaneta is situated in Marracuene District to the east of the capital town. The area has been growing as an important tourism destination, most sought out by inhabitants of Maputo in search of cleaner beaches and more pristine environment. A biggest limitation for the widespread of use of the area is the absence of adequate facilities to cross Incomati river. At present this is done using an old ferry boat with very low carrying capacity. Long queues are formed, especially during weekends, by people going to and coming back from the beach.

Fisheries activities

There is a fishing port in Maputo city with official name of Porto de Pesca de Maputo. Commercial, sport and artisanal fishing are also developed in the same city.

The Bay of Maputo has been the scene, in recent years, of intense fishing activity, particularly small-scale fishing which show little development, because, among other several reasons, of deficient markets (Ngale, A. J., 2012).

The fishing activity in Macaneta is dominated by artisanal fishermen. The products can be observed in Marracuene Village as well as in Macaneta local markets. The industrialization of this activity in the area will certainly promote development of the business and increase and reach other markets in Maputo and other locations.

Fisheries Production, Market and Conservation

Analysis of the fishery indicators lead to the conclusion that there is over-exploitation of resources in trawl fisheries (beach and on board), hand lines and surface gillnet are yet sustainable exploitation in gillnets background. The main species caught are mostly small in size and before their sexual maturity.

Increased supervision in relation to mesh sizes of gillnets and bags of trawls is necessary to set the default number of mesh sizes for nets to regulate the size of the nets\ for gear and for line fishing.

The highest yield of fishing for trawling to the beach was recorded in 2001 (42 kg / net day) with a decreasing trend. Catches and gillnet income of surface gillnet, trawl to the board and hand line decreased over the years and this gives an indication of pressure in the exploitation of these resources.

At the bottom gillnet, fishing effort, catch and incomes showed a non-significant increasing trend where higher catches were observed in 2008 (592 t), coinciding with high yields (14 kg/net day).

6- WORLD BANK SAFEGUARDS POLICIES

In line with the project characteristics, it is to be expected that fisheries, public works and private investments including public-private partnerships will have expressive weight within SWIOFish. It is particularly in the fisheries sector, in the same way as in agriculture, that the inability to take advantage of the vast natural and social opportunities offered by the country to diversify its economy, create employment and income opportunities for a large majority is most felt. Due to its focus on fisheries and basic general infrastructure and systems development SWIOFish will finally trigger only four of the 10+2 World Bank Operational Safeguards Policies, namely, Environmental Assessment (OP/BP 4.01), Involuntary Resettlement (OP/BP 4.12), Natural Habitats (OP/BP 4.04), and Physical Cultural Resources (OP/BP 4.11). These Safeguard Policies are briefly reviewed and described below.

Table 8: Safeguard Policies Triggered by the Project

Safeguard Policies Triggered	Yes	No
Environmental Assessment (OP/BP 4.01)	X	
Natural Habitats (OP/BP 4.04)	X	
Forests (OP/BP 4.36)		X
Pest Management (OP 4.09)		X
Physical Cultural Resources (OP/BP 4.11)	X	
Indigenous Peoples (OP/BP 4.10)		X
Involuntary Resettlement (OP/BP 4.12)	X	
Safety of Dams (OP/BP 4.37)		X
Projects on International Waterways (OP/BP 7.50)		X
Projects in Disputed Areas (OP/BP 7.60)		X

6.1 Environmental Assessment (OP/BP 4.01)

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

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

Category B: A proposed project is classified as Category "B" if its potential adverse environmental and social impacts on human populations or environmentally and socially important areas,

including wetlands; forests, grasslands, and other natural habitats, are less adverse than those of Category "A" projects. These impacts are site-specific and easier to deal with; few if any of them are irreversible; and in most cases appropriate mitigation measures can be readily designed. The scope of ESIA for a category "B" project may vary from project to project, but it is narrower than that of a category "A" ESIA. Like Category A ESIAs, it examines the project's potential negative and positive environmental and social impacts and recommends any measures needed to prevent, minimize, mitigate or compensate for adverse impacts while improving the project environmental and social performance. For simple Category B projects with very limited/low social and environmental impacts the preparation of Environmental and Social Management Plan (ESMP) that builds upon an ESMF might be sufficient.

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

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

Mainly because of its limited environmental and social impacts the Project had been now classified as a Category "B" project.; and since the sub-projects have not yet been clearly identified the World Bank required the preparation of an ESMF, which is a screening tool to screen sub-projects for potential environment and social impacts. Most of the subprojects will fall under Category B and some under Category C. In fact, the only infrastructure the project will be financing will be some rural feeder roads to link production areas to the main roads as well as to other areas of particular interest (railway, transformation/industrial units, important trade centers, etc.). Based on the outcome of the social and environmental screening, to be done by the Environmental, Social, Health and Safety Specialists, which will work in the two provinces, once defined, sub-projects will need to prepare a simple ESIA with ESMP, a freestanding ESMP, or no-action needed. The costs for the preparation of these ESIAs with ESMPs or freestanding ESMPs need to be included into the Project budget. The outcome of the screening and the determination of the subproject Category will need to be confirmed and approved by MICOA to verify compliance with Mozambique's EIA Policy. Though World Bank policies and procedures are those to be followed, the TORs for these ESIAs would also need to be approved by both MICOA and the World Bank.

Furthermore, to ensure good compliance with OP/BP 4.04 (Natural Habitats) and OP/BP 4.11 (Physical Cultural Resources), the ESMF has made some provisions to ensure that adequate measures are taken to minimize the negative impacts that may occur. Like for this ESMF, OP/BP 4.01 also requires that prior to sub-project appraisal, both the GOM through the Ministry for the Coordination of Environmental Affairs (MICOA) and the World Bank will approve and disclose the ESIA/ESMP, freestanding ESMP and RAP documents, which need to have an Executive Summary in English and Portuguese in publicly accessible places in the sub-project areas and on the website of the MF, as well as on the Infoshop website of the World Bank in Washington DC. The disclosure will need to be announced in the local newspapers and on the local radio (the transcripts of these disclosure announcements need to be sent to the World Bank for records keeping). The disclosure will provide beneficiaries, affected groups and local NGOs the chance to comment on the sub-project. A notebook and pencils need to be present at the disclosure sites as means for stakeholders' comments. The time for providing comments will be minimum 1 month. Relevant comments need to be included in the final ESIA, ESMP or RAP documents. The GOM, as the owner of the safeguards documents, must officially submit the approved and disclosed safeguards instruments/documents to the Bank and authorize IDA to disclose the documents at its Infoshop in Washington DC. By making the ESMF, PF and any ESIA/ESMP documents available to the

public prior to project appraisal, the proposed project will be in compliance with the World Bank Access to Information Policy, and hence ready for Board approval for funding.

Subprojects also need to be in compliance with the applicable World Bank Environmental, Health and Safety (EHS) Guidelines of April 2007. These are i) General EHS Guidelines; ii) some of the Agribusiness/Food Production EHS Guidelines; iii) Tourism and Hospitality Development EHS Guidelines; and iv) Electric Power Transmission and Distribution EHS Guidelines.

6.2 Involuntary Resettlement (OP/BP 4.12)

Under the World Bank Safeguard Policy (OP/BP 4.12 - "Involuntary Resettlement"), no physical relocation of people, or taking of land or other privately held assets, will take place under the SWIOFish project. However, a Process Framework for SWIOFish in Mozambique is being prepared to address the potential impacts on local livelihoods of future fishing restrictions that might curtail the level of fishing effort in particular areas. The subproject screening procedure described in this ESMF will also screen for livelihood issues and verify that Program-supported alternative livelihood activities will be carried out in the areas where they are most needed, with adequate funding.

6.3 Natural Habitats (OP/BP 4.04)

This policy applies to sub-projects, which could have a potential impact on important natural habitats outside protected areas as well as in protected areas as such. Significant conversion of natural habitat is allowed under this policy if there are no viable alternatives, but the affected natural habitats need to be compensated by an ecologically similar area of the same or larger size and the area needs to be better managed and protected. Subprojects involving the significant conversion of critical natural habitat, i.e. protected areas or critical natural habitat areas outside protected areas where endemic or endangered species mentioned on the IUCN Red List species are living and which could be severely affected or made extinct cannot be financed. The ESMF has made some provisions to ensure that adequate measures are taken to minimize the negative impacts that may occur.

6.4 Physical Cultural Resources (OP/BP 4.11)

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

7 LEGAL AND INSTITUTIONAL FRAMEWORK FOR ENVIRONMENTAL AND SOCIAL MANAGEMENT IN MOZAMBIQUE

Similar to what happened in most countries in Africa after the Rio Conference on Sustainable Development in 1992; Mozambique has been undertaking an enormous legal and institutional reform trend. The reform extends to the environmental sector. It has been under implementation in the form of: (a) adherence to and adoption of a series of international and regional environmental protection and conservation conventions and protocols; (b) approval of a significant set of legislation with direct and indirect implications to environmental protection; (c) creation of specific public institutions or strengthening of existing institutions dedicated to both environmental and social management.

7.1 Legal Framework

7.1.1 Adherence to International and Regional Conventions and Protocols

In terms of adherence to and adoption of a series of international and regional environmental protection and conservation conventions and protocols the following should be mentioned:

General principles:

Mozambique has been adhering to a series of international legal instruments that relate to the need of being proactive in environment protection and conservation. Under line 2 of article 18 of the country's Constitution, the rules of international law have the same value in domestic law and once ratified by the Parliament and Government they become constitutional normative acts. In light of alinea 1 of article 18, "*treaties and international agreements duly approved and ratified, are enacted in the Mozambican legal order*".

Important international and regional treaties and conventions ratified so far include:

- The UN Convention on Biodiversity ratified by Resolution n.º 2/94, of 24 of August: this is aimed at "the conservation of biological diversity, the sustainable use of its components and fair and equitable sharing of benefits arising from the use of genetic resources, including by appropriate access to genetic resources and appropriate transfer of relevant technologies, taking into account all rights over those resources and technologies, as well as through adequate funding". This international instrument, advocates the conservation of ecosystems and natural habitats and maintenance and recovery of viable populations of species in their natural surroundings. It is an essential foundation for the creation, development and protection of conservation areas in the country, which sometimes can be endangered by carrying out oil and gas operations and other industrial operations without due regard to the provisions of environmental legislation
- Convention on the Protection, Management and Development of Marine and Coastal Environment in East Africa, ratified by Resolution n.º 17/96, of 26 of November: it highlights a series of measures to protect and conserve the marine and coastal environment of the Party States, particularly in terms of preventing and combating pollution and the protection of the regions' flora and fauna against the growing threats caused by many human activities.
- African Convention on Nature and Natural Resources Conservation ratified by the Parliament's Steering Committee through Resolution n.º 18/81, of 30 December: is aimed at ensuring the conservation, use and development of land, water, forest and

wildlife resources of Member States, bearing in mind not only the general principles of nature conservation, but also the best interests of the communities themselves

- Protocol related to Wildlife Conservation and its application in the SADC, ratified by Resolution n.º 14/2002, of 5 of March: it is aimed at establishing common approaches and support to conservation and sustainable use of wildlife resources relating to the effective enforcement of laws in the region and within the domestic laws of each Party State.
- Resolution n.º 21/81, of 30 of December, by the Cabinet that turns Mozambique into an UICN member: among other it is aimed at encouraging and facilitating cooperation amongst governments, international organizations and people interested in nature conservation and its resources.
- September 2000 and Millennium Development Goals of September 2000, through which the GOM accepted and reiterated that the country's development depends on a variety of factors influencing each other mutually. Eight goals were selected to be achieved by 2015 (see MDG). Health, education, water and sanitation occupy a central position in the commitments.

Other important international and regional conventions and protocols ratified by the Mozambican State include:

- Vienna Convention for the Protection of the Ozone Layer and the Montreal Protocol on Substances that Deplete the Ozone Layer (Resolution No. 8/93 of 8 December);
- United Nations Framework Convention on Climate Change – UNFCCC (Resolution No. 1/94 of August 24, 1994);
- Kyoto Protocol (Resolution No. 10/2004 of 28 July);
- Convention on International Trade in Endangered Species – CITES (Resolution No. 20/81 of December 30);
- Cartagena Protocol on Biosafety (Resolution No. 11/2001 of 20 December);
- United Nations Convention to Combat Desertification and Drought (Resolution No. 20/96 to November 26);
- Stockholm Convention on Persistent Organic Pollutants and (POPs) (Resolution No. 19/96 of November 26, 1996);
- Basel Convention on the Control of Trans boundary Movements of Hazardous Wastes and Their Disposal (Resolution 18/96 to November 26, 1996);
- Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (Resolution 10/2009 of 29 September. The Convention entered into force in Mozambique in July 2010)

7.1.2 Approval of Domestic Policy and Legal Instruments

General Legislation

The Constitution

Mozambique's 2004 Constitution includes two fundamental environmental pylons, namely: "the right of every citizen to live in a clean environment and the responsibility to protect this right" as well as recognition of environmental protection as a public interest.

The country's fundamental law contains a series of general legal provisions aimed at preventing and controlling pollution and erosion; integration of environmental concerns into sectorial policies; promotion of the integration of environmental values in educational policies and programs; ensuring the rational use of natural resources while maintaining their capacity for renewal, ecological stability and human rights of future generations. It is also concerned with the promotion of land use planning with a view to ensure an adequate location of activities and a sensible socio-economic development.

Poverty reduction strategies[35]

At the macroeconomic level, PARP III[36] defines the main policy guidelines leading to the integration of the environment, social and environmental health issues into the poverty alleviation strategy. As part of those priorities for the environment, sanitation ranks first, highlighting the *direct relationship between conditions of access to water and sanitation, poverty and the health status of the population*. Poor health and poverty are seen as closely linked. Under "sanitation, health and environmental", the health subsector has been placed at the top of the agenda in the fight against poverty.

The Environmental Law n.º 20/97, of 1 of October 1997

This Act is "*aimed at defining the legal bases for a correct use and management of the environment and its components for the realization of a system of sustainable development in the country*".

Article 4 of the Environment Law establishes a range of basic legal principles, which highlight: the principle of rational use and management of environmental components, with a view to further improve the quality of life of citizens and the maintenance of biodiversity and ecosystems; the precautionary principle, whereby the environmental management should prioritize the establishment of systems to prevent acts that could be harmful to the environment, to prevent the occurrence of significant negative environmental impacts or irreversible damage, regardless of the existence of scientific certainty about the occurrence of such impacts, and the principle of global and integrated vision of the environment as a set of interdependent natural ecosystems, which must be managed so as to maintain their functional balance.

This law has formed the basis for defining specific environmental laws and regulations.

The Environmental Impacts Assessment (EIA) Regulation, approved by Decree n.º 45/2004, of 29 of September

Mozambique has developed comprehensive regulations to cover the EIA process, which are included in the Regulation of the Process for Environmental Impact Assessment[37]. The regulations are in line with the world's environmental and social management best practices, including World Bank recommendations and procedures.

There are three main specific objectives of any EA exercise:

- Screening and scoping of the proposed developments in terms of their potential impacts on the natural and social receiving environment, indicating both its beneficial outcomes and adverse effects. The initial screening is meant to determine the scope of the Environmental and Social Impacts Assessment (ESIA) required prior to approval of interventions. If any investment is likely to have significant adverse environmental impacts that are sensitive, diverse or unprecedented (Category A), the ESIA will be more stringent than if the investment has impacts which are less adverse, site-specific, mostly reversible and where adequate mitigation measures can be designed (Category B). For investments with multiple sub-projects, this screening is often done in the form of a checklist of potential impacts included in standard Environmental and Social Management Frameworks (ESMFs).
- The actual Environmental Impacts Assessment (ESIA), which assesses the potential impacts of the investment in detail and evaluates alternatives.
- Proposal of measures to be taken in order to avoid, mitigate and/or eliminate adverse effects both at the planning, design and installation stages, and during operation and

[35] There have been three poverty reduction strategies guiding the country's development since 1996.
[36] Poverty Reduction Action Plan 2011-2014
[37] Decree 45/2004 of September 29, 2004 and Decree 42/2008 of November 04, 2008.

eventual decommissioning of the project. This is generally done in the form of an Environmental and Social Management Plan (ESMP), which is normally an intrinsic part of the ESIA.

The Scoping Exercise, ESIA and the Environmental and Social Management Plan (ESMP) are components of particular importance in any EA process. Scoping primarily explores fundamental issues and identifies any potentially significant positive and negative environmental (and social) impacts associated with the proposed development, helping to determine the scope of the Environmental and Social Impacts Assessment. An ESMF and an ESMP include in an annex Environmental and Social Clauses (ESC), which serves as a guide for the contractor during construction. One of these clauses is the "Chance Find Procedure" mentioned earlier. These ESC should be included in the bidding documents and in Constructions Companies Contracts for systematic compliance during project construction.

The ESIA regulation also foresees that the Draft Scoping/TOR and Draft ESIA/ESMP should be subject to public debate with the objective of:

- Keeping Interested and Affected Parties (PI&As) informed about key issues and findings of each stage of the ESIA;
- Gathering concerns and interests expressed by various project stakeholders;
- Obtaining contributions/opinions from stakeholders in terms of avoiding/minimizing possible negative impacts and maximize positive impacts of the project; and
- Supporting the social dialogue and identifying from the onset, stakeholders' perceptions and expectations. This can contribute to the action planning and effective communication in order to minimize the impacts of the project. The process also allows for rethinking the project's technical aspects

Specific public participation aspects are regulated by Diplomas 129/2006 and 130/2006 and other related regulatory instruments.

Certain interventions might require people to be resettled. The Regulation of the Environmental and Social Impacts Assessment Process, which governs the EIA process in Mozambique, says very little about resettlement, except in its Annex I, point 1. Infrastructures, line a), where it states "under environmental licensing, all interventions requiring people to be resettled will be considered as Category A Activities".

After many years of not having a single instrument to guide resettlement planning and action on August 8, 2012 the Cabinet approved ***Decree 31/2012,*** the new "*Regulation on the Resettlement Process Resulting from Economic Activities*".

This regulation fills a longstanding void in this regard. However, as it stands, this new regulation contradicts a lot with the applicable World Bank Operational Safeguards Policy (OP/BP 4.12) in various angles/domains as highlighted below:

- *Article 15* indicates that a Resettlement Action Plan is part of the Environmental Impact Assessment, as per Decree 45/2004, of September 29 of the latter process;

In terms of principles, the new regulation establishes that the resettlement process should ensure social cohesion, social equity and direct benefits in that the affected people should directly benefit from the interventions that caused their resettlement and respective socioeconomic impacts;

In the definition of objectives, the regulation restates the principle of turning resettlement into a development opportunity by allowing affected people to enjoy quality life, social equity and ensuring the sustainability of the physical, environmental, social and economic aspects around them.

In line with the ultimate interest of linking resettlement with District Land Use Plans, it also indicates that District Governments should approve resettlement action plans and that this should be done by the department that supervises land use planning at that level, i.e. the District Services of Planning and Infrastructures.

- In relation to the rights of the affected people, the regulation states that these are entitled to:
    - The reestablishment of income and living standards that are equal and/or higher than what they had before resettlement;
    - Have their assets transported to the new site;
    - Live in an area with adequate social and economic infrastructure;
    - Have enough space to develop their subsistence activities; and
    - Give their opinions throughout the entire resettlement process.

It then goes on to elaborate on the various units that from the government side should closely supervise, monitor and evaluate the resettlement process to ensure that the best practices are adopted and that lessons are learnt to benefit the process at hand and other related processes in the country. Of particular note in this regard is the establishment of the District Resettlement Committee

Article 13 of the Regulation deals with "Public Participation" and emphasizes that resettlement should be participatory throughout its phases and that major public meetings should be formally made known. Article 14 highlights the importance of the "Right to Information" by affected people and other relevant stakeholders. In relation to public participation and disclosure in general, Article 23 clearly states that the planning, preparation and implementation of a RAP should result in at least four (4) public meetings, which should be heralded in local media.

Articles 16, 17 and 18 deal with specific aspects related with the types of resettlement, land and housing specifications, including details about the social and economic infrastructure that should be made available to the resettled people.

Articles 19, 20, 21 and 22 delve into the steps and work contents related with the planning, preparation and implementation of the RAP and provide the guidelines to be adhered to.

It is worth stressing that this is a new decree, whose practical implications are still to be seen and assessed. Preliminary indications are that it does not solve the need to be specific in certain areas of the resettlement process, which continue to be spread over a series of legal documents.

Thus, it will continue to be necessary to creatively combine those documents to devise the best measures to be adopted in relation to specific issues.

Among other, it will certainly to continue to be relevant to basically follow the OP 4.30 /PO 4.12 of the World Bank on Involuntary Resettlement, which is endorsed by the Mozambican government as has been the case of the resettlement procedures undertaken to date by development initiatives. And where there are discrepancies between the two sets of regulation the WB policies will take precedence.

Decree 31/2012 makes no provision of Framework as a starting point in situations where project intervention area's footprints are not known; nor does it provide (i) basic characteristics to trigger resettlement, (ii) entitlement eligibility criteria, and/or (iii) room for grievance redress mechanism upon which PAP can rely upon for peaceful resolution of their concerns.

In fact, Mozambique legislation guiding involuntary resettlement is spread over a series of legal documents dealing with land, general rights, compensation, etc. To counteract potential inconsistencies derived from using laws and regulations that are not always easy to harmonize, most

of the resettlement procedures undertaken to date by development initiatives in Mozambique have followed the OP/BP 4.12 of the World Bank on Involuntary Resettlement, which is systematically endorsed by the Government, as one of the member-countries. The Policy covers the involuntary taking of land, as well as restriction of access to means of livelihood.

Whenever an investment is likely to result in involuntary resettlement, a Resettlement Policy Framework (RPF)/Process Framework (PF) should be prepared by the borrower, defining the principles, organizational arrangements, criteria for eligibility and compensation, grievance redress mechanisms and monitoring processes to be adopted. Once the Social Screening process (also included in the ESMF environmental and social screening form – ESSF) has determined with certainty that resettlement will be needed, a Resettlement Action Plan (RAP) is further prepared, approved and implemented prior to the physical implementation of the civil works activities. The details are presented in the RPF already mentioned above, which has been prepared as a standalone document as part of the Project.

Regulation to Prevent Pollution and Protect Marine and Coastal Environment, approved by Decree n.º 45/2006, of 30 of November

This instrument has, as its aim: to prevent and limit pollution from illegal discharges from ships, platforms or land-based sources, off the coast of Mozambique and the establishment of legal bases for the protection and conservation of areas in the sea, lake and river, beaches and fragile ecosystems that are public domain. It also categorizes the various activities and determines the levels of their acceptability. It also deals with land-based sources of marine pollution.

The Forests and Wildlife Law (Law n.º 10/99, of 7 of June) and specific regulations

Among other aspects, the law defines the protection and conservation of specific biodiversity components as well as certain flora and fauna species found in certain places

The Land Law (Law n.º 19/97, of 1 of October)

The law and its Regulation 66/98, provide the basis to define access rights, land use rights and procedures for the acquisition and use of land title by the communities and individuals. The same law and the regulation embodies key aspects defined in the constitution in relation to the land such as the maintenance of the land as state property and that land cannot be sold as well as the absence of a "land market" per se in the country. Among other aspects it defines "areas meant to meet public interest" as belonging to public domain. It also protects customary and community rights over land.

The Land Planning Law (Law n.º 19/2007 of 18 of July) and its regulation

It establishes a number of important principles for environmental protection in the context of regional planning. Line 1 of article. 5 of this Act, states "land use planning aims to ensure the organization of national space and sustainable use of natural resources, noting the country's economic legal, administrative, cultural and material conditions favorable to social development and, to promote the quality of life, the protection and conservation of the environment. It establishes hierarchical responsibilities among central, provincial, district and local governments in land use planning processes.

National Water Law in 1991 and the National Water Policy from 1995[38]

Under the water law and policy the following principles are adhered to: (i) water supply and sanitation services should be provided in accordance with the demand and economic capacity of

[38] Updated in 2007

the users; (ii) tariffs should allow for the recovery of operational and maintenance costs, and later contribute to investment and sustainability of the systems; and (iii) in as far as possible water supply and sanitation services should be decentralized to autonomous local agencies. Under the water law and policy, water and sanitation are formally dealt with as a unity although sanitation is seen as still being in a situation of relative disadvantage.

A process of separation of functions and roles and responsibilities of the various role players has been underway. In water, water resources and bulky water production roles have been separated from water supply asset holding and from water services management. A regulatory entity has also been established with the mandate of keeping a balance between government and private sector management at the same time that consumers are given a voice in infrastructure planning and management. The government retains the role of policy formulation and general promotion. However, in practical terms the country is still going through a transition process with government interfering across the entire sector doing cumulatively policy formulation, regulation, implementation and management of services. Nonetheless, there has been enormous progress made in both implementation and institutional adaptation.

The Law on Local State Administration nº 8/2003 and Decree nº 15/2000 on Local Authorities

These legal instruments expand the level of control and responsibility to local authorities for local development and decentralization.

Mine (14/2002) and Oil (3/2001) Laws

The Law n. º 14/2002 of 26 June regulates the terms of exercising the rights and duties relating to the use and exploitation of mineral resources with respect for the environment, considering their rational use and benefit to the national economy. The same law stipulates that "the right to use and exploit mineral resources shall be exercised in accordance with the best and safest mining practices, in compliance with the environmental quality standards established by law and with a view to developing a long-term sustainability". Specific areas in which sustainability should be materialized include: a) reconnaissance b) exploration and research; c) mining; d) treatment and processing, e) marketing or other uses of the mineral product, and f) other related purposes. In its turn Law 3/2001 of February 21 is governed by the same principles as stipulated above and regulates oil production in the country.

Pesticides Regulation (Ministerial Diploma nr 153/2002, of 11 of September)

This is a joint regulation between the ministries of agriculture, health and environment aimed at regulating the importation, distribution, production, disposal and use of agrarian pesticides for the protection of animal and public health purposes. It requires all operators active in the importation, distribution, production of pesticides to be registered. It also classifies the various pesticides in three major categories, where those of Class III and II are the least lethal and those of Class I are the most lethal. It also regulates the labeling and packaging of pesticides, as ways of facilitating identification and protecting the environment and particularly public health.

Occupational Health and Safety

Occupational health and safety combine provisions from different legal instruments namely: the Constitution, the Labor Law and a series of provisions from subordinate legislation, much of it inherited from the colonial period. ILO conventions, especially Convention no 17, related with compensation for workplace accidents as well as ILO Convention no 18, regarding compensation for occupational illnesses, also apply.

The Constitution (Article 85) states that all workers have a right to a fair wage, rest and vacation and to a safe and hygienic work environment. The Labor Law (Articles 216 through 236) indicates that workers have the right to work under hygienic and safe conditions and that employers have the obligation to create such conditions and to inform workers regarding the risks associated with specific tasks that they are supposed to perform. This could be in the form of safety equipment and work clothing to prevent accidents and negative effects on workers' health. Under the Labor Law employers and workers are expected to work together to ensure health and safety at the work place. Companies with high risk of accidents or occupational hazards are required to establish workplace safety committees to ensure compliance with health and safety norms investigate the causes of accidents and organize preventive measures. Such committees must include representatives of both the employer and the workers.

The Labor Law also stipulates that industry-specific regulations on health and workers' safety may be established by ministerial diploma, by the Minister of Labor, the Minister of Health or the Minister in charge of the specific sector. It is worth mentioning that in 2008 (December) the Ministry of Health approved its specific guidelines in this regard (MISA/DNAM (December 2008) – "Guidelines on Safety and Health in the Workplace", Maputo, Mozambique).

Large size companies (i.e. with more than 100 employees) and companies carrying out strenuous, unhealthy or highly dangerous activities must have health units on site. Medical professionals are supposed to regularly examine workers to determine, among others, if they are well enough to do the work called for in their contracts. HIV/AIDS tests fall outside such a provision. For certain sectors and in line with their specific provisions regular health checks are mandatory. Such is the case of workers dealing with food and beverages.

7.2 Institutional Framework

The GOM established the Ministry for the Coordination of Environmental Affairs (MICOA), in 1994. MICOA has been refining its approach to tackle environmental management by adopting medium to long-term strategies and policies. In more recent times, focus has been on (i) integration of land use planning into decentralized planning, (ii) reduction of the people living in environmentally risky and sensitive areas; (iii) environmental education and promotion; and (iv) regulation and supervision of natural resources management activities. These aspects are enshrined in the Environmental Strategy for Sustainable Development 2007-2017 (EADS). MICOA is a coordinating entity in recognition of the fact that environmental management is the result of a combination of interventions by a series of development sectors and stakeholders at various levels. Main areas of intervention include policy formulation, general promotion, planning, research/technologies, investment in infrastructures and other relevant areas, regulation, surveillance, extension/education/awareness creation, etc. The understanding of environment as a crosscutting subject coordinated by MICOA has led to the definition of environmental line ministries to integrate the other ministries/sectors that deal directly with the main environmental components, i.e. soil and subsoil, water, air and the biotic components (plant and animal). In general, these can also subdivided into two major categories:

(i) Those depending directly on natural resources as their main source of raw materials (inputs) comprise:

1. Agriculture (land and forests)
2. Fisheries (fishery resources)
3. Mines (mineral resources)
4. Public works and housing (water and land)

(ii) Those whose outputs depend largely on the supply of environmental services comprise:

5. Energy (water, mineral resources, biotic elements for bio fuels, etc.)
6. Tourism (landscape and wildlife)
7. Health (water and infrastructures)

At present, the list of environmental line ministries includes, but it is not limited to:

- **Energy**: Energy production and distribution (electricity, fuels and renewable energy);
- **Agriculture**: Plant and animal production, forests and wildlife, land and cadaster, agricultural irrigation and agricultural research and extension ;
- **Health**: health including environmental health as part of public health;
- **Mining/Mineral Resources**: Geology, mines and fossil fuels;
- **Public Works and Housing**: Water, buildings, roads and bridges, housing and urbanization;
- **Tourism**: Tourism and respective hotel industry as well as conservation areas related with tourism;
- **Fisheries**: Fisheries' management and inspection, fisheries research and technologies.

The fisheries sector management

The services of the Fisheries Administration at central and provincial level have a key role in the fisheries management process, for example in the licensing, supervision and management of resources. The management of artisanal fisheries, and especially the beach seine, is based on a small number of measures required by national general rules:

- Period of closure for industrial and semi-industrial shrimp fishing at the Sofala Bank is between November to February. This period has been changed from zone to zone. Note that this closure is valid only for industrial and semi-industrial fisheries. For artisanal fishing the closure period is restricted to only 1 month, usually in January. The other fishing gear such as gillnets and line, are not subject to this measure.
- Minimum mesh size permitted is 38 mm. However, for conservation fisheries resources and fisheries management reasons, the mesh size can be changed (extended) for each fishing area.
- Preservation of endangered species. Catches are not allowed to mammals and sea turtles, rare or endangered species and other internationally protected species and of interest to the investigation. These species once captured should be according to the law, released back to the sea.

In addition to these general rules specific local rules may be established at the provincial level, which may include e.g. limiting the number of gear, or gear type, allowed in a particular area or period. These verifications are, however, rarely exercised. Similarly, compliance with general rules on closure and mesh is usually low or variable, largely due to lack of effective inspection.

The fisheries research is done by the National Institute of Fisheries Research (IIP), which is also represented at provincial level. IIP recommends management measures to the Fisheries Administration. However, to date, the level of formalized advice on tactical planning of artisanal resources has been quite modest compared to industrial fisheries. The latter are under a strict control production targets (quotas) regime. This contrast is due, in part, to the short history of routine monitoring of artisanal resources, and the dispersed nature of these fisheries.

The general regulations for small scale fishing also include intervention in the management process by users of fishery resources (local fishing community), provided they are integrated into community-based organizations named Fisheries Councils (CCP). However, the efficiency and dynamism of these organizations varies from region to region. As regards the surface gillnet, it is also recommended to reduce fishing pressure by improving the selectivity of net and/or the identification of periods/areas suitable for the major species caught off-season. Actions should include review of mesh and frame coefficients of the net in order to adjust them.

SWIOFISH planning, implementation, monitoring and evaluation can substantially benefit from this institutional arrangement for sustainable management of environmental and social factors. As

indicated, to begin with, the National Program Steering Committee will be chaired by the MF and will consist of representatives from relevant ministries such as MPD, MoF, MICOA MICOA,, MTC, MOPH, MINAG and the private sector. This institutional arrangement is also meant to ensure that all relevant sectors and institutions have a voice in all important stages of SWIOFISH development, including in environmental and social implications of the project.

It should be mentioned that although there has been increased harmonization between the GOM Regulations and the WB Safeguards Policies, differences in a number of areas and aspects remain. **Under the Program whenever there is a conflict between national legislation and World Bank safeguards policies, the latter prevails**.

8 ENVIRONMENTAL AND SOCIAL CONCERNS OF TARGETED AREAS

In addition to contacts with central level institutions in Maputo city, the provinces of Cabo Delgado (Pemba), Nampula (Nacala and Ilha de Moçambique), Sofala (Beira), Zambezia (Nicoadala and Inhassunge) and Maputo (Marracuene/Macaneta and Maputo City (Porto)) were visited both for reconnaissance and preliminary assessment of the field conditions and initial public consultations with local stakeholders and later on for extensive data collection and in-depth discussions with local stakeholders. More specifically the following public consultation meetings took place:

- Cabo Delgado province – Pemba: June 3rd, 2014;
- Nampula Province – Nacala: June 4th, 2014
- Nampula Province – Ilha de Moçambique: June 4th, 2014;
- Sofala Province – Beira/Praia Nova: June 5th, 2014;
- Zambezia Province – Quelimane June 6th, 2014)
- Zambezia Province –Zalala: June 8th, 2014

The meetings were publicly announced in the newspaper of major circulation in Mozambique (Notícias) on the 30th of May 2014. The details about the public consultation process carried out have been captured in this version of the ESMF Report. This includes a standalone report on the public participation process that is included as an annex of this document.

Extensive literature review was also carried out with the purpose of identifying key environmental and social concerns in the project areas.

From all the elements that were gathered, the following issues seem to deserve special attention:

Land use planning: In compliance The Land (Territorial) Planning Law (Law n.º 19/2007 of 18 of July) and its respective regulation the districts have been instructed to prepare and have been preparing district and inter-district land use plans, while towns and cities and respective governments including municipalities work on urban plans within the areas under their jurisdiction. In line with the law, the plans are aimed at:

(i) guaranteeing the right to land occupation for people and local communities;
(ii) re-qualifying urban areas, which due to a combination of factors, including the war that ended in 1992, have been growing in an unplanned way in many places;
(iii) identifying and enhancing capabilities;
(iv) preserving the ecological balance of soil quality and fertility;
(v) ensuring compatibility and coordinate environmental and social policies and strategies and socio-economic development;
(vi) optimizing management of natural resources; and
(vii) managing land conflicts.

In some cases, these plans have not yet been completed but they are seen as important instruments in deciding the siting of interventions including those falling and/or expected to fall under the Program. Local and central level stakeholders are of the opinion that in a practical way, the Program should endeavor to support the smooth completion of the land use plans as part of the process of deciding the best location and/or design of the various interventions. The program should try to align its interventions with the existing land use plans. Annex 1 presents *the status quo* of the preparation of District Land Use Plans (PDUT), which can be used to enlighten the Project approach[39]. The annex does not include municipal and urban/town land use plans but during

[39] Some updating should be considered before making use of this listing in the field.

program implementation the status of these should also be ascertained before deciding on the siting of interventions.

For a certain number of infrastructures such as docks/ports and surrounding facilities preliminary indications are that these are mainly confined to areas already earmarked or reserved to accommodate them. In some cases it will be necessary to adjust rehabilitation and/or construction processes to existing or under preparation port master plans (e.g. in Pemba and Maputo) but these will not be associated with any significant needs for resettlement or lengthy processes of harmonization with district land use plans.

Protection of areas of special importance (conservation/protected areas and wetlands): as seen in the description of the receiving natural environment some of the program areas are located in and/or close to conservation areas (e.g. Quirimbas Archipelago) or sensitive areas (mangroves, coral reefs, wetlands, including protect species, etc.). WB and GOM requirements for managing those areas in a sustainable manner will have to be adhered to in all program interventions. A list of protected, sensitive areas and species, including those in the IUCN red-list will be compiled as part of the ESMF to serve as the guide for the program in terms of conservation.

Enough room to assist all categories of fishing people and communities to increase their production and productivity: for fisheries promotion including aquaculture a rapid assessment indicates that finding areas to locate the different fisheries activities can be done without exacerbating any land conflicts.

9 POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACTS AND MITIGATION MEASURES

As stated in Chapter 2 of this document the project will have four main components with the following preliminary allocation of funds:

a) **Component 1: Improved governance of fisheries** to target actions by the public sector.
b) **Component 2: Increased fisheries contribution to country economies**. Increased economic benefits to be generated by the private sector and the component will target the private sector, including public investments critical to a profitable private sector.
c) **Component 3: Cost-effective regional collaboration** to target activities that will add value through regional collaboration and support the function and activities of regional collaborative institutional and mechanisms.
d) **Component 4: Program management and coordination** cross-cutting human and institutional capacity building is embedded in each component.

Activities under these four components will affect the different environmental and social components in different ways. The ESMF for this program focuses mainly on Component 2 – Increased fisheries contribution to country economies, notably the infrastructures likely to be rehabilitated and/or constructed under this component such as: (i) Construction of primary vendors' markets and associated infrastructures including freezers systems, water supply and washing areas; (ii) Construction of fisheries demonstration centers in the major fishing poles; (iii) Construction of dedicated shops for supply of fisheries inputs; (iv) Construction of workshop areas for fishing boats building, repairers and maintenance; and (v) Construction of specific aquaculture facilities (tanks and laboratories) in selected suitable sites; (vi) Construction/rehabilitation of docks, landing sites and other infrastructures used to facilitate fishing production operations.

Figure 26: Primary vendors market in Zalala (Zambezia)[40]

[40] It is non-operational although cooling systems have been installed. It is expected to be operational soon.

This ESMF does not deal specifically with the issues of fisheries management as such including aspects such as closure periods, minimum mesh, fishing quotas, preservation of endangered species, and adequate regional exploitation of fisheries resources. Under Component 2 and related infrastructures the environmental components likely to be directly affected include:

- land resources on which the proposed small-scale infrastructure, such as landing sites, fish markets, laboratories and applied research assets, training facilities and social facilities for fisher associations and women's groups, warehouses and other buildings, etc. will be built;
- air quality, which has the potential to be negatively affected by dust generated from the various construction/rehabilitation and project operations;
- soils which may be polluted with oils and lubricants;
- water resources including freshwater and seawater which may be affected by diversions, and debris from civil works, oil spills, etc.;
- vegetation which may have to be cleared to pave the way for new installation of facilities; and
- communities, which will generally benefit from the project, but at times could be negatively affected, e.g. the risk of the loss of land and/or loss of assets.

The generalized identification of the program potential environmental and social impacts was done considering the environmental and social components that are likely to be affected by the program activities. This was done through literature review of projects implemented in the same areas, similar projects and through preliminary consultations with key stakeholders, particularly MF, IDPPE, INAQUA representatives, local leaders, fishing people and communities in general and key informants and professional judgment.

9.1 Potential adverse environmental and social impacts

The environmental and social impacts will result from the project activities under component 2. These impacts relate to the final design, construction and operation of landing sites, fish markets, laboratories and applied research assets, training facilities and social facilities for fisher associations and women's groups, warehouses including freezing facilities and other buildings as well as other physical infrastructure.

Adequate selection criteria for investors will need to be applied to avoid the risk that communities lose the access to their land. **Large-scale investors, which need to acquire large land areas will not be supported**. For all environmental and social impacts the applicable World Bank Group Environmental, Health and Safety (EHS) Guidelines of April 2007 will need to be applied. Especially the General EHS Guidelines and the Agribusiness and Food Production EHS Guidelines will need to be applied. The applicable Agribusiness and Food Production EHS Guidelines will be applied to the fisheries facilities from investors who are associated with Program financed activities.

Although the expected environmental and social impacts will be limited in extension, the following negative environmental and social impacts can be expected:

Soil

During construction activities, soil erosion may be caused by exposure of soil surfaces to rain and wind during site clearing, earth moving, and excavation activities. Improper grading of land may also cause drainage and erosion problems. The resulting soil particles may be transported into surface drainage networks and rivers, thus, affecting the quality of natural water systems and ultimately the biological systems using the waters. Water may accumulate in excavated pits potentially leading to the breeding of insects and other infectious organisms, which could increase

the prevalence of malaria and bilharzia. Accidental spill of oil or lubricant may infiltrate into the soil and enter surface or groundwater.

Boat wakes, which lap at the shoreline, can contribute to increased shore erosion. Most of these relate to boats moving at or near maximum speed through waterways. If boats are moving at a speed slow enough to avoid leaving a wake, there will not be shoreline erosion. There was little found in the literature that pertained specifically to boats maneuvering near docks or landing areas.

Air Emissions

Construction and rehabilitation activities of landing sites, fish markets, laboratories and applied research assets, training facilities and social facilities for fisher associations and women's groups, warehouses and other buildings, processing facilities, etc. are usually associated with the release of dust generated from land clearing, excavation and movement of earth materials, cut and fill operations, contact of construction machinery with bare soil, and exposure of bare soil and soil piles to wind. The use of construction equipment and power generators is expected to release exhaust related pollutants such as carbon dioxide (CO2), nitrogen oxides (NOx), sulfur oxides (SOx), particulate matter (PM) and hydrocarbons (HCs). Agro-processing facilities can cause air pollution. The air emission standards in the applicable World Bank Group Agribusiness and Food Production Environmental, Health and Safety Guidelines, as well as the General Environmental, Health and Safety Guidelines need to be applied. The cleaning and rehabilitation of fuel oil tanks in oil storage facilities may generate volatile organic compound (VOC) emissions. For small operations as the ones expected under PROJECT air emissions during rehabilitation/construction and operation phases tend to be confined to the immediate vicinity of the rehabilitation/construction and operation sites and will have insignificant impacts on air quality. Adequate preventive, design and management measures will suffice to prevent such emissions from being harmful to people and surrounding biophysical setting.

Noise

During construction/rehabilitation and operation activities, noise may be caused by the operation of pile drivers and demolition machines, earth moving and excavation equipment, generators, concrete mixers, cranes as well as fuel oil tank erection and pipe laying works. The increased noise level may impact on construction workers and nearby residential areas. However, most of the impact will be limited to the works' implementation phase and will end when the works are complete. Noise levels may not exceed 55 dB during day time and 45 dB during the night in residential areas and 70 dB in industrial areas during all times during the day and night.

Solid and Liquid Wastes

Solid and liquid wastes will be produced during construction and operation. This solid and liquid waste needs to be managed. Non-dangerous wastes can be disposed of in urban landfills. Hazardous wastes, such as used oils need to be disposed in an environmentally sound manner. They are normally disposed off through a contractual arrangement with the oil suppliers, who will take the waste oils away for recycling.

Rehabilitation of fuel storage facilities may involve the removal of contaminated soils around fuel dispensers, piping, and tanks. Depending on the type and concentration of contaminants present, such soils may need to be managed as hazardous wastes. In addition, bulky, inert and contaminated solid waste items are likely to be generated during the rehabilitation of fuel storage facilities such as damaged tanks. If improperly managed such wastes may constitute an environmental problem. These facilities will need to be removed and disposed of in an environmentally sound manner by the contractors.

Any construction at or near the water edge, or where debris can be washed or blown into the water, should be surrounded by silt screens, which must be placed in the water before the work starts. The screens should also be placed around storage areas, to prevent waste from blowing away and to prevent sediment run-off into the sea. Cement used to make concrete can be carried to nearby reefs with local currents. Because cement raises the pH of the surrounding seawater considerably, cement used to construct the docks has the potential to affect coral communities.

Water Quality

Surface water pollution may result from uncontrolled discharges into freshwater or brackish water rivers. Accidental spills of oil, polluted runoff from polluted areas and sediment transport. The latter impact is particularly significant when rehabilitation and/or construction activities occur within or in close proximity to surface water such as in the case of the rehabilitation and/or construction of heavy fuel oil supply facilities on the coastal strip. Polluted water flowing into surface water bodies could impact the aquatic organisms and affect the quality of life of downstream water users when river waters are involved. Many people are still using river water as a source for drinking water. Groundwater contamination may occur from percolation of oil and lubricants into soil. Nevertheless, waters disturbed by rehabilitation and construction activities are likely to recover when sediment or other pollution is controlled and natural processes are permitted to replenish. The effluent standards in the applicable World Bank Group Agribusiness and Food Production Environmental, Health and Safety Guidelines, as well as the General Environmental, Health and Safety Guidelines need to be applied.

Flora and Fauna

Marsh plants and submerged aquatic vegetation are ecologically critical as a source of food and nursery habitat for fish, shellfish, amphibians, reptiles, birds and mammals that live in coastal waters or the adjacent marsh and uplands. Vegetated areas also stabilize shoreline and bottom sediments against erosion. Impacts to plant health and productivity from docks generally occur in one of the following ways:

- Short-term construction impacts: activities during construction can destroy plants either above the tide line or below by pulling them from the substrate or destroying their root systems. Placement of the pilings using a vibratory pile driver rig destroys any vegetation within the footprint of the pilings.
- Chronic impacts from shading: both marsh grasses and sea grasses have adapted to living in extended periods of sunlight. Therefore, shading can have significant impacts on the health and productivity of these plants, shoot density, biomass, and overall plant growth. Changes in vegetation density and hardiness may lead to increasing sediment erosion and re-suspension, and increased undercutting of the marsh shoreline near the dock because robust healthy marsh and sea grass vegetation is no longer present to hold the sediments in place.
- Chronic impacts from storage of floats and boats and associated foot traffic. Floats, boats, or any other solid structure stored, either permanently or seasonally on the marsh face will significantly shade, and therefore destroy, any vegetation present.

Stream pollution by sediments from rehabilitation and construction activities often consists of suspended and settable solid particles that may coat, bury, suffocate or abrade living organisms such as eggs, larvae, fish, etc. Many aquatic invertebrates and fish may undergo changes in population density and community composition if high concentrations of suspended solids occur. Aquatic vegetation may be adversely affected by a reduction in photosynthesis due to high turbidity. Dredging may also increase turbidity and sediment load and reintroduce into suspension bottom sludge trapping toxic precipitates. The toxic sludge may be ingested or concentrated in freshwater or marine plant and animal species and biologically magnified in the food chains. Detonations from

blasting for in-stream foundation excavations may produce underwater shock waves potentially injuring or killing fish in their sphere of influence.

Accidental oil spills in aquatic ecosystems can cause significant mortality in aquatic organisms. These spills need to be prevented at all means by locating fueling and machine maintenance stations at least 100 meter from rivers and sea.

Health and Safety

Safety issues may arise during the rehabilitation and construction phases if community's access to works' sites is not controlled. People may be injured by construction machinery or may fall in open trenches.

The rehabilitation/construction and operation of fuel supply facilities are associated with the risk of release of flammable material due to accidental damages to the fuel tanks from works-induced activities, such as landslides or collapse of tall structures such as cranes, and broken pipelines from works-induced vibration.

Health and safety measures at the construction sites, as described in the World Bank Environmental, Health and Safety Guidelines need to be applied and enforced by the contractors. These include the wearing of protective clothing, masks, construction site boots, helmets, gloves and others.

Socio-Economic

The rehabilitation and construction phase will generate a number of short-term job opportunities for the local people, as well as new opportunities to improve livelihoods for local communities and reduce poverty.

If adequate measures are not put in place, there will also be some potential negative socio-economic impacts, especially related to loss of land through the wrong selection of investors (e.g. land-grabbing for extensive aquaculture projects or other interventions) and loss of land and/or other assets as a consequence of involuntary resettlement. There is also a potential risk to the disturbance of physical cultural resources, and the potential negative impact of the influx of external workers, including foreign workers.

The installation of the different program components in agricultural, housing and commercial lands may cause damage to cultivated crops (depending on how and when the land is taken from farmers to be passed on to the program subprojects and other related initiatives), housing components (e.g. fences, walls, etc.) informal businesses (kiosks/vending stalls and barracas), including on components of other public and private utilities (e.g. telecommunication and electricity poles). This could be potentially associated with social problems such as the loss of houses and structures on the land, and facilities, and the potential negative impacts on livelihoods of the communities who lived on the land or used it for cultivation.

At the social level, there could be increased tensions between farmers and fishing communities with regard to land issues or between pastoralists and farmers related to wandering livestock. In some of the districts this is already a serious problem, which, if not adequately managed, could get worse as the program progresses.

Overall, the project activities could have negative impacts on certain aspects of local livelihoods, housing, social and economic infrastructure and natural resources, not only because of the facilities and infrastructure that will be provided, but especially because of the influx of local, regional and even international investors and workers.

The environmental and social risk factors and challenges of the project will be: (i) unauthorized occupation (and non-consensual) of land belonging to local people; (ii) work conflicts and disputes for work between local people and people from other parts of the country and/or outside the country; (iii) the likely widespread of STIs including HIV/AIDS.

In addition to agriculture and housing land as described above, the influx of investors in fisheries and related businesses and of an external work force also has the potential to result in the need of increased infrastructure for water supply, sanitation, schools and health centers that can overstretch the local government capacity to provide them.

Physical Cultural Resources

In Mozambique it is common for projects/programs of this nature to interfere negatively with sites of cultural, religious or historic importance (e.g. family and community cemeteries and other sacred places). Upon discovery of graves, cemeteries, cultural sites of any kind, including ancient heritage, relics or anything that might or believed to be of archeological or historical importance during any stage of project development, such findings should be immediately reported to the Program Management in order to ascertain the measures to be taken to protect such historical or archaeological resources. All forms of inappropriate removal/disposal should be avoided.

9.2 Other potential adverse socio-economic impacts

Increase in HIV/AIDSs and STDs Cases

The spread of HIV/AIDS is likely to increase, especially during infrastructure development and construction, when workers from outside the region are brought into to it to live for long periods without their respective spouses. During operation interaction with truck drivers and other external workers with local women could be an open door for HIV/AIDS and/or ISTs propagation, especially among poor households, women and a younger generation often used as sex-workers to be self-sustained or sustain their families. Contractors should develop and implement an HIV/AIDS-IST prevention plan, which should include the training as an awareness raising campaign of their workers and the surrounding communities, provision of sufficient and free condoms of good quality to their work force, provide treatment for workers who are infected, etc.

Work/job conflicts between local people and external work force (national, regional and international)

If not adequately managed there could be real conflicts and/or misunderstandings surrounding the criteria for hiring of an external work force. Without clear criteria and communication local people might look at the hiring of external work force as unjust and detrimental to their immediate interest. This has the potential to cause conflicts and disruptions, including violence.

9.3 Potential positive impacts

Improvement of local infrastructure and particularly landing facilities, freezing rooms, fish markets, processing units, etc. meant to connect fisheries producers to markets will lead to the adding of value to local fisheries products.

The improvement of local infrastructure can also be expected to lay the foundations for the extension of telecommunication and internet networks (mobile), electricity and other amenities, which will contribute to making local economy more modern and competitive, as well as improve people's livelihoods, habits (i.e. way of thinking and conducting their daily lives) and way of socializing (increase inter-village/inter-community exchanges, etc.).

Implementation of the Project will, among others, stimulate private investment in the fisheries sector. Serious constraints may be lifted by the establishment of basic infrastructure while providing considerable support to the private sector institutions and national as well as foreign initiatives throughout value chains.

In environmental terms, the project will result in better management of natural resources surrounding planned interventions.

In social terms, the positive impacts of project activities could be brought by external investors introducing new production systems, technologies and practices. It is expected that these investments will contribute to improved technology and fish farming and production systems (e.g. aquaculture), reduction of post-harvest losses, improving revenue and marketing conditions, a better utilization of production processing; broadening the range of products, strengthening the skills of the various actors in the fisheries sectors (producers, traders, processors, packagers, conservation, transporters, etc.).

At the community level, in addition to the availability, accessibility and affordability of transport and telecommunication services, the expected impacts will be: improved food security, reducing the risk of hunger, improving nutrition and increased protein intake, and the creation of new and development of employment in fisheries value chain (reduction of unemployment and the exodus of young people, the creation of local employment opportunities, improved living conditions).

The program will provide opportunities for development of aquaculture in some of the program areas: (i) private actors will develop aquaculture subsector - including high value-added products for export, (ii) models of win-win partnership between local urban and rural communities and private investors can be expected to emerge.

The project has the potential to strengthen the existing police and protection structures to ensure the safety of goods and people.

In summary, the following positive impacts can be expected, and hence further expanded:

- Positive impacts of rural and urban markets for fisheries and the entire value chain.
- Positive impacts from availability, accessibility and affordability of electricity services in urban/rural areas (new businesses and shops to sell cold drinks, recharging of cellphone batteries, etc.);
- Positive impacts of processing, storage and packaging facilities.

9.4 Measures to mitigate negative impacts

A preliminary list of measures to be adopted to mitigate potential and significant negative impacts of the program is presented in the table below. Due to the localized and temporary nature of rehabilitation and construction works, fast recovery of the minor impacts will take place after construction is completed.

Table 9: Measures to mitigate negative impacts

Potential negative impacts	Mitigation measures
Soil and groundwater: During construction and rehabilitation: accidental discharge of on-site wastewater, hydrocarbons and chemicals can adversely affect groundwater and soil in the area; Top soil management Soil erosion problems associated with construction	During construction: Mitigation measures include proper storage of hydrocarbons and dangerous chemicals on site and the installation of natural, concrete or synthetic liners beneath oil and chemical storage tanks and the placement of these structures within a bunded impermeable concrete structure of 110% the volume of the largest tank. Other important measures include proper surface drainage during both the construction and operation phases, minimization of on-site water and chemical usage (oil, lubricants and fuel), as well as limiting the exposure of the soil to accidental releases of pollutants. Chemicals used on-site should preferably be non-toxic and readily biodegradable. Fueling areas should have a concrete slab so that petrol and oil cannot escape into the environment. Drainage systems in maintenance areas should be equipped with an oil/water separator; During construction put the top-soil apart and place it back on top after construction has finished. During operation: ▪ Awareness and training of fisher communities Focus on existing quarries and construction areas: Rehabilitation of affected areas, e.g. quarries and other construction areas. Put in place vegetative filters to filter sediments out of run-off. Rehabilitation works should start as soon as possible after the construction work is finished.
Air emissions: release of dust from land clearing, excavation and movement of earth materials, cut and fill operations, contact of construction machinery with bare soil, and exposure of bare soil and soil piles to wind.	Control techniques for minimizing PM emissions involve watering of surfaces, chemical stabilization, or reduction of surface wind speed with windbreaks or source enclosures. Covering the road surface with a new material of lower silt content, such as covering a dirt road with gravel or slag has also proved to be efficient. Regular maintenance practices, such as grading of gravel roads, also help to retain larger aggregate sizes on the traveled portion of the road and thus help reduce emissions. Low cost measures also include: ▪ Proper site enclosure through appropriate hoarding and screening; ▪ On-site mixing and unloading operations; ▪ Proper handling of cement material; ▪ Maintaining minimal traffic speed on-site and on access roads to the site; ▪ Covering all vehicles hauling materials likely to give off excessive dust emissions; ▪ Ensuring adequate maintenance and repair of construction machinery and vehicles; ▪ Avoiding burning of material resulting from site clearance; ▪ Covering any excavated dusty materials or stockpile of dusty materials entirely by impervious sheeting; ▪ Proper water spraying when necessary; ▪ The provision of water troughs at entry and exit points to prevent the carryover of dust emissions, beyond the construction site

Potential negative impacts	Mitigation measures
	Measures to reduce truck traffic emissions include proper truck maintenance and the adoption of a traffic management plan while avoiding congested routes. Regarding on-site construction equipment, proper maintenance procedures and the quality of diesel fuel used are important to reduce emissions. Equipment should also be turned off when not in use, to reduce power needs and emissions of pollutants.
Fish processing facilities from project associated investors	Fish processing facilities can cause air pollution. The air emission standards in the applicable World Bank Group Agribusiness and Food Production Environmental, Health and Safety Guidelines, as well as the General Environmental, Health and Safety Guidelines need to be applied.
Noise: noise levels emitted during the construction/rehabilitation and operation may exceed acceptable noise level standards	Mitigation measures to be adopted mainly during construction and operation to minimize noise levels include but are not limited to: ▪ Enclosing the site with barriers/fencing ▪ Effectively utilizing material stockpiles and other structures, where feasible, to reduce noise from on-site construction activities ▪ Choosing inherently quiet equipment ▪ Operating only well-maintained mechanical equipment on-site ▪ Keeping equipment speed as low as possible ▪ Shutting down or throttling down to a minimum equipment that may be intermittent in use, between work periods ▪ Utilizing and properly maintaining silencers or mufflers that reduce vibration on construction equipment during construction works ▪ Restricting access to the site for truck traffic outside of normal construction hours ▪ Proper site logistics and planning ▪ Limiting site working hours if possible ▪ Scheduling noisy activities during the morning hours ▪ Informing the locals when noisy activities are planned ▪ Enforcing noise monitoring
Fish processing facilities from project associated investors	Fish processing facilities can cause noise pollution. The noise emission standards in the applicable World Bank Group Agribusiness and Food Production Environmental, Health and Safety Guidelines, as well as the General Environmental, Health and Safety Guidelines need to be applied.
Solid and liquid wastes: during construction/rehabilitation and operation, there will be generation of construction and operation debris as a result of various construction and operation activities	The generated solid materials can be used for reclamation purposes whenever applicable. However, care should be taken to ensure the absence of contaminated fill material and the adequacy of the physical and chemical properties of such material to limit potential adverse impacts on water and soil and ensure project safety. Construction and demolition wastes can also be minimized through careful planning during the design stage, by reducing or eliminating over-ordering of construction materials to decrease waste generation and reduce project costs. The contractor should carry out sorting of construction and demolition wastes into various categories and adopt re-use/recycle on site whenever deemed feasible. Chemical wastes generated during the construction phase include containers that were used for storage of chemical wastes on site, the chemical residue as well as contaminated material. Rehabilitation of fuel storage facilities may involve the removal of contaminated soils around fuel dispensers, piping, and tanks, as well as bulky, inert and contaminated solid waste items such as damaged tanks. Storage of hazardous waste should take place in a separate area that has an impermeable floor, adequate ventilation and a roof to prevent rainfall from entering. In addition all chemical wastes should be clearly labeled in Portuguese and, stored in corrosion resistant containers and arranged so that incompatible

Potential negative impacts	Mitigation measures
	materials are adequately separated. General refuse generated on-site during the construction phase should be stored in enclosed labeled bins or compaction units separate from construction and chemical wastes. General refuse is generated largely by food service activities on site, therefore, where feasible, reusable rather than disposable dishware should be promoted. Aluminum cans, glass, plastics, wood and metals may be recovered from the waste stream by individual collectors if they are segregated and made easily accessible, so separate, labeled bins for their storage should be provided.
Hydrocarbons (waste oils)	Hydrocarbons should be stored on an impermeable concrete floor with concrete bundling. It should be negotiated with the new oil supplier to take back the waste oils for recycling by a MICOA authorized recycler. When rehabilitating areas where, at present, oil storage are located and sites are hydrocarbon contaminated, it will be necessary to clean up the site completely before starting any rehabilitation activities. A rapid environmental audit will need to be conducted to identify the action plan for site clean-up.
Fish processing facilities from project associated investors	Fish processing facilities can cause solid waste pollution. The solid waste management practices in the applicable World Bank Group Agribusiness and Food Production Environmental, Health and Safety Guidelines, as well as the General Environmental, Health and Safety Guidelines need to be applied.
Water quality: the primary sources of potential impacts to water quality will be from pollutants from site runoff, accidental spills, which may enter surface waters (marine and river) directly or through the storm drainage system	Surface run-off from the construction site should be directed into storm drains through adequately designed sand/silt removal facilities such as sand traps, silt traps and sediment basins. If oil is present, oil/water separators should be installed, which should be regularly cleaned. Channels, earth bunds or sand bag barriers should be provided onsite to properly direct storm water to silt removal facilities before discharge into the surrounding waters. Silt removal facilities should be maintained with deposited silt and grit being regularly removed after each rainstorm to ensure that these facilities are functioning properly at all times. Moreover, the rainwater pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities and not directly to the aquatic environment. Open stockpiles of construction materials on site should be covered with tarpaulin or similar fabric during rainstorm events to prevent the washing away of construction materials, while earthworks should be well compacted as soon as the final surfaces are formed to prevent erosion especially during the wet season. Water used in vehicle and plant servicing areas, vehicle wash bays and lubrication bays should be collected and connected to foul sewers via an oil/grease trap. Oil leakage or spillage should be contained and cleaned up immediately. Spent oil and lubricants should be collected and stored for recycling or proper disposal and should be stored on impermeable and bounded surfaces. All fuel tanks and chemical storage areas should be provided with locks. Fuel tanks should be placed in concrete bounded areas of 110% of the volume of the largest fuel tank. The contractor should also prepare guidelines and procedures for immediate cleanup actions following any spillages of oil, fuel or chemicals. Sewage from toilets, kitchens and similar facilities should be contained in sanitary cesspools before being transported by trucks to a nearby wastewater treatment plant. As for the wastewater generated from concreting, plastering, internal decoration, cleaning work and other similar activities, it should undergo large object removal by bar traps at drain inlets.

Potential negative impacts	Mitigation measures
Fish processing facilities from project associated investors	Fish processing facilities can cause water pollution. The water effluent standards in the applicable World Bank Group Agribusiness and Food Production Environmental, Health and Safety Guidelines, as well as the General Environmental, Health and Safety Guidelines need to be applied.
Flora and fauna: stream pollution by sediments from rehabilitation and construction activities by suspended and settable solid particles that may coat, bury, suffocate or abrade living organisms. Many aquatic invertebrates and fish may undergo changes in population density and community composition if high concentrations of suspended solids occur. Aquatic vegetation may be adversely affected by a reduction in photosynthesis due to high turbidity.	To minimize stream pollution by sediments, it is recommended to reduce or prevent soil erosion from the construction site by: ▪ Scheduling construction/rehabilitation to avoid heavy rainfall periods (i.e., during the dry season) to the extent practical ▪ Contouring and minimizing length and steepness of slopes ▪ Protecting to stabilize exposed areas ▪ Install sediment traps, e.g. reed screens ▪ Re-vegetating areas promptly ▪ Designing channels and ditches for post-construction flows Additional measures include: ▪ Carefully select right-of ways/corridors of impact to avoid important natural areas such as wild lands and sensitive habitats ▪ Utilize appropriate clearing techniques (hand clearing vs. mechanized clearing) ▪ Maintain native ground cover beneath lines ▪ Replant disturbed sites soon after construction/rehabilitation ▪ Manage right-of-ways/corridors of impact to maximize wildlife benefits
Accidental hydrocarbon spill will have a detrimental impact on aquatic life.	General implementation and enforcement of good agricultural practices and crop management, e.g. contour line farming, in order to reduce erosion. Prevent accidental hydrocarbon spills by storing hydrocarbons into concrete bunded areas and equip areas where hydrocarbons are used with oil/grease/water separators.
Deforestation, soil degradation through erosion, habitat destruction may occur during clearing	Compensate lost trees in the same area. Install erosion prevention and control measures as mentioned above. Avoid sensitive habitat by fencing the area, so that the habitat cannot be entered by trucks and workers.
Health and safety: occurrence of accidents (direct and indirect) to workers on-site, pedestrians, and machine operators or passengers during construction/rehabilitation and operation	Occupational health and safety measures should include: ▪ Restriction of access to the construction site by proper fencing with site boundaries adjoining roads, streets or other areas accessible to the public should undergoing high enough fencing along the entire length except for a site entrance or exit ▪ Establishment of buffering areas around the site ▪ Provision of guards on entrances and exits to the site

Potential negative impacts	Mitigation measures
	▪ Installation of warning signs at the entrance of the site to prohibit public access ▪ Provision of training about the fundamentals of occupational health and safety procedures ▪ Provision of appropriate personal protective equipment (PPE) (impermeable latex gloves, working overalls, safety boots, safety helmets, hearing protecting devices for workers exposed to high noise levels, and lifesaving vests for construction sites near water bodies) ▪ Ensuring that workers can swim (at work sites near water) and that lifesaving rings are available at the worksite, near water ▪ Ensuring that the protective material is being used wherever it is required ▪ Ensuring that especially sensitive or dangerous areas (like areas exposed to high noise levels, areas for especially hazardous work etc.) are clearly designated ▪ Ensuring that all maintenance work necessary for keeping machines and other equipment in a good state will be regularly carried out. ▪ Ensuring that the workers (and especially those doing hazardous work or otherwise exposed to risks) are qualified, well trained and instructed in handling their equipment, including health protection equipment ▪ In case blasting is required the Contractor should work according to an approve Blasting Plan, which need to be approved by the Supervising Engineer and the Client ▪ Provision of adequate loading and off-loading space ▪ Development of an emergency response plan ▪ Provision of on-site medical facility/first aid ▪ Provision of appropriate lighting during night-time works ▪ Implementation of speed limits for trucks entering and exiting the site Regarding hazardous substances, the following measures should be implemented: ▪ Ensuring that hazardous substances are being kept in suitable, safe, adequately marked and locked storing places ▪ Ensuring that containers of such substances are clearly marked, and that material safety data sheets are available ▪ Ensuring that all workers dealing with such substances are adequately informed about the risks, trained in handling those materials, and trained in first aid measures to be taken in the case of an accident. ▪ Designating an area where contaminated materials and hazardous waste can be stored for proper disposal according to environmental guidelines in force in the country and as specified in the applicable World Bank Group Environmental, Health and Safety Guidelines of April 2007. ▪ The adoption of good housekeeping practices for ensuring hygiene on site ▪ The elimination of pools of stagnant water, which could serve as breeding places for mosquitoes The provision of bed nets for workers living on site. Ideally, these nets should be treated with an insecticide The appropriate elimination of waste of all types, including wastewater ▪ Monitor the prevalence of intestinal and urinary bilharzia and malaria. If the prevalence increases implement the following: ▪ Distribute long-lasting insecticidal impregnated mosquito bed nets (LLINs) to affected communities, to control malaria ▪ Mass treatment of high risk groups with praziquantel need to be carried out to control intestinal and urinary bilharzia

Potential negative impacts	Mitigation measures
	▪ Minimize contact with infected water by requiring people to wear boots and gloves ▪ Support to access to drinking water and autonomous sanitation facilities ▪ Reduce fecal and urinary pollution of surface waters by prohibiting defecation and urine in water and putting in place sanitation systems (latrines, etc.) ▪ Educate affected communities with regard to these water-borne diseases ▪ Follow WHO guidelines
Socioeconomic impact including resettlement, reduction of arable and pastoral land, prevention of HIV/AIDS and influx of external workers: potential loss of land or land use, interruptions to means of livelihood, disturbances to cultural resources, and influx of foreign workers	▪ Select project sites and rights-of-way (ROW) in a consultative and participatory manner so to avoid important social, agricultural, and cultural resources and avoid areas of human activity ▪ Utilize alternative designs to reduce land and ROW width requirements and minimize land use impacts ▪ Ensure a high rate of local employment to minimize influx of foreign contract workers: preferred preference to local people in order to avoid social conflicts ▪ Prevention of STDs, HIV/Aids: Create awareness and educate workers and nearby communities. Provide free, sufficient, good quality condoms for personnel. Provide treatment for infected personnel ▪ Supply and enforce wearing protective equipment (helmets, boots, dress, gloves, masks, goggles, etc.) by workers ▪ Strictly follow government instructions on the hiring of foreign workers and clarify criteria for hiring them ▪ Favor local labor where the required skills are available ▪ Environmental management of construction waste (installation of litter bins, regular collection and disposal in authorized sites) ▪ Awareness on respect for local customs ▪ Educate and training of local people and workers

The planning and implementation of mitigation measures will be done under the guidance and responsibility of safeguard staff at INAQUA, IDPPE and MF and contracted out on a competitive basis to service providers.

Contractors for simple subprojects will be mainly responsible for the implementation of the SECs (Social and Environmental Clauses), which will be included in the bidding documents and will be part of their contractual obligations.

For more complex projects the Contractors will be required to prepare and implement their own Contractor Environmental and Social Management Plan (CESMP). For this purpose they will need to employ qualified staff. These requirements will need to be included in the bidding documents and in their contracts.

The Supervising Engineers will by contractual arrangements be made responsible for the adequate implementation of the SECs and CESMPs. The Supervising Engineer will need to employ qualified staff for this purpose.

10 GUIDELINES FOR SUB-PROJECT SCREENING, PREPARATION, APPRAISAL, APPROVAL AND MONITORING

There will be the need to ensure that potential environmental and social impacts are adequately addressed through the institutional arrangements and procedures used by the Program interventions for managing the identification, preparation, approval, environmental licensing, implementation, monitoring, evaluation and auditing of sub-projects.

The Program has been classified as Category B project. Most of the sub-projects will fall within this category, while some will be Category C. As per both Mozambican and WB regulations Category B projects require less stringent ESIA/ESMP processes due to the fact that the environmental and social impacts are easier to deal with; few if any of them have irreversible effects; and in most cases appropriate mitigation measures can be readily designed. As is the case with any intervention environmental and social best practices recommend that negative impacts be avoided and/or minimized and that adequate and implementable mitigation and management measures be put in place early enough where avoidance is not feasible.

The key to environmental and social management is the environmental and social screening process, which may or may not result in the preparation of a full ESIA/ESMP document, a freestanding ESMP or no action need to be taken. The screening process should follow the Safeguard Policy OP 4.01/BP on Environmental Assessment of the World Bank and the Mozambican Regulations for Environmental and Social Impact Assessment. The screening process will be carried out at specific sub-project sites in the field once they have been identified. The environmental and social screening process is necessary to identify if the subprojects will cause environmental and social impacts. The environmental and social screening is part of the preparation and approval process of subprojects financed by the Project.

The objectives of the ESMF screening process include:

a) determine which construction/rehabilitation and operation activities are likely to have potential negative environmental and social impacts;

b) determine the level of environmental and social work required, including whether an ESIA/ESMP or a freestanding ESMP is required or no action need to be taken;

c) determine appropriate mitigation measures for addressing adverse impacts;

d) incorporate mitigation measures into the development plans for the subproject;

e) facilitate the review and approval of the construction/rehabilitation and operation proposals; and

f) provide guidance for monitoring environmental and social parameters during the implementation and operation of project activities;

g) ensure the final environmental and social evaluation of the project.

The extent of environmental and social work that might be required, prior to the commencement of construction/rehabilitation works, and during operation will depend on the outcome of the screening process.

Below, critical aspects to be adopted to avoid/minimize negative impacts as well as mitigate and manage them correctly are suggested.

10.1 Screening of Project Activities and Sites

Depending on the size, nature and perceived environmental consequences of a project Mozambican Regulation for ESIA (Decree 45/2004) provides for three project categories, namely A, B and C. Where it is clear that project activities fall under Category B, a simplified ESIA needs to be carried out. The screening process will be used to determine the appropriate types of environmental follow-up measures, depending on the nature, scope, and significance of the expected environmental and social impacts from each of the Pgram subproject activities.

Both the Environmental and Social Screening Form (ESSF in Annex 2) and the Annex 3 of Decree 45/2004 will be completed by INAQUA/IDPPE Environmental, Social, Health and Safety staff. The screening forms, when correctly completed, will facilitate the:

- identification of potential environmental and social impacts and the identification of health and safety risks;
- determination of their significance;
- assignment of the appropriate environmental category; and
- determination of the need to conduct an ESIA/ESMP or a freestanding ESMP an needed, or determine that no action need to be taken.

The responsible MICOA structure on Provincial or District level will need to confirm the abovementioned screening process to comply with Mozambican environmental legislation, the screening process will be conducted in the following manner:

Preparation activities for the screening process will include a desk appraisal of the intervention (e.g. construction/rehabilitation and operation plans) for sub-project related infrastructure.

Subsequent to the desk appraisal of the interventions, the initial screening of the proposed sub-project activities will be verified in the field, with the Environmental and Social Screening Form (ESSF) prepared by the Project Safeguard staff. The District Environmental Officers, stationed at the SDPI and/or municipalities, will do the verification. Subsequently, they will oversee the preparation and implementation of the required measures.

10.2 Assigning the Appropriate Environmental and Social Categories

The ESSF, when completed, will provide information on the assignment of the appropriate environmental and social category to a particular subproject. The Provincial Departments of Environmental Impact Assessment in collaboration with the Environmental and Social Specialists from the Project Coordination/INAQUA/IDPPE will be responsible for categorizing a subproject as either A, B or C. It is not expected that any of the subprojects will be Category A through the application of OP/BP 4.01.

Category A and more complex Category B sub-project activities would have significant and long-term adverse environmental and social impacts and therefore would require an ESIA with ESMP, in accordance with Mozambican legal requirements. Category B projects are those with one or a few potentially significant adverse impacts, which would require an Environmental and Social Management Plan (ESMP) to address specific impacts during project construction or operation, but not a full ESIA. Category C projects would not involve any significant adverse environmental impacts; they would therefore not require an ESIA or a specific ESMP, but they would require adherence to good

environmental practices, including any applicable Environmental and Social Clauses to be included in the Contractor's Contracts.

The assignment of the appropriate environmental category will be based on the provisions of the World Bank Operational Policy (OP 4.01/BP) on Environmental Assessment and the Mozambican ESIA Guidelines.

The ESIA and/or ESMP should be disclosed in country at the project sites and on the MF website and the World Bank Infoshop prior to commencement of any project construction activities.

10.3 Carrying out Environmental and Social Work

After reviewing the information provided in the Environmental and Social Screening Form (ESSF) and the Preliminary Environmental Information Sheets and having determined the appropriate environmental and social category, the Provincial Directorate of Environment (DPCA) in close collaboration with the Core Management Team will determine whether (a) the application of simple mitigation measures outlined in the Environmental and Social Checklist (Annex 4) and Environmental and Social Clauses for Contractors (Annex 5) will suffice (Category C); whether (b) an Environmental and Social Management Plan (but no ESIA) needs to be prepared to address specific environmental impacts (Category B); or whether (c) a full ESIA/ESMP will need to be carried out (Category A or complex Category B).

10.4 Environmental and Social Checklist:

The Environmental and Social Checklist in Annex 4 will be completed by qualified Environmental and Social Specialists of the Core Management Team. Most of the subprojects will be categorized as Category B, which may not require a full ESIA, and will benefit from the application of mitigation measures outlined in the checklist.

If there is already an existing design for a subproject, the Provincial Directorate of Environment in collaboration with INAQUA/IDPPE and the NMU/CMT will assess the potential environmental and social impacts on the chosen site and on the community and will recommend modification of the design or the location in order to mitigate or reduce these potential impacts.

10.5 Environmental and Social Impacts Assessment (ESIA)

Certain subprojects will be found to require an ESIA. In such a case, the ESIA would identify and assess the potential environmental and social impacts of the proposed activities, evaluate alternatives, as well as design and implement appropriate mitigation, management and monitoring measures. These measures would be captured in the Environmental and Social Management Plan (ESMP) which will be prepared as part of the ESIA Document.

Where required, preparation of the ESIA that includes an ESMP will be carried out by the Borrower in consultation with the relevant stakeholders, including potentially affected persons. Environmental and Social Specialists of the Project Implementation Units, in close consultation with the Provincial Directorate of Environment and/or DNAIA and on behalf of the District Governments or Municipalities, will arrange for the (i) preparation of ESIA/ESMP terms of reference; (ii) recruitment of a consultant to carry out the ESIA/ESMP; (iii) public consultations and participation; and (iv) review and approval of the ESIA/ESMP following the national ESIA approval process. ESIAs and ESMPs also need to be sent to the World Bank for approval and disclosure.

10.6 Subproject Review and Approval

The Environmental and Social Specialists at INAQUA/IDPPE will fill in the environmental and social screening forms and identify the mitigation measures presented in the environmental and social checklists or additional ones not mentioned in the checklists in order to classify the sub-project. Where an ESIA/ESMP or a freestanding ESMP has been carried out, the Environmental and Social Specialists in collaboration with the Provincial Directorate of Environment/DNAIA will review the reports to ensure that all environmental and social impacts have been identified and that effective mitigation measures have been proposed, including institutional arrangements for the implementation of the ESMP and a budget.

Based on the results of the above review process, and discussions with the relevant stakeholders and potentially affected persons, the INAQUA/IDPPE Environmental and Social Specialists, in case of sub-projects that do not require an ESIA/ESMP or a freestanding ESMP will make recommendations to the Municipal or District Government to go ahead with the project implementation.

It is a known fact that at present it is mainly at the provincial and central levels that solid capacity exists for conducting the ESIA/ESMP processes. At the district and municipal levels such capacity is either non-existent or weak. To ensure that all stages of the process including the verification of screening forms is completed correctly for the various sub-project locations and activities, training will be provided to members of the SDPI and Municipalities. Technical advice and training on environmental and social impacts assessment and implementation of mitigation measures will be provided by a contracted safeguards specialist or by the Environmental and Social Specialists at INAQUA/IDPPE, with assistance of World Bank safeguard specialists.

10.7 Participatory Public Consultation and Disclosure

Local people and communities as well as their representatives need to be continuously involved in the decision-making related to the diversity of Project interventions. The various pieces of Mozambican legislation on land issues place public consultation and participation at the top of the agenda. The Project will ensure that the provisions in those regulatory documents are strictly adhered to. Local people/communities and their representatives are properly placed to take care of the needs of local stakeholders and to promote the local resource management capacity.

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

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

For the PPP to be effective there are norms and procedures to be observed throughout.

The ESIA/ESMP process emphasizes the clear need for frequent interaction and communication between the general public, parties affected by the proposed Project, local NGOs, external interested and concerned organizations, as well as Project scientists and engineers.

Each aspect of the technical investigations generally includes a data collection and verification phase, followed by analysis and evaluation, then synthesis and conclusions. The findings of each phase are communicated as appropriate to external parties.

In terms of the ESIA Regulations in force in Mozambique (Decree 45/2004 and Diplomas 129/2006 and 130/2006 and other related regulatory instruments) mandatory public consultation meetings mark the end of each main phase, e.g. scoping and definition of terms of reference as well as a public consultation on the draft final ESIA document. Under Mozambican legislation, these should be announced at least 15 days prior to the meeting day. In addition to being invited by public notices, a certain number of participants to these meetings should be directly invited by letters of invitation drafted by the Consultant, issued, and distributed by the project developers. In this case the PCU would be at the forefront in ensuring that relevant stakeholders are invited and participate in the meetings.

During the meetings, the ESIA team in collaboration with the developers' (CMT/INAQUA/IDPPE) representatives and the engineering team, maintain PI&APs informed of the main issues and findings of each phase and collect concerns and interests expressed by the various project stakeholders. Public meetings are non-technical in nature and are expected to contribute to get stakeholders' inputs in terms of avoiding/minimizing possible negative impacts and optimizing the positive impacts of the subproject.

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

In compliance with both the GoM regulation and World Bank guidelines, before a sub-project is approved, the applicable documents (ESIA, ESMP) must be made available for public review at a place easily accessible to beneficiary communities (e.g. at a local government office, at the DNAIA/DPCA/SDPI/SDAE), and in a form, manner and language that can easily understood, including the non-technical summaries of the main documents. They must also be forwarded to the World Bank for approval and disclosure at the Public Information Center in Maputo and at the World Bank Infoshop in Washington DC. In the case of ESIA/ESMP public consultation and participation processes, Mozambican guidelines have similar pre-requisites which should be strictly followed under the Project.

During the preparation of the final ESMF public consultation were carried out. Two main phases took place. The first was during the initial stage (April/May 2014) as way of getting the preliminary views from main stakeholders on possible program characteristic and impacts as well as on issues that should deserve particular attention. The second took place after the draft of the ESMF, PF and ESIA/ESMP of Inhassunge (in June 2014) with the aim of informing stakeholders about the program structure and contents, including the project geographical boundaries and to get their views on issues to be reexamined, program's possible environmental and social impacts and possible ways of mitigating them. The feedback received from stakeholders has been integrated in many sections of the three documents including the ESMF and are summarized in Annex 6 of this document. It also includes the names of

the people that have been consulted. The final ESMF will be disclosed in-country and in the World Bank Infoshop prior to appraisal.

10.8 Annual Monitoring Reports and review

Monitoring of the compliance of project implementation with the mitigation measures defined in its ESMF, ESIA/ESMP will be carried out jointly with communities, the Environmental and Social Specialists of the Core Management Team, MICOA's local representatives, extension workers and the Service Provider (i.e. CSO) responsible for implementing the Program.

District (SDPI) and municipal authorities should supervise the monitoring activities and are required to report annually on sub-project activities during the preceding year. The information to be included in these annual reports to capture experience with implementation of the ESMF procedures will be included in an annex to be prepared as part of the annual report, which will be used as a guide.

Compliance monitoring comprises on-site inspection of activities to verify that measures identified in the ESMF, ESIA/ESMP are being implemented. This type of monitoring is similar to the normal tasks of a supervising engineer whose task will be by contractual arrangement to ensure that the Contractor is adhering to the contractual obligations with regard to environmental, social, health and safety practices during construction, as prescribed in the Social and Environmental Clauses (SEC) included in the bidding documents and Contracts or as described in the Contractor ESMP.

MICOA, through DPCA and DNAIA (or an external consultant) will have the responsibility of conducting the environmental, social, health and safety inspection. An annual inspection report must be submitted (together with the monitoring report) to the MF and the World Bank for review and approval.

Independent local consultants, local NGOs or other service providers that are not otherwise involved with the Project, thus independent, may carry out annual reviews. Annual reviews should evaluate the annual monitoring report from district authorities and the annual inspection report from DPCA/DNAIA.

It is worth pointing out that annual reviews are not normal for ESIAs/ESMPs with the current practices. The Core Management Team at central (CMT) and provincial levels (INAQUA and IDPPE) need to make dedicated efforts to ensure that this work is done properly.

10.9 Environmental and Social Audit

An external independent environmental, social, health and safety audit will be carried out at mid-term of project implementation and at the end of the project. The audit team will report to the MF and the World Bank, who will deal with the implementation of any corrective measures that will be required. The audits are necessary to ensure that (i) the ESMF process is being implemented appropriately, and (ii) mitigation measures are being identified and implemented accordingly. The audit will be able to identify any amendments in the ESMF approach that are required to improve its effectiveness.

The Audit Reports will include:

- A summary of the environmental, social, health and safety performance of the sub-projects, based on the ESIAs, ESMPs, and the implementation of the Environmental and Social Clauses in the Contractor Contracts and Contractor ESMPs;
- A presentation of compliance and progress in the implementation of the sub-projects ESMPs;

- A summary of the environmental and social monitoring results from individual sub-projects monitoring measures (as set out in the sub-project ESMPs).

The main tasks of the audit will be to:

- Consider the program description;
- Indicate the objective, scope and criteria of the audit;
- Verify the level of compliance by the developer with the conditions of the ESMP, Environmental and Social Clauses in contracts, and Contractor ESMPs;
- Evaluate the developer's knowledge and awareness of and responsibility for the application of relevant legislation;
- Review existing program documentation related to all infrastructure facilities and designs;
- Examine monitoring programs, parameters and procedures in place for control and corrective actions in case of emergencies;
- Examine records of incidents and accidents and the likelihood of future occurrence of the incidents and accidents;
- Inspect all buildings, premises and yards in which processing, testing and transportation takes place within and without the project area, as well as areas where goods are stored and disposed of and give a record of all significant environmental, social, health and safety risks associated with such activities;
- Examine and seek views on health and safety issues from the project employees, the local and other potentially affected communities; and
- Prepare a list of health and safety and environmental and social concerns of past and on-going activities.

10.10 Other Important Issues

10.10.1 Integration and harmonization with the district land use plans

In addition to defining the district as the main territorial planning unit the GOM, through the Land Planning Law (Law n.º 19/2007 of 18 of July) and its regulation, requires all districts to have land use plans. As stated above district land use plans are meant to provide adequate zoning for interventions based on suitability of the different land areas and respective pre-conditions. These plans are a way of exercising holistic and integrated approach to land resources management, including strategic planning. The siting of subprojects will benefit immensely from being harmonized with the district land use plans. An adequate zoning at the district and/or municipal level should be able to provide sound guidance regarding the best siting for each specific subproject.

However, due to a multitude of reasons most of the districts are still in the process of finalizing these plans and/or of enforcing them. It is possible that by the time the Project will be implemented these plans will not yet be available in their final form and/or conditions will not be ready for enforcement. In some other cases existing plans will not be of the best quality and the Program should endeavor to assist in revising the plans to bring them up to standard.

Given the complexity of this program, it is Highly Recommended to employ, as part of the project management by MF, INAQUA and IDPPE, qualified Safeguards Specialists. It is also recommended to employ a Communication Officer in the Core Management Team in Maputo. These staff members will have the overall responsibility to ensure due and timely compliance with the agreed recommendations in the safeguards documents. These specialists will participate in the joint supervisions mission with the WB and subsequently ensure timely implementation of agreed Safeguards Action Plans (SAP).

11 GUIDELINES FOR ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN AND MONITORING REQUIREMENTS

Environmental and Social Management Plan (ESMP)

A site specific ESMP should be conducted as part of the ESIA process, as per the Regulamento do Processo de Avaliação do Impacto Ambiental (RPAIA)'s point (g) of Article 12, and should include the "monitoring of impacts, prevention plans, as well as accident contingencies".

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

An effective ESMP for specific sub-projects will be a practical document, which will precisely set out both the goals and actions required in mitigation.

The ESMP covers a set of measures that need to be taken to ensure that impacts are dealt with in the following hierarchical order[41]:

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

The management measures set forth in the ESMPs for more complex sub-projects and the Environmental and Social Clauses (SECs) for simple sub-projects will be included in the bidding documents and in the various contractual clauses for the design, construction and appropriate operation of the interventions to be adopted. All construction contracts should comply with the Environmental and Social Clauses and if relevant with the ESMP and Contactor ESMP prepared for the specific sub-project. Their implementation is the responsibility of the contractors. The Supervising Engineers will be required to monitor the adequate implementation of these clauses, ESMPs and CESMPs. For complex sub-projects the contractors will be required to prepare and implement his/her

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

own Contractor ESMP and should employ an experienced environmental, health and safety specialist for this purpose. The Supervising Engineers will be required by contractual arrangement to supervise the adequate implementation of these Contractor ESMPs, other ESMPs or SECs and should employ an experienced environmental, health and safety officer for this purpose.

A series of steps to be followed to ensure that fisheries under the Project follow the best practices this document will also include an annex on Good Fisheries Practices - Hygiene and Safety (Annex 7), which should be creatively followed where the Program will be supporting fisheries and fisheries related sub-projects.

12 TRAINING AND CAPACITY BUILDING REQUIREMENTS

Successful implementation of the Program will depend among others on the effective implementation of the environmental and social management measures outlined in the ESIAs/ESMPs. Training and capacity building will be necessary for the key stakeholders to ensure that they have the appropriate knowledge and skills to implement the environmental and social management plans.

12.1 Institutional Capacity Assessment and Analysis

Descriptions made in Chapter 7 clearly show that there has been considerable progress in institutional, legal and regulatory processes related with environmental and social management in Mozambique. However, coordination and law enforcement remain a serious challenge.

The Ministry for the Coordination of Environmental Affairs (MICOA) is entrusted with the responsibility of "promoting sustainable development through the practical leadership and execution of the country's environmental policy". However, it is a Ministry that is relatively new compared to other traditional ministries (e.g. agriculture, public works, education, health, MPD and MMAS, etc.) and it has been facing real problems to advance its coordinating role and responsibilities.

The various institutions, development strategies, laws and regulations are still in need of harmonization to ensure that they achieve common goals within the sector. Human and material investments are required to translate the various provisions into concrete actions. This is further compounded by the fact that most of the country's inhabitants are active in the informal sector, which makes it very difficult to regulate them.

Based on needs identification a specific institutional and human capacity-building program for environmental and social management will have to be developed as part of the Project. Beneficiary institutions might be the Ministry for the Coordination of Environmental Affairs (MICOA) at its various levels, mainly the provincial and district levels, relevant line ministries at provincial and district levels, e.g. agriculture, public works, energy, mineral resources, health, education, MMAS and MPD, etc., including local authorities (e.g. municipalities and others such as CSOs). A detailed capacity-building program will be developed during implementation, with a focus on strengthening the District, Municipal and Provincial structures responsible for environmental and social management.

The District Services of Planning and Infrastructure (SDPI), which have a unit that deals with environmental matters at the district level, should be given special attention to build their capacity to manage the ESIA/ESMP processes. So far, these processes are managed mainly at the provincial and central level. Only limited number of districts have made significant strides in getting actively and competently involved in ESIA/ESMP processes. In as far as possible lessons learned from districts with experience should be replicated in the program areas as part of the Program planning and implementation.

To deal with the various and complex issues related with communication, coordination, capacity building and institutional strengthening there will be qualified Safeguard Specialists and a Communication Officers in the two regions/provinces stationed at INAQUA and IDPPE.

12.2 Proposed Training and Awareness Programs

The general objective of the training and awareness programs for implementation of the ESIAs and ESMPs is to:

- sensitize the various stakeholders on the linkages between environment and social impacts and Program subprojects, particularly rural feeder roads, agriculture development, agro-industry, water supply, energy, education, health, municipal development, etc.;
- demonstrate the role of the various key players in the implementation and monitoring of the safeguards instruments (ESMF-ESIA/ESMP, etc.);
- sensitize representatives and leaders of community groups and associations (who will in turn convey the message to their respective communities) on the implementation and management of the mitigation measures; and on their roles in achieving environmental and social sustainability;
- ensure that both provincial and district level personnel are able to provide leadership and guidance as well as supervise the implementation of their components in the ESIA/ESMP;
- ensure that participants are able to analyze the potential environmental and social impacts, and competently prescribe mitigation options as well as supervise the implementation of management plans;
- strengthen local NGOs and teams of extension workers to provide technical support to the farmers.

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

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

Practical ways of reaching all target groups will need to be devised for training and capacity needs assessments as well as for delivery of the training. The "*Learning by Doing*"[42] approach in relative detriment of studies and other forms of advice and assistance will be given priority consideration. The training of trainers is also seen as a relevant approach as it will assist in the creation of basic conditions for sustainability and replication of the interventions. The outcomes of such a process will live beyond the life span of Program.

12.3. Technical Assistance (TA)

In due course the need for short, medium and long term Technical Assistance will be assessed. The results will be used to devise the best approach to deploying TA to the program.

Particularly important in TA will be to ensure that the various external inputs from different providers of goods and services to the program are aligned and harmonized with the Program's ultimate goals. Capacity building and transference of knowledge and skills for MF, MICOA, MOPH and the overall environmental and social sector will be at the center of the activities to be carried out.

[42] In which relevant personnel at the various levels are exposed to examples of good practices and/or where they learn by seeing and/or doing how things are approached and done.

13 ESMF MONITORING REQUIREMENTS

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

Program Core Management Team, especially the safeguard specialists, will have the overall responsibility for coordinating and monitoring the implementation of the ESMF. They will have to conduct sensitization programs to inform stakeholders about the framework, how it works and what will be expected of them. They will undertake continuous compliance monitoring and evaluation to ensure that:

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

The Program Core Management Team will consult and coordinate with the appropriate government agencies on social and environmental monitoring. Quarterly progress reports will be prepared and circulated to all relevant entities covering aspects such as:

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

For major project activities, the Project will procure an external independent consultant/firm to (i) conduct the monitoring and evaluation of the sub-project activities, and (ii) verify the effectiveness of measures for mitigation of negative impacts and enhancement of positive impacts. The Independent consultant/Firm will develop a detailed monitoring and evaluation plan (including questionnaires and inventory forms) from terms of reference, based on the ESMPs and CESMPs submitted to and approved by the GOM and the WB/IDA.

14 PROPOSED ESTIMATED IMPLEMENTATION BUDGET.

Below is the itemized budget for preparing and implementing the ESMF and respective ESIAs/ESMPs, including monitoring, evaluation, auditing and capacity building.

Table 10: Estimated budget for ESMF implementation

Item	Total Amount inUS$1,000.00
ESMF Implementation	
Program start-up and preparation for implementation	$15.00
Contracting of ESMF service providers and mobilization	$45.00
Sub-project identification, preparation and monitoring assistance	$50.00
General technical assistance	$60.00
Specific technical assistance	$50.00
Monitoring	$35.00
Inspection	$40.00
Annual review	$45.00
Triennial audit	$55.00
Training and Capacity Building	
At central level	$35.00
At provincial level	$45.00
At district/municipal level	$60.00
Extension workers and other technical personnel at the grassroots level	$75.00
Producers' associations and SMEs	$80.00
NGO, CBO, Community Associations	$60.00
Preparation and implementation of ESIAs, ESMPs	
Preparation and implementation of ESIAs, ESMPs	$100.00
Total	**850.00**

The total cost of preparing and implementing ESMF, and the ESIAs/ESMPs under this document stands at **US$ 850.00** (eight hundred, fifty American Dollars).

15 GRIEVANCE AND CONFLICT REDRESS MECHANISMS

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

When the actions of local communities conflict with the biodiversity objectives of the area, they must try to resolve these conflicts through negotiation with the relevant authorities. In doing so, engagement of government or independent civil society groups may help resolve these problems in such a way that the interests of communities and conservation are appropriately balanced.

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

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

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

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Annexes

Annex 1: Status Quo of Preparation of District Land Use Plans in the Project Area (provinces)[43]

[43] These might require an updating.

PROVÍNCIA	ORDEM	TOTAL DE PLANOS	DISTRITOS COM PLANOS ELABORADOS	ANO DE ELABORAÇÃO	DISTRITOS SEM PLANOS
CABO DELGADO	1	1	Pemba Metuge	2008	
	2	2	Mecufi	2008	
	3	3	Balama	2009	
	4	4	Montepuêz	2009	
	5	5	Macomia	2009	
	6	6	Chiúre	2009	
	7	7	Namuno	2009	
	8	8	Ancuabe	2009	
	9	9	Mueda	2010	
	10	10	Nangade	2010	
	11	11	Meluco	2011	
	12	12	Ibo	2011	
	13	13	Muidumbe	2011	
	14	14	Quissanga	2011	
	15	15	Mocimboa da Praia	2012	
	16	16	Palma	2012	
Total de distritos com planos = 16					

PROVÍNCIA	ORDEM	TOTAL DE PLANOS	DISTRITOS COM PLANOS ELABORADOS	ANO DE ELABORAÇÃO	DISTRITOS SEM PLANOS
NAMPULA	**25**	**1**	Mossuril	2009	Moma
	26	**2**	Ilha de Moçambique	2008	Mongicual
	27	**3**	Nacala - Porto	2009	Eráti
	28	**4**	Angoche	2008	Memba
	29	**5**	Nacala -a- Velha	2010	Nacarôa
	30	**6**	Mongovolas	2011	
	31	**7**	Murrupula	2011	
	32	**8**	Monapo	2010	
	33	**9**	Nampula Rapale	2011	**Total Distritos Sem Planos = 5**
	34	**10**	Muecate	2011	
	35	**11**	Mecuburi	2011	
	36	**12**	Malema	2012	
	37	**13**	Ribaúe	2012	
	38	**14**	Meconta	2012	
	39	**15**	Lalaua	2012	
Total de distritos com Planos = 15					

Source: MICOA (2012)

PROVÍNCIA	ORDEM	TOTAL DE PLANOS	DISTRITOS COM PLANOS ELABORADOS	ANO DE ELABORAÇÃO	DISTRITOS SEM PLANOS
ZAMBÉZIA	40	1	Mocuba	2009	Namarroi
	41	2	Pebane	2009	Gurué
	42	3	Alto Molócué	2009	Lugela
	43	4	Namacurra	2009	Total de distritos sem Planos = 3
	44	5	Mangaja da Costa	2009	
	45	6	Chinde	2009	
	46	7	Morrumbala	2011	
	47	8	Mopeia	2011	
	48	9	Gilé	2011	
	49	10	Nicoadala	2012	
	50	11	Ile	2012	
	51	12	Milange	2012	
	52	13	Inhassunge	2012	
Total de Distritos Com Planos = 13					

PROVÍNCIA	ORDEM	TOTAL DE PLANOS	DISTRITOS COM PLANOS ELABORADOS	ANO DE ELABORAÇÃO	DISTRITOS SEM PLANOS
SOFALA	62	1	Nhamatanda	2009	
	63	2	Muanza	2009	
	64	3	Machanga	2009	
	65	4	Cheringoma	2009	
	66	5	Chemba	2009	
	67	6	Buzi	2009	
	68	7	Maríngue	2009	
	69	8	Caia	2011	
	70	9	Marromeu	2011	
	71	10	Gorongoza	2012	
	72	11	Dondo	2012	
	73	12	Chibabava	2012	

PROVÍNCIA	ORDEM	TOTAL DE PLANOS	DISTRITOS COM PLANOS ELABORADOS	ANO DE ELABORAÇÃO	DISTRITOS SEM PLANOS
MAPUTO	105	1	Boane	2010	
	106	2	Matola	2010	
	107	3	Magude	2011	
	108	4	Moamba	2011	
	109	5	Matutuine	2011	
	110	6	Marracuene	2012	
	111	7	Manhiça	2012	
	112	8	Namaacha	2012	
Total de distritos com Planos = 8					

Annex 2: Environmental and Social Screening Form for subprojects

Nr of order :……	Date of filling

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

Part A: Brief description of the subproject
……

Part B: Identification of environmental and social impacts

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

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

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

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

Part D: Project classification and environmental and social work

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

Project classified as category:

A ☐ B ☐ C ☐

Annex 3: Preliminary Environmental Information Sheet

FICHA DE INFORMAÇÃO AMBIENTAL PRELIMINAR

1. Nome da actividade:

2. Tipo de actividade:

a) Turística ☐ Industrial ☐ Agro-pecuária ☐ Outro ☐

Especifique

b) Novo ☐ Reabilitação ☐ Expansão ☐

3. Identificação do(s) proponente(s):

4. Endereço/contacto:

_____

_____

5. Localização da actividade:

5.1 Localização administrativa:

5.2 Meio de inserção:

Urbano ☐ Rural ☐

6. Enquadramento no zoneamento:

Espaço habitacional ☐ Industrial ☐ Serviço ☐ Verde ☐

7. Descrição da actividade:

7.1 Infra-estruturas da actividade, suas dimensões e capacidade instalada (juntar sempre que possível as peças desenhadas e escritas da actividade):

7.2 Actividades associadas:

7.3 Breve descrição da tecnologia de construção e de operação:

7.4 Actividades principais e complementares:

7.5 Tipo, origem e quantidade da mão-de-obra:

7.6 Tipo, origem e quantidades de matéria-prima :

7.7 Produtos químicos citados cientificamente a serem usados: (caso a lista seja longa deverá produzir-se em anexo)

7.8 Tipo, origem e quantidade de consumo de água e energia:

7.9 Origem e quantidade de combustíveis e lubrificantes a serem usados:

7.10 Outros recursos necessários:

_____
_____
_____

8. Posse de terra (situação legal sobre a aquisição do espaço físico):

_____
_____
_____

9. Alternativas de localização da actividade:

(Motivo da escolha do local de implantação da actividade e indicando pelo menos dois locais alternativos)

_____
_____
_____

10. Breve informação sobre a situação ambiental de referência local e regional:

10.1 Características físicas do local de implantação da actividade:

Planície ☐ Planalto ☐ Vale ☐ ntanha ☐

10.2 Ecossistemas predominantes:

Rio ☐ Lago ☐ ar ☐ restre ☐

10.3 Zona de localização:

Zona Costeira ☐ Zona do interior ☐ Ilha ☐

10.4 Tipo de vegetação predominante:

Floresta ☐ Savana ☐ Outros ☐ (especifique)___

A vegetação é dominada por gramíneas, pinheiros casuarinos, coqueiros e arbustos e árvores indígenas.

10.5 Uso do solo de acordo com o plano de estrutura ou outra política vigente:

Machamba ☐ Habitacional ☐ Industrial ☐

Protecção ☐ Outros ☐ (Especifique)_____

10.6 Infra-estruturas principais existentes ao redor da área da actividade:

11. Informação complementar através de mapas

- Outra informação pertinente que julgar relevante.

Local, data (dia/mês/ano)

Annex 4: Checklist for environmental and social impacts

Program Activities	Issues to be addressed	Yes	No	If yes,
Fisheries developments ▪ Quays; ▪ Major improvements to fishing harbors or development of new marinas in the form of: o Rehabilitation or upgrading of fishing ports, landing sites, fish markets, laboratories and applied research assets, training facilities and social facilities for fisher associations and women's groups; ▪ Larger infrastructure and assets such as: o Strategic fishing port/landing facilities (Maputo, Beira, Quelimane Nacala and Angoche); o Fish chilling facilities at airports, and o Possible investments in improved enforcement capabilities. ▪ Construction/rehabilitation of office/conference buildings/facilities to host permanent headquarters for the SWIOFC.	• Will there any loss of vegetation during the construction and operation of the fisheries subprojects? • Are there adequate services and plans for liquid and solid waste disposal during construction and operation? • Will the waste and trash generated during the construction and operational phases of the subprojects be cleaned up and disposed off? • Will there be fire equipment and safety equipment on-site in case of an emergency or accident during construction and operation? • Is there any risk of pollution of groundwater, surface water or soil by the subproject activities? • Is there any risk of air pollution by subproject activities, e.g. fish processing, packaging, storage, freezing, transportation, etc.? • Are there any environmentally sensitive areas in the vicinity of the area of operations that may be negatively impacted? • Are there impacts on the health of local residents and the implementing and operating staff? • Are there any impacts of waterborne diseases on local communities, e.g., malaria and bilharzia? • Are there visual impacts caused by construction and infrastructure? • Are there any odors that may come from the disposal of waste from fisheries activities? • Are there human settlements or sites of cultural, religious or historical importance near the subproject site? • Will there be any conflicts/disturbances between local people and external people working for the project? • Will the project interfere with any physical/cultural resources?			If yes, draw appropriate mitigation measures described in Chapter 9 and the Annex 7. Good Fisheries Practices

Annex 5: Environmental and Social Clauses

The environmental and social clauses presented below will be integrated into Contracts for the Design, Construction, Operation and Maintenance of Program subprojects.

a. Prior arrangements for carrying out works

Compliance with laws and regulations:

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

Permits and approvals before work

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

Meeting before starting works

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

Identification of concessionaire networks

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

Release of public and private domain

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

Environmental and social management program

The Contractor shall prepare and submit for approval by the Project Manager a detailed project environmental and social management program including: (i) a site plan showing the location of the site and the various areas of the site for project components and locations, (ii) a site plan for waste management indicating the types of waste, the type of collection considered, the storage, the method and location of disposal; (iii) the information and awareness program specifying targets,

themes and selected consultation modality; (iv) a plan for accident management and health protection stating the risks of major accidents which endanger the health or safety of staff and / or public security measures and / or health protection to be applied in the context of an emergency plan. The Contractor shall also prepare and submit, for approval by the prime contractor, a plan to protect the environment of the site, which includes all security measures to protect the site and forward a site decommissioning plan at the end of works.

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

b. Construction Plant and Work Camp Rules

Location standards

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

Display rules and staff awareness

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

Use of local labor

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

Child labor

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

Respect for working hours

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

Protection of site personnel

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

Person(s) Responsible for Health, Safety and Environment

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

Appointment of staff on duty

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

Measures against traffic barriers

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

c. Decommissioning of construction sites

General Rules

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

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

Protection of unstable areas

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

Control the execution of environmental and social clauses

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

Notification

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

Sanction

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

Reception of the works

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

Obligations under the guarantee

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

d. Environmental and Social Clauses

Works signage

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

Measures for the movement of construction equipment

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

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

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

Vehicles of the Contractor shall, at all times, comply with the requirements of the Highway Code in force, particularly with regard to the weight of the laden vehicle.

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

Protection of crossing areas and agricultural activities

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

Protection of wetlands, fauna and flora

It is forbidden for the Contractor to establish temporary installations (storage areas and parking, or paths to circumvent works, etc.) in wetlands, including the filling of existing temporary pools. In the case of vegetated areas, the Contractor must adapt to the local vegetation and be careful not to introduce new species without consulting the forestry services. For all deforested areas lying outside the ROW and required by the Contractor for the purposes of its works, the top soil must be kept separate and restored afterwards.

Protection of sacred sites and archaeological sites

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

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

Measures for logging and deforestation

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

Liquid Waste Management

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

Solid waste management

The Contractor shall deposit the garbage in bins to be emptied and sealed periodically. In case of evacuation of the site by trucks, bins should be sealed to prevent the waste spillage. For hygiene reasons, and in order to not attract vectors daily collection is recommended, especially during hot periods. The Contractor shall dispose of or recycle the wastes in an environmentally sound manner. For this purpose the Contractor should store waste in labeled containers. The Contractor shall deliver the waste, if possible, to existing disposal sites.

Protection against noise pollution

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

Prevention against STD / HIV / AIDS and related diseases

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

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

Site journal

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

Equipment maintenance and equipment projects

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

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

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

Dust control

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

REPUBLIC OF MOZAMBIQUE
MINISTRY OF FISHERIES
SUMMARY OF ISSUES RAISED DURING MEETINGS WITH STAKEHOLDERS (CABO DELGADO, NAMPULA, SOFALA AND ZAMBEZIA PROVINCES)

PROVINCE: Cabo Delgado

INTRODUCTION

Cabo-Delgado is located in the Northern region of Mozambique. For the consultations various key stakeholders were contacted. These were informed on the Program, and subsequently their views and opinions on the main issues relating to Environmental Management and Resettlement were recorded. The stakeholders also provided contributions to the Environmental and Social Management and Resettlement Policies being elaborated by Ministry of Fisheries as this was the main objective of the consultations.

MAIN FINDINGS

IDPPE Cabo Delgado - Manuel Daniel, Juliana M. Supeta, Acácio Mussa

IIP Cabo Delgado – Afonso Lino Maruse, Sérgio José,

All the interviewed government representatives admitted that small scale fisheries activities in Pemba have the potential to grow, however there are challenges throughout the whole production chain. One of the main challenges faced in the sector is to attract the private sector to invest in supplying fishing equipment in Pemba, at an affordable price for the small scale fishermen. According to the respondents, Pemba also lacks key infrastructures such as workshop areas as well as trained personnel dedicated to undertake building, maintenance and repair of fishing boats used by small scale fishermen. Additional infrastructures required are primary vendors' markets equipped with appropriate freezers for better storage of fisheries products.

The respondents also call for the need to construct demonstration centers where appropriate fishing methods, storage, handling, inspections and marketing of fisheries products can be carried out by competent government staff at provincial and district levels. They acknowledged that despite the growing number of fishermen, there is limited government technical and financial capacity (particularly in the islands) at provincial level to disseminate best fishing practices and carry out actions towards promoting sustainability in the fisheries sector.

Additionally, small scale fisherman have limited access to loans, mostly because the interest rate is significantly high for this level of fishing activities undertaken by small scale fishermen. The respondents emphasized the need to improve the working conditions for the government staff working directly with fishermen; particularly the need to consider improving their housing conditions as well as making available transportation means to facilitate the monitoring of fishing activities in Cabo Delgado. They also highlighted the need to invest on the fisherman and ensure that they have capacity to build safe fishing boats, and consider purchasing vehicles with freezers

for better transportation of fisheries products from the sources to distant markets. The respondents further noted that there have been initiatives under PROPESCA to undertake assessment of the potential fisheries sites in Cabo Delgado, but such initiative should also examine the need for restructuring the fisheries sector as a whole, to contemplate the improvement of working conditions for government staff.

Regarding the development of aquaculture projects, the respondents pointed out that there are many women who on daily basis dedicate their time into collecting fisheries products such as crabs, oysters and mussels. As a result, the aquaculture projects should target those groups since they already know the importance of these species, and they may be willing to be involved in growing such species in an organized manner within specific sites, thus increasing their economic gains as well as minimizing pressure on resources growing naturally.

Regarding environmental management, the respondents indicated that due to the lack of docking sites, most activities associated to building and maintenance of boats are undertaken in the proximities of the sea in an open area, and it is likely that contaminants such as used oils and fuels from engines as well as paints are affecting the sea environment. Poor fishing practices such as the use of inappropriate fishing gears (locally known as *chicocota*) and mosquito's nets are considered to be the most significant human activities that might be contributing to declining fishing stocks. Mangrove forests known to be key systems for reproduction of marine species are also being cut to sustain human needs in construction and use as fuel (firewood). These aspects, associated to the effects of climate change might be taken into considerations when planning projects towards improving the small scale fisheries in Cabo Delgado.

SUMMARY

Environmental concerns are still novel in Mozambique, and the implications of polluting activities into the sea environment such as contaminants associated with boat painting and used oils spills from boat engines is generally poorly understood by members of the fishermen communities. The SWIOFish program therefore offers an opportunity to promote and ensure that all fisheries activities as well as the proposed civil works to improve fisheries infrastructures take into consideration environmental and social management as well as good resettlement practices in the targeted areas, regardless of the extent of the activity.

There is still a lack of coordination between different government institutions with MICOA, the Fisheries and the Municipalities in regards to monitoring of environmental impacts in the coastal zones. Thus, mainstreaming environment, building technical and financial capacity for multisectoral government entities as well as the fishermen have to be prioritized under the proposed SWIOFish program or through complementary funding initiatives. Dissemination of information and environmental regulations as well as awareness on the adverse environmental impacts on development efforts is crucial for fighting poverty in a sustainable manner.

PUBLIC CONSULTATION MEETINGS – CABO DELGADO, NAMPULA, SOFALA AND ZAMBEZIA

In order to gather public's views on the foreseen civil works program (infrastructure construction/rehabilitation) for small-scale fisheries, and in fulfilment of the requirements of both the World Bank's Environmental Guidelines and the Mozambican Environmental Law, public consultation meetings were held in Cabo Delgado, Nampula and Zambezia provinces targeted for the SWIOFish program.

The public meetings were conducted in line with the Mozambican law described by the Ministerial Diploma 130/2006 for Public Consultation. In line with the requirements of this decree, the meetings were preceded by publication in the national newspapers (Noticias) prior to the date of the meeting. Key stakeholders were also contacted by emails and telephone to inform them about the meeting and request their inputs. A summary of the project information was produced and sent to the stakeholders at the targeted provinces through the Provincial Directorates of Fisheries namely António Mário Carvalho (Cabo Delgado), Daniel Momade (Nampula), João Duarte Saize (Sofala) and Arcílio Madede (Zambézia) which were identified as focal point to liaise with interested public. The public consultation meetings took place in the following dates:

- Cabo Delgado province – June 3rd, 2014;
- Nampula Province (Nacala) – June 4th, 2014
- Nampula Province (Ilha de Mocambique), June 4th, 2014;
- Sofala Province (Beira – Praia Nova) - June 5th, 2014;
- Zambezia Province (Quelimane and Zalala) - (June 6th and 8th, 2014).

The following are summarises of the issues raised at the public meetings.

PUBLIC MEETING

Venue: Cabo Delgado – Pemba (Sala da Cruz Vermelha de Mocambique)

Date: June 3, 2014

Time: 08:30h – 10:30h

PARTICIPANTS:

Consultants:

Public: 13 participants

INTRODUCTION

The proposed **South West Indian Ocean Fisheries Governance and Shared Growth in Mozambique (SWIOFish Mozambique**), is a program through which the World Bank (WB) and the France Development Agency (AFD) will support the Government of Mozambique (GOM) to sustainably increase the competitiveness of country's fisheries sector as a way of ensuring that the

sector realizes its recognized potential of creator of employment and wealth and as a crucial contributor to the diversification of the economy.

The main objective of this meeting was to inform potentially interested and affected populations on the proposed program, as well as to gather their views or opinions for subsequent inclusion in the process of decision making for the program.

PRESENTATIONS

The meeting in Cabo Delgado was chaired by the consultant, preceded with the opening of the meeting, wishing all participants a warm welcome and a brief description of how the meeting would proceed.

Public meeting held in Pemba – Cruz Vermelha de Moçambique

PROGRAMME DESCRIPTION

The program description and objectives were made by the consultant Eduardo Langa. The consultant gave a brief introduction and explanation of the meeting's objectives, and the scope and motivation for the Construction/Rehabilitation of Infrastructure Program for the fisheries sector as well as covering the legal aspects concerning the environmental and social considerations under the World Bank policy and the Mozambican Law.

Then the consultant explained the need for Environmental and Social Management, and Process Frameworks for the Program, and described some potential negative and positive impacts that may be associated to the program. As the main goal of the meeting, the consultant proceeded by requesting the participant's opinions in relation to the challenges faced by the fisheries communities in Cabo Delgado province, as well as potential environmental and social impacts related to the program.

DISCUSSSIONS:

Questions/Issues	By whom
▪ There has been a number of projects planned for Cabo Delgado but we hardly see the results. Recently we have been having meetings promoted by PROPESCA but no results; ▪ The Climate Change initiatives to support the fishermen in Cabo Delgado have not shown any results yet; ▪ Regarding infrastructures, first vendors markets, Freezers, docking sites and workshop areas are fundamental structures to effectively promote fisheries sector; ▪ There is a need to empower the existing fishing inputs stores, as well as establish shops to sell boat's engine ; ▪ Rehabilitation of fisheries associations' headquarters can also contribute significantly to the improvement of working conditions in this sector; ▪ Lack of fishing equipment and other associated inputs is a chronic problem affecting fishing activities in Cabo Delgado as it. No loans available to support the fishermen, lack of spare parts to fix the engines. The boats used are typically rudimentary and with safety implications; ▪ Regarding environmental management, the Pemba area is faced with the sanitation problems, lack of toilets and the sea sites are used for toilets, hence potentially causing health problems; ▪ Inadequate fishing gears and inappropriate net mesh such as the use of mosquito's nets which kill juvenile fish as well as eggs, and therefore affecting the fish stocks; ▪ Devastation of mangrove forests and other types of forests to obtain timber for the manufacturing of fishing boats; ▪ In the past the government took responsibility to subsidize the building of work yards and workshop areas for the boat repairs – Today the municipality should take this responsibility to subsidize the sector of create incentives for commercial operators to operate in buying and selling of fisheries equipment. ▪ The proposed SWIOFish project should not only look at the infrastructures, but also other aspects complementary to the fishing activity, such as training, funding and restructuring of the government entities working in the fisheries sector. ▪ To date the government has been working with banks and other financial institutions towards lowering the interest to make loans affordable for small-scale fishermen. Other alternative that should be considered by the government would be to subsidize fuel	(Jaime Mário Semedo– President of Fisheries Community Council of - Pemba)

Questions/Issues	By whom
▪ Although several activities to raise awareness have been taking place, poor fishing methods and poor sanitary practices prevail along the coastline of Pemba. These issues should be addressed by the proposed SWIOFish program. ▪ There should be a stronger link between the potential projects to be funded under SWIOFish and the beneficiaries, and it should be recommended that the fishermen be involved during the construction phase of the projects. Hiring of local labor is fundamental to avoid conflicts with local populations.	
▪ Fishing with the use of mosquito nets is a problem. Because there are no alternative for income generation unsustainable fishing practices are present in the province.	
Responses	**By whom**
▪ Specific Projects or activities under SWIOFish will be identified once the funding has been secured by the Mozambican Government. It is envisaged that discussions will be held at that stage with a view to prioritize activities that will be implemented. ▪ The Program forms part of the Government Poverty Reduction Program, and it stresses the importance of public involvement and the fishermen community is central to the activities under SWIOFish and public comments are be taken into consideration when prioritizing actions to be implemented.	Eduardo S. Langa

PUBLIC MEETING

Venue: Nacala – Centro de Pesca de Naherengue - Nacala.

Date: 04 June 2014

Time: 08:30h – 10:30h

PARTICIPANTS:

Consultants:

Public: 26 participants

INTRODUCTION

The program description and objectives were made by the consultant Eduardo Langa. The consultant gave a brief introduction and explanation of the meeting's objectives, and the scope and motivation for the Construction/Rehabilitation of Infrastructure Program for the fisheries sector as well as covering the legal aspects concerning the environmental and social considerations under the World Bank policy and the Mozambican Law.

Then the consultant explained the need for Environmental and Social Management, and Process Frameworks for the Program, and described some potential negative and positive impacts that may be associated to the program. As the main goal of the meeting, the consultant proceeded by requesting the participant's opinions in relation to the challenges faced by the fisheries communities in Nampula, (specifically Nacala and Ilha de Mozambique), as well as potential environmental and social impacts related to the program.

Public meeting held at CCP Naherengue – Nacala

PRESENTATIONS

The meeting in Nacala was chaired by the consultant, preceded with the opening of the meeting, wishing all participants a warm welcome and a brief description of how the meeting would proceed.

PROGRAMME DESCRIPTION

The program description and objectives were made by the consultant Eduardo Langa. The consultant gave a brief introduction and explanation of the meeting's objectives, and the scope and motivation for the Construction/Rehabilitation of Infrastructure Program for the fisheries sector as well as covering the legal aspects concerning the environmental and social considerations under the World Bank policy and the Mozambican Law.

Then the consultant explained the need for Environmental and Social Management, and Process Frameworks for the Program, and described some potential negative and positive impacts that may be associated to the program. As the main goal of the meeting, the consultant proceeded by requesting the participant's opinions in relation to the challenges faced by the fisheries communities in Nampula province, as well as potential environmental and social impacts related to the program.

DISCUSSIONS:

Questions/ Issues	By Whom
▪ The fisheries sector in Nacala lack any form of government support and this is reflected in the absence of banking institutions to make available loans with reasonable interest rates to benefit the small-scale fishing activities.	Agi Momade
▪ Lack of commercial shops operating in the fisheries sector is a major issue in Nacala. There is a general lack of fisheries inputs in Nacala. We would like to have a local dealer selling and repairing engines for boats which could take us to the high sea.	Omar Amisse Omar Amisse Muriricho Julião
▪ In the past we had in Nacala specific shops selling fisheries equipment, but these are no longer operational, and the equipments are in short supply. Some of the equipments being sold in Nacala are inappropriate for the type of fishing practiced here. It is therefore fundamental that those who sell fisheries equipments understand what is it that the fishermen would like to purchase for their activities.	Galibo Califa
▪ The fishermen in Nacala would like to have more access to bank loans, but with interest rates compatible with the level of small-scale fishing.	Galibo Califa
▪ Inappropriate fishing methods employed by fishermen have been one of the reasons for depletion of fisheries resources. There are two fish reserves in Nacala, but due to scarcity of fish in the bay, some fisherman tend to fish illegally in the reserves. Investment is needed to support monitoring actions with a view to preserve fish stocks in Nacala.	Galibo Califa Galibo Califa
▪ Workshop area needed – Currently boat repairs are carried out randomly along the beach. This may potentially lead to pollution and affect the fisheries resources. The SWIOFish program should also consider	Galibo Califa

Questions/ Issues	By Whom
creating incentives for those fishermen using "*chicocota*" with a view to providing adequate fishing equipment as a way of contributing to preservation of fisheries resources. ▪ Nacala (Naherengue) also needs "primary sales" market fully equipped with storage freezers and running water for hygienic handling of fisheries products. ▪ Fish demand in Nacala is not met with the current fish supply. As an example, all the fish caught in Nacala is completely sold in Nacala without satisfying the full demand. This is likely to be the scenario in the future particularly with significant economic growth of both Nacala Porto and Nacala-á-Velha where population growth is expected to grow further as a result of development of the Nacala Port and its ancillary infrastructure. ▪ Aquaculture development in Nacala should be seen as priority to meet fish demand in this growing market. ▪ Technical capacity of the government fisheries authority needs to be strengthened to carry out adequate supervision of the coastal zone to ensure that fish stocks are not completely depleted as well as ensuring quality through effective inspection of the fisheries product being made available in the Nacala market.	Galibo Califa

PUBLIC MEETING

Venue: Ilha de Moçambique – Conselho Comunitário de Pesca – Nacala (Nanhupo)

Date: 04 June 2014

Time: 14:30h – 16:30h

PARTICIPANTS:

Consultants:

Public: 16 participants

INTRODUCTION

The program description and objectives were made by the consultant Eduardo Langa. The consultant gave a brief introduction and explanation of the meeting's objectives, and the scope and motivation for the Construction/Rehabilitation of Infrastructure Program for the fisheries sector as well as covering the legal aspects concerning the environmental and social considerations under the World Bank policy and the Mozambican Law.

Then the consultant explained the need for Environmental and Social Management, and Process Frameworks for the Program, and described some potential negative and positive impacts that may be associated to the program. As the main goal of the meeting, the consultant proceeded by requesting the participant's opinions in relation to the challenges faced by the fisheries communities in Nampula, (specifically Nacala and Ilha de Mozambique), as well as potential environmental and social impacts related to the program.

Public meeting at CCP Nanhupo – Ilha de Mocambique

PRESENTATIONS

The meeting in Ilha de Mocambique was chaired by the consultant, preceded with the opening of the meeting, wishing all participants a warm welcome and a brief description of how the meeting would proceed.

PROGRAMME DESCRIPTION

The program description and objectives were made by the consultant Eduardo Langa. The consultant gave a brief introduction and explanation of the meeting's objectives, and the scope and motivation for the Construction/Rehabilitation of Infrastructure Program for the fisheries sector as well as covering the legal aspects concerning the environmental and social considerations under the World Bank policy and the Mozambican Law.

Then the consultant explained the need for Environmental and Social Management, and Process Frameworks for the Program, and described some potential negative and positive impacts that may be associated to the program. As the main goal of the meeting, the consultant proceeded by requesting the participant's opinions in relation to the challenges faced by the fisheries communities in Nampula province, as well as potential environmental and social impacts related to the program.

DISCUSSIONS:

Questions/ Issues	By Whom
▪ There has been a number of people coming to the Island to gather information on the fisheries, promising changes and improvements in the sector but at the end nothing happens. Perhaps they are writing their university coursework…	Ateremane Amire
▪ About aquaculture projects there is nothing happening here on Ilha de Moçambique, but we do hear that there are aquaculture projects being implemented elsewhere in Nampula. We are interested in participating in the aquaculture projects as the initiative could employ many people and also reduce current pressure on the fisheries resources on open sea.	Ateremane Amire Nuro Ambasse
▪ In the past we have requested boats and other equipment to facilitate monitoring of the fisheries but we have not received and it has been difficult to undertake an effective monitoring of the fisheries on Ilha de Moçambique.	Amisse Alpaca
▪ It is really important to have the Consultants carrying out surveys here but most importantly, we need to have feedback of the decision made based on our contributions/inputs.	Amisse Alpaca
▪ In the Quissanga area, there is only one engine powered boat – so we are really happy to know that there is a possibility of funding in the small-scale fisheries sector.	Muaziza Ali
▪ Aquaculture projects could be really a success here – species such as crabs and shrimps could be grown well here.	
▪ Ilha de Moçambique has the right conditions to develop the fisheries; labour and the willingness to work but there is lack of funding. There is also the lack of fisheries inputs – No single shop in Ilha de Moçambique sells fisheries inputs (fishing nets, safety equipment…), making it difficult to work effectively in this sector. Fishermen have to travel to Angoche in order to purchase material to fix fishing nets…	Atumane Mussa Momade Ibrahimo (President of Fishermen Asssociation
▪ The fisherman would lie to have access to funding as well as	

Questions/ Issues	By Whom
equipment to improve their fishing techniques and improve their catches. The techniques currently used are rudimentary and fishermen cannot improve their economic conditions using the current methods.	of Ilha de Moçambique)
▪ We need storage facilities – in some cases we do catch good quantity of fish but we have no means to conserve and most fish products are lost. We have in the past applied for loans to purchase freezer systems, but the amount made available to us was insufficient and as a result we could not obtain the freezers systems with specification that we needed. This is an issue which needs to be corrected – We should receive the total amounts that we request when we apply for loans.	Momade Ibrahimo Momade Ibrahimo
▪ Fishing at Ilha de Moçambique is done at high sea as opposed to fishing in the shallow waters, and the limiting factor has been the lack of fisheries equipment such as supply of engines and the respective parts as well as fishing nets.	Momade Ibrahimo Momade Ibrahimo
▪ In the past the communities and their leaders were well organized. There used to be traditional ceremonies in coordination with religious leaders in view to ask the spirits to protect the fishermen and as a prayer for abundance of fish. In these days no such ceremonies and that could also be the reason for lack of fish.	
▪ The aquaculture activity on the Ilha de Moçambique should be empowered.	

PUBLIC MEETING

Venue: Beira – Conselho Comunitário de Pesca da Beira – Praia Nova

Date: 05 June 2014

Time: 16:30h – 18:30h

PARTICIPANTS:

Consultants:

Public: 16 participants

INTRODUCTION

The program description and objectives were made by the Planning and Statistics delegate of the Provincial Directorate Claudia Alves, who introduced the Team and outlined the objectives of the meeting and invited the participants to contribute. Subsequently, the consultant gave a brief introduction and explanation on motivation for the Construction/Rehabilitation of Infrastructure Program for the fisheries sector as well as covering the legal aspects concerning the environmental and social considerations under the World Bank policy and the Mozambican Law.

Then the consultant further explained the need for Environmental and Social Management, and Process Frameworks for the Program, and described some potential negative and positive impacts that may be associated to the program. As the main goal of the meeting, the consultant proceeded by requesting the participant's opinions in relation to the challenges faced by the fisheries communities in Sofala, (specifically in Beira area), as well as potential environmental and social impacts related to the program could be addressed.

Public meeting with fishermen (Centro de Pesca da Praia Nova – Beira)

PRESENTATIONS

The meeting in Beira was conducted in two stages. The first stage with the provincial director of Fisheries in Sofala, and the second stage was with a group of fishermen association at Conselho Comunitário de Pesca da Praia Nova. The meeting was chaired by the consultant, preceded with the opening of the meeting, wishing all participants a warm welcome and a brief description of how the meeting would proceed.

PROGRAMME DESCRIPTION

Meeting with Sofala's Provincial Director of Fisheries:

The Director (João Duarte Size) who is very familiar with the SWIOFish program, welcomed the Consultants and highlighted the need to look at the whole fisheries chain and determine priorities for funding. He went on to stress that in the production side, there is a need to determine the technical specifications of fishing boat types that should be made to take into account the fishing methods as well as safety matters.

The director also considered the need for investment in solar panels for appropriate conservation of fisheries in the remote areas such as Muanza, which have fishing potential, but with no access to electricity from the national grid. In addition, the director pointed out that the small scale fisheries sector is disorganized. There is a need to build a fisheries market center for safe trading of fisheries products, and where health authorities can carry out inspections and declare the products safe for human consumption.

Regarding aquaculture – The Director indicated that aquaculture projects are welcome in Sofala, however, supply of inputs should also be considered on aquaculture development to be successful.

As pointed out by the Director, lack of funding has been a serious problem for the small-scale fishermen. The interest rate has been significantly high and there are no incentives for the small-scale fishermen to pursue the available funding scheme.

Finally, the Director highlighted the need for strengthening technical capacity of the government staff to carry out an effective monitoring of the small-scale fisheries sector. The commercial and industrial fisheries surveillance and monitoring is well define, however, there is a ned to strengthen and focus on small-scale fisheries sector surveillance and monitoring.The provincial directorate lacks basic equipment to undertake this important activity for preservation of fisheries resources in key areas of the Sofala province. The Director proposes also to adopt an integrated management approach involving identifying negative human impacts (among other issues, the depletion of mangrove forests, coastal erosion, and pollution from various sources) and their respective mitigation along the coastline since this is an important ecosystem for the wellbeing of the sea environment.

Meeting with fishermen at Conselho Comunitátio de Pesca da Praia Nova

The program description and objectives were made by the consultant Eduardo Langa. The consultant gave a brief introduction and explanation of the meeting's objectives, and the scope and motivation for the proposed Construction/Rehabilitation of Infrastructure Program for the fisheries sector as well as covering the legal aspects concerning the environmental and social considerations under the World Bank policy and the Mozambican Law.

Then the consultant explained the need for Environmental and Social Management, and Process Frameworks at the early stage of the Program, and described some potential negative and positive impacts that may be associated to the civil works under the SWIOFish program. As the main goal of the meeting, the consultant proceeded by requesting the participant's opinions in relation to the

challenges faced by the fisheries communities in Sofala province, as well as potential environmental and social impacts related to the program. Contributions made by participants are recorded on the table below.

DISCUSSIONS:

Questions/ Issues	By Whom
▪ The main issue affecting the small scale fisheries sector in our region is the continuous use of "chicocota". There has not been any solution for this problem to date. The people using this fishing technique should be identified and be supplied with appropriate fishing nets as a way of discouraging this practice. It is understandable that they do so for survival therefore punitive measures alone will not resolve the problem.	João
▪ Fisherman lack access to funds, credit initiatives which have been implemented in the past for fishermen proved to be ineffective and unattractive as the interest was even high than that of commercial banks. There have been a number of meetings held with government authorities to resolve this issue but no solution yet.	João
▪ Fishermen have also requested the government to subsidize fuel for those who have engine powered boats but such request has not been met yet – and associated to this, there is the requirement for the fishermen to have an organized accountancy which is almost impossible for common fishermen with no formal education. Thus, the proposed SWIOFish program should really consider the issues being raised here because improving infrastructures alone as prescribed under the SWIOFish program will not necessarily result in an improvement in the small scale fisheries sector.	José Manuel Feito (President of the Community Council of Fiheries – Nova Sofala) Delop Ramugi (President of the Community Councol of Fisheries – Praia Nova) Delop Ramugi
▪ There is an understanding that fishermen could improve by using boats which can stay at the sea for 48 hours, but again with the current interest rates it would be very difficult for fishermen to improve their fishing conditions.	Balbino Razão Delop Ramugi
▪ The creation of *Conselho Comunitário de Pesca (CCP)* was a good initiative for the government as these bodies function as intermediaries between the fishermen and the authorities. The government however should support the CCPs and make an effort resolve the issues concerning the small scale fishermen.	Delop Ramugi Delop Ramugi (President of the Community Councol of Fisheries – Praia Nova)
▪ Lack of supply of fisheries inputs is also a serious matter repeatedly raised by fishermen in this type of gatherings, but no response to date. Certain suppliers are selling inappropriate fishing nets and there is no monitoring of the equipment being sold and that add to the already major problem of use of "chicocota" and mosquitoes nets.	
▪ With regards to major environmental issues, the use of inappropriate fishing methods and the cutting of mangroves along the coast are some of the key human impacts affecting the recovery of fish stocks.	José Manuel Feito (President of the Community Council of

Questions/ Issues	By Whom
▪ Coastal erosion and climate change are also major issues affecting the small scale fisheries activities. ▪ From the point of view of the common fishermen, the proposed SWIOFish program is not yet a priority in Beira – this is because we can have all the infrastructures that we need by the fishermen are not being able to bring the fish from the sea because they lack appropriate equipment. Thus, the main priority for the fishermen at this point would be to make funds available at affordable interest rates. ▪ We have had bad experience with the road Nova Sofala-Tungo which was supposed to improve access to benefit the fisheries in this major fishing potential – Such road was never completed by the funding for it has been released. We are therefore concerned that there could be people trying to obtain funding in the name of small-scale fisheries while their priority is something else. We hope this is not the case with SWIOFish. We strongly recommend that the fishermen be truly involved in the decision making process particularly for planning and construction of infrastructure to benefit the fisheries sector.	Fiheries – Nova Sofala)

PUBLIC MEETING

Venue: Hotel Flamingo – Quelimane – Zambezia province

Date: 06 June 2014

Time: 14:00h – 15:00h

PARTICIPANTS:

Consultants:

Public: 19 participants

INTRODUCTION

The program description and objectives were made by the Consultant, who introduced the Team and outlined the objectives of the meeting and invited the participants to contribute. Subsequently, the consultant gave a brief introduction and explanation on motivation for the Construction/Rehabilitation of Infrastructure Program for the fisheries sector as well as covering the legal aspects concerning the environmental and social considerations under the World Bank policy and the Mozambican Law.

Public meeting in Quelimane –Hotel Flamingo

Then the consultant further explained the need for Environmental and Social Management, and Process Frameworks for the Program, and described some potential negative and positive impacts that may be associated to the program. As the main goal of the meeting, the consultant proceeded by requesting the participant's opinions in relation to the challenges faced by the fisheries communities in Zambezia, as well as potential environmental and social impacts related to the program could be addressed.

PRESENTATIONS

The meeting in Quelimane was conducted in two stages. The first stage with the provincial director of Fisheries in Zambezia, Mr. Arcícilio Madede, and the second stage was with members of groups of fishermen associations at Hotel Flamingo in Quelimane. The meeting was chaired by the consultant, preceded with the opening remarks, wishing all participants a warm welcome and a brief description of how the meeting would proceed.

PROGRAMME DESCRIPTION

Meeting with Zambezia's Provincial Director of Fisheries:

The Director proved to be well conversant with the SWIOFish program, and welcomed the Consultants and highlighted that the aquaculture component lacks infrastructures in Zambezia province, despite the fact that Zambézia province has better conditions for development of aquaculture activities on the coast as well as in the interior. He highlighted that in the past, there have been ideas to build a demonstration center where fisheries extensionists could demonstrate the aquaculture techniques to the communities and attract them to participate in this initiative and replicate elsewhere – The Director therefore sees the SWIOFish program as an opportunity to implement this initiative. The director highlighted the need to raise community's awareness on development of aquaculture projects, but he noted the lack of incentives for this sector to grow despite having suitable areas identified. He also pointed out that incentives should be in the form of tax exemptions for retailers dedicated to importing or fabricating the aquaculture inputs.

Regarding the small scale fisheries, the director highlighted the lack of fisheries infrastructures – There are no docking station which makes it difficult to monitor the fisheries products by competent government authorities before the products are released to the markets for human consumption. He went on to explain that the one existing port in Quelimane is not in good conditions since it has been built in the 90s, it has never been rehabilitated or maintained and visual inspections suggest that this infrastructure is not in good conditions. In addition, the dry docking station is not operational and the semi-industrial fishing boats are annually sent to South Africa for maintenance and repairs, which costs a significant amount of money. In some cases repairs are undertaken in artisanal conditions with all the safety and environmental implications associated to the process. The workshop is outdated and new technology should be installed. The freezers system is not operational and as a result, a significant amount of fish is lost due to lack of adequate storage.

When it comes to monitoring of the fisheries, the Director pointed out that the fisheries sector faces a major challenge and highlighted the need to build monitoring centers to monitor the major fishing poles. He believes building capacity and empowering the fisher supervisors would contribute to a greater improvement of monitoring of inappropriate fishing practices as well as depletion of mangroves and consequent degradation of the coastal zones which affect the fish stocks in the area.

Public Meeting held at the Flamingo Hotel - Quelimane

The program description and objectives were made by the consultant Eduardo Langa. The consultant gave a brief introduction and explanation of the meeting's objectives, and the scope and motivation for the proposed Construction/Rehabilitation of Infrastructure Program for the fisheries sector as well as covering the legal aspects concerning the environmental and social considerations under the World Bank policy and the Mozambican Law.

Then the consultant explained the need for Environmental and Social Management, and Process Frameworks at the early stage of the Program, and described some potential negative and positive impacts that may be associated to the civil works under the SWIOFish program. As the main goal

of the meeting, the consultant proceeded by requesting the participant's opinions in relation to the challenges faced by the fisheries communities in Zambezia province, as well as potential environmental and social impacts related to the program. Contributions made by participants are recorded on the table below.

DISCUSSIONS:

Questions/ Issues	By Whom
▪ The SWIOFish program is targeting the same districts as those of PROPESCA and there should be complementarities to these two program and avoid doing the same activities.	Abel Mabunda (Delegate of National Administration Fisheries)
▪ The SWIOFish program should promote sustainability actions by working with the fisheries associations who in certain cases tend to employ unsustainable practices as their fishing methods.	Abel Mabunda
▪ The SWIOFish Program could help the province by funding the preparation of zoning maps which would result on mapping and identification of potential zones for development of fisheries. This is a fundamental tool for effective management of the fisheries resources by the government and the communities.	Abel Mabunda
▪ Environmental issues have been associated to overfishing, cutting of mangroves, poor fishing techniques – organized groups of fisherman can deal with these issues more effectively if they have an incentive.	Abel Mabunda
▪ We appreciate the presentation and wish to highlight that all the key infrastructures for this sector are degraded here in Quelimane (docking stations, freezers systems) and this fact makes it difficult to operate in the fisheries sector.	Samuel Mavie (Director of Fishing Port)
▪ The dry dock station was built in 1994 funded by JICA and was operational until 2010. At the moment it degraded and the SWIOFish program might consider this important infrastructure for maintenance of fishing fleet.	Luciano Bothelho (Director of Dry Docking) Abacar Carimo Sunde
▪ Danida is currently funding certain activities on sustainable fishing and mangrove management in Iinhassunge and Chinde with perspective to expand to Maganja da Costa.	Abel Mabunda
▪ The fishermen would like to have access to funds at accessible interest rate to help them to invest in the fisheries activities.	
▪ There are 23 CCPs in Zambezia which require government's assistance regarding their legalization and capacity building regarding issues related to environmental management – the government should support this process.	Ilídio Banze (Delegate of National Institute for Aquaculture Development)
▪ Aquaculture – The fish stocks tend to be diminishing, and as a result, development of aquaculture could serve to minimize the current pressure on the fisheries resources, particularly if the fishermen were to be involved in aquaculture projects.	Ferreira Amade Assura

Questions/ Issues	By Whom
▪ The fishermen of Zambezia province are disappointed - they lack support to obtain bank credits –We also would like to know the focal points at the provincial directorate of fisheries because in certain cases we do not know where to channel our concerns.	Celestino Reno
▪ The fishermen could benefit from government support on training of CCPs in project elaboration and management to help them manage their business effectively.	Celestino Reno
▪ TheSWIOFish project refers only to infrastructures and nothing on funding and yet, the fisheries sector is not covered by the District Development Fund (*7milhoes de Meticais*) – it is clear here that complementary projects are needed to provide funding for the fisheries activity.	Macário Pedro
▪ There are inputs for fisheries activities, however, theses inputs cannot be affordable for fishermen	Hérminío (President of the Community Council of Fisheries – Zalala)
▪ The SWIOFish project is welcome as it will strengthen our capacity to catch more more fish, however, from our experience from the past, we would like that to see this project financing or empowering workshops to repair and provide spare parts for our boats, as we have a lot of boats obtained from the past projects like PROPESCA and other but the main problem is maintenance.	

Annex 7: Good Fisheries Practices - Hygiene and Safety

Environmentally and Socially Friendly Fisheries Systems

Measures of good fisheries practices integrating environmental and social sustainability aspects

Technical steps	Environmental and social measures
Opening and closure of fishing periods	There are specific periods for fisheries opening and closure that need to be consciously adhered to. These vary from place to place as well as from types and categories of fisheries. e.g. the period of closure for Industrial and semi-industrial shrimp fishing at the Sofala Bank, in Mozambique, is between November to February. There are small variations within the entire Sofala Bank area. For artisanal fishing the closure period is restricted to only 1 month, usually in January. The other fishing gear such as gillnets and line, are not subject to this measure.
Fishing gears	Together with other protective initiatives such as opening and closure of fishing periods and areas, the selection of adequate fishing gear is of key importance for greater protection of threatened species, young fish and small fish. There are two aspects to this selection process: (i) one is to prevent the catching inclusion of fish which are smaller than the minimum permitted size (small fish and young fish), and (ii) the other is to avoid the catching of other species than the target species. Non- target species are often called by catches. In Mozambique the minimum mesh size permitted is 38 mm. However, for conservation fisheries resources and fisheries management reasons, the mesh size can be changed (extended) for each fishing area
Preservation of endangered species.	Catches are not allowed to mammals and sea turtles, rare or endangered species and other internationally protected species and of interest to the investigation. These species once captured should be according to the law, released back to the sea
Improving food quality	Ensure quality of food (hygienic, packaging, transportation, storage and processing) Prioritize the establishment of a system of risk analysis and critical control point (HACCP hazard analysis of critical control point)

In addition to these general rules specific local rules may be established at the provincial level, which may include limiting the number of gear, or gear type, allowed in a particular area or period.

The general regulations for small scale fishing also includes intervention in the management process by users of fishery resources (local fishing community), provided they are integrated into community-based organizations named Fisheries Councils (CCP). However, the efficiency and dynamism of these organizations varies from region to region. As regards the surface gillnet, it is also recommended to reduce fishing pressure by improving the selectivity of net and/or the identification of periods/areas suitable for the major species caught off-season; Actions should include review of mesh and frame coefficients of the net in order to adjust them.

Annex 8: List of People Consulted[44]

Nr	Name	Institution	Position	Contact
1	Tome Capece	IDPPE	National Director	
2	Ernesto Poiosse	IDPPE	Head of Department of Social Development	
3	Amos Chamussa	IDPPE	Head of Department of Planning	
4	José Halafo	INAQUA	National Director	
5	Angélica Dengo	MP	Head of Department of Cooperation	
6	Ilidio Banze	INAQUA-Zambezia	Delegate	824215350
7	Samuel Mavie	Porto de Pesca Quelimane	Director	824322340
8	Abel Mabuna	ADNAP	Delegate	847918796
9	Americo D. Sumale	IDPPE-Zambezia	Delegate	847918796
10	Macario Pedro	IDPPE-Zambezia	Extensionist	829449870
11	Alifo Abudo	Chuabo Dembe-Zambezia	Fisherman	
12	Amisse Mussa	Chuabo Bembe-Zambezia	Fisherman	849462313
13	Avelino Amai	Chuabo Bembe-Zambezia	Fisherman	825097727
14	Dionisio Varela Pires	IIP-Zambezia	Technician	822508070
15	L. Monteino Januário	Doca Seca - Quelimane	Director	825759800
16	Cesaltino Reino	DPPZ	Technician	843225555
17	Mandavir Falamo	Chuabo Dembe	Fisherman	
18	Manuel Amade	ICIDUA	Fisherman	
19	Mussa Atibo	ICIDUA	Fisherman	
20	Juma Ali Amisse	Chuabo Dembe	Fisherman	823974883
21	Ferreira A. Surate	Chuabo Dembe	Fisherman	824916406
22	Justino Victorino Miguel	Chuabo Dembe	Fisherman	840191535
23	Alifo Abudo	Chuabo Dembe	Fisherman	848421118
24	Abacar Carimo Sunde	Chuabo Dembe	Fisherman	866834395
25	João Duarte Saize	DPP Sofala	Director	
26	Claudia Alves	DPP Sofala	Head of Department of Planning	824894370
27	Manuel Antonio	CCP Praia Nova - Beira		825860080
28	Dilip Ramgy	CCP Praia Nova - Beira	President of the CCP	844282540
29	Jose Manuel	CCP Praia Nova - Beira		866175057
30	Alberto Manuel	Praia Nova - Beira	Fisherman	823175596
31	Zinhangadjo Mangano	DPP - Sofala	Technician	825860080
32	João Almeida	CCP Praia Nova	Fisherman	846313005
33	Mioses Paulo Nharimol	CCP Praia Nova	Fisherman	
34	José António Chacamba	CCP Praia Nova	Fisherman	
35	Castigo Mavire	CCP Praia Nova	Fisherman	
36	Fernando Francisco	CCP Praia Nova	Fisherman	
37	Fernando M. Manjara	CCP Praia Nova	Fisherman	
38	Balbino R. Secretário	CCP Praia Nova	Fisherman	
39	Viagem Joaquim	CCP Praia Nova	Fisherman	
40	Fernando Magufoi	CCP Praia Nova	Fisherman	
41	Rui Raul	CCP Praia Nova	Fisherman	
42	Francisco Maiawe	CCP Praia Nova	Fisherman	
43	Alberto Mussa	CCP Praia Nova	Fisherman	823175546
44	Manuel Magudje	CCP Praia Nova	Fisherman	
45	Nazario Carcala	IDPPE – I. de Moçambique	Extensionist	825816099
46	Januario Amade	CCP da Ilha de Moçambique	Fisherman	825616915
47	Amisse Alupaca	CCP Quissanga I. de Moçamb	Fisherman	827945760
48	Muaziza Ali	CCP Quissanga I. de Moçamb	Aquaculturist	
49	Jaime Juma	CCP Quissanga I. de Moçamb	Fisherman	863327330
50	Atumane Mussa	CCP Sanculo I. de	Fisherman	865605796

[44] Signed lists of people who participated in the main public meetings are available.

Nr	Name	Institution	Position	Contact
		Moçambique		
51	Naima Ali	CCP Quissanga I. de Moçamb	Fisherman	860658477
52	Atomane Amimo	CCP Ilha de Moçambique	Fisherman	865166226
53	Saranque Abudo	CCP Ilha de Moçambique	Fisherman	866972481
54	Nuro A.	CCP Ilha de Moçambique	Fisherman	862191809
55	Ramadane Artur	CCP Sanculo I. de Moçambique	Secretary and Fisherman	866085173
56	Momade Momade	CCP Ilha de Moçambique	Secretary and Fisherman	869463496
57	Celso Ussene	CCP Ilha de Moçambique	Fisherman	823380112
58	Muarecha Ali	CCP Ilha de Moçambique	Fisherman	827715233
59	Momade Ibraimo	ASSOPIMO – I. de Moçambique	President	820214507
60	Manuel Daniel	IDPPE – Cabo Delgado	Delegate	828654580
61	Afonso Lino Munduze	IIP – Cabo Delgado	Delagate	828707620
62	Sérgio José	IIP – Cabo Delgado	Techcnician	827224659
63	Juliana M. Supeta	IDPPE – Cabo Delgado	Technician	828381490
64	Acácio Mussa	IDPPE – Cabo Delgado	Technician	825442030
65	Luís Momade	CCP Rupela	Fisherman	821058053
66	Ramadane Asse	Associação WIWANANA	Fisherman	
67	Dade Sacuro	Associação WIWANANA	Fisherman	825508414
68	Jaime M. Sumido	CCP Rupela	Fisherman	844056987
69	Chabudo Amisse	Associação WIWANANA	Fisherman	866645090
70	Chamanga Sidique	Associação WIWANANA	Member	866783660
71	Cultume Abdulay	Associação WIWANANA	Member	861496812
72	Filipe Mário Semedo	Gestão do Mercado de Pesca	Member	844073675
73	Manuel Ussene	CCP Naherenque - Nacala	President	823205947
74	Calibo C. Buanauli	ASSOPENA	Secretary	824200662
75	Abacar Nahulue	CCP Naherenque	Fisherman	825662535
76	Nahulue Mussondoque	CCP Naherenque	Fisherman	823388632
77	Chaquire B. Amade	ASSOPENA	Member	825801898
78	Age Momade	ASSOPENA	Member	827139206
79	Omar Amisse	ASSOPENA	Member	823219076
80	Momade Cláudio	CCP Naherenque	Fisherman	
81	Lança Juma	CCP Naherenque	Fisherman	
82	Muzé Cabo	CCP Naherenque	Fisherman	
83	Diupa Ali	CCP Naherenque	Fisherman	
84	Gudamido Abacar	CCP Naherenque	Fisherman	
85	Sete Selemane	CCP Naherenque	Fisherman	
86	Cebo A. Assane	CCP Naherenque	Fisherman	
87	Afonso Amade	CCP Naherenque	Fisherman	
88	Amade Issufo	CCP Naherenque	Fisherman	
89	Matinthi João	CCP Naherenque	Fisherman	
90	Selemane A. Abdala	CCP Naherenque	Fisherman	
91	Abdul N.	CCP Naherenque	Fisherman	
92	Camine Chale	CCP Naherenque	Fisherman	
93	Suhel Awal	CCP Naherenque	Fisherman	
94	Latifo Gulamo	CCP Naherenque	Fisherman	
95	Amade Ussene	CCP Naherenque	Fisherman	
96	Muriricho Julião	CCP Naherenque	Fisherman	
97	Nurtino Alde	CCP Naherenque	Fisherman	
98	Amade Diogo Ntalausse	CCP Naherenque	Fisherman	
99	Rachide A.	Cons. Municipal de Nacala	Public Servant	825247507
100	Serafina Cortêz	IDPPE - Nacala	Extensionist	824298266

REPÚBLICA DE MOÇAMBIQUE

MINISTÉRIO DAS PESCAS

South West Indian Ocean Fisheries Governance and Shared Growth in Mozambique (SWIOFish Mozambique, P132123)

Terms of Reference for Consulting Services (Individual)

Assignment title	Preparation of Safeguards instruments for SWIOFish Mozambique: Environmental and Social Impacts Assessment (ESIA), Environmental and Social Management Framework (ESMF) and Process Framework (PF).
Contract duration	40 days for ESIA, ESMF & PF
Primary assignment location	Provinces covered by SWIOFish - Mozambique Project implementation

Maputo, February 2014

A. Context and Objectives of the Assignment

Background

1. This consultancy will support the preparation of the **South West Indian Ocean Fisheries Governance and Shared Growth Project** in Mozambique (**SWIOFish Mozambique**) which should be cofinanced by World Bank and the French Development Agency (AFD). Its objective is to ensuring safeguards compliance of the project with regards to World Bank and AFD procedures, being agreed that World Bank procedures and template will be used for both donors. The Programme Development Objective of the proposed project is "*to increase the shared benefits from economic growth based on sustainable fisheries and coastal marine resources"*.

2. The SWIOFish Mozambique project is part of a broader regional endeavour in the South West Indian Ocean that targets growth and poverty reduction through sustainable development of the fisheries sector. It also complements smaller World Bank initiatives in the fisheries sector of Mozambique, including the Community-based Coastal Resources Management and Sustainable Livelihoods Grant, a technical assistance aimed at reforming the fisheries sector, both under implementation.

3. The project will be implemented through 4 components:

- Componente 1 - *Improved governance of priority fisheries*;
- Componente 2 – *Increased economic benefits to the region from priority Fisheries*;
- Componente 3 – *Cost-effective regional collaboration;*
- Componente 4 – *Program management and coordination*.

Context of the assignment

4. World Bank and AFD safeguard policies guidelines require that Ministry of Fisheries (MinPescas) effectively assesses and mitigates the potential environmental and social impacts of the projects proposed activities. As a result, MinPescas is required to prepare three standalone safeguards instruments, namely: an Environmental and Social Management Framework (ESMF), an Environmental and Social Impacts Assessment (ESIA), and a Process Framework (PF).

5. The primary objective of this assignment is to support the Government of Mozambique in the preparation of the three above mentioned standalone safeguard instruments, which the World Bank and AFD will review prior to project appraisal. The ESMF will be prepared with the aim to effectively assess and mitigate the potential environmental and social impacts, including the health and safety-related impacts of future sub-project activities under SWIOFish Mozambique. The ESIA will be completed specifically for the Inhassunge Aquaculture Project, which will be a major sub-project under the overall SWIOFish Project. The PF will be prepared to present the criteria and procedures to be followed when a sub-project activity is identified as having potential adverse social impacts on existing land rights, assets, or livelihoods as a result of new restrictions of access to fisheries or other natural resources.

6. Preparing the ESMF and PF will enable both the Government and the World Bank/AFDto agree on principles and processes, so that these need not be discussed for every sub-project during project implementation. It also allows project stakeholders and beneficiaries to undertake specific sub-projects without having to re-negotiate fundamental agreements on a case-by-case basis.

A. B. Scope of the Assignment

7. Based on the objective of the assignment described above, the Consultant will be required to work in Maputo as well as to travel to the project implementation area. The Consultant will liaise with the overall SWIOFish Mozambique preparation team (Maputo, and selected provinces),

technical staff from MinPescas, MICOA, DNEPP, DNFP, ADNAP, IIP, INAQUA, IDPPE, FFP, DTEP, INIP, etc. and other relevant strategic stakeholders at both the central and provincial levels. S/He will liaise with the World Bank/AFD staff and relevant staff from other donors engaged in environment and social activities in the selected areas.

8. With a special emphasis on field work, the Consultant will interact with local actors such as Local Administrators, NGO, SDAE extension workers and technical staff, potential beneficiary groups, and others. The desk review will include among other: environmental and social policies, strategies and approaches prevailing in the country; environmental and social analyses recently carried out under other relevant projects co-financed or not by the World Bank or AFD (PPACG, TFCA II, MOZBio); SWIOFish Mozambique sub-project screening, approval, implementation and monitoring criteria and procedures (if available); review of on-going Sustainable Development (SDN) projects co-financed by the World Bank; provisions in the national laws for public consultations and participation requirements on social and environmental aspects and potential risks.

9. The Consultant will prepare and deliver three standalone safeguards documents as described below, namely ESMF, ESIA and PF. Each of these reports is expected to include information on the following:

- Executive Summary: *A non-technical executive summary in both Portuguese and English;*
- Project Description: *Provide a brief description of the project, with emphasis on components with activities which will trigger environmental and social impacts;*
- Impacts: *Identify, assess and – to the extent possible – quantify the potential environmental and social impacts and risks in the intervention zone of SWIOFish subprojects;*
- Public/Stakeholders Consultation and Participation: *Ensure that World Bank/AFD requirements on public consultation and participation are being met in full. Present the outcomes of a participatory and inclusive public consultation conducted by the Consultant in each standalone documents with various categories of beneficiary stakeholders in the selected provinces/areas of intervention. Outline each stakeholder group's perception of and reaction to the project (i.e. receptiveness and willingness to collaborate for the sustainable management of the proposed project activities) and suggest ways of retrofitting their main views and concerns in the project design, implementation and monitoring and evaluation. Include minutes of all consultation meetings for each report, highlighting i.e. gender and vulnerable groups distribution and dimensions, and describing how fishing communities and other stakeholder groups have been identified;*
- Public Consultation and Participation Plan (PCPP): *Develop a participatory and inclusive public consultation plan that could be easily followed up at the local level for the environmental and social screening process for SWIOFish Mozambique subprojects, as well as during the planning stages of these sub-project activities;*
- Legal Framework: *Review of the national laws (incl. traditional and customary practices) governing the environment and natural resources (for ESMF) and governing the appropriation of land or other assets, including restriction to access to fisheries or other natural resources (for PF). Identify potential discrepancies between national laws (such as the Decree 45/2004 of September 29, 2004, Decree 31/2013 of August 8, 2013) and World Bank policies (mainly OP/BP4.01 and OP/BP4.12) and establish mechanisms for a converging implementation;*
- Implementing Agency: *Identify/propose individuals/organization/agency responsible for jointly implementing the ESMF, ESIA and PF. Assess the government's and implementing agency's technical and administrative capacities to manage the project's potential environmental and social issues, and propose – as appropriate – viable mitigation measures to reinforce their technical and practical capacities in this regard, taking into consideration the relevant environmental and social policies, legal, regulatory and administrative frameworks in place, as well as the technical experiences of individuals/organization/agency in dealing with these issues in previous operations;*
- Safeguards Policies: *Review the World Bank environment and social safeguard policies including those not yet triggered by the project (as well as national legislation) and make recommendations regarding their*

applicability to SWIOFish Mozambique. Recommendations pertaining to the treatment of applicable safeguards policies in the context of SWIOFish Mozambique sub-projects should also be formulated;

- Public Disclosures: *Bearing in mind that SWIOFish is classified by the World Bank as an environmental Category A project (because it includes large-scale aquaculture), propose steps and timeline to ensure that public disclosures of key findings are adequately implemented, and in synch with the overall project preparation calendar.*

More specifically:

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK (ESMF)

10. In addition to the above, **the ESMF should provide information that includes the following** (among other information, as appropriate):

a. A description of the overall SWIOFish Mozambique Project and each planned sub-project investment.

b. A concise diagnostic analysis of the project's main environmental and related social issues, including those involving typical fisheries practices in the SWIOFish Mozambique participating countries. This should include an explanation of how the SWIOFish Mozambique Project would help to make these fisheries more environmentally sustainable.

c. Criteria and procedures for environmental and social screening of proposed civil works sub-projects, to (i) avoid sites of high sensitivity and (ii) ensure that the appropriate level of attention is given to potential environmental and social impacts and their corresponding mitigation or enhancement measures.

d. The ESMF should specify the criteria and format for preparing individual Environmental Management Plans (EMPs) for civil works sub-projects (other than the Mozambique Inhassunge Aquaculture Facility, which has its own specific ESIA). Each EMP should cover (i) specific environmental requirements for the construction and operation of each civil works sub-project, including mitigation measures to address adverse impacts along with enhancement measures to reinforce positive impacts; (ii) an implementation schedule of specific environmental measures in relation to the associated main civil works; (iii) institutional responsibility for carrying out each environmental measure (Ministry of Fisheries, civil works contactor, civil works supervising engineer, or others); and (vi) budget for specific environmental management measures.

e. For all aquaculture sub-projects (such as at Macaneta, Mozambique), the ESMF should affirm that only species native to the same river basin would be cultivated. Otherwise, if any non-native species were to be considered for cultivation, the ESMF would need to outline the criteria and procedures for assessing and minimizing any risks that the non-native species could become invasive and threaten the survival of native aquatic species. Naturalized species that occur in the same water body as the proposed sub-project and that have already been found to be of low ecological risk for native species could be used without further risk assessment.

f. For all port infrastructure projects, the ESMF should prescribe operating rules that would minimize ocean pollution, including from solid wastes such as plastic trash.

g. Standard Environmental Rules for Contractors to follow in all civil works sub-projects, including proper waste disposal, no hunting, no bush-meat purchase, no inappropriate interactions with local people, and Chance Finds Procedures for any physical cultural resources discovered during construction.

h. Summary of public consultations held on the draft ESMF, particularly (i) who was invited, representing which organization or interest group; (ii) who participated by attending a meeting and/or providing comments; (iii) the dates and venues of any workshops or other meetings held; and (iv) a summary of the main comments expressed.

i. A concise explanation of how the overall SWIOFish Mozambique Project and each sub-project investment would comply with the applicable World Bank Safeguard Policies, including Environmental Assessment (OP/BP 4.01), Natural Habitats (OP/BP 4.04), Pest Management (OP 4.09), Physical Cultural Resources (OP/BP 4.11), and Involuntary Resettlement (OP/BP 4.12).

j. The ESMF Title Page should include the name and/or logo of the Fisheries Ministry and/or other government agency, to indicate clearly that the report represents the views of each country's government and not just of a consultant.

o ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)

11. **In addition to the ESMF for the overall SWIOFish Project, a specific Environmental and Social Impact Assessment (ESIA) is required for the Inhassunge Aquaculture Project (a SWIOFish sub-project).** An existing EIA report for Inhassunge, *Estudo de Impacto Ambiental do Projecto de Aquacultura de Inhassunge* (2004), provides a great deal of valuable information about the proposed project. Nonetheless, specific updates and improvements (indicated below) will be needed to make this EIA compliant with the World Bank's Environmental Assessment OP 4.01 and other applicable Safeguard Policies. None of these improvements are likely to require additional scientific field work, so the needed changes can be made relatively quickly. The revised EIA--here called ESIA (Environmental and Social Impact Assessment) for consistency with standard World Bank usage—should incorporate the following specific improvements:

a. **English Executive Summary.** All World Bank-supported Category A projects must have an Executive Summary (ES) in English; however, the main report can be in Portuguese. The ES will be forwarded by World Bank staff to the Bank's Executive Directors prior to Appraisal. The ES (both the English and Portuguese versions) should be well-written, since this is all that many stakeholders will read from the ESIA.

b. **Species Choice.** Although the existing EIA refers only to the production of shrimp, it is expected that the Inhassunge aquaculture facility would also cultivate, at a minimum, native tilapia and freshwater clams. The ESIA should therefore reflect this--and any other--new information. With respect to the choice of species, the ESIA should confirm that only species native to the Zambezi River and associated estuary would be cultivated. Conversely, if any non-native species were to be considered for cultivation at the facility, the ESIA would need to outline the criteria and procedures for assessing and minimizing any risks that the non-native species could become invasive and threaten the survival of native aquatic species. Naturalized species that occur in the same water body as the proposed sub-project and that have already been found to be of low ecological risk for native species could be used without further risk assessment.

c. G**eographic Information.** The ESIA should provide improved color maps showing (i) the locations of the existing aquaculture facility; (ii) the proposed new facility (including the planned layout of the ponds, office and processing facilities, etc.); (iii) the existing land cover, including upper mudflats, grassland, acacia savanna, and mangroves; and (iv) planned set-aside areas, such as to keep the acacia savanna and mangrove patches from being converted. The ESIA should also indicate the number of hectares to be developed for each block of aquaculture ponds. Moreover, the ESIA should indicate that the project area lies within the Zambezi River Delta Important Bird Area, comprising about 500,000 ha (Birdlife International 2001, *Important Bird Areas in Africa and Associated Islands: Priority Areas for Conservation*).

d. **Land Tenure and Livelihoods.** Although Section 3.3.5 of the existing EIA provides a start, the revised ESIA should describe the land tenure of the project area (e.g. Government land, with what type of concession to which prospective land users). It should also clearly explain that (i) no people live anywhere within the area to be used for aquaculture; (ii) no structures or other privately-held assets would be affected under the

project; (iii) there are no conflicting land claims over the area; and (iv) no existing livelihoods will be adversely affected by the project. Accordingly, the Involuntary Resettlement OP 4.12 would not be triggered in the case of this sub-project.

e. **Employment Generation.** The EIA (Section 4.3.1) points to local employment generation as a positive impact of the project. The ESIA should estimate this impact in quantitative terms, such as the number of short-term (construction) and long-term (operation) jobs created, including the expected percentage of women employees. Wherever feasible, the project design should target the new jobs towards existing small-scale fishermen who may be overfishing or using destructive fishing practices, in order to provide a more sustainable alternative livelihood.

f. **Physical Cultural Resources.** The existing EIA states that there are no cemeteries or historic or sacred sites within the proposed project intervention area. However, the Bank mission visited a relatively large, run-down old house within the project area. The ESIA should therefore indicate the history of this structure, whether it is considered to have any historical or other cultural value based on specified criteria; and what plans exist for this site (if any) under the project. The ESIA should also indicate Chance Finds Procedures for what steps would need to be followed in case any items of cultural value are uncovered during construction.

g. **Grasslands.** The ESIA should quantify the number of hectares of short grassland (*pradaria pantanosa salgada*) that would be converted to aquaculture ponds and associated facilities. It should also provide some data on how extensive this same vegetation type is within the Zambezi Delta area, to verify the preliminary finding that the area of this grassland type lost to the project would not be significant.

h. **Mudflats.** The ESIA should explain (better than has been done in Section 4.2.2.1 of the existing EIA) that the mudflats to be converted to aquaculture ponds under the project are only infrequently wet, and thus **not** the biologically highly productive inter-tidal mudflats that are an important habitat for migratory shorebirds and other fauna. In fact, well-managed aquaculture ponds would improve upon the existing habitat for many species of aquatic birds, as the September 2013 World Bank project preparation mission observed at the existing nearby aquaculture facility.

i. **Access Road.** As noted in the EIA (Section 4.3.2.1), the project design includes the construction of an access road from the new aquaculture facility to the existing Recamba-Mucupia highway. In addition to indicating the length of this new road and showing it on a detailed map, the ESIA needs to discuss potential induced environmental impacts, such as new informal garbage dump(s), cutting of mangrove or acacia trees, cutting in ecological corridors or illegal hunting of birds or other wildlife. The ESIA also needs to indicate how the project would mitigate these impacts, such as through regular patrols or an entrance gate to inhibit unauthorized entry.

j. **Environmental and Social Management Plan.** The existing Environmental Management Plan (EIA Chapter 5) is rather weak, focusing largely on the monitoring of environmental parameters. The revised ESMP should also cover (i) key environmental mitigation and enhancement measures that correspond to the impacts identified by the ESIA; (ii) implementation schedule (during construction as well as operation) for these key environmental measures; (iii) institutional responsibilities for implementing each measure; (iv) budget for implementing the key actions, in terms of "mainstreamed" construction and operating costs as well specifically identified "incremental" costs; (v) operating rules for the facility, such as no use of non-native species and no shooting or trapping of aquatic birds; and (vi) standard Environmental Rules for Contractors (including proper waste disposal, no hunting, no bush-meat purchase, no inappropriate interactions with local people, and Chance Finds Procedures for any physical cultural resources discovered during construction).

k. **Environmental Monitoring.** In addition to monitoring water quality parameters as planned, it would also be helpful for the project to monitor biodiversity, such as the

numbers and species of aquatic birds that visit the aquaculture facility. If such data were assembled in a useful way and publicly disseminated, it would help to enhance the image of the aquaculture facility as an environmentally friendly operation.

l. **Pest Management.** The existing EIA mentions that the aquaculture facility would use a very short-lived natural pesticide, Tea Seed Cake (*Camelia* plant extract), to rid new tank water of small aquatic fauna that would compete with, parasitize, or prey upon the shrimp, right before the juvenile shrimp are introduced to the tank. This can be consistent with certified organic production, since "organic" is usually interpreted to mean "no synthetic compounds"--not "no pesticides" *per se*. Nonetheless, this is sufficient (on a strict interpretation) to trigger the World Bank's Pest Management Policy (OP 4.09). To comply with this policy, the Consultant should prepare a very brief Pest Management Plan (a few pages would suffice) that provides (i) a brief description of the Tea Seed Cake and how it would be used (building upon the paragraph in Section 2.2.4 of the existing EIA); (ii) a brief section on aquatic birds which might feed upon the shrimp or other aquaculture species and whether these birds would always be tolerated (which is evidently the case at the existing private aquaculture facility in the same area), or, if not, what measures might be taken to discourage which species from visiting the aquaculture ponds--under NO circumstances should any shooting or other lethal control ever take place; and (iii) the criteria and procedures to be followed if any other pesticide use or other pest management practice were to be considered in the future.

m. **Public Consultation.** Annex 2 of the existing EIA (*Consulta Publica*) needs to be substantially strengthened to comply with the requirements of OP 4.01. Since this would be a Category A project, there should be at least two consultation events: (i) One on the scope of the ESIA (including these Terms of Reference and, as background, the existing EIA and (ii) another on the new draft ESIA when it is completed. A broad range of stakeholders (including conservation NGOs) should be invited to express their views. An expanded Annex 2 of the ESIA should indicate (i) who was invited, representing which organization or interest group; (ii) who participated by attending a meeting and/or providing comments; (iii) the dates and venues of any workshops or other meetings held; and (iv) a summary of the main comments expressed.

n. **Report Ownership.** The ESIA Title Page should include the name and/or logo of the Fisheries Ministry and/or other Mozambican Government agency, to indicate clearly that the report represents the views of Government and not just of the consultant.

o. **MICOA Approval.** The World Bank should be provided with a copy of MICOA's official letter of approval of the project, along with any linked environmental conditions. Ideally, the Bank would receive MICOA's approval letter prior to Appraisal; at the very latest, the letter would be needed prior to disbursement from the overall SWIOFish Project to this aquaculture project.

o PROCESS FRAMEWORK (PF)

12. The Government recognizes that measures which reduce the access of vulnerable and marginalized groups to fisheries or other natural resources may entail adverse impacts on their existing livelihoods. For this reason, the Bank's Operational Policy (OP/BP 4.12) on Involuntary Resettlement applies to Components 2 and 3 of the SWIOFish Mozambique Project.

13. In addition to the ESMF and ESIA, the Consultant will take the lead in developing the Process Framework (PF), bringing international and local experience as well as best practice to inform the process. A PF is normally prepared when World Bank-supported projects may cause restrictions in access to natural resources in legally designated parks and protected areas; however, in the case of SWIOFish Mozambique, the PF would apply as well to other types of project-related restrictions of access to fisheries or other natural resources. The PF will indicate the process by which livelihoods potentially affected by restrictions of access to natural resources could be maintained, restored, or improved through appropriate project activities (see OP 4.12, paras. 7 and 31). The Consultant will be responsible for developing the PF content as well as for ensuring its

timely delivery, in close consultation with fishing communities, groups of vulnerable and marginalized Peoples (VMPs), NGOs and local government officials. Specifically, the process framework should describe the participatory processes by which the following activities will be accomplished:

a. **Preparation and Implementation of Project Components**. The PF should briefly describe the project and components or activities that may involve new or more stringent restrictions on natural resource use. In the context of SWIOFish Mozambique, such restrictions might come about through the enforcement of new fisheries management plans, possibly involving (i) the seasonal or long-term closure of previously exploited fishing areas or (ii) restrictions on fishing methods or type of gear used. The PF should also describe the process by which potentially impacted persons participate in project design.

b. **Determining Eligibility Criteria for Affected Persons**. The PF should establish that potentially affected communities will be involved in identifying any adverse impacts, assessing of the significance of impacts, and establishing of the criteria for eligibility for any mitigating or compensating measures necessary.

c. **Livelihood Restoration or Improvement Measures.** The PF should describe the process by which, during project implementation, measures will be identified and applied to assist affected persons in their efforts to improve their livelihoods or restore them, in real terms, to pre-displacement levels, while maintaining the sustainability of fisheries and ecosystem management. In particular, the PF should describe the methods by which communities would identify and choose potential mitigating or compensating measures to be provided to those adversely affected, and procedures by which adversely affected community members will decide among the options available to them.

d. **Grievance and Conflict Resolution.** The PF should describe the process that would be used for resolving disputes relating to resource use restrictions that may arise between or among affected communities, and grievances that may arise from members of communities who are dissatisfied with the eligibility criteria, community planning measures, or actual implementation.

e. **Administrative and Legal Procedures.** The PF should explain the role of relevant administrative jurisdictions and line ministries in the restriction of access to natural resources and the promotion of alternative livelihoods.

f. **Monitoring Arrangements.** The PF document should outline the arrangements for participatory monitoring of project activities as they relate to (beneficial and adverse) impacts on persons within the project impact area, and for monitoring the effectiveness of measures taken to improve (or at minimum restore) incomes and living standards.

14. **The Consultant will lead inter-agency coordination and public/NGO participation.** The PF will be developed in a participatory manner and in close consultation and cooperation with all key stakeholders (VMP groups/communities, key line ministries, local governments, and NGOs). The community groups and other key stakeholders should be consulted (i) in meetings held during preparation before the PF is finalized and (ii) when a draft PF is available. The draft and final PF and other relevant materials will be provided to affected groups in a timely manner and in a form and language that is understandable and accessible to the groups being consulted. The Consultant should maintain a record of the public consultation and the records should indicate: Means (including those other than consultations, such as surveys, used to seek the views of affected stakeholders; the date and location of the consultation meetings, a list of the attendees and their affiliation and contact address; and, summary minutes.

15. **Report.** The Consultant will provide a Process Framework report that is concise and limited to significant social and environmental issues. The main text should focus on findings, conclusions and recommended actions, supported by summaries of the meetings held, data collected and citations for any references used in interpreting those data. The Process Framework should be organized according to the outline below (as suggested in OP/BP 4.12):

- Executive Summary
- Description of the Project
- Policy, Legal and Administrative Framework
- Procedures for Involvement of Project Affected Peoples (PAPs) *in:*
  - Development of Eligibility Criteria for PAP
  - Identification of impacts and mitigation strategies
  - Identification livelihood options and sub-project activities
- Complaints and Grievance Resolution mechanism
- Administrative and Legal Procedures
- Monitoring Arrangements
- Implementation responsibilities and costs
- Inter-Agency and Public/NGO Consultation
- List of References
- Appendices*:*
  - *List of Consultants and Team preparing process framework*
  - *Records of Inter-Agency and Public/NGO Consultations, Communications, Meetings;*
  - *Data and Unpublished Reference Documents*:

B. C. Expected Outputs & Deliverables

16. All outputs and reports are expected to be compiled in **three final standalone environmental safeguards instruments (ESMF, ESIA and PF)** and are required to be delivered by the Consultant to MinPescas in hard copy (3 sets of each report) as well as in electronic form on CD-ROM (3 discs, each including all 3 safeguards instruments: ESMF, ESIA and PF) **no later than 2 calendar months after the signing of the contract**.

17. All intermediary outputs and **final reports should be in Portuguese or English** with an executive summary (including main conclusions and where applicable, recommendations) for each report in both English and Portuguese language. Final reports should be also translated into French.

18. The Consultant is also expected to be invited by MinPescas/the SWIOFish Mozambique project team to present the main findings of the assignment. Hence, the Consultants will be required to **produce a presentation** summarizing the main findings of the 3 safeguards instruments, including invitation of the relevant national level institutions where the studies were done.

D. Consultants qualifications, expertise required and specific task

19. For this assignment, MinPescas is seeking to recruit an individual Consultant with the following profile:

Senior Safeguards Specialist:

- An environmental and social impacts assessments specialist per training, with at least 15 years of proven experience and with an emphasis on environmental and social assessments, involuntary resettlement and preparation of safeguards documents; preferably in Mozambique and southern/eastern Africa.
- A good knowledge of the Mozambican fisheries sector, rural development and/or environmental and biological/ecological issues and policies prevailing in Mozambique is highly desirable.

- A University degree (*preferably MA*) in one of the relevant disciplines (NRM, Environment, Ecology, Biology, Environmental Economics, Sociology, Anthropology, etc.) is required.
- Ability to communicate and write in both English and Portuguese is strongly desired. Understanding/speaking another, local language would be a plus.

20. The consultant is responsible for the coordination and delivery of the 3 safeguards instruments (ESMF, ESIA and PF), as well as preparation of the presentation, and related activities. S/He will ensure that these safeguards instruments are linked and to avoid disconnect between the documents.

21. **The total number of paid days for the Environmental Specialist in charge of the ESMF, ESIA and PF is not expected to exceed 40 (forty) days.**

C. E. Reporting and supervision arrangements

22. For all aspects of this assignment, the Consultant will be reporting to the SWIOFish Mozambique Project Coordinator at MinPescas in Maputo.

23. Full program and consultant time line must be submitted to project coordinator after signing the contract.

D. F. Responsibilities of the contracting party

24. SWIOFish Mozambique project team at MinPescas will be responsible for compiling all relevant literature and all relevant documentation from similar rural/local development projects with appropriate Government agencies.

E. Annex 1: Brief preliminary description of the planned SWIOFish Mozambique Project

A. Preliminary Project Description

The Project Development Objective (PDO) is to improve the management effectiveness of selected priority fisheries at regional, national and community level. Overall, the project intends to build the capacity and leadership required and address core economic governance issues to lay a firm foundation for shared economic growth based on fisheries and aquaculture. It aims at improving the management of the most economically important fisheries, improving co-management of the small-scale fisheries, and facilitating public and private investments to increase the contribution of fisheries to national economies. The proposed project will include the following components and sub-components:

(1) **Enhanced regional collaboration**. The component would support activities which provide regional value added or where country collaboration is essential to achieve mutual goals. It would foster regional cooperation on tuna fisheries to capture benefits for the coastal developing countries, including reduction in illicit fisheries activities; establish technical capacity to monitor threats to the marine environment, and facilitate regional fisheries knowledge exchange and human resource development. The sub-components would be common to all countries.

- Sub-component 1.1. Transboundary marine resources and challenges. The sub-component would support collaboration on transboundary living marine resources including formal arrangements on joint actions for selected fisheries, vulnerable species, habitats and ecosystems of regional importance; and on shared challenges, such as piracy, illicit fisheries activities, and securing coastal state benefits from marine resources.
- Sub-component 1.2. Sustainable regional institutional arrangements. The activities would provide for the further development and consolidation of sustainable institutional arrangements for regional fisheries collaboration through development of the SWIOFC and associated regional institutions, including the programming and financing of an agreed regional work program, continuation of priority activities emerging from SWIOFP and formulation of common approaches in global and regional fora.
- Sub-component 1.3. Knowledge generation, exchange and capacity development would focus on scientific, socio-economic, trade and governance priorities with a particular emphasis on co-management, tuna fisheries, marine tourism and building competitive businesses. Subject to specific requests the Program would build capacity and undertake field work to monitor and publish analyses of the impacts of mining and megaprojects on the marine and costal environment.

(2) **Improved governance of priority fisheries**. The component would support the implementation of core policy instruments through developing coherent fisheries policies with a sound economic rationale and development trajectory, backed by human and institutional capacity building to implement the policies and plans. Three closely-linked and mutually supportive activities are envisaged:

- Sub-component 2.1. Management of priority fisheries (including aquaculture), prioritizing the most economically and socially important fisheries and the design and/or implementation of small-scale fisheries co-management and accompanying legal and institutional arrangements within the framework of the FMP.
- Sub-component 2.2. Improving the performance of public institutions and assets to place them on an economically and financially sound and cost-effective basis, with particular reference to basic fisheries services and infrastructure, and improved information for policies and decisions. It would include both infrastructure and institutional development.

- Sub-component 2.3. Establishment of a dashboard of environmental, social and economic indicators to track the progress of the sector towards achieving country policy and planning goals, and to provide a basis for adaptive management and adjustment of policies and programs.

(3) **Increased economic benefits to national economies from priority fisheries**. As an engine of growth, the private sector is constrained by several factors including: a weak investment and business climate, infrastructure, business advisory services and credit. The component would improve the sector investment climate and finance and facilitate viable investments already at an advanced planning stage. It will also prepare the analyses and organize the financing for proposed future investments. Three closely linked sub-components focus on an improved business climate, support for private sector initiatives and planning for strategic infrastructure.

- Sub-component 3.1. Improved business and investment climate. The sub-component would undertake the analyses required to identify and address the critical constraints to business and trade and develop an action program to improve the fisheries business opportunities and investment climate.
- Sub-component 3.2. Support for socially, economically and environmentally sustainable community and enterprise development and investments would address the constraints to business and create a favorable investment climate through facilitating access to credit, one-stop-shop investment and advisory services, preparation of models and feasibility studies for bankable and sustainable projects and by identifying co-financing opportunities.
- Sub-component 3.3. Investment in strategic infrastructure would undertake investments in small/ medium scale infrastructure and undertake the planning for potential future investments in larger infrastructure and fleet adjustments.

(4) **Program management and coordination.** The last component would support country implementation of the Program and coordination of the regional component through country and regional Program Steering Committees (PSC) and Program Management Units (PMUs).