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Republic of Mozambique

Ministry of Agriculture and Food Security

National Institute for Irrigation

Smallholder Irrigated Agriculture and Market Access Project

Environmental and Social Management Framework (ESMF)

April 2018

ACRONYMNS

ANE	National Roads Authority
ARA	Regional Water Administrations
ARAP	Abbreviated Resettlement Action Plan
CEPAGRI	Centre for the Promotion of Agriculture
DE	Directorate of Economics– under the Ministry of Agriculture focusing agrarian reform
DER	Department of Rural Extension– responsible for extension services in rural areas)
CPF	Country Partnership Framework
DPOPHRH	Provincial Directorate of Public Works, Housing and Water Resources
DPTADER	Provincial Directorates for Coordination of Environmental Action
DNGRH	National Directorate of Water Resources Management - through the International Rivers Office)
DNAB	National Directorate of the Environment
DNSA	National Directorate of Agrarian Services
DPASA	Provincial Directorate of Agriculture and Food Security
DPTADER	Provincial Directorate of Environment, Land and Rural Development
DPEM	Provincial Directorate of Mining and Energy
DPOPHRH	Provincial Directorate of Public Works, Housing and Water Resources
DTNF	National Directorate of Land and Forests
EDM	Electricity of Mozambique
ESSS	Environmental and Social Safeguard Specialist
FAO	United Nations Food and Agricultural Organization
FUNAE	National Fund of Energy
GAC	Governance and Anti-Corruption
GOM	Government of Mozambique
IDA	Irrigation Development Agency
IIAM	National Institute of Agriculture Research
INIR	The National Irrigation Institute
IRRIGA	Smallholder Irrigated Agriculture and Market Access Project
MASA	Ministry of Agriculture and Food Security
ME	Ministry of Energy
MITADER	Ministry of Land, Environment and Rural Development
NAPA	National Action Plan to Adopt Climate Change
NDEE	National Directorate of Electric Energy
NIP	National Irrigation Programme
NIS	National Irrigation Strategy
PNGA	National Environmental Management Program
PAPA	Food Production Action Plan
PARPA-II	Action Plan to Reduce Absolute Poverty II
PNI	National Irrigation Programme

PIU	Project Implementation Unit (i.e. unit to be established within MASA and to be staffed by adequately and well qualified technical and fiduciary staff)
PPP	Public Private Partnerships
PROIRRI	Sustainable Irrigation Development Project
PRP	Provincial Review Panel
RAP	Resettlement Action Plan
RPF	Resettlement Policy Framework
SDAE	District Services for Economic Activities
SDPI	District Services for Heritage and Infrastructure
IRRIGA	Smallholder Irrigated Agriculture and Market Access
TFCA	Trans-frontier Conservation Area
UASMA	Social Affairs and Environmental Unit
VLD	Voluntary Land Donation
WHO	World Health Organization
WUA	Water User Association

EXECUTIVE SUMMARY

Introduction

This is the Environmental and Social Management Framework (ESMF) of the Smallholder Irrigated Agriculture and Market Access Project, better known as IRRIGA, which will be implemented by the Ministry of Agriculture and Food Security of Mozambique (MASA), with World Bank (WB) support, during the period 2018 and 2024. IRRIGA will continue and consolidate the developments initiated by the Sustainable Irrigation Development Project (PROIRRI), expected to phase out in December 2018, after close to seven years of implementation.

The project will focus on the central provinces of Manica, Sofala and Zambezia and the northern province of Nampula. It is designed to target smallholder irrigated agriculture and access to markets. It will add new 5,000 ha of irrigated land to the 3,000 ha developed under PROIRRI.

ESMF will guide the screening of the proposed Project interventions (sub-projects) to ensure that they do not affect negatively the natural and social environment. It outlines several principles, which include: (i) a systematic procedure for participatory screening for sub-project sites and sub-project activities for environmental and social considerations; (ii) a step-by-step procedure for predicting the main potential environmental and social impacts of the planned sub-project activities; (iii) a generic environmental and social management plan for addressing negative externalities during sub-project implementation (planning, construction and operation); (iv) a step by step monitoring and evaluation system for implementation of mitigation measures; (v) an outline of recommended capacity building measures for environmental and social planning and monitoring of the sub-project activities; and (vi) a budget to ensure that the Project has adequate resources to meet its own interests, especially financial resources for the preparation, licensing and implementation sub-projects Environmental and Social Impact Assessments (ESIAs), Environmental and Social Management Plans (ESMPs) and Resettlement Action Plans (RAPs).

It is prepared in compliance with the requirements of both the beneficiary Government of Mozambique (GOM) and the funding World Bank (WB/IDA) and justified by the fact that at the stage of formulation of this ESMF the exact location, number, specific scale of the new 5,000 ha of irrigated land to be developed, which could justify conducting the environmental and social impact assessments and corresponding environmental and social management plans, are not yet known.

The ESMF sets the tone and will be used in conjunction with the (Integrated) Pest Management Plan (PMP) and (iii) Resettlement Policy Framework (RPF), prepared separately to guide the project and its actors in dealing with the sustainable use of pesticides and potential impacts of the project to trigger involuntary resettlement, respectively.

In addition to the introduction the document comprises thirteen chapters, namely (i) description of the proposed project; (ii) project implementation arrangements; (iii) development context; (iv) applicable environmental and social policy and legal framework; (v) environmental and social concerns in the project area; (vi) lessons learnt from PROIRRI (vii) potential environmental and social impacts and mitigation measures; (viii) guidelines for sub-project screening, preparation, appraisal, approval and monitoring; (ix) guidelines for environmental and social management plan and monitoring requirements; (x) training and capacity building

requirements; (xi) ESMF monitoring requirements; (xii) proposed estimated implementation budget. Report references and a series of annexes are used to complement issues presented and discussed throughout the document.

Secondary data review, interviews and discussions with key informants including experts in relevant project sectors and subsectors and other key informants in the field as well as from public consultation meetings that took place in February 2018; review of similar projects, mainly lessons learned from PROIRRI and SUSTENTA; direct observations in the project area; and Consultant's judgement, were the main sources of information to prepare the document.

Project Description and Implementation Arrangements

The project will have the following five main components and respective allocation of funds:

a. Capacity Development of the Irrigation and Agriculture Institutions (US$8 million of IDA grant);
b. Development of Irrigation Systems (US$46 IDA grant);
c. Agriculture Intensification and Market Linkages (Total US$22 million: US$20 million IDA grant and US$2 million from beneficiaries);
d. Project Management, Monitoring and Evaluation (US$6 million from IDA grant); and
e. Contingency and Emergency Response (0).

It will also build synergies and seek harmonization with other initiatives with the potential of facilitating the fulfilment of its objectives and targets, such as SUSTENTA, MozFIP and its MozDGM and MozBIO, under the Ministry of Environment, Land and Rural Development (MITADER), but will not be limited to these.

MASA/INIR will be the project Developer at the three levels of implementation, i.e. (i) national, (ii) provincial, and (iii) district. There will be a Project Implementation Manual (PIM) to guide all actors in the process. At all levels MASA/INIR will work hand in hand with the MOPHRH, MITADER, and Ministry of Industry and Trade (MIC), in the overall decision-making and implementation.

Project Development Context

The project happens at a time when Mozambique is going through a period of economic and financial hardships after a remarkable growth between 1995 and 2013-2015. The project also happens in a country marked by considerable imbalances in the access to the benefits of development among its citizens and regions, a phenomenon that even during the period of growth could not be addressed. More than 50% of the people are poor.

However, the country remains as one of the best endowed countries in Africa in terms of natural capital. It is drained by several important rivers, nine of which are international, with the Zambezi being the largest and most important river, the fourth-longest in Africa, and the largest flowing into the Indian Ocean from Africa. The Zambezi river is present in three of the project provinces, i.e. Manica, Sofala and Zambezia.

It is also endowed with vast land resources, i.e. close to 40% (36 million ha) of the 800,000 km² of Mozambique territory are arable land. However, only 10% of the total arable land is under cultivation of which only 1% is in the hands of commercial agriculture. The remaining

99% of the cultivated land is in the hands of subsistence farmers and are distributed by close to 4.0 million small farms of slightly above 1 ha and less than 10 ha in size.

Agriculture contributes 26% of total GDP and is the source of livelihood for 78% of the population but due to the high dependence on hydrometeorological factors one important subsector in the development of this economic activity is irrigation. The country experiences high levels of climate variability and extreme weather events (i.e. droughts, floods, and tropical cyclones), which when combined with the country's hypsometry translate into serious damages.

To reposition irrigation in national development, with the WB support the GOM formulated the Sustainable Irrigation Development Project (PROIRRI – 2011-2018), which will be continued and consolidated under IRRIGA (2018-2024).

The four provinces in the project area combined represent 53% of the total population and are among the richest in agricultural potential, including irrigation.

Legal and Regulatory Framework

From the environmental and social point of view the project adheres to the regulations and policies of both the GOM and WB.

- **World Bank**

In line with the WB policies IRRIGA will trigger seven of the 10+2 World Bank Operational Safeguards Policies, namely, Environmental Assessment OP/BP 4.01; Natural Habitats OP/BP 4.04; Pest Management OP 4.09; Physical Cultural Resources OP/BP 4.11; Involuntary Resettlement OP/BP 4.12; Safety of Dams OP/BP 4.37; Projects on International Waterways OP/BP 7.50. It will also adhere to the World Bank Group General Environmental, Health and Safety Guidelines (EHS), Agribusiness/Food Production EHS Guidelines from April 2007.

Separately a Resettlement Policy Framework (RPF) has been prepared to satisfy the Involuntary Resettlement (OP/BP 4.12) Safeguard Policy requirements and an (Integrated) Pest Management Plan (PMP) has been prepared to satisfy OP 4.09 requirements. These will be used together with this ESMF.

- **Government of Mozambique**

The project will benefit from the enormous process of reform and streamlining of laws, regulations and institutions to promote sustainable development that Mozambique has been undertaking for more than twenty years.

The developments are of high relevance in the management of irrigation development as they touch on land, water, biodiversity, social and economic aspects, which are important components in the subsector. These will be adhered to and applied systematically throughout all phases of project development.

The project and this ESMF is cognizant though that despite the progress witnessed several weaknesses and risks/challenges remain such as incipient decentralization, excessive departmentalization; human and technological resources, inadequate flow of financial resources, deficient public-private cooperation; and discrepancies between modern and traditional management and communication systems.

The ESMF also notes that although there has been increased harmonization between the GOM Regulations and the WB Safeguards Policies, differences in certain areas and aspects remain.

Under the Project whenever there is a conflict between national legislation and World Bank safeguards policies, the latter prevails.

Environmental and social concerns in the project area and mitigation of project impacts

Through public consultation and other forms of data collection it was possible to make a preliminary assessment of the environmental and social concerns of the people in the project area. The following aspects, but not only, can be highlighted:

- **Water quantity and quality**: the siting of the subprojects should target areas known for having sufficient water to meet the needs of the various users, downstream and upstream, to avoid conflicts and other problems. Water users including irrigation can contribute to water contamination, which, if not properly managed, ultimately can undermine the different interests of the various users;
- **Irrigation by gravity vs pumping and the use of alternative sources of energy**: under IRRIGA irrigation by gravity will be the approach although pumping irrigation schemes will also still be an option. To counteract the issue of prohibitive costs of electricity that comes as the major deterrent, the adoption of alternative sources of energy, notably solar, should be considered under the project.
- **Soil erosion and other soil related problems**: past experiences under PROIRRI and other irrigation projects show that site selection, technical design and production technologies have a strong potential of aggravating soil erosion particularly in areas that are already prone to that phenomenon. Adequate siting and production technologies are required to avoid/minimize/mitigate common problems.
- **Other investments and facilities to increase the viability of investments in irrigation**: the project focus on irrigation infrastructure should not ignore that irrigation projects require other infrastructures and facilities such as rural roads, electricity, storage facilities, processing and other forms of facilitation.
- **Sound environmental and social management**: all the known environmental and social management safeguards need to be applied systematically under IRRIGA to ensure that the impacts on the natural and social receiving environment are adequately identified, assessed and management plans are adopted and applied to avoid destruction, pollution/contamination, restrictions, etc. in all phases of subproject planning, design, construction, operation and eventual decommissioning.

The ESMF provides an assessment of the above-mentioned impacts and other and provides generalized guidelines about their mitigation and management. It also takes note of the fact that even though the environmental and social impacts of IRRIGA will tend to be localized and of low/medium intensity, when combined with other issues, water and natural resources uses (i.e. climate change, traditional agriculture, forests, industry, mining, etc.) these impacts can be significant. This also has implications on project design including the planning, siting, design specifications, construction, operation and eventual decommissioning of project's subprojects.

The ESMF then presents more detailed (i) guidelines for subproject screening, preparation, appraisal, approval, implementation and monitoring, including the roles and responsibilities of the various agencies and a grievance mechanism to be used by project affected people and other project stakeholders in the presentation and adoption of corrective measures where grievances will occur; (ii) guidelines for preparing environmental and social management plans (iii) indications about the training and capacity building, technical assistance best suited for the project, including the approaches to be adopted; (iv) and ESMF monitoring requirements.

The above-mentioned sections of the document are practical in nature and are aimed at assisting all the agents/parties that will be active in the implementation of the project's environmental and social safeguards to deal with the various issues on a day-to-day basis.

ESMF Budget

The ESMF estimates that 2,7 % of the total budget assigned to environmental and social management and ESMF preparation and implementation, from total IRRIGA budget. IRRIGA will build on PROIRRI efforts to perform environmental and social management and will consolidate them.

The total amount to cover all the work to be done under the ESMF preparation and implementation for the project stands at **US$ 2,202,500.00**.

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1 INTRODUCTION

This document forms the Environmental and Social Management Framework (ESMF) of the Smallholder Irrigated Agriculture and Market Access Project, aka IRRIGA, which will be implemented by the Ministry of Agriculture and Food Security of Mozambique (MASA), with World Bank (WB) support, during the period September 2018 and December 2024. The project is expected to play a crucial role in the consolidation of the developments initiated by the Sustainable Irrigation Development Project (PROIRRI), which will phase out in December 2018 after close to seven years of implementation. PROIRRI is and was the most relevant undertaking in irrigation development in Mozambique since the country embraced the market economy from the mid-1980s and enjoyed peace and democratic pluralism from 1992 onwards.

The relevance of IRRIGA comes from the fact that Mozambique's economy is dependent on agriculture (i.e. over 26% of the GPD of the country is derived from this activity), with the bulk of the jobs being generated by it. It also sustains the livelihoods of most people. The productivity of the agricultural sector in Mozambique is highly dependent on weather conditions. Most farms are rainfed and subsistence-based as opposed to commercial farms reliant on irrigation. The most recent major floods (i.e. January 2015) as well as the floods of 2000 resulted in major crop losses and damage to infrastructure including loss of lives.

It follows that due to the dependence of agriculture on rainfall, in at least 95% of the cultivated areas (EI, 2010), as well as the great water resources potential existing in Mozambique, the development of its agriculture has strong relations with irrigation. Irrigation is meant to create national capacity at several critical points to store water in times of abundance for use in the frequent periods of scarcity, including controlling excesses of water at times of excessive occurrence (drainage). Water excesses and scarcity occur variably from north to south of the country, with the south being the region of greatest dependence and vulnerability.

As illustrated in Figure 1-1, below, t**Error! Reference source not found.Error! Reference source not found.**he project will focus on the central provinces of Manica, Sofala and Zambezia and the northern province of Nampula.

Figure 1-1: Context map of the provinces that form part of the IRRIGA project

The proposed project is designed to target smallholder irrigated agriculture and access to markets.

Among other developments, under IRRIGA 5,000 ha of irrigated land in the project area will be financed to facilitate increased cropping intensity and agricultural productivity and enhanced climate resilience. This will include engineering studies, construction works, and equipment required to equip the 5,000 ha of irrigated land that will be added to the 3,000 ha developed under PROIRRI. The first 3,000 ha under PROIRRI used mainly water from Buzi, Púngoè and Zambezi river basins, whereas for new 5,000 ha under IRRIGA other river basins such Lúrio, Meluli and Licungo will add to the three previous ones as to be potentially considered for irrigation purposes. As explained in Chapter 8 the irrigation infrastructures (e.g. dams/weirs) under PROIRRI were mostly situated in the tributaries of the main rivers. It was only in some cases where water was pumped directly from the river to the irrigation schemes that water was abstracted from the main course of some of the project major rivers. This approach will be maintained under IRRIGA.

In line with the requirements of both the beneficiary Government of Mozambique (GOM) and the funding World Bank the various physical and processual developments related with the design, construction and operation of irrigation infrastructures and equipment as well as of all the systems and mechanisms in and around irrigated agriculture will be done with strict observance of sound management of the project receiving natural and social environment.

At the stage of formulation of this ESMF the exact location, number, specific scale of the new 5,000 ha of irrigated land to be developed, which could justify conducting the site-specific environmental and social impact assessments (and corresponding environmental and social management plans), are not yet known. A list of around 10,000 ha to 15,000 ha of potential preliminary existing traditional irrigation schemes were pre-identified for rehabilitation and expansion; among these the 5,000 ha will be selected[1] according certain criteria. The specifications will be developed during project implementation, which is expected to start in September 2018 or beginning of 2019. Under such circumstances the preparation of the Environmental and Social Management Framework is considered the best management instrument for WB funded projects.

The Environmental and Social Management Framework (ESMF) will 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 outlines several 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 generic environmental and social management plan for addressing negative externalities during 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

[1] At this stage it is impossible to state the number of hectares of irrigated land to be financed by province or the total number of irrigation schemes to be financed by IRRIGA for the total 5,000 ha proposed under IRRIGA; only after screening the potential 15,000 ha against the selection criteria, which can only take place after project implementation, data collection and technical capacity in place at the PIU that will be feasible.

Environmental and Social Management Plans (ESMPs), Environmental Licences and, if needed, Environmental and Social Impact Assessments (ESIAs).

Under the ESMF it is stipulated that IRRIGA subprojects should (i) carry out integrated assessment to identify the environmental and social impacts, risks, and opportunities; (ii) conduct effective community engagement through disclosure of subproject-related information and consultation with local communities on matters that directly affect them; and (iii) manage environmental and social performance throughout their life.

The ESMF will set the tone and be used in conjunction with the (Integrated) Pest Management Plan (PMP) and Resettlement Policy Framework (RPF), which have been prepared separately to guide the project and its actors in dealing with the sustainable use of pesticides and potential impacts of the project to trigger involuntary resettlement policy (OP 4.12) The former will be used to ensure a proper consideration of pesticides in the entire production cycle, including adequate selection and safe use, storage, disposal of pesticides and pesticide containers (integrated pest management plan - IPMP); and the latter to avoid/minimize involuntary resettlement and ensure that where such will have to happen the necessary consultation and engagement of affected people and their representatives will be conducted and that Project Affected People (PAP) will be compensated and/or assisted prior to the start of any construction activity. They will be given opportunities to participate in planning and implementing resettlement programs. PAPs will be assisted in their efforts to improve their livelihoods and standards of living or at least to restore them, in real terms, to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher.

In addition to this introductory chapter the document comprises twelve chapters, namely (i) description of the proposed project; (ii) project implementation arrangements; (iii) development context; (iv) applicable environmental and social policy and legal framework; (v) environmental and social concerns in the project area; (vi) lessons learnt from PROIRRI (vii) potential environmental and social impacts and mitigation measures; (viii) guidelines for sub-project screening, preparation, appraisal, approval and monitoring; (ix) guidelines for environmental and social management plan and monitoring requirements; (x) training and capacity building requirements; (xi) ESMF monitoring requirements; (xii) proposed estimated implementation budget; the report references and series of annexes are used to complement issues presented and discussed throughout the document.

The preparation of this report was based on a combination of methods of data collection and processing, from the following main sources (i) secondary data review; (ii) interviews and discussions with key informants including experts in relevant project sectors and subsectors (agriculture, irrigation, water resources management and public infrastructure) and other key informants in the field as well as from public consultation meetings that took place in February 2018, as detailed in Annex 1; (iii) review of similar projects and lessons learned, mainly PROIRRI and SUSTENTA; (iv) direct observations in the project area; and (v) Consultant's judgement.

2 DESCRIPTION OF THE PROPOSED PROJECT

The proposed project is designed to focus on the development of irrigation schemes for smallholder farmers as well as support the market access to inputs and outputs to and from irrigated agriculture. The irrigation schemes to be financed will be on already existing traditional ones, in order to rehabilitate and expand them; the project will not finance the construction of new irrigation schemes. Also, water gravity-fed schemes will be prioritized as opposed to pumping ones, due to lower maintenance and operational costs. Typical IRRIGA physical interventions in irrigation per se will be in the form of (a) upgrading the areas around the water intakes and the main canals; (b) construction of water collection structures and/or rehabilitation of damaged embankments; (c) installation of control structures like water gates; (d) upgrading the main canals and, where necessary, lining critical stretches of the distribution system; and (e) use of local plants/grasses (like vetiver grass) to control canal erosion;; associated investments such as rehabilitation of rural roads ("last mile") or connecting power lines (in case of pumping-fed schemes) may also take place[2]. The intensification of irrigated agriculture will also facilitate investments in (i) storehouses; (ii) a processing unit at a pilot level; (iii) basic access to irrigation areas, etc.

The three main pillars of the project are:

1) Capacity development of the irrigation institutions to provide the National Irrigation Institute (INIR) with the necessary capacity to design and technically supervise the construction and operation of new irrigation schemes under the National Irrigation Program (PNI), strengthening Water Users Associations (WUAs[3]) to adequately undertake on-farm water management and operations and maintenance (O&M) of irrigation schemes;
2) Irrigation development for smallholders by linking them with existing or emerging private agri-business companies in the country by using the concept of out-growers or contract farmers for companies in the project area; and
3) Promote agriculture intensification, enhance agriculture productivity and strengthen market access for smallholders on the irrigation schemes that have already been completed under the PROIRRI irrigation project in Zambezia, Sofala and Manica provinces.

The project also aims to provide INIR with adequate skills and resources to manage environmental and social risks or impacts of its investments (since planning stage to monitoring and auditing).

As indicated the proposed project (IRRIGA) will be geographically focused on the central and northern provinces of Manica, Sofala, Zambezia and Nampula. The project is expected to provide improved irrigation services and market linkages to smallholder farmers in 5,000 hectares of irrigated land cultivated by near 12,000 smallholder farmers in the targeted Provinces. Additionally, the project will provide agricultural intensification and improved market linkages to the new 5,000 ha to be developed plus 3,000 ha of land that will have been developed under PROIRRI.

[2] To explore synergies with other WB projects, such as SUSTENTA or Feeder Roads, sub-project rural roads will likely be financed by these other projects.
[3] The law and regulation governing the establishment and operation of these organizations was developed under PROIRRI.

IRRIGA intends to further develop (i) technical and institutional capacity for irrigation projects national wide, (ii) small scale irrigation infrastructure[4] for smallholder farmers and (iii) means for intensification and improve market linkages. The main different from PROIRRI, while also promoting more infrastructure for irrigated land, is that IRRIGA focus more on intensification and market linkages than PROIRRI did, allowing beneficiaries from PROIRRI to easier market their products and shift from subsistence agriculture to commercial one.

The project will have five main components:

f. Capacity Development of the Irrigation and Agriculture Institutions;
g. Development of Irrigation Systems;
h. Agriculture Intensification and Market Linkages;
i. Project Management, Monitoring and Evaluation; and
j. Contingency and Emergency Response.

The scope and contents of these components and allocation of funds are detailed below.

Component 1 - Institutional Capacity Building (US$8 million of IDA grant). This component is designed to improve the enabling policy environment, support the regulatory framework, improve investment strategy and technical oversight, strengthen institutions and enhance beneficiaries' capacity for sustainable development and management of irrigated agriculture; building up on PROIRRI capacity legacy in MASA and INIR. In response to a request from the Ministry of Agriculture and Food Security, the project will also further support the development of investment planning and management capacity (including environmental and social management) for coordinating all donor funding for the development of irrigation sector in the country. This component will finance three activities: (i) establishing the Agriculture Investment Management Unit (AIMU); (ii) strengthening the capacity of irrigation institutions; and (iii) strengthening the capacity of agricultural institutions and market information systems. It will have the following subcomponents:

- **Sub-component 1.1. Agriculture Investment and Management Unit**. This sub-component will support the establishment of AIMU, to serve as the implementation agency of for MASA program. This Unit will consist of qualified staff hired competitively and will be operationally responsible to plan and implement the agriculture program in the country funded by international partners. Initially the Unit will manage only IRRIGA Project and gradually will evolve and include other investment operations funded by international partners at MASA. Under the IRRIGA Project, the Unit will be responsible for assurance of technical quality (including environmental and social management) in all phases of the development of the irrigation schemes and INIR will be responsible for policy and regulatory framework issues;
- **Sub-component 1.2. Strengthening Irrigation Institutional Capacity**. This sub-component will support the development of regulatory tools for irrigation services, review of the existing institutional structures, and the development of required

[4] As mentioned earlier, it is impossible, at present stage, to put forward the number of hectares of irrigated land to be financed by province or the total number of irrigation schemes to be financed by IRRIGA for the total proposed 5,000 ha; only after screening the potential 15,000 ha against the selection criteria, which can only take place after project inception, data collection and technical capacity is in place at the PIU, that will be feasible.

guidelines, norms and systems for promoting efficient delivery of irrigation services. Specifically, this subcomponent will support the following activities: (i) provide technical assistance to INIR to continue irrigation institutional reforms initiated under PROIRRI; and (ii) strengthen technical and operational capacity of INIR. The regulatory tools and processes were broadly identified as part of the PNI and will be further refined and implemented with support from this project. This includes: (a) preparation and adoption of the public private partnership (PPP) regulations; (b) a review of the INIR's mandates for enhancing its financial and patrimonial autonomy; (c) the development of relevant regulatory tools and contract models for partnerships in irrigation, as defined in the PNI; (d) the development of the regulations and tools for licensing irrigation development in the country; and (e) partnerships with formal education systems in the country (e.g. University Eduardo Mondlane, Universidade Politecnica de Manica among others), including provision of at least 10 internships for irrigation engineering and irrigation economics graduates for up to 12 months of field work.

- **Sub-component 1.3. Strengthening Agriculture Institutional Capacity and Market Linkages**. Increase in crop productivity, cropping intensity, and overall agriculture production is an important objective of this project by gradually transforming the traditional smallholder subsistence agriculture into more productive commercial agriculture. In this context, this sub-component is designed to finance capacity building activities of institutions involved in the development of irrigated agriculture at the national and decentralized provincial/local levels to provide appropriate technical and market information as well as complementary services needed for improved farm level investments. In this sub-component, the focus will be on the following activities: (i) applied agriculture research and development; and (iii) agriculture technology development, transfer and use. This will require effective coordination of actions at the central, provincial and local levels, and preparation of MOUs to implement specific actions to fully utilize the irrigated area developed under this project. This sub-component will promote (i) an increase in crop productivity and cropping intensity; (ii) strategic agriculture specialization; (iii) climate smart agriculture; and (iv) appropriate diversification at the farm level to reduce risk, increase product demand for the market and improve profitability and at the same time promote production and consumption of nutritious food for farmer households and the rural community.
- This sub-component will also pilot the development of a digital platform to use the available tools that could collect, process and disseminate relevant market and price information for decision making related to agriculture production and marketing. The project will also use available agro-meteorological information (agricultural observatory) to generate reports for decision making for relevant institutions involved in the agriculture development. The output could be used to facilitate inter-ministerial meetings, meeting with agro-dealers, inputs suppliers and involve research. These activities will be implemented by relevant departments at MASA, including agricultural research and extension, MITADER, Ministry of Public Works and the Ministry of Trade and Industry, including input suppliers, traders and private agribusiness operators.

Component 2: Smallholder Irrigation Development (US$46 IDA grant). This component will finance the development of 5,000 ha of irrigated land in the project area that will facilitate increased cropping intensity and agricultural productivity and enhanced climate resilience. This will include engineering studies, construction works, and equipment required to fully equip 5,000 ha of irrigated land; of which around 1,300 ha for medium/large rice irrigation

schemes, 3,000 ha for small/medium horticulture crops (vegetables) and 700 ha for value chain specific out-grower crops (e.g. sugarcane, bananas, litchi, avocados and other fruits, and high value vegetables). These crops were selected based on the Government strategies for agriculture development, market needs and existing agro-climatic conditions in the project area.

The construction of the irrigation systems will be tendered to qualified and experienced private sector contractors and the irrigation infrastructure development (rehabilitation and expansion of existing traditional irrigation schemes) is expected to consist of: (a) upgrading the area around the water intake and the main canal; (b) construction of water collection structures and/or rehabilitation of damaged embankments; (c) installation of control structures like water gates; (d) upgrading the main canals and, where necessary, lining critical stretches of the distribution system; and (e) use of local plants/grasses (like vetiver grass) to control canal erosion; associate investments such as rehabilitation of rural roads ("last mile") or connecting power lines (in case of pumping schemes) may also be considered.

The AIMU, will be responsible for technical oversight and quality control of the irrigation infrastructures falling under this component. Priority will be given to gravity-fed canal irrigation systems, as they are relatively simple to operate and maintain, and are less costly compared to the piped systems. Pumping will be considered, if at all, only for high value crops and under exceptional cases.

Component 3: Agriculture Intensification and Market Linkages (Total US$22 million: US$20 million IDA grant and US$2 million from beneficiaries). This component is designed to improve the cropping intensity, productivity, production, competitiveness and market access of near 12,000 smallholder farmers cultivating 8,000 ha of irrigated land in the project area (5,000 from IRRIGA and 3,000 from PROIRRI). This component will finance (i) capacity building through training for the establishment and operation of farmers groups and water user associations as well as local level staff; and (ii) farmers investments, using matching grants and market linkages, to enhance agricultural production and value addition. It will have the following subcomponents.

i. ***Sub-component 3.1. Capacity building for farmers associations and local level staff.*** Under this sub-component, farmer groups and associations, including WUAs, will be trained using the Farmers' Field Schools (FFSs) and the Integrated Program for the Transfer of Agricultural Technologies (PITTA-"*Programa Integrado de Transferência de Tecnologias Agrárias"*) methodologies. In addition, staff from the local government institutions and service providers, including local NGOs, will be trained to provide appropriate assistance to the project's smallholder farmer beneficiaries. Specifically, the project will support capacity building for the technical, institutional, managerial, and marketing skills of smallholder beneficiaries as well as local level staff. After appropriate training, qualified smallholder beneficiaries are expected to apply for investment support through the matching grants to introduce new and improved agriculture technologies to enhance cropping intensity, productivity, production and value chain linkages.

ii. ***Sub-component 3.2 Investment support to enhance agricultural production and value chain linkages.*** This sub-component will provide demand-based matching grants to eligible smallholder farmers, farmers' groups and organizations to introduce new and improved agriculture technologies to enhance cropping intensity, productivity, production, and value addition to increase market access. The project will support three categories of sub-projects: (i) production matching grants for the acquisition of improved

inputs (such as seeds, fertilizer, draft animals, and farm equipment) aimed at increasing agricultural productivity and production as well as support for emerging commercial farmers for innovative activities to increase the area under irrigation and/or increase water storage capacity for irrigation; (ii) value chain matching grants for post-harvest activities, including value addition, equipment, tractors/trucks, storage and marketing facilities to improve value chain linkages and market access; and (iii) at least one pilot partnership arrangement with private sector agri-business operators for the construction of horticulture processing plant in Manica province that is equipped for cleaning, sorting, grading, washing, weighing, packaging and storage of fresh vegetables.

The eligibility criteria for the matching grants consist of the level of the farmer's organization, including the availability of a business/investment plan, agronomic skills, and alignment with project supported value-chains. The implementation arrangements and grant delivery structure will be further developed as part of the Project Implementation Manual (PIM), maximizing the existing capacity at the local and provincial level, with technical support from a central project implementation unit at MASA. Considering that other Bank-funded projects also provide matching grants, the approach to be used in the three categories under IRRIGA will be harmonized with the approach under the ongoing SUSTENTA or MozBio or MozFIP.

Component 4: Project Management, Monitoring and Evaluation (US$6 million from IDA grant). The objective of this component is to safeguard project management efficiency and efficacy, by ensuring the use of resources in accordance with the project's objectives, procedures, and fiduciary guidelines; and monitoring and evaluation (M&E) of the project implementation status and performance, and the achievement of project indicators and development objective. Specifically, the project will finance (i) incremental operating costs for the IRRIGA Project Implementation at the national level led by AIMU and the provincial levels led by Provincial Project implementation Units (PPIUs), related to financial management and procurement, environmental and social safeguard compliance, audits, and reporting; (ii) technical assistance and incremental operating costs for irrigation systems planning, design, construction supervision and training; and (ii) the establishment of a Management Information System (MIS) for irrigated agriculture, and the project monitoring and evaluation (M&E) system.

Component 5: Contingency and Emergency Response (US$0). This component will provide immediate response in the event of an eligible crisis or emergency. This component is a "zero-dollar" Contingency and Emergency Response Component. In the case of an adverse event that causes a major disaster, the Government of Mozambique may request the Bank to channel some financial resources from this component to address the emergency. If agreed by the World Bank, part of the project resources will be re-allocated to this component to finance any critical emergency activities under this component.

The **project total budget is estimated at US$ 82.0 million**, at this stage. The funds will be mobilized from (i) WB/IDA US$80 million (as a grant), and (ii) in-kind and cash contribution from beneficiaries of US$2 million.

The project will build synergies and seek harmonization with other initiatives with the potential of facilitating the fulfilment of the above-mentioned objectives and targets. Important

initiatives include SUSTENTA, MozFIP[5] and its MozDGM[6] and MozBIO, under the Ministry of Environment, Land and Rural Development (MITADER) or the Feeder Roads[7] project, as these projects also aim to invest on agriculture intensification, irrigation, market access or other related infrastructure. The country's strong reliance on agriculture, turns this sector into the main driver of general economic development and rural development. In the past (e.g. in the 1990s), rural development was under the Ministry of Agriculture and since 2015 it has been under the Ministry of Environment and Land. MITADER is conducting several initiatives to promote rural development.

In addition to small and medium size irrigation schemes, which will be the core area for SUSTENTA (under implementation[8] in the provinces of Nampula and Zambézia) it will also fund the development of (i) feeder road upgrade and maintenance; (ii) rural bridges construction and upgrading; (iii) storage facilities; (iv) other types of priority infrastructure; and (v) land delimitation and individual land tenure titling. While falling outside its direct scope all these are crucial for IRRIGA and will occur in the same geographical areas. On the ground and at higher levels coordination will be promoted to ensure maximization of the resources and to avoid duplications.

[5] Mozambique Forest Investment Program
[6] Mozambique Dedicated Grand Mechanism
[7] Integrated Feeder Roads Development Project
[8] SUSTENTA actual implementation started in 2017.

3 PROJECT IMPLEMENTATION ARRANGEMENTS

As illustrated below the project will be implemented by MASA at three levels of implementation, i.e. (i) national, (ii) provincial, and (iii) district levels. Environmental and Social Safeguard Specialists (ESSS) will be present at the first two levels. There will be a Project Implementation Manual (PIM) to guide all actors in the process.

At the National Level MASA will be responsible for the overall implementation of the project, in full consultation with the other relevant Ministries to ensure consistency of the project activities with national policies and programs. A Project Coordination Committee (PCC), chaired by the Minister (or - by delegation – by the Vice Minister), with participation of MOPHRH, MITADER, and Ministry of Industry and Trade (MIC), will have the overall decision-making responsibility regarding the management of the project. The PCC will be responsible for the approval of work plans and budgets, and oversight on compliance with World Bank fiduciary requirements. The Director General of INIR (within MASA) will be the executive level head responsible for strategic direction of the project with support from the Project Technical Team (PTT). The Project will establish a Program Implementation and management Unit (will be called AIMU) at MASA and will be responsible for day-to-day management of the project. The AIMU will be composed by a Project Coordinator (PC), a communication specialist, one environmental and one social safeguards specialist, an M&E specialist, a procurement specialist, a financial management specialist and irrigation design and supervision team.

At the provincial level the Provincial Directorate of Agriculture will be responsible for implementation of the project in coordination with the provincial government directorates and district governments. A Provincial Project Coordination Committee (PPCC), chaired by the Provincial Governor, will oversee project implementation, including monitoring project progress at the provincial level and making decisions in line with the objectives and institutional arrangements that are consistent with the project document and legal agreements. The PPCC will approve the project annual plans and annual reports. The Provincial Director of Agriculture (within the provincial government) will be responsible for strategic direction of the project at the Provincial level. A Provincial Project Implementation Unit (PPIU), headed by a Provincial Project Coordinator (PPC) with support staff, will be established within the Provincial Directorate of Agriculture and will be responsible for day-to-day management of the project at the provincial level. A small executive Provincial Project Technical Team (PPTT) that will include one environmental and social safeguard specialist per province, responsible for ensuring adequate safeguard planning, assessment, approval, monitoring and reporting.

At the District Level the District Office of Economic Activities (SDAE) will be responsible for project implementation at the district level, in coordination with District Services for Planning and Infrastructures and consultation with the District Administration. The SDAE will obtain the consent of the District Administration before forwarding sub-project proposals for matching grants to the provincial level. The preparation and implementation of sub-projects for matching grants is at the level of irrigation scheme and smallholder farmer groups and associations. In order to ensure environmental and social safeguard implementation at local/district level a Safeguard Focal Point will be appointed support on safeguard assessment, monitoring and reporting.

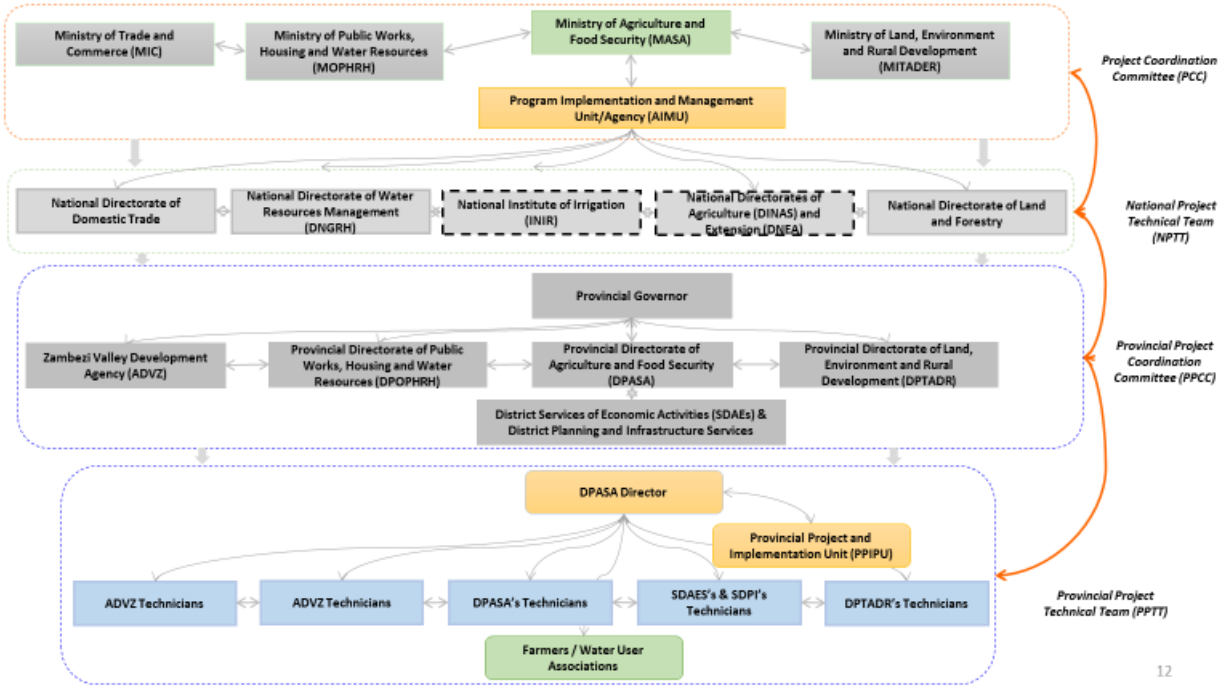


Diagram 3-1: Project implementation structure

IRRIGA focus will be on irrigation schemes and on all the processes that facilitate the realization of the potential of this subsector. Other than financing the rehabilitation and operation of irrigation schemes and agriculture intensification and market linkages through facilitating the improvement of cropping intensity, productivity, production, competitiveness and market access (storehouses, processing units and basic infrastructure), the IRRIGA will not be directly primarily involved in the funding of other infrastructures that are fundamental for agricultural and irrigation development such as (i) feeder road upgrade and maintenance; (ii) rural bridges construction and upgrading; (iii) electrification and telecommunication; (iv) other types of priority infrastructure. These will be under other projects and IRRIGA will seek to build synergies with them and this will be reflected in the structure and contents of the work of the above-mentioned coordinating and management bodies; only where these other projects are not covering IRRIGA provinces or municipalities, the latter will be financing these associate infrastructures.

As also mentioned SUSTENTA, under MITADER, which will also fund the development of small and medium size irrigation schemes and is also taking place in two of IRRIGA provinces (Nampula and Zambézia), will finance significant parts of these other components including land delimitation and individual land tenure titling as will other public and private initiatives.

Concerted partnership with SUSTENTA and other initiatives and projects (MozFIP and its MozDGM and MozBIO and Feeder Roads) and other will be a fundamental approach to be adopted by IRRIGA.

4 DEVELOPMENT CONTEXT

4.1 Mozambique

This chapter provides an overview of the country's development context, its main natural and social traits, the position of agriculture and irrigation in national development, and selected information about the provinces in the project area and about the project area in general.

With 49% of the country's total wealth being made of natural capital, as opposed to an average of 24% in the other sub-Saharan African countries, Mozambique is one of the most endowed countries in Africa in terms of natural resources (AFD, 2009)[9]. However, despite this privileged position, according to the 2015 Human Development Index, from the United Nations Development Program (UNDP), Mozambique ranks 180 out of a total of 187 countries. More than 50% of its population lives under poverty.

There are also regional imbalances in development with the southern provinces of the country (except for Gaza province[10]) representing about 48% of the national GDP, while Maputo City itself, which covers only 5% of the total population, represents 18% of the total GDP. The central (29%) and northern (23%) regions come in the second and third positions, respectively. Yet these two regions are the most populated and endowed with natural resources.

Nevertheless, the country's economic performance was remarkable between 1995 and 2013-2015. The Gross Domestic Product (GDP) growth rate has been in the region of 7.4 in the period, which was informed mainly by a few large-scale capital investment projects, sound financial management, political stability and significant donor support. As with growth in some other developing countries in the SADC region (e.g. South Africa, Angola, etc.), the benefits of economic growth have not been enjoyed by all citizens and the link between economic growth and poverty reduction has been weak. Benefits from large scale capital investment projects tend to accrue to those who are already economically better-off (i.e. mostly minority groups residing in urban areas), as opposed to much poorer people who form the bulk of the population and particularly those living in rural areas. Urban poverty has also been showing a growing trend in the last two decades.

Political tension during the period 2013-2016, the discovery of hidden debts (2015/2016) and the decline/fluctuations of the prices of the commodities that Mozambique was starting and/or promising to export (mainly coal and gas) in the same period, have been accompanied by deacceleration of economic growth, reduced injection of foreign capital, and aid from donors. This was accompanied by high inflation and elevated depreciation of the national currency. After tight monetary policy reforms to control currency depreciation and fiscal deterioration inflation has decreased from close to 27% in October 2016 to 18% in March 2018 (BM, 2018), but the financial situation remains difficult and marked by uncertainties. Micro Small and Medium Size Enterprises (MSMEs), which are

[9] 49% of the country's total wealth is natural capital, as opposed to an average of 24% in the other sub-Saharan African countries.
[10] It represents close to 6% of the population and just under 5% of the GDP.

the dominant business entities in the country are the most affected by this complex context as they struggle to have access to finance and other forms of facilitation.

The effects of climate change, which tend to affect poorest countries with low resilience and lesser adaptive capacity, have further exacerbated the national economic challenges.

4.1.1 PHYSICAL ENVIRONMENT

As shown in Figure 1-1, from the geomorphological point of view Mozambique is divided into two topographical regions: (i) to the north of the Zambezi river, there is a narrow coastline and bordering plateau slope upward into hills and a series of rugged highlands punctuated by scattered mountains; (ii) south of the Zambezi River, the lowlands are much wider with scattered hills and mountains along its borders with South Africa, Swaziland and Zambia.

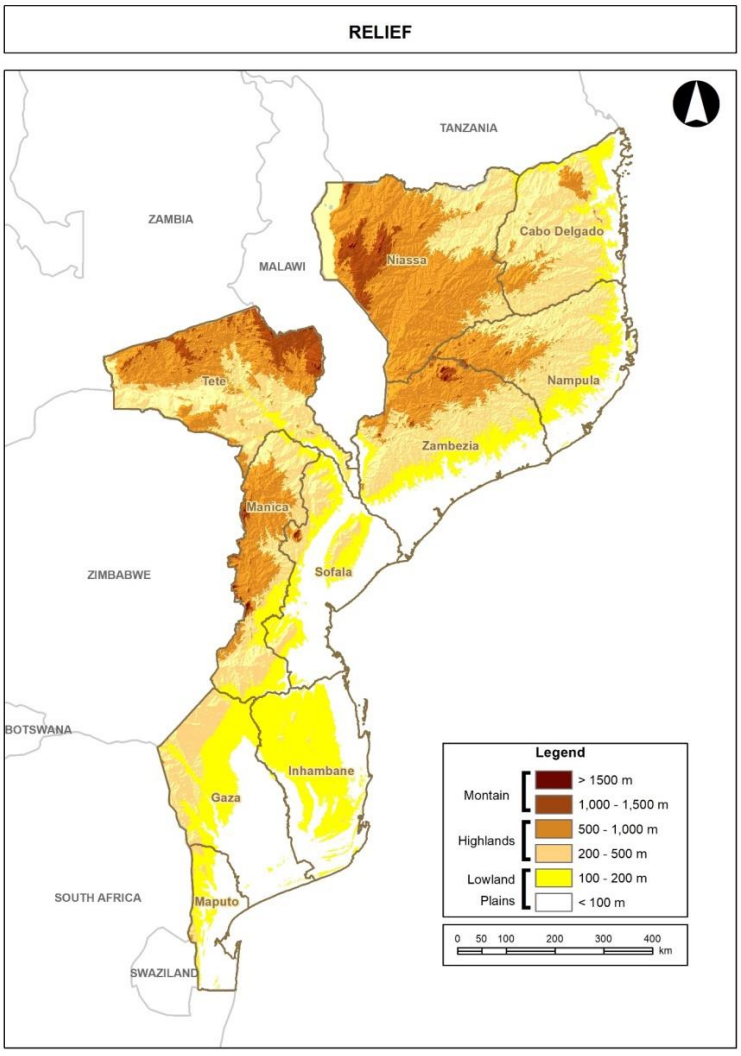


Figure 4-1: Mozambique physiography

The southern coastal areas have low water levels and extensive swamps, which make them prone to severe inundations in times of heavy rains. Monte Binga (in Manica

province), peaking at 2,435 m, is the highest point of Mozambique; the Indian Ocean (0 m) is the lowest.

The country is drained by several important rivers, nine of which are international[11]. The Zambezi is the largest and most important river, the fourth-longest in Africa, and the largest flowing into the Indian Ocean from Africa. Lake Niassa (also Malawi), which is part of the Zambezi River basin, is the country's major lake. Cahora Bassa dam, along the Zambezi River, is Africa's fourth-largest artificial lake. A small slice of Lake Chiuta is found in Mozambique. The river is subdivided into 27 sub basins, spread over five provinces (**Manica**, **Sofala**, **Zambézia**, Tete and Niassa), which includes three of the IRRIGA targeted provinces (DNGRH, 2017). A large swathe of the Zambezi River Delta contains clearly visible evidence of center-pivot irrigation meaning that there already extensive irrigated agriculture taking place in the Delta. It therefore makes sense that the fertile soils of the Zambezi Delta are incorporated in the smallholder irrigated agriculture and market access project as this can be considered a mecca for agriculture. There is an agency responsible for the management of the Zambezi River Valley (ADVZ[12]) and a Special Land Use Plan (PEOT[13]) for the Valley was formulated in 2015. Since 2016 the Strategic Plan for the Utilization and Development of Zambezi River Basin has been under formulation. Together with the PNI, formulated under PROIRRI, these are important sources of information and facts related with the strategic plan to use Zambezi River Basin resources, including the development of small and medium size irrigation schemes.

The other important rivers in Mozambique are Limpopo, Incomati, Save, Púngoè, Buzi, Lúrio and Rovuma. Save, Púngoè, Buzi and Lúrio are in the project area. Lúrio (associated with Nampula province, in this case) is an important river in Mozambique with the advantage of being confined within the country's boundaries. The other four major rivers are shared with other neighboring countries and this comes with specific requirements in the management of their water courses. The Strategic Plan for the Utilization and Development of Lúrio River Basin was formulated in 2017, and should also be used to devise the best ways of developing IRRIGA subprojects where these will fall under it.

The country has a tropical climate with two seasons, a wet season from October to March and a dry season from April to September. Climatic conditions vary depending on altitude. Rainfall is heavy along the coast and decreases in the north and south. Annual precipitation varies from 500 to 900 mm (19.7 to 35.4 in), depending on the region, with an average of 590 mm. The east and the south have a more erratic rainfall while the north and west exhibit significant regularity. Cyclones are also common during the wet season.

4.1.2 BIOLOGICAL ENVIRONMENT

The biological environment is primarily shaped by the climate, altitude and by the soil types and textures throughout the provinces and districts. An additional factor, which strongly influences the state of the environment is the human use of biological resources

[11] Maputo, Incomati, Umbeluzi, Limpopo, Save, Buzi, Pungwe, Zambezi, and Rovuma.
[12] Agência do Desenvolvimento do Vale do Zambeze.
[13] Plano Especial do Ordenamento Territorial do Vale do Zambeze.

(e.g. deforestation for timber, fuelwood/charcoal, construction, and subsistence such as hunting and fishing).

Mozambique has about 5,500 species of plants (including macroalgae) distributed in five Phyto-geographical regions and organized in communities with miombo, mopane, undifferentiated woodlands and coastal mosaic being the most common. The country's vegetation can also be divided into groups of land use and cover. Two centres of endemism (CE) have been identified in Mozambique namely Maputoland (in the south) and Chimanimani Nyanga (in the central region). Additional sub-centres are being proposed for the coastal forests (northern Mozambique) and inselbergs (in central and northern Mozambique).

About 4,271 species of terrestrial wildlife were recorded with 72% insects, 17% birds, 5% mammals and 4% reptiles. The terrestrial fauna has undergone significant change in the last 40 years due to population increase, development and the political instability that ended in 1992, which confined most of the large mammals to existing conservation areas. It is estimated that eight (8) mammals are either extinct or in danger of extinction and these also include the black rhino and giraffe. The man-animal conflict is a significant main problem in the conservation areas. 735 species of birds, most of them migratory, occur in almost all habitats of Mozambique; with emphasis to the complex of Marromeu, which supports many species of waterfowl. Many of the identified endemic species, rare and threatened habitats are associated with isolated mountain, as are the cases of inselbergs, Chiperone and Namuli hills, Mecula and Gorongosa Mountains and Chimanimani massive. About 17 species of birds make up the country's red list. Threats to birds are mostly from anthropogenic activities such as deforestation forest degradation associated with a series of socioeconomic activities (MICOA, 2009[14]).

4.1.3 SOCIAL ENVIRONMENT: POPULATION AND THE ECONOMY

Out of the country's eleven provinces the last population census (INE, August 2017) indicates that Mozambique is inhabited by 28,861,863 people. Nampula (6,102,867) and Zambézia (5,110,787) provinces represent close to 39% of the total, while the four provinces in the project area combined represent 53% of the total population (Manica and Sofala have 1911237 and 2221803, respectively. Close to 51% of the country's population are women.

People tend to concentrate along the main rivers, water courses and bodies and along the main development corridors made of roads, railways and other infrastructures.

A vicious cycle made of natural conditions, lack of capital, inadequate financial services, archaic production technologies and poor 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

[14] The National Report on Implementation of the Convention on Biological Diversity in Mozambique.

are combined to guarantee the survival of the individuals, the families and the communities.

Some of the aspects that define the practice of agriculture in Mozambique and the project the area, which are typical of the so-called "family sector"/subsistence economy are:

- Cultivation of very limited areas: slightly close to 2 ha and below 7 ha is the common size of most of the farms[15].
- 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[16].
- Over the years the family sector farmers have developed livelihood strategies oriented towards minimizing risk through crop diversification, which takes place in a variety of ways including:
    - Growing several crops and the dominance of intercropping;
    - Preferring to grow two or more consecutive crops rather than 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.

At the household level artisanal fisheries is the second most important economic activity practiced in the rivers, lakes and the long Indian Coast and the main source of animal protein in Mozambique.

The dominance of agriculture and fisheries as the main subsistence activities goes hand in hand with other activities including the emerging commercial sector of agriculture made of small and medium size farmers, which although still in small numbers, are become increasingly important in Mozambique. Artisanal mining is also another important economic activity as is formal and informal employment in local cities and towns in the public and private sector and local services (banks, telecommunications, water supply and sanitation, etc.).

Both formal and informal Micro, Small and Medium Size Enterprises (MSMEs) represent about 98.6% of all business units, 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

[15] The informal character of agriculture and animal production, which are dominant economic activities, 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.

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

accommodation 20% and manufacturing less than 10%. Most of these MSMEs tend to grow informally and as a reaction to immediate market deficiencies.

In what is relevant for the project, studies show that despite the MSMEs' 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[17]. Local entrepreneurs tend to diversify into many relatively small and uncompetitive businesses rather than growing promising small businesses into large ones that could reach out to more people and offer more income generation opportunities (job creation, gender mainstreaming, etc.).

The "Strategy for the Development of Small and Medium Size Enterprises in Mozambique" approved by the government in 2007 highlights the central role of MSMEs as drivers of employment, competitiveness, diversification and innovation, including mobilization of social resources. The strategy relies on 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.)

Priority is also given to the reduction of transaction costs for SMEs.

4.2 Agriculture and Irrigation

Close to 40% (36 million ha) of the 800,000 km² of Mozambique territory are arable land. At present only 10% of the total arable land is under cultivation of which only 1% is in the hands of commercial agriculture (i.e. medium and large enterprises that focus on cash crops[18]). The remaining 99% of the cultivated land is in the hands of subsistence farmers and are distributed by close to 4.0 million small farms of slightly above 1 ha and less than 10 ha in size.

Agriculture contributes 26% of total GDP and is the source of livelihood for 78% of the population. The sector has been displaying considerable growth averaging 6.8% over the period 1996 to 2015, which was less than the growth of the GDP of around 7% over the same period. The main negative contributing factor has been the high vulnerability of agriculture to natural disasters, mainly droughts and floods, particularly in the southern and central regions.

In 2011 the government approved the agricultural strategic plan (2011), i.e. PEDSA, with the aim of: (a) producing sectoral synergies to transform the agriculture sector from being predominantly one of subsistence farming into being more competitive; (b) embodying a vision that is shared by the sector´s key actors; and (c) dealing with the issues that affect investor confidence.

[17] M. Krause and F. Kaufman, "*Industrial Policy in Mozambique*", 2011
[18] Mainly sugar, tobacco, cotton, and more recently fruit (e.g. banana).

Due to the high dependence on hydro-meteorological factors one important subsector in the development of agriculture is irrigation.

Historically, the total irrigated area fell from around 120,000 ha in the mid-1970s, after the country's independence, to close to 40,000 soon after the end of the civil conflict in 1992, and there is still a lot of work to be done to rehabilitate existing irrigation systems even before new ones are built. There are currently around 180,000 ha that have different forms of infrastructure for irrigation, of which only close to 50% are used mainly for sugarcane and increasingly some banana/fruit production. Only 8.8% of family sector farmers use some form of irrigation (TIA, 2008).

The country's irrigation strategy (EI, 2011) gives an orientation on how to establish the irrigation schemes and the property rights of the infrastructure. With the WB support a growing recognition of the importance of irrigation in the development of the country's agriculture led, among other developments, to the formulation and implementation of the Sustainable Irrigation Development Project (PROIRRI – 2011-2018), to which IRRIGA will be a form of continuation and consolidation.

After decades of stagnation PROIRRI has been an attempt of revitalizing the subsector. It focused on increased market led agricultural production and increased productivity in the development of new or improved irrigation schemes in central Mozambique. The project targeted the provinces of Manica, Sofala and Zambézia and it is expected to make available 3,000 ha of operational irrigation schemes, which will precisely be inherited by IRRIGA.

During PROIRRI implementation the National Institute of Irrigation (INIR) was established in 2012[19] and the National Irrigation Program (PNI) was formulated and approved in 2016.

INIR is the unit under the Ministry of Agriculture and Food Security (MASA) responsible for irrigation development. It works in close collaboration with the other MASA departments responsible for agrarian and extension services, such as the Department of Agriculture and Silviculture, the Department of Agrarian Extension; and the Agrarian Development Fund. It also collaborates with other relevant institutions for irrigation development, notably the National Directorate of Water Resources Management (DNGRH), from the Ministry of Public Works, Housing and Water Resources (MOPHRH), which is responsible for water resources planning and allocation, including the development and operation of major hydraulic works through the Regional Water Administrations (ARAs[20]). As shown in Figure 4-2, the country is subdivided into five regional water administrations (ARAs), i.e. Southern (Sul); Central (Centro), Zambezi (Zambeze), Central-North (Centro Norte) and North (Norte). There is also collaboration with the National Directorate of Land and Forestry in the Ministry of Land, Environment and Rural Development (MITADER), responsible for land allocation and titling.

Despite being defined as administratively and financially autonomous by its statutes INIR operates typically as any other national directorate within MASA and it is highly dependent on the government budgeting and funding systems and cycles. Among other

[19] Decree 09/2012, of May 11

[20] The country is subdivided into five regional water administrations (ARAs), i.e. Southern (Sul); Central (Centro), Zambezi (Zambeze), Central-North (Centro Norte) and North (Norte).

aspects this means that it does not have the necessary revenue stream, financial autonomy and ultimately technical capacity to flexibly undertake initiatives in the development and management of irrigation schemes and the host of issues (human, technical, institutional, financial, etc.) around the sustainability of those schemes.

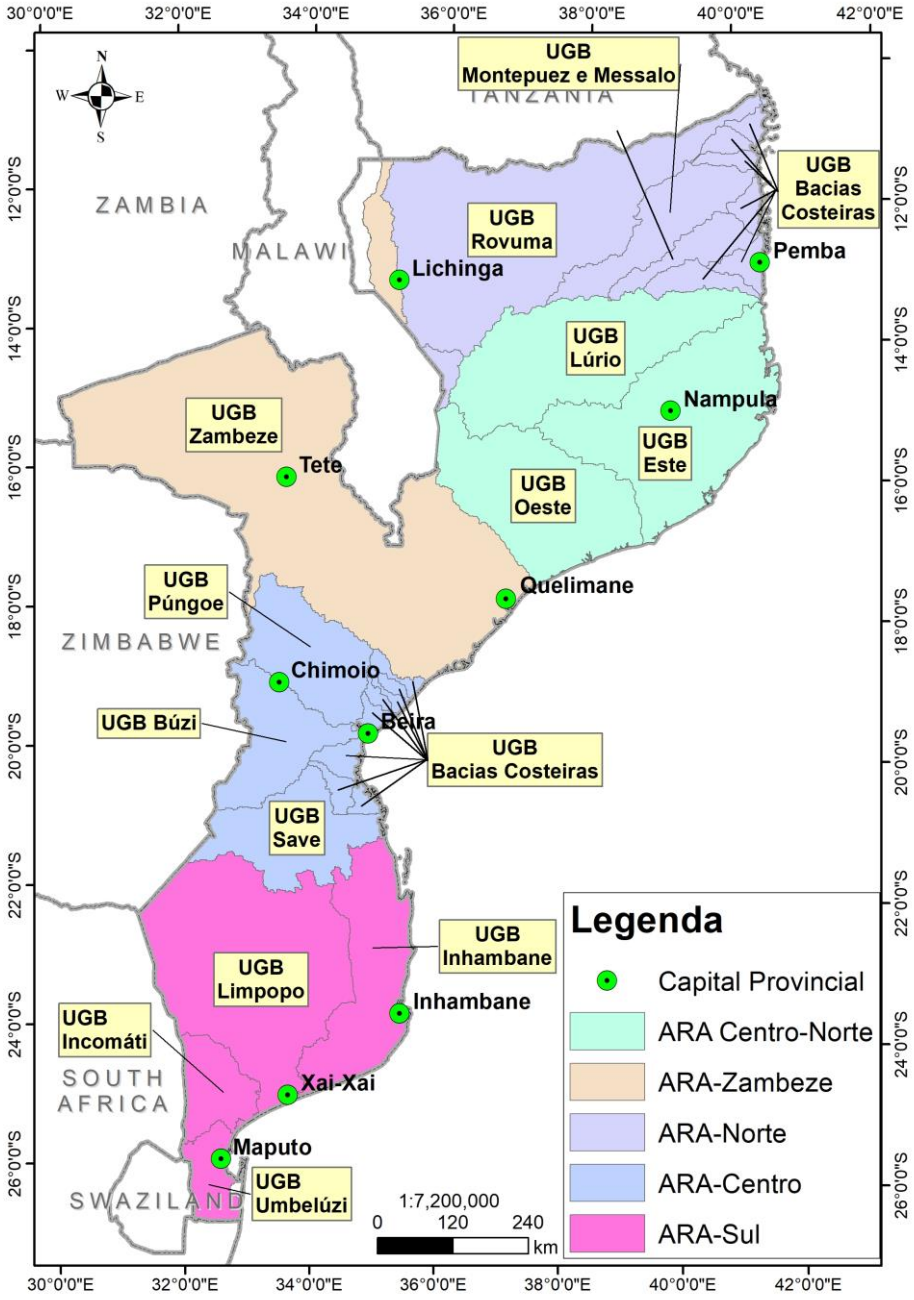


Figure 4-2: The five Regional Water Administrations in Mozambique (ARAs)

The PNI consists of a series of reforms and investments aimed at addressing critical irrigation development needs and medium-term food security targets for the country. The program considers three development scenarios, i.e. moderate, medium and high. Under the moderate scenario it is expected that close to US$ 1 billion will be invested to at least develop additional 125,500 ha (32,000 ha public and 90,500 ha private) of irrigated land

by 2042. The initial phase of IRRIGA is focused on strengthening INIR's institutional capacity to plan for and manage irrigation infrastructure and services. Water Users Associations (WUAs) have also been identified as crucial in the system. They are expected to contribute to improve agriculture and on-farm water management, and operations and maintenance (O&M) of the irrigation schemes after receiving the necessary capacity building. The law and regulation for the creation and operation of WUAs was formulated under the auspices of PROIRRI.

PNI implementation will require technical capacity and financial resources to significantly enhance the irrigation sub-sector to contribute to the critical strategic objectives of the agricultural sector of "increased production and agricultural productivity and the competitiveness of this sector to contribute to reducing food insecurity, increasing marketable surpluses and thus incomes from agriculture", as enshrined under PEDSA (MINAG, 2011). These are the issues that will be addressed by IRRIGA through the five components outlined above.

4.2.1 WATER AND IRRIGATION

Mozambique's vast water resources are well known. **Error! Reference source not found.** shows the main rivers in the project area and Table 4-1, estimates IRRIGA's six (6) river basins flow/runoff, as well as current and future uses with IRRIGA's additional 5,000 ha of rehabilitated and expanded irrigated land over these 6 river basins where IRRIGA sub-projects will potentially be sited (in Lúrio, Meluli, Licungo, Zambeze, Púngoè, and Buzi river basins), assessing the cumulative impact of current demands plus IRRIGA foreseen water demands at each river basin level. These estimates state clearly that, at river basins level, the future cumulative water demand with IRRIGA ranges from 0.16% to 4.1 %, which is minimal.

Figure 4-3: Main rivers in the project area

As stated above Zambezi, Lúrio, Púngoè and Buzi are the dominant rivers complemented by a series of tributaries and other minor rivers and water courses and bodies.

Table 4-1: Cumulative water abstraction from 6 IRRIGA river basins and Potential Areas for Irrigation Development in the Project Areas

River Basin	Mean Annual Runoff (million m^3)	Cumulative water abstraction (million m^3)*	Province	Potential Area (ha)				Key issues
				Total	Rice	Horticulture	Sugar cane	
Lúrio	9,630	51 (0.53 %)	Nampula	770		770		Limited storage capacity. Systems are primarily traditional irrigation canals
			Zambézia	115		115		Hydraulic structures dilapidated. Traditional irrigation canals with high water losses
Meluli	2,539	6.9 (0.27 %)	Nampula	540		540		system operating but require expansion for full utilization of irrigation potential
Licungo	9,630	14.9 (0.16 %)	Zambézia	3,165	3,000	165		Systems dilapidated and partially operational. No major rehabilitation done and repairs mostly done locally
Zambeze	100,422	382 (0.38 %)	Zambézia	1,035	600	435		Systems dilapidated, partial rehabilitation, difficult access. High operational costs due to energy inefficiencies.
			Sofala	370	370			Systems dilapidated and partially operational. Small repairs done locally
Púngoè	4,272	179 (4.1 %)	Manica	1,921		1,921		Systems operating below capacity and hydraulic structures require rehabilitation. Very good agro-climatic conditions for horticulture
			Sofala	1,301		1,001	300	Systems dilapidated and partially operational. No major rehabilitation done, except for some sugar cane schemes and repairs mostly done locally
Buzi	7,982	152 (1.9 %)	Sofala	5,657	657		5,000	Systems dilapidated, partial rehabilitation, difficult access. High operational costs due to energy inefficiencies.
			Total	**14,874**	**4,627**	**4,947**	**5,300**	

*** Includes current and IRRIGA estimated abstractions (source: PNI, Lúrio and Zambezi river basin plans, ARA Centro, ARA Zambezi and ARA Centro-Norte estimates)**

4.3 Climate change

Globally, southern Africa is one of the most vulnerable regions to the impacts of climate change.

The country experiences high levels of climate variability and extreme weather events (i.e. droughts, floods, and tropical cyclones), which when combined with the country's hypsometry translate into serious damages. Droughts are the most frequent disaster,

occurring every three to four years, and pose a major constraint to development given that most of the population of Mozambique reside in rural areas and rely on rain-fed agriculture. As shown below (Figure 4-4) Mozambique also lies at the end of nine transnational river basins and flooding in its deltas is a perennial threat to both farmers and infrastructure, especially when coupled with cyclonic storm surges. Four of these river basins (Zambeze, Púngoè, Buzi and to some extent Save) are found in the project area.

Box 4-1: Climate change related variations

Existing data suggests that mean air temperatures will rise by at least 1.8 to 3.2°C nationwide by 2075 (MICOA 2003: 71). Precipitation is predicted to fall by 2 to 9 per cent, which will take greatest effect between November and May (during which period the IPCC forecasts there will be a 5 to 15 per cent drop in regional rainfall). This will have an especially pronounced impact on crop yields, as this coincides with the growing season. Other expected changes are a 2 to 3 per cent increase in solar radiation, and a 9 to 13 per cent rise in evapotranspiration.

The occurrence of different categories of extreme events is reasonably well mapped in Mozambique. The country's river basins that are prone to major flooding and impacts are Maputo, Umbeluzi, Incomati, Limpopo, Save, Buzi, Púngoè, Zambezi, Licungo and Messalo. Those with the largest number of displaced people, flooded areas, loss of crops are the Limpopo and Zambezi. The basins where there are the greatest damages in road infrastructure are Limpopo, Incomati, Umbeluzi and Púngoè. Hypsometry and geographical location (e.g. coastal vs hinterland) are also important determinants of the geographical location of these extreme events. Accordingly, while floods are a phenomenon of the southern and central regions cyclones are most frequent in coastal and marine areas. The southern and central regions also experience frequent droughts than the northern, where rains tend to have a more regular pattern. The provinces with the highest incidences of cyclone occurrence are Inhambane in the south, Sofala in the center, and Nampula in the northern region of the country. Sofala, Zambezia and Nampula are within the project area. The first two in the central region and the latter in the north. Thus, three of the targeted provinces and especially their eastern and low laying areas are among the most exposed.

Living with the effects of climate change, as imposed in the foreseeable future, calls for adaptation and mitigation measures to offset or reduce such effects. Over the years, different sectors (agriculture, fisheries, water, public works, transport and communication (tourism, energy, mining, forestry and fauna) have gathered significant data to allow the country to knowledgeably tackle recurrent natural disasters, including developing adaptation in terms of finding ways of developing economic and social activities under conditions caused by climate change and preventing and mitigating negative impacts on socioeconomic activities. Efforts are underway to effectively use this knowledge base to increase the country's resilience to this phenomenon.

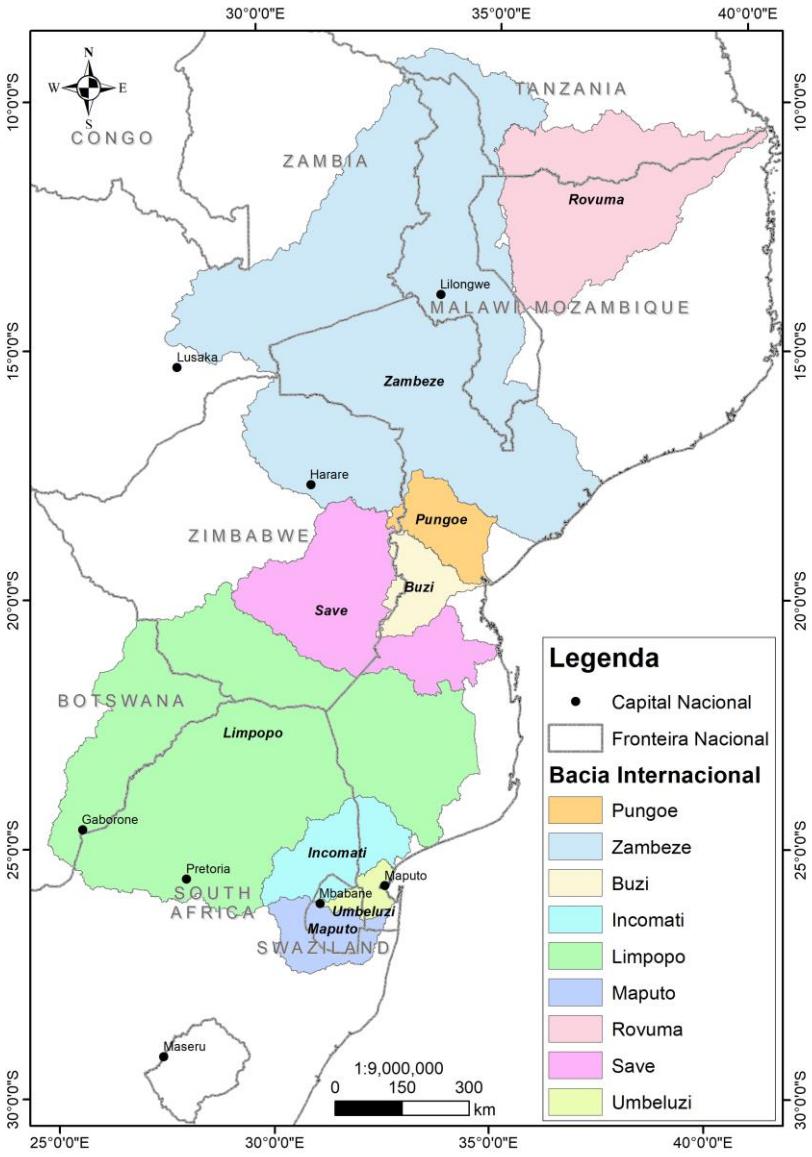


Figure 4-4: International river basins in Mozambique

Investments and actions being undertaken include but are not limited to: (i) prevention of natural hazards and improving its early warning systems; (ii) reaction measures; and (iii) reconstruction after a disaster strikes. Adaptation measures are being implemented in all relevant sectors with particular attention being paid to the coastal zones and erosion control (Climate Risk and Adaptation Country Profile, 2011[21]), where it is estimated that close to 60% of the country's population lives.

The priority adaptation measures identified in the Mozambique National Adaptation Programme of Action (NAPA, 2007), which have been translated into projects, include the following:

- Improving early warning systems;
- Strengthening farmer coping capacities;

[21] *World Bank Group. Global Facility for Disaster Reduction and Recovery (http://countryadaptationprofiles.gfdrr.org).*

- Improving the knowledge and management of rivers;
- Limiting erosion;
- Developing sustainable fishing;
- Promoting public awareness of climate change;
- Improving agency coordination;
- Integrating climate change into decentralized district planning.

Some of the adaptation and mitigation measures will be outlined for subprojects under IRRIGA. Adaptations mechanisms for different sectors have been identified and are indicated in the table below. These will need to be considered in the design of subprojects identified for IRRIGA, which will either be new projects or existing projects carried over from PROIRRI. A key example of adaptive measures for the agricultural sector would include the need for farmers to adjust their crops and seeds considering the shifting suitability of lands for the harvesting of crops under conditions of climate change. The types of crops or seeds that are selected ought to be informed by the anticipated climatic regimes because of climate change.

Table 4-24-2: Adaptation options by sector in the in the Climate Risk and Adaptation Profile Report for Mozambique

Sector	Adaptation option
Agriculture/food security	• Switch to different cultivars (drought tolerant/shorter cycle); • Improve and conserve soils; • Agricultural research and transfer of technology; • Establish seed banks; • Target degraded areas for new cultivars, including crops with shorter growing cycles; • **Improved and expanded irrigation systems**, monitoring and control of pests and diseases; • Improving grazing practices to conserve soil fertility, and promoting hay feeding; • Encourage community reforestation using native species.
Coastal Zones and Marine Ecosystems	• Develop Integrated Coastal Zone Management; • Develop/plan new investment requirements; • Research/monitor the coastal ecosystem; • Reforestation in logged mangrove zones.
Water Resources	• Increase water supply, e.g. by using groundwater, building, improving or stabilizing reservoirs; • Watershed management, desalination; • Improve or develop water management, including monitoring tools for use by dam operators; • Establish a regulatory framework for dam and water-way security.
Energy	• Promotion of hydro and alternative energy sources to meet some of the nation's mounting energy demands; • Advance bio-energy technology in rural areas • Expand nation's energy grid.
Infrastructure	• Pre-investment studies of renewable resources • Relocation of vulnerable housing and industrial zones; • Construction of durable and securely located buildings; • Building of dune barriers and fortified sea walls; • Dredging of critical canals; • Improved engineering standards of roads to sustain heavy rainfall.
Urban Areas	• Improve urban sanitation;

Sector	Adaptation option
	• Combat water pollution in over-burdened and underutilized water systems; • Improve waste management.

Some of the adaptive measures/options are specifically relevant to the IRRIGA project, especially those concerning agriculture and food security, water resources, as well as energy and infrastructure in general. Specific adaptation options should be tailored into the design of subprojects identified for inclusion in IRRIGA. Disasters brought about by climate change are often accompanied by losses of human lives, damages to public and private assets, which translate into significant GDP losses. These offset the country's efforts to eliminate poverty and interfere negatively with development.

Since independence successive governments have sought to establish adequate mechanisms for reducing vulnerability through development and adoption of policies, strategies, action plans and setting up adequate institutional arrangements to manage disasters, poor coordination and lack of effective leadership have been offsetting the existing potential and delaying the use of the resource base to establish clear lines of response articulating all levels (central, provincial, district, municipal, local, community, etc.). Prevailing isolated and every so often overlapping initiatives have translated into dispersion and inadequate use of the scarce resources.

The inclusion of further climate change mitigation and adaptation measures into the project could be highly relevant as they will be implemented in areas with significant level of exposure to this phenomenon involving poor communities.

Awareness of the climate change dimension of development can be expected to assist in the (i) identification of critical areas of intervention which harmoniously should combine mainstreaming environmental management and climate change adaptation with overall socioeconomic development and be consistent with interventions in those areas. Evidence shows that extreme events are often made worse by poor land use planning. Recurrent floods and inundations due to rainfall and/or sea level rise are made worse by inadequate siting and design of public and private infrastructures that extend to situations in which well mapped and demarcated flood plains and water lines are used for wrongly setting up infrastructures including roads, dikes, water supply and sanitation, irrigation and drainage systems and others.

Important areas of lessening the effects of extreme weather events are related with good practices in the use and management of natural resources such as vegetation (e.g. avoiding deforestation and forest degradation), soil and water. Negative practices around these environmental components tend to exacerbate the effects of extreme hydro-meteorological events.

The levels responsible for implementing mainstreaming interventions (provinces and mainly districts, municipalities and communities) need to be provided with solid science-based information, knowledge, attitude and behavior by the sectors and where relevant in combination. In this regard the inclusion of climate change in the IRRIGA subprojects is also highly relevant. IRRIGA will adopt a proactive approach to dealing with these phenomena.

4.4 An Overview of the Project Area

IRRIGA project will be implemented in four provinces, i.e. Sofala, Manica, Zambézia and Nampula. The first three were also part of PRIORRI, of which IRRIGA is a natural continuation and from which it will inherit 3,000 ha of irrigated areas to then develop additional 5,000 ha across these four provinces. Most of the irrigation schemes to be inherited from the three provinces under PROIRRI and their main characteristics can be seen in Annex 2.

This subchapter provides and overview of these provinces from the point of view of biophysical and socioeconomic environment. Potential project environmental and social impacts under this ESMF, related PMP, RFP and later ESIA/ESMP and RAP, and the host of environmental and social management systems to be adopted by the project etc. will be identified, assessed and managed against the main characteristics of this receiving environment.

4.4.1 SOFALA PROVINCE

Sofala Province has a population of 2,221,803 inhabitants (Census of 2017) distributed in 13 districts namely: Búzi, Caia, Chemba, Cheringoma, Chibabava, Dondo, Gorongosa, Machanga, Maringué, Marromeu, Muanza and Nhamatanda. The total surface area of Sofala is around 68,018 km^2 (i.e. 9% of the country's surface area) with a population density of 32.7, it can be defined as a relatively sparsely populated. Combined with good rainfall and good conditions for agriculture (fertile soils) this bodes well for the expansion of irrigation and market access in this province. There are two distinct climatic seasons in the project area: a hot rainy season from December to March and a cooler drier season from April to November, with rainfall recorded in all months of the year.

The City of Beira is the capital of the Sofala Province, located in the central region of Mozambique and it is the second largest capital city in the country. Beira City is located below the sea level and as a result tends to experience soil erosion problems. Trade and commerce and economic growth continue to increase in Beira, while informal trade is also increasing exponentially. The Beira Port, the Development Corridor and the Sena Railway Line, as well as the city's geographical location make Beira economically attractive given its strategic position in linking the central and northern regions of the country. This strategic location is equally of importance to Mozambique's landlocked neighboring countries, which make use of both the Beira Corridor including the Port for communication and transportation of goods and services to and through the country.

Ecologically important areas in Sofala Province include the isolated Gorongosa Mountain Rift Valley Complex, which rises to 1,863m in the southern-most Mozambican sector of the African Rift Valley, as well as the Beira Corridor and the Buzi River floodplain. Orographic rainfall provides the mountain with an annual rainfall of over 2,000mm per year. The mountain supports tropical to montane rainforest on its summits with heath grasslands. Endemic and near-endemic plants and animals occur within the mountainous habitats. Examples include the Green Headed Oriole (*Oriolus chlorocephalus*) sub-species, characterized by a white wing patch found on the Gorongosa Mountain, the Dappled-mountain Robin (*Modulatrix orostruthus*), the Chirinda Apalis (*Apalis chirindensis*) a restricted range species, Swynnerton's Forest Robin (*Swynnertonia swynnertoni*) and separate subspecies of the White breasted Alethe (*Alethe fuelleborni*).

A variety of wetland habitats occur in the Rift Valley including rivers, lakes, temporary pans, reed swamps, floodplain grassland and palm savanna. The diversity of habitats in the Rift Valley makes it one of the finest wildlife grazing ecosystems in Africa as reflected by the spectacular wildlife that inhabited the Valley prior to the armed conflict.

Figure 4-5: Location map of Sofala Province

Because of being the most diverse area in Mozambique, the Gorongosa Mountain Rift Valley Complex presents a cluster of conservation areas comprising "Coutadas Oficiais" (Wildlife Hunting Areas), a National Park (Gorongosa National Park) and a Wildlife Reserve (Marromeu Reserve). In 2004 Mozambique inscribed the District of Marromeu as a Ramsar site[22] on the International Convention for the Conservation of Wetlands of

[22] https://www.ramsar.org/sites-countries/the-ramsar-sites

International Importance especially as waterfowl habitats (i.e. the international convention for the conservation and sustainable use of wetlands).

Based on 2000 data the Development Strategy for the Rice Sector in Mozambique (Ministry of Agriculture/GPSCA, 2005) placed Sofala in the third position (14%) in the national production of rice. Traditionally rice production is almost exclusively in the hands of the family sector/traditional farmers. The province is also known for hosting two of the four country's sugar cane farms and industries in operation at present, i.e. Marromeu and Mafambisse. The other operations are in Maputo province, in the south, i.e. Maragra and Xinanvane. Under IRRIGA the potential of transforming traditional rice production into a more commercial endeavor as well as the establishment of linkages (out growers) between existing large commercial farms and industries is particularly appealing. Under PROIRRI these aspects were tested and will be consolidated under IRRIGA.

4.4.2 MANICA PROVINCE

Manica Province covers an area of 61,661 km² and a total population of **1,911,237** (Census of 2017), distributed by three Municipalities (Catandica, Manica and Chimoio), and nine districts (Bárue, Gondola, Guro, Machaze, Macossa, Manica, Mossurize, Sussundenga and Tambara). The population of Manica represents 7% of the country's population with the surface area of the province (61,661km^2) covering 7% of that of the country, and a population density of 31, making Manica relatively sparsely populated. In the same way as the previous province this, combined with very high rainfall and good agricultural soils, bodes well for the improvement of agriculture in the province in the form of the smallholder irrigation and market access project (IRRIGA).

The province is characterized by a tropical climate, with two distinct seasons: a rainy season from September to March, and a dry season from April to August. Because of its altitude and relief, Manica in general has relatively high rainfall. The Province consists of three topographic areas, namely mountains, plateaus and plains. The mountains are located mainly in the far West, with generally higher altitudes of more than 1,000 m near the border with Zimbabwe. The soils in Manica Province are mainly brown and clayey soils and red clay-sandy soils. Manica is rich in water resources with the Zambezi River flowing in the far north, the Púngoè and Buzi in the central region, and the Save River flowing in the south of the province.

The key economic activities in areas around Manica province are centered primarily around agriculture, with a focus on food and cash crops; commercial activities, which are dominated by the informal market, focused on consumables needed by individuals and households; fishing; and timber exploitation, amongst others. Chimoio is the capital of Manica Province and is the fifth-largest city in Mozambique. The Chimoio area is also the major producer of bananas, located in Gondola.

The key sensitive areas in the Manica Province include the **Chimanimani Massif**, which forms part of the great eastern escarpment along the Mozambique-Zimbabwe border and comprises a high diversity of habitats and species. Nearly 1,000 vascular plant species have been recorded for the Chimanimani Mountains and three species of *Erica* and two species of *Protea* are considered endemic. Large mammals are well represented although populations are depleted, meaning that their abundance is low. Two amphibians and one

reptile species are considered endemic. Over 160 bird species have been recorded for Chimanimani (Dutton & Dutton 1975), some of which are considered endemic to the Afro-montane regions of eastern Africa. The massif belongs to the Chimanimani National Park in Sussundenga District. It also includes four forest reserves: Tsetsera, Moribane, Nhahezi and Mahate, which are embraced by the project of trans-boundary conservation area of Chimanimani along with the National Park.

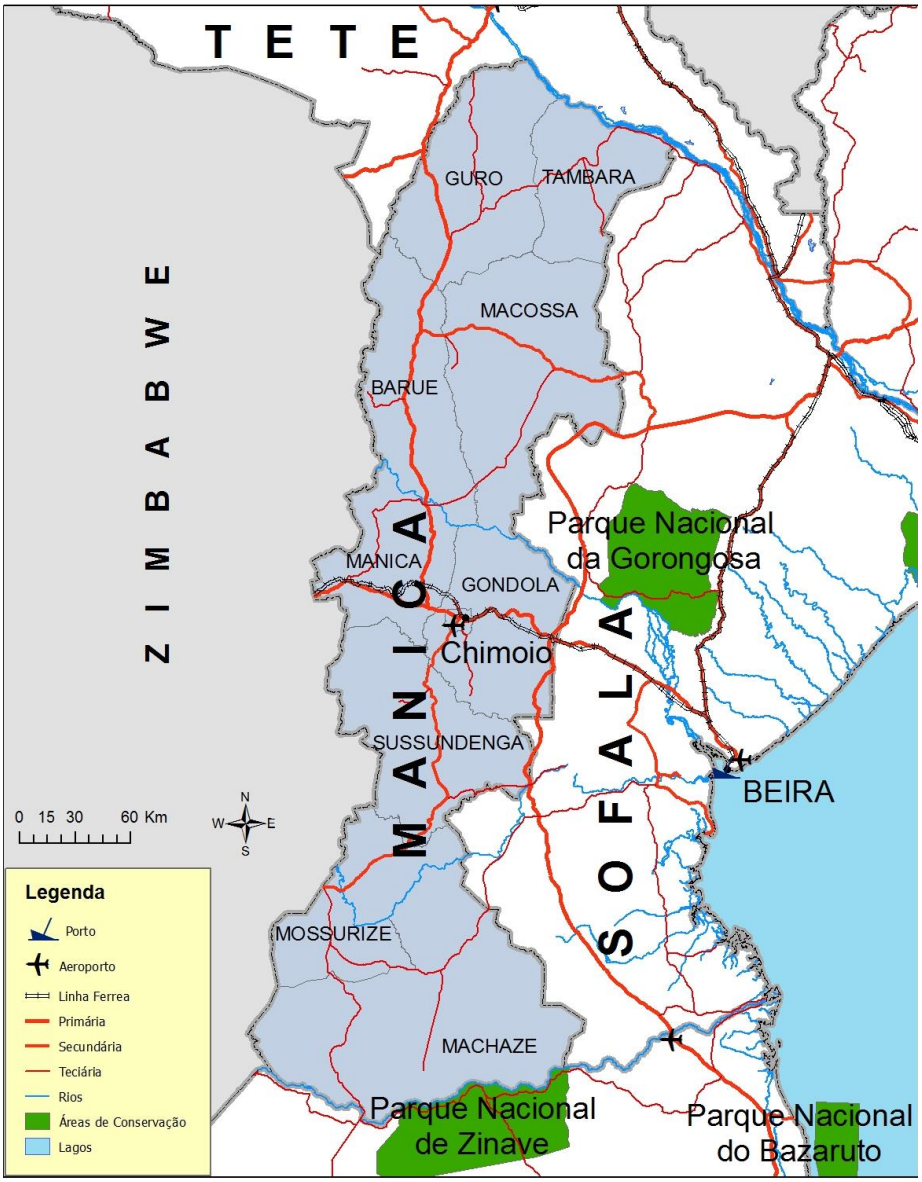


Figure 4-6: Location map of Manica Province

Manica has a long-standing tradition of small and medium size commercial farming with the use of irrigation inherited from the colonial period focusing mainly on the production of horticulture and fruit. The use of ox power in agriculture also has some considerable tradition among local farmers. All these aspects combined, i.e. good soils, favorable topography (which makes the adoption of irrigation by gravity relatively easy), water abundance (regular rainfall and rivers), relative use of advanced farming technologies and tradition of producing for the market make this province particularly appealing to meet IRRIGA interests. There is room to revive all these elements (physical, socioeconomic and cultural) to build a thriving commercial sector led by small and medium size

agricultural producers. PROIRRI has significantly demonstrated the veracity of this assumption, which it is expected that IRRIGA will consolidate.

4.4.3 ZAMBÉZIA PROVINCE

With an estimated population of 5,110,787, Zambézia is the second most populous province in Mozambique after Nampula, with over 18% of the country's population. With a surface area of 105,008 km^2**,** Zambézia is relatively sparsely populated with a much lower density of 48.7 (i.e. lower than that of Nampula but much higher compared to the other provinces in the country). Much of the surface area of Zambézia Province is drained by the Zambezi River. Much of the coast consists of mangrove swamps, while inland areas comprise most forest.

The Capital City of Zambézia is Quelimane, and the province used to comprise 16 districts (i.e. Alto Molocue, Chinde, Gilé District, Gurué, Ile, Inhassunge, Lugela, Maganja da Costa, Milange, Mocuba, Mopeia, Morrumbala, Namacurra, Namarroi, Nicoadala, and Pebane. Three new districts have been recently established i.e. Mulavela, Derre and Mulumbo (MAFP, 201817).

The key notable attribute of the Zambézia Province is the Zambezi River and the extensive floodplains along its banks, as well as the vast Zambezi Delta at the estuary by the Indian ocean (nearest town to the estuary is Luabo).

Figure 4-7: Location map of Zambézia Province

Based on 2000 data the Development Strategy for the Rice Sector in Mozambique (Ministry of Agriculture/GPSCA, 2005) placed Zambézia in the first position (close to 51%) in the national production of rice. According to the same study, all the districts in this province have natural favorable conditions to produce rice, but three of them represent close to 50% of the total production (Namacurra, Nicoadala, and Ile).

4.5 Nampula Province

The population of Nampula has been estimated at 6,102,867 according to the 2017 census statistics for Mozambique (Censo 2017). This makes Nampula the most populous province in Mozambique with over 21% of the total population of the country. In terms of surface area, Nampula covers 81,606 km^2 of the surface area of Mozambique (799,380km^2), making it the fourth biggest province after Niassa (129,056km^2, 16% of Mozambique), Zambézia (105,008km^2; 13%), Tete (100,007km^2; 13%) and Cabo Delgado (82,625km^2; 10%). The population density of Nampula is 74.8 people per km^2 making it second only to Maputo City at 3,670.57/km^2 and Maputo Province at 96.20. however, even given the relatively very high population and density, Nampula is

relatively undisturbed and has vast areas of fertile agricultural lands that can be exploited for commercial agriculture.

Nampula is a coastal province with two predominant seasons: a warm rainy December-March season and a temperate/dry April-November season. While the rainfall is normally around 656–901 mm in most parts of the province, it reaches up to 1,160–1,390 mm in the southern tips of Malema and Ribauè (National Meteorology Institute 2007). Evapotranspiration averages 1000 to 1400 mm (Métier, 2005). During the rainy season from February to March, cyclones do affect parts of the coastline.

One key attribute of Nampula is Port of Nacala, a city located in the northern parts of the Province, at about 200 km from the city of Nampula. The Port of Nacala is the third largest harbor in the Mozambique after Maputo and Beira and is considered the deepest port on the east coast of Africa. Nacala is a railway terminal that connects with Malawi and is also located strategically to provide access to the port to landlocked neighboring countries. Nacala is in a region with sub-humid tropical climate with a dry season.

The Nacala Special Economic Zone was launched in 2009 and has seen an influx of foreign investments into the area. The SEZ comprises the Nacala–Velha and the port districts including Nacala-Porto. The location of this deep-water port on the Mozambican coast as well as the urban setup of the city with important facilities and services makes the city a vital export center for upstream countries (mainly Malawi and Zambia). The existence of the Port and railway infrastructure constitutes the Regional Transport Corridor, known as the Nacala Corridor, presents Nacala City with a strong potential for economic development and employment opportunities.

The smallholder irrigation agriculture and market access project would play an important role in unlocking opportunities for the agricultural sector in Nampula.

Along the South of the Lúrio River there are 4 forest reserves Mpalwé (51 km2), Ribauè (52 km2), Mecubúri (1,954 km2) and Baixo Pinda (MICOA 1997). Established during the 1950s to protect the flora they have been under Ministry of Agriculture and Food Security management. The reserves have suffered significant human influence during the war and post war, when management was not possible due to safety reasons. The Mpalwè and Ribauè Forest Reserves vegetation consist of forest fragments dominated by miombo species, particularly *Julbernardia globiflora, Uapaca, Sterculia*, and pure stands of bamboo (*Oxytenanthera* sp). There are a series of river streams that have springs on both mountains. The water streams are particularly covered with gallery forest with *Milicia excelsa, Xylopia* sp., *Harrungana madagascariensis, Trema orientalis, Breonadia salicina, Syzygium owariense,* among others. On the mountain slopes patches of closed canopy forests mixed with bamboo can be found (Muller et al. 2005).

Figure 4-8: Location map of Nampula Province

The Development Strategy for the Rice Sector in Mozambique (Ministry of Agriculture/GPSCA, 2005) placed Nampula in the second position (close to 15%) in the national production of rice.

5 APPLICABLE ENVIRONMENTAL AND SOCIAL POLICY AND LEGAL FRAMEWORK

5.1 World Bank Safeguards Policies

IRRIGA is designed to focus on the development of irrigation schemes for smallholder farmers (rehabilitation and expansion of existing traditional ones). It will also support a series of interventions to facilitate market access to inputs and outputs to and from irrigated agriculture.

Due to their suitability to smallholder farming and sustainability in the context of the rural areas of Mozambique the project will favor gravity-fed irrigation systems. Pumping systems, which have proven to be challenging in some of the rural communities due to limited access to electricity, spare parts, technical assistance and other forms of assistance, will only be adopted in a very few and well justified cases.

The rehabilitation of irrigation schemes will focus on three business lines, i.e. rice, horticulture and out-grower crops. This will go hand in hand with supporting farmers' investments, using matching grants and market linkages, to enhance agricultural production and value addition.

The development of other infrastructures and services related with the development of agriculture and irrigation such as roads, trade and storage facilities, etc. will not fall directly under the project. IRRIGA will focus on facilitating linkages of smallholder farmers with private sector that will be identified as critical to enhance productivity and sustainability of the operations to be directly supported.

Project focus with potential implications on the natural and social environment will be on:

(i) the rehabilitation and expansion of irrigation schemes mainly in the form of (a) upgrading the areas around the water intakes and the main canals; (b) construction of water collection structures and/or rehabilitation of damaged embankments; (c) installation of control structures like water gates; (d) upgrading the main canals and, where necessary, lining critical stretches of the distribution system; and (e) use of local plants/grasses (like vetiver grass) to control canal erosion;

(ii) improvement of the cropping intensity, productivity, production, competitiveness and market access of smallholder farmers cultivating irrigated land in the project area in the form of (i) capacity building through training for the establishment and operation of farmers groups and water user associations as well as local level staff; and (ii) farmers investments, using matching grants and market linkages, to enhance agricultural production and value addition,, such as inputs (seeds, fertilizers, pesticides, equipment, etc.); storehouses/warehouses and a pilot processing plant for horticulture products will be financed in Manica province;

(iii) At certain (small) extent rural roads ("last mile" approach), power-lines (pumping-fed schemes) will also be financed.

Thus, IRRIGA will trigger seven of the 10+2 World Bank Operational Safeguards Policies, namely, Environmental Assessment OP/BP 4.01; Natural Habitats OP/BP 4.04; Pest Management OP 4.09; Physical Cultural Resources OP/BP 4.11; Involuntary Resettlement OP/BP 4.12; Safety of Dams OP/BP 4.37; and Projects on International Waterways OP/BP 7.50.

The project will also adhere to the World Bank Group General Environmental, Health and Safety Guidelines (EHS), Agribusiness/Food Production EHS Guidelines from April 2007. A Resettlement Policy Framework (RPF) has been prepared to satisfy the Involuntary Resettlement (OP/BP 4.12) Safeguard Policy requirements and an (Integrated) Pest Management Plan (PMP) has been prepared to satisfy OP 4.09 requirements. These two documents have been prepared separately, however they should be used together with this ESMF.

Table 5-1: Safeguard Policies Triggered by the Project

Safeguard Policies	Applicability to IRRIGA	
	YES	NO
Environmental Assessment OP/BP 4.01	✓	
Natural Habitats OP/BP 4.04	✓	
Forests OP/BP 4.36		✓
Pest Management OP 4.09	✓	
Physical Cultural Resources OP/BP 4.11	✓	
Indigenous Peoples OP/BP 4.10		✓
Involuntary Resettlement OP/BP 4.12	✓	
Safety of Dams OP/BP 4.37	✓	
Projects on International Waterways OP/BP 7.50	✓	
Projects in Disputed Areas OP/BP 7.60		✓

The table below makes a summary of each of the World Bank Operational Safeguards Policies. The table is followed by additional explanations about all the safeguards and particularly of those that are directly triggered by IRRIGA.

Table 5-2: The Ten World Bank Operational Safeguards Policies

Safeguard Policies	Main Objective	Applicability	Application for IRRIGA
Environmental Assessment (OP/BP 4.01)	Used in the World Bank to identify, avoid, and mitigate the potential negative environmental impacts associated with Bank lending operations. This policy is considered to be the umbrella policy for the Bank's environmental 'safeguard policies.	The purpose of Environmental Assessment is to improve decision making, to ensure that project options under consideration are sound and sustainable, and that potentially affected people are properly consulted.	Applicable, since the IRRIGA may lead to some environmental and social adverse impacts. All subprojects will have to undergo an environmental impact assessment from design through to implementation, monitoring and evaluation in accordance with the GOM and WB principles.
Natural Habitats (OP/BP 4.04)	Aimed at ensuring that World Bank-supported infrastructure and other development projects consider the conservation of biodiversity, as well as the numerous environmental services and products, which natural habitats provide to human society. The policy prohibits Bank support for projects which would lead to the significant loss or degradation of any Critical Natural Habitats, whose definition includes natural habitats which are either: (i) legally protected; (ii) officially proposed for protection; or (iii) unprotected but of known high conservation value. In other (non-critical) natural habitats, Bank supported projects can cause significant loss or degradation only when (i) there are no feasible alternatives to achieve the project's substantial overall net benefits; and (ii) acceptable mitigation measures, such as compensatory protected areas, are included within the project.	It strictly limits the circumstances under which any Bank-supported project can damage natural habitats (land and water areas where most of the native plant and animal species are still present).	Applicable, since the project has the potential of having areas of intersection with natural habitats (water resources, wetlands, forests, etc.), which should not be negatively affected by its development. The ESMF include measures for addressing potential negative impacts on natural habitats in general.
Forests (OP/BP 4.36)	Aimed toto rule Bank financing on commercial harvesting operations it also aims contribute for reducing deforestation, enhance the environmental contribution of forested areas, promote afforestation, reduce poverty, and encourage economic development. The policy is currently being revised to make it more effective and in recognition of the fact that forests play an increasingly important role in poverty alleviation, economic development, and for providing local as well as global environmental services.	Reduction of deforestation and use of forests to promote economic development.	Not applicable. Intersections between the project and forests is not expected to be generalized, but rather quite minimal. Most if not all the irrigation schemes to be rehabilitated and expanded are in areas already used for agricultural purposes. It is possible that some of the areas may have witnessed substantial forest recovery after many years of not being used but are not and should not be the ones classified as forest areas the local/district land use plans. Also if any patch of forest will be

Safeguard Policies	Main Objective	Applicability	Application for IRRIGA
			found in the sub-project implementation area, it will be addressed under OP/BP 4.04.
Pest Management (OP 4.09)	Aimed at assisting rural development and health sector projects to avoid using harmful pesticides and encourage the use of Integrated Pest Management (IPM) techniques in the whole of the sectors concerned.	Where pesticides have to be used in crop protection or in the fight against vector-borne disease, the Bank-funded project should include a Pest Management Plan (PMP), prepared by the borrower, either as a stand-alone document or as part of an Environmental Assessment.	Applicable, since certain elements of the project, particularly intensification of agriculture, may encourage the use of pesticides in an area without a strong tradition of using these products. All the necessary precautions will need to be taken in order to avoid the creation of a situation where the use of pesticides can negatively affect local people.
Physical Cultural Resources (OP/BP 4.11)	The objective of this policy is to avoid, or mitigate, adverse impacts on cultural resources from development projects that the World Bank finances. The assumption is that cultural resources are important as sources of valuable historical and scientific information, as assets for economic and social development, and as integral parts of a people's cultural identity and practices. The loss of such resources is irreversible, but fortunately, it is often avoidable.	The borrower identifies physical cultural resources likely to be affected by the project and assesses the project's potential impacts on these resources as an integral part of the EA process, in accordance with the Bank's EA requirements	Applicable. Although the project is not expected to interfere with any known and recognized historical or cultural resources because it will involve civil works it will require proper screening to avoid or minimize any effect on physical cultural resources on a clearly defined precautionary fashion. The screening process will be outlined and detailed in the Environmental and Social Management Framework (ESMF) to implement a Chance Finds procedure and provide guidelines for measures to be taken when specific activities are likely to trigger this policy, such as preparing a Physical Cultural Resources Management Plan.
Indigenous Peoples (OP/BP 4.10)	The policy underscores the need for Borrowers and Bank staff to identify indigenous peoples, consult with them, ensure that they participate in, and benefit from Bank-funded operations in a culturally appropriate way - and that adverse impacts on them are avoided, or where not feasible, minimized or mitigated.	Integration of indigenous peoples in project development and benefits	Not applicable as there are no people falling under the category of indigenous people in the project area and/or in Mozambique in general.

Safeguard Policies	Main Objective	Applicability	Application for IRRIGA
Involuntary Resettlement (OP/BP 4.12)	The policy aims to avoid involuntary resettlement to the extent feasible, or to minimize and mitigate its adverse social and economic impacts. It is also aimed at promoting the participation of displaced people in resettlement planning and implementation. Its key economic objective is to assist displaced persons in their efforts to improve or at least restore their incomes and standards of living after displacement. The policy prescribes compensation and other resettlement measures to achieve its objectives and requires that borrowers prepare adequate resettlement planning instruments prior to Bank appraisal of proposed projects	The policy is triggered in situations involving involuntary taking of land and involuntary restrictions of access to legally designated parks and protected areas.	Applicable. Although limited in scope and size some of the project interventions may result in loss of assets by local people and these will need to be restored/compensated in line with the GOM and WB regulations and guidelines. A Resettlement Policy Framework (RPF) has been prepared to address these potential negative impacts on communities.
Safety of Dams (OP/BP 4.37)	Aimed at ensuring that experienced and competent professionals design and supervise construction of bank-funded dams, and that the borrower adopts and implements dam safety measures through the project cycle. The policy also applies to existing dams where they influence the performance of a project. In this case, a dam safety assessment should be carried out and necessary additional dam safety measures implemented.	Ensure that all precautionary measures necessary to strengthen the institutional, legislative, and regulatory frameworks for dam safety programs are in place where there are bank-funded dams.	Applicable. Although limited to small size dams (embankments and weirs) the project will embark on the rehabilitation (and may upgrade) of existing embankments/weirs and is open to the construction of a number dams (embankments/weirs) as part of the upgrading and expansion of the existing tradition irrigation schemes. Dams/weirs/embankments design, O&M manual must be reviewed by qualified experts.
Projects on International Waterways (OP/BP 7.50)	Aimed at assisting riparian states to make appropriate agreements or arrangements for the entire waterway, or parts thereof, where bank-funded projects involve international rivers. It requires that adequate detailed procedures for inter-state notification be followed by riparian states	Where the project area stretches over water ways that cover more than one state	Applicable. The project has the potential of using water from four international rivers/basins (Zambezi, Púngoè, Buzi and Save). Despite the fact that given the downstream location of the areas of the project and of the country (lowest riparian) in general as well as the very low impact of the developments to be undertaken the interference with the water courses in a way that could have negative impacts on upstream countries, the country is bound by the SADC Revised

Safeguard Policies	Main Objective	Applicability	Application for IRRIGA
			Protocol on Shared Watercourses, of August 2000[23], to keep the countries with which it shares the rivers informed by the development.
Projects in Disputed Areas (OP/BP 7.60)	Aimed at ensuring that the Bank only finances projects in disputed areas when either there is no objection from the other claimant to the disputed area, or when the special circumstances of the case support Bank financing, notwithstanding the objection. The policy details those special circumstances.	Where there are disputed areas the Bank wants to make sure that it is not making any judgment on the legal or other status of the territories concerned or to prejudice the final determination of the parties' claims.	Not applicable. There are no known disputed areas in the project area

[23] It is mainly through this Protocol that Mozambique implements the United Nations Convention on the Law of the Non-Navigational Uses of International Watercourses, of 1997, as all the Mozambican international rivers are shared with SADC member states.

5.1.1 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. Similarly, each proposed subproject activity is required to undergo the same social and environmental screening process to qualify for funding. This is done through the systematic usage of the Environmental and Social Screening Form (ESSF), Annex 4. Moreover, according to OP/BP 4.01 the Bank classifies proposed subprojects into one of four categories, depending on the type, location, sensitivity, and scale of the project and the nature and magnitude of their potential environmental and social impacts:

Category A: A proposed project is classified 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. Environmental and Social Impact Assessment (ESIA) for a Category A project examines the project's potential negative and positive environmental and social impacts, compares them with those of feasible alternatives (including the "without project" situation), and recommends any measures needed to prevent, minimize, mitigate or compensate for adverse impacts and improve environmental and social performance. For a Category A project, the borrower is responsible for preparing safeguards documents, normally either an Environmental and Social Management Framework (ESMF) when the physical footprint of a project is unknown by appraisal, or an Environmental and Social Impact Assessment (ESIA with an Environmental and Social Management Plan [ESMP]), or an Environmental Audit/Risk Assessment whenever the physical footprint of a project activity is known prior/by appraisal stage.

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

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

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

Due to the localized, limited and thus manageable environmental and social impacts IRRIGA has been classified as a Category "B" project; and since the sub-projects location 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 likely fall under Category B and some under Category C; no Category A sub-project will be financed. The typical physical interventions of the project will be the rehabilitation and expansion of small scale existing traditional irrigation schemes and possibly facilitate the development of other types of priority infrastructure to link production areas to the markets (inputs and outputs for irrigation); associate infrastructure such as rural roads and power-lines will not fall primarily under the project,, rather other WB related projects will be primarily responsible these, such as SUSTENTA, MozBio or Feeder Roads. The project will also facilitate and improve production and productivity and trade. Based on the outcome of the social and environmental screening, to be done by the Environmental and Social, Specialists, which will work in the four provinces, once defined, sub-projects will need to prepare a simplified ESIA/ESMP, a freestanding ESMP, and an abbreviated RAP or no-action needed. The costs for the preparation of these simplified ESIAs, freestanding ESMPs or RAPs 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 MITADER to verify compliance with Mozambique's EIA Policy. Though World Bank policies and procedures are those to be followed, the ToRs for these simplified ESIAs need to be approved by both MITADER 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 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 of Land Environment and Rural Development (MITADER) and the World Bank will approve and disclose the simplified ESIA, 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 MITADER's website, 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 15 days, as per the Decree No. 130/2006 - General Directive for the Public Participation Process. 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 bank's Infoshop. By making the ESMF, a Pest Management Plan (PMP) and RPF documents available to the public prior to project appraisal, the proposed project will follow the World Bank Access to Information Policy, and hence ready for Board approval for funding.

Subprojects also need to follow 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.

5.1.2 PEST MANAGEMENT (OP 4.09)

Any World Bank financed project that stimulates the use of pesticides will need to prepare and disclose prior to project appraisal a Pest Management Plan (PMP). Further, the procurement of any pesticide in a Bank-financed project is contingent on an assessment of the nature and degree of associated risks, considering the proposed use and the intended users. With respect to the classification of pesticides and their specific formulations, the Bank refers to the World Health Organization's Recommended Classification of Pesticides by Hazard and Guidelines to Classification (Geneva: WHO 1994-95). The following criteria apply to the selection and use of pesticides in Bank-financed projects:

- They must have negligible adverse human health effects;
- They must be shown to be effective against the target species;
- They must have minimal effect on non-target species and the natural environment. The methods, timing, and frequency of pesticide application are aimed at minimizing damage to natural enemies;
- Their use must consider the need to prevent the development of resistance in pests.

At a minimum, pesticide production, use and management should comply with FAO's Guidelines for Packaging, Use and Storage of Pesticides, Guidelines on Good Labeling Practice for Pesticides, and Guidelines for the Disposal of Waste Pesticide Containers on the Farm. The Bank does not finance formulated products that fall into WHO classes IA and IB, or formulations of products in Class II, if (a) the country lacks restrictions on their distribution and use; or (b) they are likely to be used by, or be accessible to, lay personnel, farmers, or others without training, equipment, and facilities to handle, store, and apply these products properly.

IRRIGA project triggers OP 4.09 the World Bank Safeguard Policy on Pest Management, since it will support agricultural development, it will support post-harvest pest control to minimize post-harvest pest damage through the program's improved technology adoption by farmers. Procurement of pesticides will not be financed until it becomes evident that local capacity exists to adequately manage their environmental and social impacts in compliance with OP 4.09 as described above, particularly with regards to health and safety aspects that are directly linked to human health conditions affecting women, the poor and most vulnerable groups of the community, such as toddlers, elderly and handicapped.

Given the pest management issues to be dealt with under this project a separate Pest Management Plan (PMP) has been prepared and will be disclosed prior to project appraisal. The PMP should be used as part of this ESMF.

5.1.3 INVOLUNTARY RESETTLEMENT (OP/BP 4.12)

Under the World Bank Safeguard Policy (OP/BP 4.12 - "Involuntary Resettlement") resettlement should be avoided where feasible, or minimized, exploring all viable alternative project designs. Where it is not feasible to avoid resettlement, related activities should be conceived and executed as sustainable development programs, providing sufficient investment

resources and means to enable the persons displaced by the project to share in project benefits. Displaced persons should be meaningfully consulted and should have opportunities to participate in the planning and implementation of resettlement programs.

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

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

A Resettlement Policy Framework (RPF) for the Project has been prepared to guide involuntary resettlement operations issues such as land acquisition by setting forth the basic principles and prerogatives to be followed by the recipient once the physical footprint of the project intervention area is known (i.e. elaboration of site specific Resettlement Action Plans-RAPs). Thus, this document (i.e. the ESMF) will not elaborate on resettlement issues but rather be used together with the standalone RPF. However, the subproject screening procedure described in this ESMF should also screen for resettlement issues and determine if OP/BP 4.12 will need to be further triggered and how much detailed the needed RAP will/must be. The Project overall budget should include in addition to the implementation of this RPF, sufficient funds to finance the preparation and implementation of site specific RAPs prepared for sub-projects.

5.1.4 NATURAL HABITATS (OP/BP 4.04)

This policy applies to sub-projects, which could have a potential impact on important natural habitats outside and inside protected areas. Significant conversion of natural habitat is allowed under this policy if there are no viable alternatives, but the affected natural habitat needs to be compensated by an ecologically similar area of the same or larger size and the area needs to be better managed and protected. Subprojects involving the significant conversion of critical natural habitats. As critical natural habitats are considered as 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, areas traditionally recognized by communities as sacred (forests, groves) cannot be financed.

Because of the strong relations between irrigation and water, soil, vegetation/biodiversity, human activity and the dynamics created among these elements it is possible that in some of the areas in which the rehabilitation and expansion of the existing traditional irrigation schemes (and other related elements) will have to consider adequate measures to avoid any forms of degradation that could translate into threats to the equilibrium of natural habitats.

It is believed that the series of measures recommended under this ESMF in terms of subprojects being selected and designed to avoid, minimize, restore resources in special areas will ensure that adequate negative impacts that may occur do not translate into threats to biodiversity and ecological services. As it will be better elaborated under Chapter 8.1, it will be importance to ensure that dams (embankments/weirs) and/or any other water infrastructures do not interfere

negatively in a significant extent with environmental flows of the rivers/water courses that will be used to store water.

Rather than triggering OP/BP 4.36 – Forests, any potential impact on forest habitats will be dealt under OP/BP 4.04 Natural habitats.

5.1.5 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 artefact is found, construction should be 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.

Especially because under the project there will be civil works involving earth movements in areas that have not been under the influence of human activity for long periods, the ESMF has made provisions to ensure that adequate measures are considered to minimize the negative impacts that loss of important cultural resources.

5.1.6 SAFETY OF DAMS (OP/BP 4.37)

Experience shows that the safe operation of dams has significant social, economic, and environmental relevance. The Bank's involvement in dam financing requires that experienced and competent professionals design and supervise construction, and that the borrower adopts and implements dam safety measures throughout the project cycle. The policy also applies to existing dams where they influence the performance of a project. In this case, a dam safety assessment should be carried out and necessary additional dam safety measures implemented.

OP 4.37 recommends, where appropriate, that Bank staff discuss with the borrowers any measures necessary to strengthen the institutional, legislative, and regulatory frameworks for dam safety programs in those countries. However, as foreseen under component 2 of IRRIGA, dam (weirs and embankments) financing will be limited to small, traditional, existing irrigation schemes upgrade and maintenance, rehabilitation of water storage facilities, and other types of priority water control structures that can be expected to cause minimal adverse environmental and social impacts in the project area. Impacts will be minimal, but all precautions will be taken not only to deal with the physical aspects but also the biological ones, such as maintaining environmental flows to preserve the health of the ecosystems and communities downstream the infrastructures, therefore under IRRIGA, design of the rehabilitation works for small dams shall include generic dam safety measures designed and/or reviewed by qualified engineers. Site specific ESMPs will include mitigation measures for investments involving small dams.

5.1.7 PROJECTS ON INTERNATIONAL WATERWAYS (OP/BP 7.50)

This policy comes as a continuation of the United Nations Convention on the Law of the Non-Navigational Uses of International Watercourses, of 1997 with the aim of assisting riparian states to make appropriate agreements or arrangements for the entire waterway, or parts

thereof, where bank-funded projects involve international rivers. It requires that adequate detailed procedures for inter-state notification be followed by riparian states.

The project is expected to use water four international rivers/basins (Zambezi, Púngoè, Buzi and Save). Despite the fact that given the downstream location of the areas of the project and of the country in general as well as the low impact of the developments to be undertaken the interference with the water courses in a way that could have negative impacts on upstream countries is limited, the country is bound by the SADC Revised Protocol on Shared Watercourses, of August 2000, to keep the countries with which it shares the rivers informed by the development. It is mainly through this Protocol that Mozambique implements the United Nations Convention on the Law of the Non-Navigational Uses of International Watercourses, of 1997, as all the Mozambican international rivers are shared with SADC member states.

The main areas are foreseen in the SADC Revised Protocol on Shared Watercourses, of August 2000 are: (i) exchange of information and consultation; (ii) notification on planned measures that might have adverse effects, including availability of technical data and information related to environmental and social assessment (after six months + six (if needed be) for the affected state(s) to respond after the necessary assessment); (iii) examination of the notifications; (iv) responses to notifications; (v) consultations and negotiations; (vi) regular monitoring – data collection, exchange/communication; (vii) complaints related to findings (obligations set out in the protocol and related special agreements) that have not been met by the other state(s); (viii) decision, communication and implementation of urgent/emergency measures; (ix) harmonisation of policies, laws, institutional set up, monitoring systems and instruments; (x) prevention and mitigation of adverse effects; (xi) preparation, implementation and monitoring of specific agreements pertaining to specific shared water courses; and (xii) settlement of disputes, involving a host of aspects such as identification, communication, negotiations, response, negotiations settlement and recourse to tribunal where an issue is not resolved amicably.

In close collaboration with Mozambican authorities and other relevant authorities MASA/INIR will undertake to implement the relevant steps to ensure compliance, where such is going to be necessary.

5.2 Mozambican Legal and Institutional Framework

Mozambique has been undertaking a vast legal and institutional reform movement to improve the country ability to manage the environment and turn it into a more sustainable process. The reform 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.

It is not possible to cover all the aspects in this document. Reference is made only to those considered relevant under IRRIGA and should be used with an open attitude to ensure that other aspects that are not directly covered but that may become relevant during project implementation are adequately considered.

5.2.1 LEGAL FRAMEWORK

5.2.1.1 Adherence to International and Regional Conventions and Protocols

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. As per point 1 of article 18, of the Constitution "*treaties and international agreements duly approved and ratified, are enacted in the Mozambican legal order*".

Several international and regional Conventions, Protocols and Treaties with relevance for the **Project** and not only have been ratified, namely:

- 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.
- **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. The importance of this convention for Program can be at the same level as the **UN Convention on Biodiversity**, described above.
- 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. This as well as other SADC regional protocol on natural resources such as water and shared water courses and other is also an important Protocol for Program and should be highlighted and its implementation supported under this Program. The SADC region has been instrumental in its attempts to bring about practical elements to protect resources of common interests in the region. This involves information sharing, technical cooperation, joint efforts to mobilize resources and to make strategic investments and to take concerted actions, including joint monitoring of the state of resources and the environment. It is a known fact that biodiversity and ecosystems know no boundaries. What is done in each country has the potential of affecting a wider geographical space.

- **Ramsar Convention on Wetlands of International Importance**, ratified by Resolution No. 45/2003 of 5 November. Under these Conventions countries, including Mozambique prepare a list of Wetlands of International Importance. The governments commit themselves to sustainably use such areas by promoting territorial planning, policy development and publication of legislation, management actions and education of their people, as well as the proper and effective management of such areas in an integrated approach *vis a vis* international cooperation particularly regarding transboundary wetlands, the shared wetland systems, common species and development projects that may affect wetlands.
- **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.
- Mozambique is one of the 196 countries that signed and ratified the new international agreement in Paris, in December 2015, to reduce greenhouse gas emissions to contain global warming to 2°C. COP 21 was a decisive meeting, 3 years after the end of the commitment period of the previous international agreement, the Kyoto Protocol (COP 3). Indications are that this is yet to be turned into a specific resolution for the adherence to be enacted as a national legal provision. Irrespective of what the future has got on hold the country's Intended Nationally Determined Contribution (INDC), of September 2015, is clear about the fact the country's mission is to "reduce climate change vulnerability and improve the wellbeing of Mozambicans through the implementation of concrete measures for adaptation and climate risk reduction, promoting mitigation and low-carbon development, aiming at sustainable development, with the active participation of all stakeholders in the social, environmental and economic sectors".

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);
- 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);

5.2.1.2 Approval of Domestic Policy and Legal Instruments

- The National Constitution

In its capacity as the "mother law", governing the Mozambican legal system, it sets up an important environmental protection tool. Accordingly, Article 90, in respect of the right of the country's citizens to live in a healthy environment, forms, together with Article 117, which

embodies the duty of the State to protect the environment, two of the main pillars of the Mozambican legal and constitutional system with regards to environmental protection.

Paragraph 1 of Article 90 stipulates that "every citizen shall have the right to live in a secure environment and have the duty to protect it." The implications of such a provision are very relevant, bearing in mind that the acknowledgement of a certain asset means that the environment is a fundamental right- for which all people are required to positively contribute to.

The principles of environmental protection under the Constitution of the Republic of Mozambique should be safeguarded above all else.

Sustainable Development Goals

The SDG was adopted during the UN general assembly on September 25th, 2015, in which set of goals to end poverty, protect the planet and ensure prosperity for all by 2030. 17 goals were adopted, and Mozambique has incorporated the Sustainable Development Goals (SDG) in the five-year government plan by October 2015. Goal number 6 is relevant to this project as stated **Ensure availability and sustainable management of water and sanitation for all**.

Environment

Table 5-3: Relevant environmental legislation

Legislation	Description	Relevance
GENERAL		
Resolution No. 5/95 Environmental Policy	Establishes the basis for all environmental legislation. According to Article 2.1, the main aim of this policy is to ensure sustainable development in order to maintain an acceptable balance between the socio-economic development and environmental protection. To achieve the above objective, the policy must ensure, among other requirements, the management of natural resources in the country and the general environment - to preserve its functional and production capacity for the present and future generations.	All developers are responsible for ensuring that all their proposed activities conform to this policy to ensure environmental sustainability of the project.

Legislation	Description	Relevance
Law 20/97 Environmental Law	It defines the legal basis for the proper use and management of the environment and its components. It applies to all public and private activities that directly or indirectly may influence environmental components. In its Article 9 it outlaws any form of pollution and environmental degradation. The Environment Act lays the foundation for there to be damage prevention and environmental protection. As far as the implementation of infrastructure is concerned, Article 14, clause 1 states that "the implementation of infrastructure for any other purpose which, by their size, nature and location, can cause significant negative impact on the environment is outlawed, …". This is especially applicable for zones susceptible for erosion or desertification, wetlands, environmental protection areas, and other ecological sensitive zones.	This law determines the relevance of environmental protection and prevention of any harm that may be caused to any of the environmental components by project development.
ENVIRONMENTAL IMPACT ASSESSMENT		
Decree No. 54/2015 Regulation on the Environmental Impact Assessment Process	It establishes the rules to be followed for environmental licensing of any activity to be carried out on national territory.	This regulation forms the ESIA for project environmental licensing processes that should be followed. All provisions of this piece of legislation will need to be followed during project implementation in relation to all relevant interventions. Diagram 99-1 makes a summary of the process
Decree No. 129/2006 General Guidelines for Preparation of Environmental Impact Assessment	Details the procedures for conducting an environmental impact study, and the format, structure and content of the environmental impact assessment report. The purpose of this decree is to standardize the procedures to be followed and the presentation of the environmental impact assessment report.	The environmental impact study report must comply with the specifications of this Decree.
Decree No. 130/2006 General Directive for the Public Participation Process	Details the procedures to be followed in the consultation process within the environmental impact assessment process. The purpose of this Decree is to ensure maximum participation of those concerned and affected by the project during the environmental impact assessment process	All public participation processes must follow the procedures issued by this Decree
Decree No. 25/2011 Regulation of the Environmental Audit Process	Highlights the importance of environmental audit as a tool for an impartial and documented management process to ensure the protection of the environment. It establishes procedures for evaluating the operational and working processes in relation to the requirements of the environmental management plan, including environmental legal requirements approved for a particular project.	Once the project is authorized, the developer must have in place a functioning, frequent and independent internal audit system, irrespective of the public environmental audit that the project may be subject to under this decree

Legislation	Description	Relevance
Decree No. 11/2006 Regulation on environmental inspection	Aimed at supervising, monitoring and making regular verification of compliance with environmental protection standards at national level.	The project will be subject to inspections by MITADER during its implementation in order to verify compliance with the environmental management plan and environmental legislation. The developer must cooperate with such inspections.
EMISSIONS AND AIR QUALITY		
Decree No. 18/2004 Regulation on environmental quality standards and waste emissions	Provides parameters for the maintenance of air quality; standards for emissions of gaseous pollutants from various industries, including mobile sources. Also emphasizes prevention and control of water pollution and soil protection.	The project must meet the maximum permissible limits of air quality standards established under this regulation, so as not to harm the environment. The project must comply with the standards of water quality and effluent emissions, considering emissions allowed by law, so as not to harm the environment. Any proposed action should consider the levels permitted under this decree. The violation of such is liable to a fine.
Decree No. 67/2010	Proposes Changes to Decree No 18/2004, which are included in Annexes I and V, referred to in Article 7 and 16 of the previous decree. This legal instrument amends and adds new standards for environmental quality to be considered in any activity in the country.	Idem.
WASTE AND POLLUTION		
Law 20/97 Environmental Law	Article 9 of this law proscribes the production and disposal of toxic substances or pollutants in the soil, subsoil, water or atmosphere as well as imposing a ban on any activities that may accelerate any form of environmental degradation beyond the limits set by law.	The project should implement the provisions of this Regulation. Measures to prevent any form of pollution beyond the limits set by the regulations must be taken.
Decree 13/2006 Regulation on Waste Management	This regulation operationalizes the intent of the environmental law. Establishes the legal framework for waste management in Mozambique. The purpose of this legal provision is to establish rules for the generation, transfer and disposal of solid waste. Article 5 classifies waste into two categories: hazardous and non-hazardous. The management of hazardous waste is assigned to the MITADER, including the management of licenses. Only registered and licensed companies and entities are allowed to collect, transport and handle hazardous waste in appropriate locations.	The project should implement measures for the better management of solid waste in accordance with this Regulation.

Water

Legislation	Description	Relevance
Law 16/91 Water Law	States that the use of public water basin as a management unit, is based on the principle of user pays and polluter pays. The use of water requires an authorization by the regional administration of water that oversees the basin through license (short term) or lease (long term). The Water Act also emphasizes prevention and control of water pollution and soil protection.	The Developer has the responsibility to implement measures to prevent pollution of water resources during and after project implementation. If there is any discharge to be made in shallow waters, an authorization by the respective ARA subject to a fee is required.
Decree 26/91 of November 14 – creation of ARAs	Creates 5 regional water administrations for all country and defines the territorial boundary between them.	Defines the correspondent ARA has responsibility on water resource management in which the dams will be located.
Resolution 46/2007 of August 21 Water Policy	States the following short term (2015) and long term (2015) objectives: (1) satisfaction of basic human needs; (2) improve sanitation to prevent waterborne diseases; (3) economic development; (4) environmental conservation; (5) drought and flood vulnerability reduction; and (6) promotion of peace and regional integration.	All objectives of water policy are to be considered in the project.
Water resource management strategy (approved in 22nd ordinary session of Ministry Council, August 21 of 2007)	The main objective of the national water resource management strategy is to implement the water policy objectives. Related to the project is presented in: Chapter 2 – Water Resource Management. On this subject, the following strategic objectives are related to the project: 2.5 – Hydraulic infrastructures and 2.8 – Drought Management. The main actions in this strategy is to build and rehabilitate small dams in short term (<5 years) and built and manage medium and large dams in medium (5-10 years) and long term (>10 years). 2.9 – Water and Environment. Ensure that proposed infrastructures such as dams along the rivers do not threaten ecological services. One of important strategic actions is to ensure ecological flow according to downstream needs and avoid elimination of small floods or compensate with small artificial discharges reviewing constantly the operation rules. 2.10 – Water quality and pollution control. Actions: adopt polluter-pay approach, promote environmental impact assessment in any development initiatives along the water course, and monitor compliance of effluent discharges.	Development of project is in same line as stated in this strategy.

Legislation	Description	Relevance
Decree 43/2007 of October 30 2007 - Regulation on water License and concession	Regulates the private water utilization licensing process. It also applies to discharge of effluents. This regulation prioritizes the water supply for human consumption and sanitation above all other uses. No license or concession would be issued if environment is affected negatively. According to this regulation, ARAs are responsible to issue licenses and monitor implementation of contracts. Article 26 specifies that license and concession regime for hydraulic infrastructures (include dams) must observe existing and expected specific regulations.	
Decree 47/2009 of October 07 2009 - Regulation on small dams	This regulation is the only regulation related specifically to dams in the country. It applies to design, construction, exploration and maintenance of small dams (max. 15m height and 1 million m^3 of storage capacity). It emphasizes that for other type of dams must the respective ARA must receive request for authorization purposes.	Applicable.
Regulation on dam safety (under preparation)	This regulation is still under preparation. Defines the DNGRH and ARAs as overall responsible entities to implement and monitor its implementation. Also defines participation of other institutions such as Engineer Laboratory of Mozambique, National Institute of Disaster Management, Consulting Commission for Dam Safety, as well as project developer.	Awaiting enactment
SADC Revised Protocol on Shared Watercourses, of August 2000	It establishes a series of steps (13) to be followed in the management of water courses shared by more than one-member state. The main objective is maintaining unity and cohesion of each watercourse, balance between the various aspects of water use and management (social, economic, environmental, etc.), increased cooperation, coordination and harmonization among States in the region and particularly those sharing specific watercourses, amicable resolution of disputes including recourse to courts where amicable settlement is not achieved as well the operational aspects that assist in the materialization of these principles	Applicable

Construction

Legislation	Description	Relevance
Ministerial Diploma No. of May 22 Regulation of civil works activity licensing	Defines the requirements and conditions for exercise, modification suspension and termination of the contractor activity in Mozambique. The contractor must have authorization ("Alvará") of specific Category (V) – hydraulic infrastructures for the project.	Construction activity must be done by registered/licensed contractors according to the procedures presented in this regulation.
Decree 5/2016 of March 8 Regulation of Contracting of Public Works, Supply of Goods and Provision of Services to the State	Specifies the procedures for tendering a public construction service.	If project is to be public investment, procedures for tender must comply this regulation.
Decree 94/2013 of December 31 Regulation of contractor and civil works consultant activity	Establishes norms to the contractors and civil works activity in Mozambique. The public and works are divided into the following categories: (1) Buildings and monuments; (2) Urban Works; (3) communications; (4) building electrical installations; (5) hydraulic infrastructures; (6) foundations e water intakes.	Procedures for operation of consultant and contractors must follow this regulation.

Land and Spatial Planning

Legislation	Description	Relevance
Law No. 19/97 of October 1 Land Law	Defines the rights of people who use the land, indicating the details of the rights based on customary claims and procedures to acquire titles for its use and benefit communities and individuals.	The project must respect the land use rights of communities. If any activity (such as agriculture) is disturbed by the project, the parties affected should be compensated accordingly.
Decree 66/98 of December 8 Land Law regulation	Operationalizes the objectives of the Land Law. Defines total protection areas reserved for nature conservation and protection status, as well as partial protection zones, which may be granted land use titles and where activities cannot be implemented in the absence of a license. The partial protection areas include, among others, the strip of land with 50m wide from the edge of the lakes and rivers' historic maximum, the 250m strip of land wide around the reservoirs, 100m bandwidth on the coast and estuaries.	This regulation defines zones of total and partial protection. In these areas, land use is restricted. The Developer must meet these regulatory requirements.
Decree No. 19/2007 of July 18	Is intended to guide the spatial planning of the territory recognizing the rights of citizens enshrined in the Constitution. Article 20 refers to the expropriation of private property belonging to or used by the communities due to activities of public interest or necessity/usefulness. In these cases, fair compensation must be paid to cover,	The Developer must consider fair compensation when it becomes necessary to expropriate private property.

Legislation	Description	Relevance
Land Planning Law	among others the loss of tangible and intangible assets, disturbance of social cohesion and loss of productive assets.	
Decree No. 23/2008 of July 1 Regulation of Land Use Planning Act	Establishes the legal systems of land-use planning instruments at national, provincial, district and municipal levels.	All procedures for possible expropriation for dam construction should be followed.
Decree No. 60/2006 of Urban Land Use Regulation	Features in Chapter X procedures for expropriation for purposes of spatial planning.	The Developer should consider the guidelines in introducing the planned infrastructure in the municipality areas, specially laying distribution network pipes.

Resettlement and Compensation

The National Resettlement and Compensation Regulation has been developed in the RPF. The gap between the National Resettlement Regulation and the World Bank OP 4.12 on Involuntary Resettlement has also been assessed in the RPF.

Healthy and Safety

Legislation	Description	Relevance
Law No. 23/2007 Labor Law	Applies to legal relations of subordinate work established between employers and workers, national and foreign, of all industries operating in the country. Chapter VI provides the principles and safety rules, hygiene and health of workers.	The project should ensure that employees carry out their activities in good physical and environmental conditions. Inform them about the risks of their work and instruct them on proper compliance with health and safety standards at work. Developers/contractors must also provide first aid in case of accident, sudden illness, poisoning or illness. The developer/contractor in cooperation with the unions shall inform the competent organ of labor administration on the nature of work accidents or occupational diseases, their causes and consequences, after making consultation and registration.

Legislation	Description	Relevance
Law No. 5/2002 Law of Protection of Workers with HIV/AIDS	Sets out principles designed to safeguard all employees and employment seekers to not be discriminated against in the workplace or when applying for jobs because they are suspected or have contracted HIVAIDS. Article 8 provides that an employee who is infected with HIV in the workplace, as part of their professional occupation, in addition to compensation they are also entitled to, adequate medical care aimed at easing their state of health, according to the Labor Law and other applicable legislation, funded by the employer. HIV testing to workers, job seekers to assess them during their application, job maintenance or for promotion purposes is prohibited. All testing is voluntary and should have worker's consent.	The developer/contractor must train and guide all workers to carry out their tasks even if they are infected with HIV-AIDS. The developer/contractor must raise awareness among workers to prevent, and to know their status on HIVAIDS and disseminate information about the disease and on how to prevent it.
Decree No. 45/2009 Regulation on the General Labor Inspectorate	Lays down rules on inspections, under the control of the legality of work. Article 4 paragraph 2 provides for employer's responsibility in the prevention of occupational health and safety risks of the employees.	Developer/contractor must meet the requirements. In the case of inspection, the developer/contractor should help and provide all necessary information to the inspectors.

Cultural Heritage

Legislation	Description	Relevance
Decree 42/90 Regulation of Funeral Activity	Stipulates that the burial of corpses in rural areas can be done in cemeteries or other places approved by the Authorities. But too often there are family cemeteries or even within the properties. No reference is made in regard to the transfer of corpses in rural areas, that development projects should comply with. It is assumed that traditional leaders should be consulted to define appropriate burial sites and traditional practices to be followed for this purpose.	Under the practice recommended by this decree, the Developer should refer to local community leaders about the existence of graves along the areas of work or implementation of the new sections of road. If so, recommendations for relocation incompliance to traditional practices should be observed.

Legislation	Description	Relevance
Law 10/88 Cultural Protection Law	Is aimed at legally protecting property and cultural and intangible heritage of Mozambique. Under this law, the material cultural heritage includes monuments, groups of buildings (of historical, artistic or scientific value), places (of archaeological, historical, aesthetic, ethnological or anthropological importance) and environments (physical and biological formations of interest).	Some artefacts can be found during construction. If this happens, the Contractor shall immediately notify the relevant authority.

5.3 Institutional Framework

Several institutions, systems and mechanisms have been and continue to be created in the country to achieve a balance in the promotion of sustainable development. These extend to the support and development of agriculture and irrigation and IRRIGA will rely on them to serve its interests.

There will be multiple institutional interactions to materialize the core objectives of the project. It is not possible to foresee all of them at this stage and as with the case of laws and regulations an open attitude will be required to absorb any new issues as they come to light. Chapter 3 of this document made a brief presentation of the project implementation arrangements. A few more details are offered in this subchapter to serve as a basis and guide in the understanding of the roles and responsibilities of the essential actors.

5.3.1 MINISTRY OF AGRICULTURE AND FOOD SECURITY (MASA)

The Developer will be primarily the Ministry of Agriculture and Food Security through INIR and/or any other entity to whom INIR will delegate its responsibilities for project implementation.

MASA is the lead institution for agriculture development responsible for formulating and implementing agricultural policies at the national level, including agrarian services, crop development, livestock, irrigation, forestry and food security. Irrigation development fall under the National Irrigation Institute (INIR), which is under MASA. INIR works in close collaboration with the other MASA departments responsible for agrarian and extension services, such as the Department of Agriculture and Silviculture, the Department of Agrarian Extension; and the Agrarian Development Fund which finances agriculture projects.

The Ministry of Agriculture and Food Security (MASA) was created under Presidential Decree n.º 1/2015, of 16 January. Under the Resolution of the Inter-ministerial Public Service Commission n.º 2015, of June 26 - Approval of the Organic Statute of the MASA, the MASA is the central body of the State that, according to the principles, objectives and tasks defined by the Government, directs, plans and ensures the implementation of legislation and policies in the field of agriculture, livestock, agricultural hydraulics, agroforestry and food security, having the following attributions and competences:

1. **Attributions of the MASA:**

a) Promotion of production, agro-industrialization and competitiveness of agricultural products;
b) Promotion of sustainable development through the administration, management, protection, conservation and rational use of resources essential to agriculture and food security;
c) Promotion of the use and sustainable development of agroforestry resources;
d) Promotion of agricultural research, extension, technical assistance and food security;

e) promotion, monitoring and evaluation of agrarian and food security programs, projects, plans, and

f) Licensing of agrarian activities.

2. Competences of the MASA:

a) In the area of Agriculture:

i. Propose the approval of agricultural development legislation, policies and strategies;
ii. Implement sub-sector policies, strategies, plans, programs and projects;
iii. iii. Establish standards for licensing, supervision and monitoring of the activities of the sub-sector;
iv. iv. Establish standards for the implementation of projects and programs to promote agricultural activities;
v. Ensure plant health protection and phyto-sanitary control;
vi. Promote agricultural research programs and disseminate results;
vii. Promote and guarantee technical assistance to producers through the extension services, to increase production and productivity;
viii. Promote and guarantee the qualification of producers;
ix. Promote the creation and development of infrastructures and services to support agricultural activities, and
x. Produce and systematize information on agriculture in the country.

b) In Livestock:

i. Propose the approval of legislation, policies and strategies for livestock development;
ii. Implement sub-sector policies, strategies, plans, programs and projects;
iii. Establish standards for licensing, supervision and monitoring of the activities of the sub-sector;
iv. Establish standards for the implementation of projects and programs to promote livestock activities;
v. Ensure animal health protection, including aquatic animals, zoo-sanitary control and public health;
vi. Promote animal and veterinary research programs and disseminate results; vii. Promote and guarantee technical assistance to producers through agricultural extension services, to increase production and productivity;
vii. Promote and guarantee the training of producers. ix. Promote the creation and development of infrastructures and services to support livestock activities;
viii. Produce and systematize information on livestock in the country.
ix. In Agricultural Hydraulics:
x. Propose the approval of legislation, policies and strategies for hydro-agricultural development;
xi. To define, elaborate and promote programs and projects for the development of hydro-agricultural infrastructures;
xii. Promote the management and sustainable use of water for increasing production and productivity in agriculture, and

xiii. To elaborate and implement norms and procedures on the access and sustainable use of hydro-agricultural infrastructures.

d) In agroforestry plantations:

i. Propose the approval of legislation, policies and strategies for the promotion and development of agroforestry plantations;
ii. Implement sub-sector policies, strategies, plans, programs and projects;
iii. Establish norms for the implementation of projects and programs to promote agroforestry plantations;
iv. Ensure the development of agroforestry plantations for conservation, energy, commercial and industrial purposes;
v. Promoting forest research programs and disseminating results, and
vi. Promote internal processing of resources from agroforestry plantations.

e) In Food Security:

i. Propose the approval of legislation, food security policies and strategies;
ii. Promote good food preparation and use practices to ensure food and nutritional security;
iii. Produce, systematize and disseminate information on food security in the country;
iv. iv. Promote public education programs and information on access, conservation and food processing;
v. v. Ensure inter-sectoral promotion and coordination in formulating, monitoring, evaluating and implementing the policy framework and strategies to ensure food and nutritional security of the population.

The National Institute of Irrigation (INIR) was created under Decree n.º 9/2012, of May 11. As per the Resolution n.º 2/2013, of April 17, which approved the Organic Statutes of INIR, in tandem with Decree n.º 9/2012, INIR is/has:

a) supervised at the Central Level by the Minister who oversees the area of agriculture, which guardianship includes the following activities: i) approval of programs, business plans and budget, including the annual reports; ii) supervision of the organs, services, documents and accounts; iii) appointment and dismissal of technical areas Directors'; iv) approval of Internal Procedure Rules, and v) creation of INIR´s delegations, after consultation the Minister that oversees the area of finances; the following assignments: i) Formulation of strategies, norms and regulations, with a view to hydro-agricultural development; ii) Definition, development and promotion of programs and projects for the hydro-agricultural development in the value chain perspective; iii) Mobilization of resources to finance programs and hydro-agricultural projects; iv) Management, handling, protection and conservation of resources essential to agrarian activity, in particular land and water resources to ensure productivity in the agricultural sector; v) Promotion of public-private partnership for the development of projects hydro-agricultural , and vi) Promotion of irrigated agriculture;
b) The following responsibilities: i) development of studies of use of land and water for agricultural purposes; ii) Promotion of the rehabilitation, construction, operation and maintenance of infrastructures hydro-agricultural; iii) Formulation of hydro-agricultural development projects and supervise and supervise their

works; iv) Approval of hydro-agricultural development projects; v) Promotion and carrying out research activities of a scientific or technological nature in the field of agricultural hydraulics; vi) Promotion of the registration of irrigated perimeters; vii) proposing plans for reserves of hydro-agricultural land for the development of irrigation; viii) Assurance of participation in integrated river basin management plans; ix) Support the establishment of producer organizations for irrigation management and monitoring their use; x) Promotion of the public-private partnership for infrastructure management hydro-agricultural; xi) Participation in the capital of irrigation development and hydro-agricultural development companies, and xii) Adoption of sustainable measures to mitigate environmental impacts resulting from activities hydro-agricultural.

Within the Ministry of Agriculture and Food Security (MASA) INIR is integrated at the National Directorate of Agriculture and Silviculture (DINAS), which as per the Public Service Inter-ministerial Commission Resolution n.º 4/2015, of June 26 – Approval of the Organic Statute of the MASA, has the following functions:

a) To Ensure the development, implementation, monitoring and evaluation of policies, strategies and legislation specific to agriculture and forestry;
b) Ensure phytosanitary protection, safeguarding public health and the environment;
c) Ensure the production and circulation of quality seed in the national market;
d) To promote agrarian mechanization, including animal traction;
e) To Monitor and inspect the commercial networks of seeds, fertilizers and pesticides;
f) To Promote reforestation for conservation, energy, commercial and industrial purposes;
g) To lead the collection, processing and analysis of data, to generate information on the course of the agrarian campaign and to disseminate it to the decision-making process;
h) To Promote the development of the private agricultural and Silviculture sector as well as the producer organization;
i) To Promote the creation of an environment to increase agricultural productivity and production, focusing on the production chain and value approach;
j) Ensure the adequacy of policies, legislation and strategies in the framework of coordination with national, regional and international institutions, as well as, within the framework of international conventions and treaties, and
k) To carry out other activities determined by hierarchically higher organs under the terms of the present Statute and other applicable legislation.

In what is of interest for this project the other relevant institutions for irrigation development include the National Directorate of Water Resources Management from the Ministry of Public Works, Housing and Water Resources (MOPHRH), which is responsible for water resources planning and allocation, as well as the development and operation of major hydraulic works through the Regional Water Administrations; and the National Directorate of Land and Forestry in the Ministry of Land, Environment and Rural Development (MITADER), which is responsible for land allocation and titling.

5.3.2 MINISTRY OF LAND, ENVIRONMENT AND RURAL DEVELOPMENT (MITADER)

MITADER is the central government institution that ensures the implementation of the policies on land, forest and wildlife, environment, conservation areas and rural development. The organic statue was approved by resolution 6/2015 of 26th June, which defines the main mandates. The relevant mandates of MITADER related to this project are presented in Table 5-4, below.

Table 5-4: Mandates of MITADER and relevance to the project

Legislation	Description	Relevance
Resolution 6/2015 of 26th June, Article 3)	**In the field of land administration and management** ii) Establish and implement guidelines and procedures for land use administration, inspection and monitoring	Formal request of the land to implement the project.
	In the field of environment ii) establish and implement guidelines and procedures to environmental licensing of development projects	Request for environmental license should follow guidelines and procedures established by MITADER. See sub-chapter 0 Regulation on Environmental Impact Assessment Process (Decree 54/2015 of 31st December)
	xi) ensure effective implementation of bilateral and multilateral agreements to respond to challenges in environmental sectors.	All agreements must be taken into account, especially if water is to be transferred from one country to another.

5.3.3 MINISTRY OF PUBLIC WORKS, HOUSING AND WATER RESOURCES (MOPHRH)

MOPHRH is the central institution responsible for the implementation and management of activities on public works, construction materials, roads and bridges, urbanization, housing, water resources, water supply and sanitation. The organic statute was approved by the Resolution 19/2015 of 17th July, which defines the mandates of this entity and its subordinate operational units. The water management infrastructures for irrigation under the project will be developed in close collaboration with MOPHRH in what related to (i) public works, (ii) construction materials; and (iii) water resources management as shown in Table 5-5.

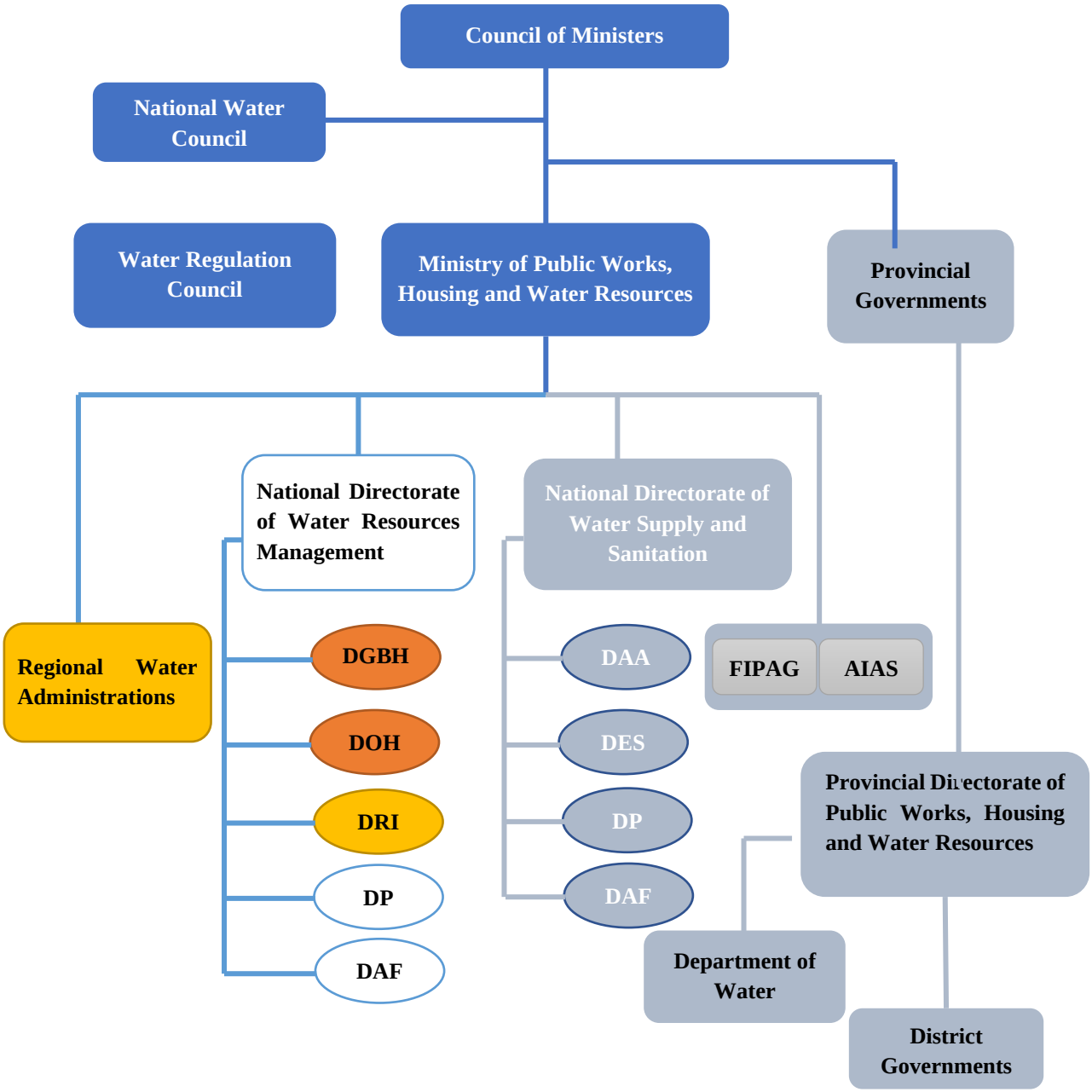
Table 5-5: Mandates of MOPHRH and relevance to the project

Legislation	Description	Relevance
Resolution 19/2015 of 17th July, Article 3)	**In the field of public works** • control public civil works to ensure security and durability	Norms of construction of civil works must comply with relevant instructions approved by MOPHRH.
	• promote construction, rehabilitation and maintenance of public infrastructures, namely roads and bridges, water supply and sanitation systems, water retention, protection and storage structures	This reinforces the fact that this project is under the core attribute of MOPHRH.
	• define the regime for design, execution and supervision of public works.	The guidelines for design, execution and supervision must be followed. See section 3.2.6 on construction regulations.
	• define technical norms and regulations for public works and buildings projects.	
	• inspect public and construction works to verify compliance with regulations and guidelines.	
	• regulate contractors and consultants for civil construction activities	Consultants and contractors must follow defined regulations.
	• establish regulations and norms for construction of hydraulic infrastructures	Specific norms for hydraulic infrastructure must be followed.
Resolution 19/2015 of 17th July, Article 3)	**In the field of construction material** • promote investigation and utilization of locally available construction materials	Local available materials should be used for the project as much as possible.
	• regulate the use of construction materials	
	• control the quality of construction materials and elements	
	• ratify construction systems	
	• establish construction materials and standard of elements	
Resolution 19/2015 of 17th	**In the field of water resources** • ensure availability of water in quantity and quality to meet sustainable socioeconomic development challenges at national level.	It is highly relevant. Although this might not yet be the reality in Mozambique, experiences from elsewhere show that irrigating tends to be one of the biggest if not the biggest water user.

Legislation	Description	Relevance
July, Article 3)	• promote establishment of agreements for joint management and share of water in internationally shared water basins	See section 3.2.5 on water regulations.
	• promote public-private partnerships on construction and management of water retention, protection and storage systems.	Opportunity to implement the project following PPP approach.
	• regulate water resources utilization in partial protection zones	
	• ensure universal access to water supply	See section 3.2.2. on sustainable development goals and section 3.2.5. on water regulations.
	• promote participation of private sector in management of water supply systems	See section 3.2.5 on water regulations.
	• regulate the services of water supply.	See section 3.2.5 on water regulations.

The organizational structure of the national water sector is presented in Diagram 5-1: Water sector organizational structure below and main institutions relevant to the project are described below.

Diagram 5-1: Water sector organizational structure



DNGRH is part of the structure of the MOPHRH responsible for water resource management. The mandates of DNGRH are to:

- Propose policies and strategies for the development, conservation, use and exploitation of water resources in river basins;
- Ensure availability of water in quantity and quality for different users an d uses;
- Coordinate cooperation actions in the field of shared water course, ensuring participation in cooperation in the field of water management;
- Assess compliance with international agreements on the joint use of water resources;

- Periodically assess water resources in the river basins and water needs at national and regional level;
- Establish the cadaster of the uses and exploitation and to operate national information systems on water resources;
- Prepare and monitor the implementation of the basin development plans to support short, medium and long-term planning of water resources utilization, conservation and development, in accordance with the principle of unit and coherence of watershed management;
- Promote investments for the construction and maintenance of strategic uses for management, storage, protection, diversion and transportation, as well as the regularization of river beds, ensuring their sustainable exploitation;
- Carry out strategic studies for the conservation, protection and development of water resources;
- Prepare proposals for legislation and the regulatory framework on water resources and ensure the monitoring and enforcement thereof;
- Keep the cadaster updated in order to guarantee the conservation of the patrimony of the public water domain;
- Ensure the integrated and rational management of water resources and the system of water resources management based on river basins;
- Ensure integrated strategic planning of water resources management;
- Ensure the establishment of water forecasting and flood warning systems;
- Prepare, update and monitor the implementation of the national plan for the construction of hydraulic infrastructures;
- Promote investments for the construction, maintenance and expansion of infrastructures for the management, protection and storage of water;
- To carry out other activities that are superior to the directorate determined in terms of the statute and other applicable legislation.

As can be demonstrated by the collaboration witnessed under PROIRRI, DNGRH is an important stakeholder in this project, and the relevance of this institution is particularly related to the functions b), c), d), h), o), and p). Regional Water Administrations (ARAs) were instituted to manage water resources at basin level, leaving the political management of water resources to DNGRH. The ARAs are responsible for the management of each of the country's five major regional river basins, namely ARA South (Sul, 1993), ARA Centre (Centro, 1997), ARA Zambeze (Zambezi River Basin, 2000) ARA Centre-North (Centro Norte, 2007); and ARA North (Norte, 2006). ARAs in general comprise 4 main operational areas, i.e. (i) general management; (ii) technical department; (iii) financial department; and (iv) legal department. ARAs are basically entrusted with the responsibility of:

- Ensuring participatory management and development of water resources in river basins of their region;
- Ensuring the protection and sustainable use of water resources;
- Managing and controlling the licensing, use and management rights for public use of water;
- Approving and supervising the construction and operation of infrastructure and development of water resources;
- Developing, maintaining and operating water infrastructure;
- Provide technical services to the Government;

- Developing, maintaining and operating the network for water resources monitoring;
- Resolving and minimizing conflicts between water users;
- Controlling and imposing sanctions when water users do so without a license;
- Defining and managing water resources protected area, as set out in the law; and
- Identifying and recording water users, and unrecorded rivers and lakes.

Under DNGRH, the Department of River Basin Management (DGBH), Department of Hydraulic Infrastructures (DOH) and Department of International Rivers (DRI) are directly linked to the relevant mandates of DNGRH related to the project.

In line with the distribution of river basins across the project area (Figure 4-2), relevant ARAs for the project are for the project are ARA Centro, ARA Zambeze and ARA Centro Norte.

Department of River Basin Management (DGBH)

DGBH is responsible for all activities related to water management at basin level for the entire country. Data storage and management and river basin plans are developed in this department.

Department of Hydraulic Infrastructures (DOH)

With the project having a component related with building a dam, the participation of DOH is important. One of the mandates of the DOH is to promote investment for the construction, maintenance and expansion of infrastructures for water management, protection and storage.

Department of International Rivers (DRI)

As shown in Table 5-6, below, and Figure 4-4, above, Mozambique shares trans-boundary hydrographic basins with nine other states. Within the project area these rivers and basins are Zambezi, Púngoè, Buzi and Save.

Table 5-6: Shared river basins in the proposed project area

N.°	River/Basin	Sharing countries
1	Zambezi	Zambia; Angola; Namibia; Botswana; Zimbabwe; Malawi; and Tanzania
2	Púngoè	Zimbabwe
3	Buzi	Zimbabwe
4	Save	Zimbabwe

Each of shared river basin has different associated complexities, and the number of connections and the necessary relationships differ in each case. It was in this context that, in 2001, Mozambique created the International Rivers Offices (GRI) (Ministerial Diploma No. 78/2001 of 23 May), which has now become the Department of International Rivers (DRI), integrated in the DNRGH. The DRI is responsible for issues related with the joint management of water resources with the riparian states, with which Mozambique shares watercourses.

One of the primary functions of the DRI is to coordinate and operationalize the aspects contained in the SADC Revised Protocol on Shared Watercourses, which established mechanisms to regulate relations between the Riparian States, thereby minimizing conflict situations.

Given the above-mentioned context, specifically, for this project, the participation of DRI is especially relevant. DRI will assist MASA and INIR to undertake the various functions of communication and negotiation with the riparian sates in line with the issues to be dealt with as foreseen in the thirteen main areas of cooperation presented in Annex 3. However, it is anticipated that considering the relatively small and almost non-intrusive nature of nature and characteristics of the water works to be carried out under IRRIGA the actions to be required will not go beyond simple notification of the undertakings.

ARAs

Specific functions of the ARAs include:

- Participation in the preparation, implementation and revision of hydrological occupation plan of hydrological basin;
- Administration and control of water under public domain, create and maintain the Water Cadaster and register private users, as well as inform and collect fees for water utilization;
- Licensing and concession of water users, authorize effluent disposal, define administrative reserve areas as well as inspect and monitor accomplishment of the requirements in which these areas where authorized;
- Approve hydraulic infrastructure projects, authorize their execution and do inspections;
- Declare the expiry of authorizations, licenses and concessions and their extension or revocation;
- Design, construct and explore of civil works carried out with its own means, as well as those assigned to it;
- Provision of technical services related to its duties and advice to local state agencies, public and private entities and individuals;
- Collect and maintain updated hydrological data needed for hydrological basin management;
- Mediate conflicts arising from the water utilization;
- Carry out water inspections, to impose sanctions, ordering demolitions of works and to eliminate unauthorized uses, and to eliminate sources of pollution;
- Propose the definition of protection zones as indicated in the water law;
- Proceed with the recognition of traditional water utilization and promote their registration;
- Any other mandates to be attributed by law.

These are all important to the project. Among other aspects the ARA will provide authorizations related with water uses for the project.

5.3.4 MINISTRY OF TRADE AND INDUSTRY (MIC)

The Ministry of Industry and Commerce is the central body of the State apparatus which, in accordance with the principles, objectives and tasks defined by the Government, oversees and supervises the following areas of the national economy: (i) food and beverage industry; (ii) textile and clothing industry, footwear and leather; (iii) chemical industry; (iv) metallurgical industry; (v) metal-mechanic industry; (vi) electrical engineering; (vi) graphic arts and publishing; (vii) distribution, maintenance and technical assistance to industrial equipment; (viii) other light industries; (ix) trade; and (x) general provision of services.

MIC comprises the following main technical units: (i) Inspection of Industry and Commerce; (ii) (iii) (iv) National Directorate of Industry; (v) (vi) National Directorate of Internal Commerce; (vi) National Directorate of Foreign Trade; (vii) National Directorate for Support to Private Sector Development (viii) Planning and Studies Department; and a (ix) Legal Office. It is within this Ministry that other important units with influence in the business environment and particularly MSME are found such as (i) National Institute for Standardization and Quality (INNOQ); (ii) Institute for Promotion of Small and Medium Enterprises (IPEME); (iii) Institute of Industrial Property (IPI); (iv) Agency for the Promotion of Investments and Exports (APIEX) and (v) Mozambique Stock Exchange (BMM).

It has the potential of playing a crucial role in the establishment of the necessary linkages for the agricultural sector and irrigation subsector, including IRRIGA initiatives to thrive.

5.3.5 OTHER LEVELS AND ACTORS

Provincial and District Levels

In line with the efforts that the country has been undertaking to promote decentralization the provincial and district entities occupy an important position in IRRIGA development. The institutions described above are also represented in different ways at the provincial and district levels.

At the provincial level the institutions at the central level are practically replicated and these have what is commonly referred to as double subordination in that they liaise with the ministerial departments to deal with sectoral issues while also subordinating to the Provincial Governor (appointed by the elected President of the Republic) in what regards the territorial and horizontal level.

The Provincial Directorates of Agriculture and Food Security (DPASA) include units that deal with irrigation. The possibility of irrigation (INIR) being organized in line with the irrigation regions, almost in the same way as the water administrations, is still under discussion and is seen by some as a promising organizational approach.

At the district level there are a few significant differences. The various sectors are amalgamated in a limited number of units although internally an attempt is made to establish technical departments that oversee technical matters in coordination with and subordination to the provincial technical units (Decree 6/2006 of Abril 12 (Statutes of District Government). The directors of these services are also report to the District

Administrators nominated by the Ministry of State Administration and Public Service (MAEFP). Relevant technical units are:

District Services of Economic Activities (SDAE)

Given the fact that agriculture is the main economic activity in Mozambique all SADEs include these services in all districts. It is only other sectors (e.g. fisheries, mining, etc.), that are only present depending on the potential of different districts. SDAEs providing assistance in the planning and implementation of agricultural activities at the district levels. Among other aspects they provide extension workers who try to provide technical assistance to farmers on the ground.

Extension services are characterized by a number of limitations notably very few extension workers to cover wide areas, limited resources such as transport to facilitate their work and considerable isolation from centers of production of relevant technical information to be passed on to the farmers.

Under the project this would be to be reversed even if by simply targeting selected growth poles in which small changes can result in promising outcomes.

District Services of Planning and Infrastructures (SDPI)

These are responsible for: (1) spatial and land use planning; (2) water resources; (3) energy; (4) public works, infrastructures and equipment; (5) transport and traffic; (6) environmental management; (7) emergency; and (8) public services.

SDPIs can be expected to occupy an important position in the project as it is responsible for the infrastructures and also environment at district level. Now SDPI are generally weak institutions in need of many forms of support in order to fulfil their mandates.

Municipalities

Law 2/97 of May 28, which defines the base for the municipalization has been translated in the establishment of 53 municipalities across the country. Chapter 4 indicates the municipalities existing in each project targeted province. Where irrigation systems will be developed within the municipal jurisdiction the units responsible for supporting agricultural services will take the lead. The water supply system is mainly located in the municipality territory which turn the municipality into an important stakeholder for the implementation of the project.

Private Sector and NGOs

Since embracing the market economy in the 1980s and political pluralism in the 1990s Mozambique has been consolidating the position of the private sector and civil society organizations in development processes.

As described in Chapter 4 the private sector is present in all areas of the economy although still facing all the listed challenges. Endogenously and/or in collaboration with regional and international organizations NGOs have also been multiplying. They are active in agriculture, rural development, conservation and other areas playing different roles such

as advocacy, education and capacity building, technical assistance and different forms of facilitation, demonstration, etc.

As explained in the previous chapters these will also play crucial roles in meeting IRRIGA objectives.

Water User Associations

The establishment and consolidation of WUAs will be crucial in the management of irrigation schemes and development of irrigation in general is one of the aspects to be considered under this heading. The same can be said about other organizations representing business actors, water users for other purposes and other actors that are of interest for agriculture and irrigation with which IRRIGA will endeavor to work closely. A list of such organizations in the country and project area will be compiled, updated continuously and used to meet the various functions of communication and coordination. During PROIRRI[24] a substantial ground was covered, and this must continue appropriately during IRRIGA.

5.4 Assessment of the Progress Made in Legal and Institutional Development and Comparison with the WB

Despite the enormous progress that has been made in both implementation and institutional adaptation the country continues to face significant challenges to make its environmental and social management instruments and practices more responsive to the ultimate interests of adopting a sound management of its natural and social base. For instance the processes downstream the issuing of environmental licenses are rather weak and/or almost non-existent. This is an area that requires serious strengthening including putting in place the various systems and procedures to make developers, public and private more compliant with sound environmental and social management requirements.

Main weaknesses and risks/challenges include but are not limited to:

- **Incipient decentralization**: despite the strong official advocacy and real efforts to promote decentralization, it is noted that there is still an excessive attachment to centralized action to the detriment of the decentralization that would place local and, above all, districts and municipalities in the driving seat in the planning, budgeting and implementation of development actions and processes. The predominant practices are continually undermining the development of local capacities and consequently the development of responsive interventions to local circumstances and needs (WB, 2009). Weaknesses also translate into an inability to integrate development initiatives across different sectors in favor of departmentalization (see below);
- **Excessive departmentalization**: that render integrated and inter-sectoral actions difficult to achieve due to lack or incipient dialogue and common action between departments and development sectors;
- **Human and technological resources**: significant limitations in the quantity and quality of human resources, especially of those in the public sector to carry out

[24] The consultation process during the formulation of WUA law and regulation created a database of agriculture and irrigation relevant organizations in the country, including public, private and CSOs.

the various functions of promotion and regulation of development. This is substantially valid in the subsector and current situation of MASA/INIR;

- **Financial resources**: inadequate financial resources and chronic deficit/budgetary dependence resulting in irregularities and inadequate flows of financial resources for various purposes (idem for MASA/INIR and irrigation);
- **Poor public-private cooperation**: there is still frequent lack of harmonization and tensions between the public and private sector roles and other non-public actors (e.g. NGOs/CSOs) in the development of the various activities.
- **Discrepancies between modern and traditional management and communication systems**: managers must continuously find ways of accommodating and assimilating traditional systems and indigenous knowledge systems into modern principles. Clearly there are two worlds that need to find ways of harmoniously working together.

Under this project MASA/INIR will work as the implementing entity in close collaboration and with MITADER and MOPHRH, which will also have the licensing, assistance and supervisory role in relation to environment and water resources. They will also work with the other actors that are of relevance for the subsector as highlighted above.

Finally, although there has been increased harmonization between the GOM Regulations and the WB Safeguards Policies, differences in certain areas and aspects still remain. **Under the Project whenever there is a conflict between national legislation and World Bank safeguards policies, the latter prevails**.

Table 5-7, below, makes a brief comparison between the Mozambican legislation and that of the WB in conducting environmental and social impact assessments while identifying existing conflicts.

Table 5-7: Gap assessment and comparison of legislation between Mozambique and WB requirements

Issue	Mozambique Legislation	WB safeguard requirements	Gaps/Conflicts
Project categorization	EIA required by Environment Law Nº 20/97 of October 7, 2007 and Decree Nº 54/2015 and the upcoming Decree Nº 54/2015. The Regulation for the EIA process classifies the projects into 4 categories: A^+ and A require a full EIA subject to review by external and domestic professional assessors, respectively for A+ and A. A Simplified EIA is required for category B and no EIA is required for Category C.	Under the OP 4.01, a full EIA is required for all projects screened as Category A. For Category B projects, some form of environmental assessment is required, usually less rigorous than a full EIA and often taking the form of an Environmental Management Plan (EMP). Beyond screening, no further ESMF/ESIA or ESMP or RPF/RAP action is required for a Category "C" project and a project is classified as Category FI if it involves investment of Bank funds through a financial intermediary	Despite some minor differences there are no conflicts between the two sets of legislation
Environmental authority must provide an environmental permit for projects prior to appraisal.	The issuing of an environmental license shall precede any other required license.	OP 4.01 requires the approval and disclosure of EIAs by the relevant government authority.	In both processes the disclosure takes place before approval and therefore any raised concern is dealt with before project approval.
National guidelines and standards exist for Occupational Health and Safety (OHS).	OHS legislation in place (Law No. 23/2007 of 1 August 2007) and implementation isis under responsibility of Ministries of Labor and, Health. Safety standards guidelines for Environmental Quality and Effluent Emission are in place (Degree No. 18/2004 of 2 June 2004)) and the implementation is under responsibility of MITADER.	The guidelines for OHS provided under the WB Occupational, Health, and Safety Guidelines should be applied for all infrastructure projects.	Mozambique has not prepared specific standards for management of wastes, and noise emissions for different industries. Therefore, World Bank standards (IFC OHS guidelines and IFC Environmental, Health and Safety guidelines) can be applied. National environmental standards (Decree No. 18/2004 of 2 June 2004 developed for other industries (air emissions, power industry, and plastic exist and can be applied).

6 ENVIRONMENTAL AND SOCIAL CONCERNS IN THE PROJECT AREA

In addition to literature review and initial contacts with central level institutions in Maputo city consultations and direct observations with people and their circumstances in the project area were made to ascertain the type and level of impact that the project might have on the receiving natural and social environment. The subchapter below presents a summary of the issues uncovered during the public meetings.

In Line with the World Bank's requirement and Mozambican Legislation (Decree 130/2006 of July 19) public participation meetings were held during the preparation of IRRIGA's ESMF, RPF and PMP. The public meetings were held with stakeholders in provinces where IRRIGA is expected to be implemented, i.e., Sofala, Manica, Zambézia and Nampula,, as well as in Maputo, to gather input from stakeholders about their experiences with the PROIRRI and other similar undertakings and improvements that can be made in the development of all phases of IRRIGA project and respective subprojects. The Public Consultation Meetings were convened through an announcement launched on 1st of February 2018 in Notícia Newspaper, (Annex 1) where a Background Information Document summarising information contained in the ESMF, RPF and PMP was presented, while the draft ESMF, RPF and PMP were made available to the stakeholders at the PIU (Maputo and Provincial representations), the Provincial Directorate of Agriculture and Food Security, and on request to the consultant as indicated in Annex 1. The scheduling of the meetings was as summarized below:

Table 6-1: Schedule of the IRRIGA public meetings

N.°	City/Province	Dates
1	Chimoio – Manica	16 February 2018
2	Beira – Sofala	20 February 2018
3	Quelimane – Zambezia	21 February 2018
4	Nampula – Nampula	16 February 2018
5	Maputo City – Maputo City	22 February 2018

The objectives of the public consultation meetings were set as follow:

- To present the context, objectives, structure and contents of ESMF, RPF and PMP to the project beneficiaries and the draft versions of the ESMF, RPF and PMP to local communities, civil society organizations and governmental structures;
- To make a preliminary identification of the project impacts on the biophysical and socio-economic environment; and
- Register the participant's contributions, concerns and clarify, as much as possible misunderstandings about IRRIGA and the related PROIRRI.

Below, summarized details of public meetings are presented.

6.1 Meeting in Manica

Key issues captured:

- Limited access to funding for projects and activities in the area;
- Outputs from the PROIRRI sites have declined over time because of lack of storage or appropriate conservation techniques to preserve the produce;

- Lack of adequate communication in the context of project implemented in areas may negatively influence project performance as has been the case with some of the PROIRI sub-projects;
- Water-scarce districts (i.e. such as Guro District which does not have any river traversing it) may struggle to benefit from IRRIGA;
- There have been cases of water contamination of agro-chemicals (likely to happen under IRRIGA if the correct measures are not implemented);This is not true. Agrochemicals are used under strict supervision of the fostering companies' personnel or SDAEs. There must be clear criteria for selection of IRRIGA subproject locations to minimize conflicts;
- A problem of abandonment of irrigation schemes during rainy season and erosion of soils;
- I was not reported as that physical cultural resources were negatively impacted by PROIRRI activities There must be a clear programme for the maintenance of irrigation schemes to control erosion problems;
- A need for processing and conservation/appropriate storage of agricultural produce;
- Weirs and irrigation schemes are a potential source of water for cattle, which may bring up all sorts of problems of contamination of the water sources;
- Contamination of water for downstream users and need to have an integrated hydrological management regime for water quality for downstream users;
- Need for agro-processing industries to be built into the agricultural value chain;
- Migratory pests may affect IRRIGA sites, as has been the case for PROIRRI sites;
- Prioritization of local labour to be part of IRRIGA project;
- Deterioration of infrastructure due to lack of maintenance plan;
- Gravity-fed irrigation systems are problematic; there is a need for water pumps to be used in some areas. The use of renewable energy sources such as solar PV panels to be considered in project design for IRRIGA;
- Most common pest in rice fields in Manica is the sparrow (bird) – which is extremely difficult to control;
- Gender redress needs to be considered in the IRRIGA project;
- Toilets in the PROIRRI sites are located far away from project sites and there is no water to drink or wash hands (unsafe hygiene);
- There are no suitable roads to access the irrigation sites;
- A road maintenance budget ought to be included as part of the IRRIGA project budget, and
- People from areas that are not selected may feel side-lined, and this may trigger disapproval and potential for conflict.

6.2 Meeting in Nampula

Key issues captured:

- Design of the IRRIGA project should consider the topographical layout of areas and incorporate that to maximize productivity;
- Any pits that are dug during site establishment should be covered up to minimize risk of accidents;
- Access to market for the produce from the agricultural areas should be adequately considered and built into the project;
- Irrigation infrastructure ought to be sustainable (key lesson from PROIRRI);
- Associations must be empowered enough to manage infrastructure on their own;
- Potential conflicts between those who belong to associations and those who do not should be minimized;
- Involve community leaders in processes of resettlement;
- IRRIGA will reduce malnutrition (if done right);
- There must be adequate mechanisms to deal with issues of water contamination in the project sites;
- Communities should be encouraged to look beyond rivers for other sources of water that could be used by their irrigation schemes (boreholes, underground water, etc.);
- Instances or incidents of corruption during project set up should be minimized;
- Infrastructure ought to be set up with careful thought on risks such as drowning of children/people;
- Conflict between upstream and downstream water users should be built into project design in the form of suitable hydrology studies for a better understanding of water resources and the impact of

abstraction.

6.3 Meeting in Sofala

Issues captured:

- Need to include contingencies in project planning to ensure that projects are completed;
- Need for hydrological studies to inform consideration of water availability for downstream water users;
- Gender mainstreaming in IRRIGA project;
- It is beneficial for communities to exploit community-owned resources such as water;
- Projects not completed under PROIRRI should be scaled up and completed under IRRIGA project;
- There were experiences of projects designed under PROIRRI which did not fit local context; such experiences should not be repeated under IRRIGA;
- Identification of materials and training qualifications of personnel for the maintenance of machinery and equipment;
- The potential for use of solar PV energy to minimize costs of electricity in some sites should be explored. This could apply to pumps in the river Muda;
- Project ought to provide site-specific information for sites;
- Rehabilitation of old infrastructure provides an opportunity for the use of renewable energy in the form of solar PV;
- There is potential for the extension of project into other areas such as the rice cultivation sites in the Administration Post of Murraça;
- There is a need for an EMP that addresses issues such as soil erosion;
- Construction of new hydraulic infrastructure for the storage of water proposed;
- The participation of institutions such as ARA and ARA Zambeze is proposed;
- Small irrigation systems to be prioritized;
- The potential use of other energy sources that are more accessible to peasants should be considered (e.g. solar PV renewables);
- The project should consider including the maintenance of existing dams (some of which are silting);
- There should be proper environmental studies and EMPs to inform project implementation to minimize problems;
- A list of all problems encountered during PROIRRI should be generated to prevent such problems from plaguing the IRRIGA project;
- Irrigation systems in Metuchira are not working (it is desirable to be considered under IRRIGA);
- There is a dam upstream of Muda River which has the capacity to be scaled up (increased);
- This irrigation scheme was not part of PROIRRI. There is no electricity in Machanga – this is a site with potential for the establishment of renewable energy facilities in the form of solar PV;
- There are no access roads to go to places of production;
- There are serious problems with hippos in Machanga; products end up rotting as they do not reach markets on time due to lack of suitable roads;;
- There is a need for training of workers who will operate machinery and equipment, and
- The treatment of solid waste should be covered in the EMP.

6.4 Meeting in Zambézia

Key issues captured:

- There are a lot of anticipated negative impacts that should be considered – this presents an opportunity to improve on negative experiences associated with PROIRRI;
- Problems of salinization of soils are well known in Zambézia;
- There are problems such as plagues of mice and elephant grasshoppers,, and

- There is a need to involve all stakeholders and make information readily available to offset social conflicts.

6.5 Meeting held in Maputo City

Key issues captured:

- Project is not about roads and energy infrastructure but for small irrigation systems to fulfil their functions roads are an extension of such;
- There will be no land acquisition – small irrigation schemes will be established in areas where smallholder farmers want to be supported by irrigation system;
- Resettlement includes loss of assets or loss of access to resources;
- Project should provide clear guidelines about how to deal with cultural assets/artefacts, and
- There is a need to draw lessons from other projects so as not to repeat mistakes made.

It is not easy to make a linear summary of the issues raised as they are so diverse. An attempt of doing so highlights the following aspects that should be adequately considered in the final design of the project and particularly in its sound environmental and social management.

Water quantity and quality: (i) the siting of the subprojects should target areas known for having sufficient water to meet the needs of the various users, downstream and upstream, to avoid conflicts and other problems. Informed by sound screening of the conditions on the ground, IRRIGA should make a preliminary effort to identify and disclose such sites before project implementation to allow the public and potential project beneficiaries to have a say in final siting of subprojects including the irrigation design specifications; (ii) different water users including irrigation contribute to water contamination, which ultimately can undermine the different interests of the various users. A sound management of water quality is required, which should involve all water users coordinated by the water authorities and the measures to be taken should consider irrigation as both beneficiary (needing water under certain quality conditions to meet its specific purposes) and potential contaminator (who could undermine its own interests and the interests of other water users by the use of fertilizers, pesticides and other polluters, triggering water salinization, etc.).

Irrigation by gravity vs pumping and the use of alternative sources of energy: even accepting that irrigation by gravity will be the norm under IRRIGA the reality is that both subprojects inherited from PROIRRI and those to be developed under IRRIGA will translate into the existing and possibly additional pumping irrigation schemes. To counteract the issue of prohibitive costs of electricity that comes as the major deterrent, the adoption of alternative sources of energy, notably solar, should be considered under the project.

Soil erosion and other soil related problems: past experiences under PROIRRI and other irrigation projects show that site selection and production technologies have a strong potential of aggravating soil erosion particularly in areas that are already prone to that phenomenon. Adequate siting and production technologies are required to avoid/minimize/mitigate common problems.

Other investments and facilities to increase the viability of investments in irrigation: the project focus on irrigation infrastructure should not ignore that for irrigation projects to thrive they require other infrastructures and facilities in rural areas such as roads and bridges, electricity, storage facilities, processing and other forms of facilitation. It is either IRRIGA will undertake some of these on its own or it will ensure that adequate synergies are established with other initiatives to bring such assets closer to where the subprojects will be developed.

Sound environmental and social management: all the known environmental and social management safeguards need to be applied systematically under IRRIGA to ensure that the impacts of the same on the natural and social receiving environment are adequately identified, measured, and management plans are adopted and applied to avoid destruction, pollution/contamination, restrictions, etc. in all phases of subproject planning, design, construction, operation and eventual decommissioning.

The issues raised highlight among other aspects the relevance of: (i) involving as many stakeholders as possible and building their capacity for each to undertake the various roles requires to promote sound management of water, soil and other natural environmental components including the social environment. Reference is made to DNGRH/ARAs (and DRI), MITADER, WUAs, MIC, private sector and CSO including coordination with other existing projects (SUSTENTA, MozFIP/MozDGM, MozBIO, etc.) and other relevant public and private investments; (ii) adopting this ESMF and related RPF, IPMP as well as subsequent ESIAs/ESMP, RAPs, etc....

The project will also need to be sufficiently clear about the strategy to be adopted to operate and maintain the irrigation schemes once they are rehabilitated and handed over to the farmers.

7 LESSONS LEARNED FROM PROIRRI

IRRIGA will continue and consolidate developments initiated under PROIRRI (2011-2018) in the process of placing irrigation in its rightful position of strong engine in the development of agriculture and the economy in Mozambique. As stated under PNI the first stage of such process will focus on rehabilitation and putting back in operation the irrigation systems that existed before independence.

IRRIGA will inherit 3,000 ha of irrigated land from PROIRRI spread over 32 irrigation schemes in the provinces of Manica, Sofala and Zambeze and will develop new 5,000 ha; and will also inherit the seven years of work experience gained while implementing PROIRRI including in what refers to the practical adoption of the environmental and social safeguards. ESMF, RPF and PMP were also formulated for PROIRRI and these have basically the same structure and contents as the instruments IRRIGA will adhere to. From PROIRRI it is fundamental to ensure that positive lessons are retained and enhanced and that the negative ones are discharged and/or corrected under IRRIGA.

Among other sources of information in the last quarter of 2017 an assessment of the environmental and social performance of PROIRRI was conducted. The findings of this exercise were and will continue to be used to fulfil the above-mentioned objective. The report and overall assessment of the project performance in complying with the environmental and social management requirements highlight the following:

Box 7-1: Summary of lessons learned from PROIRRI[25]

Of the 32 irrigation systems evaluated, it was verified that twenty seven (27)are in operation phase and the rest five (5) still under construction. For the majority of the irrigation systems (both in operation and in construction), the rules for socio-environmental management were hardly complied systematically in accordance with the regulatory instruments approved for PROIRRI, namely ESMF, RPF, PMP and SESA. There is also no adequate institutional framework for socio-environmental management in irrigation. This situation means that though some environmental and social activities (e.g., trainings, awareness raising, conservation agriculture practices, setting up mechanisms of conflicts resolution within the associations, …), most of the irrigation schemes are not complying systematically with the basic rules of PROIRRI,. The records and documentation relating to environmental management associations and practices is almost non-existent, which makes it difficult to confirm as some reports made orally. In all irrigation schemes there was no need for resettlement. In summary, the sub-projects under the PROIRRI program require in their entirety socio-environmental management measures to bring the project back to compliancy.

A more detailed assessment shows that, perhaps because of all PROIRRI's sub-projects classification as Category C for all sub-project, or any other reasons, most of the provisions foreseen under the project's environmental safeguards instruments were not strictly adhered to in practice during implementation. Reference can be made to:

- Not hiring a Project Environmental and Social Safeguards Specialist to be part of the Project Implementation Team. Several tasks that should have fallen under the responsibility of this Specialist were partially undertaken by the project's overall M&E Officer, without the necessary level of dedication and possibly technical capabilities. It was only in October 2016 that a safeguard specialist was recruited (and performed the activities for about eight (8) months); and only by December

[25] Source: Final Considerations (Assessment of the environmental and social performance of irrigation report (2017).

2017, about six months before the end of the project, the next vacant position was again filled;

- Inadequate institutional coordination /synergies amongst the various actors, mainly between irrigation (INIR/PROIRRI), water management (DNGRH/ARAs) and environmental permissions and oversight (MITADER/DINAB/AQUA). In several cases the MITADER/DINAB focal point for the project was directly involved in the preparation of environmental screening forms for the subprojects instead of just concentrating on giving advice and ensuring that such forms were adequately prepared for MITADER/DINAB to then approve and do the follow up. Safety reports for weirs (small water reservoirs facilities, e.g., of about or less than 500 m^3 capacity) and other water management infrastructures were not prepared by the ARAs and are not available, and there is no technical documentation attesting that the weirs are safe and that no repair works are necessary;
- At some extent non-existence of studies or practices to ensure the maintenance of the ecological river flows in dam/weir design, construction and operation;
- Although Vetiver grass plantation and gabions are erected in view of tackling erosion, still there is a challenge to counteract this phenomenon;
- Only in one irrigation scheme (Muda Massequece) water quality monitoring is practiced;
- There is a potential to improve the water sharing and regulation mechanisms and water among the various users inside and outside irrigation;
- Although some agriculture conservation practices are practiced in place (e.g. cultures rotation, incorporation of organic matter in the soil, leveled planting / terracing), still soil conservation practices need to be improved and poor control of soil erosion;
- Health and safety management measures, were not documented; nor criteriously and systematically addressed;
- Even though resettlement as such, and mainly as physical relocation, was almost non-existent there are issues concerning social aspects. VLD, compensation processes (where were applied), and vulnerable groups management were not documented and not systematically addressed with clear criteria.

The process shows a significant adoption of informal procedures and considerable communication based on "hear say" in detriment of written, recorded and properly kept documents. As both GOM and WB regulations and guidelines highlight being a Category C sub-projects doesn't necessarily prevent a sub-project from ensuring adequate monitoring of both environmental, social, health and safety aspects of sub-projects that are beyond safeguards.

The roles of the other institutions and entities such as ARAS (in water resources management including their permissions, inspections, technical advice, etc.) contractors, water user associations, PAPs and the issues around their levels of involvement and/or impact by or on the project need also to be properly included in the subproject cycle and documented.

Preparation of IRRIGA took these lessons into consideration and provided adequate human resources, capacity building and budget to ensure sound implementation of environmental and social management

8 POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACTS AND MITIGATION MEASURES

Particularly under components 2 and 3 IRRIGA is designed to focus on the development (mainly rehabilitation and expansion) of existing traditional irrigation schemes for smallholder farmers. It will also support a series of interventions to facilitate market access to inputs and outputs to and from irrigated agriculture.

Project focus with potential implications on the natural and social environment will be on:

(i) the rehabilitation and expansion of irrigation schemes mainly by (a) upgrading the areas around the water intakes and the main canals; (b) construction of water collection structures and/or rehabilitation of damaged embankments; (c) installation of control structures like water gates; (d) upgrading the main canals and, where necessary, lining critical stretches of the distribution system; and (e) use of local plants/grasses (like vetiver grass) to control canal erosion;

(ii) improvement of the cropping intensity, productivity, production, competitiveness and market access of near 13,000 smallholder farmers cultivating 88,000 ha of irrigated land in the project area in terms of (i) capacity building through training for the establishment and operation of farmers groups and water user associations as well as local level staff; and (ii) farmers investments, using matching grants (inputs such as seeds, fertilizers, pesticides, equipment) and market linkages, to enhance agricultural production and value addition; (iii) basic infrastructure to improve markets (e.g. storehouses, processing unit (at least one at a pilot level), basic rural access roads (mainly "last mile" approach), powerlines (connecting for pumping-fed schemes) to irrigation schemes and irrigation rehabilitation/construction camps.

Except for most of the 3,000 ha of irrigated land that were developed under PROIRRI (Annex 2), the location and details related with the development of additional 5,000 ha in the four provinces and those of the other support infrastructures were not yet know at the time of preparation of this ESMF. The exercise to select and prepare the pre-feasibility/feasibility studies of specific subprojects will be conducted after project start up.

Coordination and harmonization with other investors (public and private), projects[26] and initiatives will be sought out, but it will fall under those other entities/initiatives to adopt and apply the relevant environmental and social safeguards.

IRRIGA irrigation infrastructures will not differ significantly from those developed under PROIRRI. These consist of small/medium size dams/weirs/embankments and other simple water retention and distribution infrastructures. The biggest dams under PROIRRI

[26] World Bank financed puclic projects, such as SUSTENTA, Feeder Roads, MozFIP and MozBio (under MITADER and MOPHRH) also aim to finance agricultural related infrastructure and synergies will be explored and maximized in order to efficiently use public resources.

(Murrowe and Tsetsera) have a maximum storage capacity of 1,200 m³ and 2,500 m³ and a depth of 3-4 meters.

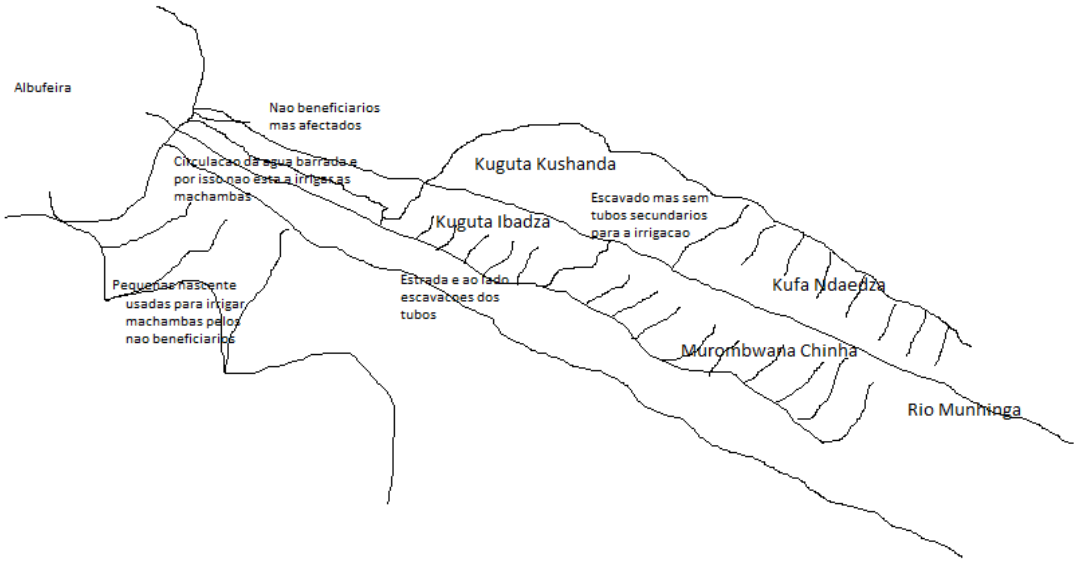


Figure 8-1: Overview of the water system of Tsetsera irrigation scheme in Rotanda, Sussundenga (Manica)

The dams/weirs adopted under the project are mostly situated in the tributaries of the main rivers. It might only be in some cases where water is pumped directly from the river to the irrigation schemes that water is abstracted from the main course of some of the project major rivers, e.g. Zambezi and Buzi.

Where dams/weirs are built usually a diversion of the river is adopted or created to install them for water intake and storage without interfering with the normal course of the river. The water that is discharged from these infrastructures is channeled to the normal course of the river at a few meters of distance. In general, this helps to retain water for use at different times including in times of scarcity, which may also be beneficial in regulating the flow of water in the normal course of rivers (e.g., flood control and droughts including environmental flows). The irrigation areas themselves are usually the same areas that have been and continue to be used by local people and their organizations/associations to develop agriculture. No other uses and/or infrastructures are found in them except occasional makeshift infrastructures meant to assist agricultural operations (temporary shelter and storage, etc.). Rehabilitation and expansion has not been associated with any significant resettlement implications.

The main environmental and social components to be directly affected by the above-mentioned interventions include:

- water resources including freshwater which may be affected qualitatively and quantitatively by the discharge of fertilizers, nutrients, different chemicals to be used for pest management, and debris from civil works, oil spills, etc. and quantitatively by water abstraction, diversions for irrigation and other uses. The qualitative and quantitative aspects are two-fold in the sense that irrigation can be affected by other uses and it also can affect other uses;
- land resources on which the proposed small-scale infrastructure will be rehabilitated;

- 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 pesticides and be subject to erosion by the various irrigation and cultivation practices;
- vegetation which may have to be cleared to expand water intakes, canals or rural accesses for new farming areas and other physical interventions related with water use and management for irrigation; and
- communities, which will generally benefit from the project, but at times could be negatively affected, e.g. the risk of loss of land and/or loss of assets on the land.

The preliminary identification of Project potential environmental and social impacts was done considering the projected interventions and the environmental and social components that are likely to be affected by the Project activities. This was done through literature review of projects implemented in the same areas and particularly those under PROIRRI. Limited consultation with key stakeholders, particularly at the central and provincial level as described in the previous chapter, scholars and key informants and professional judgment were also used.

Construction operations will be of shorth/medium term, while operation will be long term. The irrigation schemes have been and will continue to be rehabilitated in areas of relatively intensive use for agriculture in which, because of proximity to water courses, typically accommodate farming areas, trees, temporary infrastructures aimed at assisting agricultural operations and virtually no houses. This also means that the subprojects will have limited resettlement implications.

However, in line with the GOM and WB regulations and guidelines a systematic screening and identification of the issues that are likely to emerge will need to be conducted.

8.1 Potential adverse environmental impacts

The environmental and social impacts will result from the project activities under components 2 and 3. These impacts relate particularly to the (i) final design, rehabilitation/expansion and operation of small and medium scale irrigation schemes; (i) improvement of the cropping intensity, productivity, production, competitiveness and market access activities. The latter has the potential of being associated with the increased use of fertilizers and agrochemicals, including herbicides and pesticides, as well as installation and operation of agro-processing and storage facilities.

Adequate selection criteria for all sub-project actors and sites will need to be applied to avoid the risk that communities lose the access to their land, according Project Appraisal Document (PAD). Large-scale investors, which need to acquire large land areas, will not be supported under this project. Likewise, investors who want to introduce genetically modified organisms (GMOs), grow tobacco and drugs 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, especially for the units that will be

storing and/or processing large amounts of local products. The applicable Agribusiness and Food Production EHS Guidelines will be applied to the Agro-processing facilities from investors who are associated with Project financed activities.

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

Hydrology: water quality and quantity

During rehabilitation/expansion and operation of small scale irrigation schemes, and respective construction camps, etc. surface water pollution may result from uncontrolled discharges into freshwater or brackish river waters. 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 near surface water. 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.

In addition to the formal water supply systems, which usually have their specific measures to assess water quality and undertake appropriate actions to make it drinkable, many people are still using river water as a source for drinking water. Surface water can be altered using agrochemicals and pesticides and make it inappropriate for human and animal consumption. Groundwater contamination may also occur from percolation of oil and lubricants spills into soil. However, 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 pilot agro-processing facility to be financed can cause water pollution. 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.

About water quantity the issue of environmental flows stands out. In most cases, there will only be a water diversion to the irrigation scheme to be financed, keeping a significant part of the water flow in its natural course, for environmental and social uses (environmental flow). There are many formulas suggested by experts for the purposes of calculating the environmental flows. Most of these methods rely on information contained in the water flow series (history) related with a given section of a watercourse, to establish a minimum flow rate. The methods, which tend to use the average daily flow in a natural system (not monthly average flows as most methods are based on hydrological records) comprise in the methodological approach a set of hydrological concepts covering different and important aspects of ecological management of rivers that in general establish a "flow regime of ecological maintenance" in order to create rational management proposals for the conservation ecosystems in regulated rivers.

Taking into consideration that this will be done in close collaboration with the ARAs, this ESMF abstains from going into much detail in this ESMF on this subject and it is suggested that the matter be taken up in the later stages of the hydrological and environmental studies to arrive at an equation that will be suitable to the different interventions to be carried out. In close collaboration with the ARAs and MITADER,

MASA/INIR (the Developer for small and medium scale irrigation) will be responsible for ensuring that this aspect is considered adequately in each subproject. The same applies to the transport and circulation of sediments. It will be fundamental to establish and respect the requirements for sediment transport and circulation that are essential for maintaining the health of surrounding ecosystems. These, however, will need to consider that in most cases the water management systems to be built and/or rehabilitated will be small. Experts also agree that for small systems complex methods of calculation of environmental flows have little or no effect.

The procedures foreseen under the SADC Revised Protocol on Shared Watercourses, of August 2000, will be followed strictly.

Domestic (Decree 43/2007 of October 30, 2007) and regional management measures also highlight that water supply for human consumption and sanitation takes precedence above all other water uses. In cases of water stress, which are becoming common because of climate change this legal provision needs to be strictly followed. Adequate monitoring and information will be undertaken by the ARAs and water users need to adhere to instructions.

Led by DNGRH/ARAs, the irrigation schemes to be developed will adhere to integrated water resources management (IWRM) systems. "IWRM is a process which promotes the coordinated development and management of water, land and related resources, to maximize the subsequent economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems".

Soil

Construction activities: during construction activities of small scale irrigation schemes, and respective construction camps, etc. 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.

Soil erosion: dam/weir/embankment construction modifies the relationships between water and land, changes geomorphology and, consequently, the landscape. Sometimes a very limited change in terrain can have a significant effect on regional rates of erosion and soil loss. Therefore, and as a direct cause of different erosion rates, changes in the river regime and associated aquatic ecosystems are observed. These new conditions may induce social behaviors, such as encourage increased agricultural practices in the floodplain, after alteration of the average level of maximum flooding. Changes in the type of land use (agriculture, riparian vegetation, floodplain, grazing, rock masses, forests, etc.) may accentuate changes in the hydrodynamic conditions of the river system and the subsequent production/deposition of sediments, which condition the water in the associated ecosystem. Changes in a given component of the river system implies changes in all environmental variables dependent or associated with it, the river regime being the

base force that determines the possible types of ecosystems and their capacity for self-sustainability, which may also be influenced by pre-existing conditions.

Soil pollution by agrochemicals: high nutrient level is essential for productive agriculture. Under the irrigated land regime there tends to be an increase in the use of natural and chemical fertilizers which can result in excess nutrients, which in turn can cause problems in water bodies and the health of people and animals. In this context it is very likely that some of the agrochemicals to be used will be drained to the surface and underground water systems, with agrarian and environmental authorities having little capacity to monitor/control the use of agrochemicals. The use of these sources for drinking water supply become at risk due to the presence of nitrogen and phosphorus salts. This flow of fertilizers and pesticides can lead to eutrophication and disturbance of aquatic ecosystems. Pesticides and chemicals used for agriculture should be evaluated and monitored as part of the environmental management process and measures to ensure compliance with the National Pesticide Regulation (Ministerial Diploma 153/2002) as well as other relevant international directives, including compliance with the IPMP prepared for this project.

Soil salinization and potential interference with soil properties: Increased use of agrochemicals, required to retain productivity under intensive agriculture, can introduce toxic elements from fertilizers and pesticides. Furthermore, in irrigated areas, salinization is the main cause of loss of land productivity and is one of the most common adverse environmental impacts associated with irrigation. The accumulation of salts in soils can lead to irreversible damage to the soil structure essential for irrigation and crop production. The effects are more extreme in clayey soils where the presence of sodium can cause structural decay of the soil. This makes plant growth conditions very poor, makes soils very difficult to work with, and prevents recovery by leaching using standard techniques. Careful management can reduce the rate at which salinity increases and minimize effects on crops. Management strategies include: drainage; alteration of irrigation methods and periodicity; installation of sub-surface drainage systems; change in farming techniques; adjustment of crop standards; and, incorporation of soil improvements. All these actions, which can be costly, would require careful study to determine their local suitability. The development of irrigation must go hand in hand with research, with emphasis on water, soil and crops.

Air Emissions

Rehabilitation and/or construction activities in general of small and medium scale irrigation schemes; and (ii) other types of priority infrastructure, 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. In construction sites, 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 around small scale irrigation schemes, and respective construction camps, etc., 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 of small scale irrigation schemes, and respective construction camps, etc. 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.

In construction camps the 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.

Flora and Fauna

During rehabilitation/construction and operation of small scale irrigation schemes, and respective construction camps, etc., especially irrigation infrastructures and all those activities taking place in or close to water bodies 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 meters from rivers and water courses.

Rehabilitation and expansion of the existing traditional irrigation scheme and related infrastructures and the areas to be inundated by stored water as well as the installation of construction camps and the alignment and rehabilitation of construction access roads in and around forest areas requires the clearing of tall trees within the rights-of-way/corridors. Therefore, construction activities may result in loss of marginal forests and plant cover, disturbance and loss of fauna habitats, weakening and degradation of soils, disturbance of the natural landscape and morphology. Thus, the adequate selection of the location of a facility or the right of way can significantly reduce impacts on biodiversity. The losses of trees need to be compensated in the same area and/or in the proximity of it.

Also under expansion of existing traditional irrigation schemes, new irrigated areas will likely embrace already cultivated areas under rain-fed regime, however, if small patches of forest exist in that expansion area, whenever the forest shows high conservation value (such as tropical humid forest, mangroves, protected trees or other) it shall either be set aside or its impacts must be compensated by planting or preserving other forest area.

Development activities near any areas of biodiversity and other areas of particular forests wealth and diversity need to be planned and executed carefully. Depending on the sensitivity of the areas in which developments will take place the following measures, but not only, should be adopted:

- cutting existing natural vegetation should be avoided to the maximum and be limited to the minimum necessary;
- any activity of vegetation removal must be authorized in advance by the competent environmental agency, especially to avoid destroying vegetation of any special value where it can be present;
- large trees and fruit trees and those that serve as shade or have landscape value should be preserved whenever possible, if they do not offer security risks, due to their state of degradation or that of the soil;
- shrubs must be preserved to minimize soil erosion;
- in the areas for deposits of various materials during construction and even during operation, shrubs should be maintained;
- where possible, seed collection should be performed to preserve the species object of any form of disturbance intervention. This has the potential to secure necessary inputs for environmental compensation by way of replanting;
- deforestation using standard tractors or blades should be strictly prohibited. The use of fire should not be admitted in any phase of the work;
- the use of herbicides, defoliants or any types of chemicals should be prohibited regardless of their degree of toxicity, for logging purposes or any purpose in the reserve areas, and access roads.

Protection of areas of special importance (conservation/protected areas and wetlands)

A few sensitive areas have been identified and described in Chapter 4. A lot was also said about how these areas have been undergoing considerable stress due to the civil conflict, unsustainable practices in the use of natural resources by different kinds of producers and operators. Reference is made to (i) Manica; Chimanimani Massif, integrated in the Chimanimani National Park in Sussundenga District. Four forest reserves: Tsetsera, Moribane, Nhahezi and Mahate, which are embraced by the project of transboundary conservation area of Chimanimani along with the National Park; (ii) Sofala: a cluster of conservation areas comprising Coutadas Oficiais (Wildlife Hunting Areas), a National Park (Gorongosa National Park) and a Wildlife Reserve (Marromeu Reserve). Marromeu is a Ramsar site listed on the International Convention for the Conservation of Wetlands of International Importance especially as waterfowl habitats; (iii) Zambézia: with its two forest reserves Derre forest reserve - with an area of 170.000ha, and the Partial Game Reserve of Gile with 2100 km2 between the districts of Gile and Pebane in Northeast Zambézia; and finally (iv) Nampula: where along the South of the Lúrio River there are 4 forests reserves Mpalwé (51 km2), Ribaué (52 km2), Mecubúri (1,954 km2) and Baixo Pinda. These four districts and the land areas along the Lúrio River are the richest areas for agriculture in Nampula province and most likely to be targeted under IRRIGA. SUSTENTA project operations are concentrated in that area (i.e. Malema, Ribáuè, Lalaua, Rapale, and Mecubúri). Malema is known as Nampula province food basket due to its high agricultural potential.

There are also many other areas in the project area that are of value due to their biodiversity wealth and particularly vegetation even if they are not listed.

Under IRRIGA the dominant *modus operandi* will be to target existing traditional or non-operational irrigation schemes, rehabilitate and expand them. Most of these are clearly demarcated and earmarked in the district land use plans (PDUT) and other land use plans at the local level. It is not foreseen construction of new irrigation schemes where agriculture does not exist already, as it would imply bringing farmers to a new area and land use conversion, which would be very hard work in terms of costs and capacity.

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 (roads, water supply and other works).

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.

Pesticide Use and Management

As highlighted in the IPMP that has been prepared together with this ESMP, the possible and expected expansion of the introduction of advanced agriculture and agribusiness under IRRIGA has a strong potential for an increase in pest populations and subsequently a raise in pesticide usage to control them, as well as an increase in the use of chemical fertilizers across the agricultural cycle. Any increase in pest populations may be detrimental to agricultural productivity or human/animal health, which in turn will increase the dependency on pesticides. Any subsequent increase in the use of chemicals has the potential to cause harm to users, to the public and to the environment

The general use and management of pesticides including transport, storage and re-use by women, illiterate and people without strong and guided tradition of managing these products including extension workers and other agricultural officers that are not adequately skilled to assist local farmers in the use of the same products can be associated with a multitude of risks to the users themselves and the social and natural environment.

The management measures foreseen in the IPMP need to be thoroughly applied to prevent any hazards from happening during project implementation.

As a way of meeting the requirements of the national and World Bank ESIA/ESMP and RAP laws, regulations policies and guidelines all phases of the Project including those that will come after ESMP, RFP and PMP approval should continue to make concerted efforts to derive benefits from public consultation and involvement.

Land Acquisition

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

- guaranteeing the right to land occupation for people and local communities;
- 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;
- identifying and enhancing capabilities;
- preserving the ecological balance of soil quality and fertility;
- ensuring compatibility and coordinate environmental and social policies and strategies and socio-economic development;
- optimizing management of natural resources; and
- managing land conflicts.

These land use plans are important instruments in deciding the siting of interventions including those expected to fall under the Project. The Project should endeavor to support the smooth completion of the land use plans as part of the process of deciding the best location of the various interventions as highly relevant guideline. Land Use Planning falls under MITADER. The Land Use Planning Department at all levels will have to be involved in the updating of the local land use plans as a way of best implementing all IRRIGA interventions that have land acquisition implications.

Even where district (PDUT) and urban (PPU and PP) exist in some cases the quality of such instruments is not adequate. Assistance might be needed to bring them up to the required standard. This will be of importance for IRRIGA given its relevance in the development of and investment in irrigation by individuals or groups.

For projects requiring change in land tenure, use or requiring land acquisition, there will be a due diligence process to make sure that the PAPs negatively impacted are compensated according with OP 4.12 requirements. This may include those PAPs that are beneficiaries of subprojects. In cases where irrigation infrastructure, such as irrigation canals, access road, power line installation water reservoirs, need to be built to expand irrigation areas, Voluntary Land Donation (VLD) may be used to facilitate the implementation of such infrastructure requiring acquisition of small portions of land. VLD may be accepted when small areas of land and assets are affected, and where the affected users of the assets and land have agreed to give their land and other assets and when these donations don't meaningfully affect the living standards of affected people. VLD will only be considered in cases where the land will be used by local communities for irrigation infrastructure and benefits associated with the construction of such infrastructure are primarily to the local community. If such impacts to project beneficiaries are foreseen[27], VLD will be used through a participatory approach to ensure the decision to donate is taken in circumstances of informed consent or power of choice. A Voluntary Land Donation Protocol (Annex 11 of the ESMF) will be used to guide AIMU throughout the process.
The principles governing voluntary donation for IRRIGA have been developed in section 2.1 of the RPF (Interventions with Potential for Land Acquisition).

Socio-Economic

The rehabilitation and construction phase will generate several 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 (land-grabbing) and loss of land and property because 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.

Small and medium scale irrigation schemes and other types of priority infrastructure may cause damage to cultivated crops (depending on how and when the land is taken from farmers to be passed on to the Project/subprojects and other related initiatives), trees and other assets. This could be potentially associated with social problems and potential negative impacts on livelihoods of the communities who lived on the land or used it for cultivation and other daily activities before it was mobilized for IRRIGA initiatives.

At the social level, there could be increased tensions between farmers about land issues or between pastoralists and farmers related to wandering livestock. In some of the districts

27 These impacts should be determined by the screening process.

and/or specific areas mainly around towns and cities this is already a serious problem, which, if not adequately managed, could get worse as Project progresses.

Activities that may also result in negative impacts are:

- the use of Genetically Modified Organisms (GMOs), which would make farmers for 100% dependent on multi-nationals and could have other negative impacts on poverty levels and health;
- the introduction and adoption of innovative practices (cultural itineraries, post-harvest practices), e.g. through the increased use of fertilizers and pesticides;
- support to semi-industrial processes and packaging, e.g. increased use of antibiotics to control diseases.

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) increased population, certainly due to an increasing number of influx because of economic boom where the project will have higher incidence, especially during construction, which will result in increased needs of land; (iii) work conflicts and disputes for work between local people and people from other parts of the country and/or outside the country; (iv) the likely widespread of STIs including HIV/AIDS. The development of PROIRRI irrigation schemes attracted contractors and other service providers from a wider region that even went beyond Mozambique.

In addition to agriculture and housing land as described above, the influx of additional agricultural investors 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.

Physical Cultural Resources

There is also the potential for the Project 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 be or believed to be of archeological or historical importance during any stage of project development, such findings should be immediately reported to the Project Management to ascertain the measures to be taken to protect such historical or archaeological resources. All forms of inappropriate removal/disposal should be avoided.

8.2 Other potential adverse socio-economic impacts

Resettlement

Although limited in size, it is ascertained that resettlement could take place in the project intervention areas. This could be directly associated mainly with (i) development of construction camps; (ii) construction and operation of project infrastructures, including

the inundation of areas by stored water for irrigation. The potentially affected structures could be permanent houses, shops, temporary sale points, farmed areas (crops), trees belonging to local people/entities, etc. Because of the focus of the project on rehabilitation as opposed to opening new areas it expected that interferences with such assets and their owners will be limited. Abbreviated resettlement action plans (RAP) will suffice as in each case only a limited number of people and assets are likely to be affected.

Mobility and Accessibility

The rehabilitation/construction of medium scale irrigation schemes, has the potential of being associated with disturbances by bringing about changes in normal mobility and access to vital areas and resources by local people. Adequate siting and sizing of these infrastructures including community involvement in such processes is important to devise the best ways of avoiding/minimizing interferences and/or finding ways of compensating for the problems that might arise.

Increase in HIV/AIDSs and STDs Cases and Communicable Diseases

The spread of HIV/AIDS and other communicable diseases 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 must 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. It is also recommended to hire/involve a local specialized NGO to implement the HIV/AIDS Awareness campaign within both work force and surrounding communities.

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

Although large influx of male labor is not expected for the construction of Irrigation schemes, 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. The ESMP will always specify that whenever local people/organizations can carry out project activities they should be given preference. External people organizations will be hired only after evidence that locally there are no capabilities.

In principle the work/job opportunities must benefit the direct affected people with adequate involvement of local authorities to better manage the influx of external workforce. Local training programs must also be selective in target its audience amongst the local affected people as priority.

Gender-based violence

Particularly the influx of external workforce may lead to gender-based violence and women harassment at certain extent, under certain contexts. These risks must be assessed and taken into consideration during rehabilitation/construction phase of project investments, systematically monitored and reported. Influx of male labor for the construction of medium size Irrigation Schemes or other project infrastructure may also lead to Gender Base Violence.

Construction workers are predominantly younger males. Those who are away from home on the construction job are typically separated from their family and act outside their normal sphere of social control. This can lead to inappropriate behavior, such as sexual harassment of women and girls, exploitative sexual relations, and illicit sexual relations with minors.

Child labor and school dropout.

Increased opportunities for the host community to sell goods and services to the incoming workers can lead to child labor to produce and deliver these goods and services, which in turn can lead to enhanced school dropout.

8.3 Potential positive impacts

The improvement of local infrastructure and associated businesses can be expected to lay the foundations for the extension of roads, 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 agricultural sector but also in other sectors. 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 and above all it has the potential of improving land administration including land tenure systems.

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 farming systems (e.g. horticulture and general fruit and cereal cultivation (particularly rice)), 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 rice and horticultural sectors (producers, traders, transporters, traders, etc.) and out growers around other crops.

At the community level, in addition to the availability, accessibility and affordability of transport, electricity 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 agricultural employment (reduction of unemployment and the exodus of young people), the creation of local employment opportunities, improved living conditions.

The project will provide opportunities for development of agricultural production in general in the project area: (i) private actors will develop subsectors considered profitable- including high value-added products for export, (ii) models of win-win partnership between rural communities and private investors can be expected to emerge.

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

- Facilitation of rural/rural-urban trade (availability, accessibility and affordability);
- Better water management through small scale irrigation systems with positive implications on the increase of crops and time throughout the year to engage in plant and animal production;
- Positive impacts of processing, storage and packaging facilities. These will protect crops against insects and rodents, maintaining product quality, increasing life standards and consequently contribute to food security for rural populations and the general population;
- Land tenure regularization at a scale that can be expected to have significant positive impacts on natural resources management and other investments in land;
- The Project will also strengthen Provincial and District governments' capacities to promote land and water management and value chains development, which can also be expected to generate positive "sustainability spin-off" effects at the local level;
- Project activities are expected to have significant positive impacts on natural habitats, as it will promote integrated sustainable natural resource management.

Project positive externalities include agroforestry, reduced tillage, and vegetative cover. Restoration of critical natural areas is expected to increase water flow stability and reduce erosion to downstream water users. Restoration can also help create biological corridors, which serve as habitats for globally important biodiversity, and over time can increase tourism potential.

8.4 Climate change

Climate change does impact on the project outcomes and latter also impacts on the former.

According to climate change trends droughts and floods will be more frequent over time and with higher magnitude each event. Likewise, during droughts upstream riparian countries tend to release less water and during floods they tend to release more water, entailing on the lowest riparian country higher impacts of such events. Therefore, impacts on crops and livelihoods are also expected to be more severe.

Although, productivity suffers from extreme weather conditions, public infrastructure also suffers with the strength of this sort of weather conditions, especially from floods, leading to premature degradation.

Intensification does also impose changes on CO2 emissions, usually the increase of yield per hectare offsets carbon emissions released from soil, fertilizers and machinery. The conservation agriculture practices is used the more it offsets carbon emissions.

8.5 Measures to mitigate negative impacts

A preliminary list of measures to be adopted to mitigate potential and significant negative impacts of the project is presented in Table 8-8-1. Due to the localized and temporary nature of rehabilitation and construction works, fast recovery of the minor impacts will take place after construction is finished.

Table 8-8-1: Measures to mitigate potential negative impacts

Potential negative impacts	Mitigation measures
Hydrology – changes in the flow of rivers (low flow regime) and in water quality	• Integrate low flow release strategies into dam/weir operation protocols or watershed management plans • Consider the river as one of the water consumers • Estimate and implement environmental flows
Changes in the flows of rivers may have significant impacts on water availability to downstream users; negative impacts on aquatic biodiversity	• Protect flood plains, with forest cover or other vegetation for instance, which function as groundwater recharge zones and attenuate peak discharges downstream. These are additional positive functions of wetlands
Sediment accumulation may lessen the operational life of reservoirs; Floods may result in the loss of seasonal wetlands.	• Adhere to the integrated water resources management under the leadership of the water sector (DNGRH/ARAs)
Fall of water table because of excessive abstraction and negative impacts on people and biodiversity	
Rise of water table; waterlogging because of irrigation inefficiencies	• Design, implement adequate irrigation management infrastructure, drainage, etc.
Anaerobic conditions due to oversupply of nutrients. Accumulation of organic matter in water produces greenhouse gases such as methane	• On a regular basis clear reservoir of organic matter to limit anaerobic decomposition of sediment once the dam/weir is filled. • Use crop varieties with low water needs, higher yield per hectare thus reducing the extent of waterlogged area. • Methane emissions may also be reduced by proper irrigation management
Soil and groundwater: **d**uring construction and rehabilitation accidental discharge of on-site wastewater, hydrocarbons and chemicals	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

Potential negative impacts	Mitigation measures
can adversely affect groundwater and soil in the area	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;
Top soil management	• During construction put the top-soil apart and place it back on top after construction has finished. • Avoid actions on areas subject to the triggering of erosive processes Contain the sediment transport of areas affected by erosive processes, to minimize soil loss
Agrochemical pollution of water and soil from pesticides and fertilizers and erosion from agricultural areas.	During operation: • Implementation of the provisions of the Pest Management Plan • Only use approved pesticides • Adequate disposal of obsolete pesticides • Compliance with prescribed doses of pesticides • Control of the periods of pesticide application • Promoting the use of organic manure and other conservation agriculture practices • Training of stakeholders on the use of agrochemical inputs • Observance of recommendations for the use of fertilizers and pesticides bio control • Rational use of fertilizers and pesticides • Awareness and training of farmers • Apply contour line farming to avoid erosion. • 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.
Soil erosion problems associated with dam/weir construction and operation	• Undertake rocky bed mechanical rupture; • Manage coastal/shallow habitats, e.g. erosion control, planting of undergrowth (e.g. vetiver); • Introduce changes in river morphology to make the best use of available flow. Use the research services that will be part of applied research under IRRIGA to carefully study and determine the local suitability of the following mitigation/management measures:

Potential negative impacts	Mitigation measures
	• Drain the soils • Alter irrigation methods and periodicity; • Installation of sub-surface drainage systems; • Change in farming techniques, towards Conservation Agriculture practices and Climate-smart farming; • Adjust crop standards; and • Incorporate soil improvements
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. Agro-processing facilities from project associated investors	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 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.

Potential negative impacts	Mitigation measures
	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.
Noise: noise levels emitted during the construction/rehabilitation and operation may exceed acceptable noise level standards Agro-processing facilities from project associated investors	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 Agro-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	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.

Potential negative impacts	Mitigation measures
construction and operation debris because of various construction and operation activities Hydrocarbons (waste oils) Agro-processing facilities from project associated investors	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 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 should be stored on an impermeable concrete floor with concrete bunding. It should be negotiated with the new oil supplier to take back the waste oils for recycling by a MITADER 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. Agro-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 and quantity: the primary sources of potential impacts to water quality will be from pollutants from site runoff, accidental spills, which may enter surface waters (rivers, lakes and streams) 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 always. 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

Potential negative impacts	Mitigation measures
Agro-processing facilities from project associated investors Dams, weirs and other water regulation infrastructures to be rehabilitated/constructed can interfere negatively with the water and sediment flow required for the health of the ecosystem downstream the developments. Water retention and all the management measures to be adopted can also interfere negatively with other social activities downstream the developments	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 bunded surfaces. All fuel tanks and chemical storage areas should be provided with locks. Fuel tanks should be placed in concrete bunded 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. Agro-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. All measures should be taken to allow the normal flow of the river flows to be involved in the project so as not to affect the vitality of ecosystems that depend on these flows downstream including sediment transport and circulation. The most appropriate formulation of environmental minimum flow calculation to the system should be adopted considering the reduced magnitude of most of the water management schemes to be rehabilitated/built. In order to maximize water use by farmers and downstream users, under the operational phase of the irrigation scheme adequate Water Efficiency Management Practices must be put in place, linked to WUA (under a participatory approach) and Conservation Agriculture practices. The technical design should also take into consideration good practices of water use efficiency management. The design and operation of water management infrastructures (small dams/weirs) need to be done in such a way as to not interfere negatively with the host of water uses by local people downstream. The uses include drinking, washing, including ablutions, livestock, navigation, etc.
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	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

Potential negative impacts	Mitigation measures
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. Accidental hydrocarbon spill will have a detrimental impact on aquatic life.	• 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 • 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. • Compensate lost trees in the same area. Install erosion prevention and control measures as mentioned above. Avoid sensitive habitat (e.g. tropical humid forest, mangroves, riparian forest, etc.) by fencing the area, so that the habitat cannot be entered by trucks and workers.
Deforestation, soil degradation through erosion, habitat destruction may occur during clearing	Near sensitive areas such as reserves, and areas of special vegetation special measures need to be taken. These should be but not limited to (i) cutting existing natural vegetation should be avoided to the maximum and be limited to the minimum necessary; (ii) any activity of vegetation removal must be authorized in advance by the competent environmental agency, especially to ensure destroying vegetation of any special value where it can be present; (iii) large trees and fruit trees and those that serve as shade or have landscape value should be preserved whenever possible, provided that they do not offer security risks, due to their state of degradation or that of the soil; (iv) shrubs must be preserved to minimize soil erosion; (v) in the areas for deposits of various materials during construction and even during operation, shrubs should be maintained; (vi) where possible, seed collection should be performed in order to preserve the species object of any form of disturbance intervention. This has the potential to secure necessary inputs for environmental compensation by way of replanting, which already has poor in the project area; (vii) deforestation using standard tractors or blades should be strictly prohibited. The use of fire should not be admitted in any phase of the work; and (viii) the use of herbicides, defoliants or any types of chemicals should be prohibited regardless of their degree of toxicity, for logging purposes or any purpose in the reserve areas, and access roads.
Reduce magnitude of fish migration due to weir/intake rehabilitation or expansion.	

Potential negative impacts	Mitigation measures
	Whenever a small patch of forest/sensitive habitat (e.g. tropical humid forest, mangroves, riparian forest, etc.) has to be marginally cut, for instance due to expansion of infrastructure or agricultural land, proportional to its conservation value and extent of the affected area, a compensation equivalent area shall be created elsewhere. Whenever the rehabilitation and expansion of a weir or intake potentially interfere, in a significant extent, with fish migration, fish passes should be designed and considered at subproject infrastructure design and feasibility stage.
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 • 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

Potential negative impacts	Mitigation measures
Development of agriculture might increase the prevalence of water-borne diseases (intestinal and urinary bilharzia and malaria)	• 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. Regarding waterborne and water-related diseases substances, the following measures should be implemented by the contractor: • 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 • 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 regarding these water-borne diseases • Follow WHO guidelines

Potential negative impacts	Mitigation measures
Infrastructures to manage water (e.g. dams/weirs) may translate into reduction of the flow in rivers and streams, conflicts for water usage, etc.	• Design and operation of water management infrastructures (small dams/weirs) need to be done in such a way as to not interfere negatively with the host of water uses by local people downstream. The uses include drinking, washing, including ablutions, livestock, navigation, etc. • Make use of existing water management structures and where these do not exist and/or are weak assist local authorities and farmers to establish and strengthen these (e.g. water user associations) to develop and enforce water sharing systems and procedures that reduce conflicts and promote harmony. • Rehabilitation works for small dams (or construction of small weirs/embankments) shall include generic dam safety measures designed and/or reviewed by qualified engineers. Site specific ESMPs will include mitigation measures for investments involving small dams.
Socioeconomic impact including resettlement, reduction of arable and pastoral land, , and Gender-based violence, and 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 • Manage resettlement in compliance with the World Bank Safeguard Policy on Involuntary Resettlement OP/BP 4.12 and the RPF elaborated for IRRIGA • Dissemination of the use of farmyard manure • Rational use of mineral fertilizers (avoiding excess nitrogen fertilizer) • Leave land fallow to restore soil fertility • Cover bare soil with a vegetation cover to reduce soil erosion • Educate and training of farmers
Influx of external workers Public security issues regarding influx of external workers, mobilization and demobilization of staff, lack of job opportunities for local people, **, HIV/AIDS, GBV and Child Labor**	• Contractors and subcontractors must follow a Code of Conduct, which must behavior preventing form conflicts with local communities, gender-based violence and women harassment, amongst others, these must be monitored and reported through the subproject ESMP • Ensure a high rate of local employment to minimize influx of foreign contract workers: preferred preference to local people to avoid social conflicts • Supply and enforce wearing protective equipment (helmets, boots, dress, gloves, masks, goggles, etc.) by workers • Environmental management of construction waste (installation of litter bins, regular collection and disposal in authorized sites) • 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, including offering training opportunities to increase local people's chances of getting work/jobs.

Potential negative impacts	Mitigation measures
	• Awareness on respect for local customs • 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 • Establishment and operation of an effective GRM accessible to community members—ideally with involvement of NGOs—to facilitate early identification of problems and targeted mitigating interventions by Borrower; • Provision of information to communities on how to use the GRM to report issues; • Communication on hiring criteria, minimum age, and applicable laws and enforcement of legislation on child labor.

The size and location of the infrastructures to be rehabilitated as well as the set of measures that will be undertaken to ensure that they do not translate into serious environmental and social problems are assessed to be adequate for IRRIGA. However, when combined with other issues, water and natural resource uses (i.e. climate change, traditional agriculture, forests, industry, mining, etc.) the impacts can be significant. This also has implications for project design including the planning, design, construction, operation and eventual decommissioning of project subprojects. The subchapter below highlights some of the most important issues to be considered.

8.6 Cumulative impacts and Management

Cumulative impacts can be defined as impacts that result from the incremental impact, on areas or resources used or directly impacted by the project, from other existing, planned or reasonably defined developments at the time the risks and impacts identification process is conducted and within a reasonable distance from the proposed project site (Murray et al. 2015).

While a single activity may itself result in a minor impact, it may, when combined with other impacts (minor or significant) in the same geographical area, and occurring at the same time, result in a cumulative impact that is collectively significant. Thus, the impacts of this Project and more importantly of the subprojects that will come from it need to be considered in conjunction with the potential impacts from other current and future developments or activities that are underway or planned and reasonably defined and are located within a geographical scope where potential environmental and social interactions could act together with the Project to create a more (or less) significant overall impact.

To provide guidance on the Cumulative Impact Assessment (CIA) of this project, the following valued environmental and social components (VECs) are considered:

- Physical features including soil and water;
- Environmental processes;
- Ecosystem conditions (e.g. biodiversity);
- Social conditions (e.g. health, economics); and
- Cultural aspects.

In line with the nature and characteristics of the ESMF the assessment is also made in general terms and it is a rapid assessment. For the subprojects detailed assessments will be required. It would also be difficult to try to compile a comprehensive list of existing and planned development in the project area at this stage, thus the assessment focus in general traits and on what is generally known.

IRRIGA interventions will not happen in isolation. They will take place near other interventions initiated by all sorts of operators/investors, i.e. household, micro, small, medium and large in areas such as agriculture (including PROIRRI irrigation schemes and other WB financed projects), tourism, infrastructure, mining, etc. and they will have the potential of contributing to increased significance for the receiving natural and social environment. These could result in increased pressure on land, soil, water, forests, wildlife, air, etc., which could exacerbate social conflicts and the degradation of the ecosystems.

Increased pressure on soil, water and vegetation are of importance for this project. In Manica and Nampula artisanal mining activities occupy an important position in local economies.

Púngoè and Buzi rivers basins are known for considerable pollution by artisanal mining/gold panning that is a critical issue in the basin and pose serious concerns to the aquatic biota and, ultimately, to the general water users in the Púngoè basin, including agriculture (ARA Centro, 2015).

The Zambezi, Púngoè and Lúrio are already and will be recipients of large undertakings in the areas of agriculture including irrigation, mining, energy, forests, industries, tourism including ecotourism. These will pose considerable stress on water availability and quality and possibly constraint the adoption of sound integrated water resources management.

The cumulative effects of developing irrigated agriculture in areas generally marked by deforestation and poor land use practices in the entire project areas can lead to substantial erosion and increased sediment loads in rivers that deteriorate water quality. Salt water intrusion is another important water quality limitation in the deltas of the rivers (Save, Buzi, Púngoè, Zambezi, Lúrio and respective tributaries falling in the project area), which undermines the potential development of all the river basins. Most of these impacts are caused by human factors such as inappropriate land use practices or overexploitation of resources.

Cumulative impacts from rehabilitation and expansion of many existing irrigation schemes in the same river basin may pose significant stress on water availability downstream of IRRIGA sub-projects, affecting other users, such as communities, other agricultural projects or industry. On the other hand, the financed irrigation schemes upper in the river basin may limit the water availability to the irrigation schemes to be financed downstream, as well as to other users further downstream (e.g. communities).

One of the best way of mitigating the impacts of the various uses of resources, with potential negative impact on irrigation, while impacts from irrigation are prevented from aggravating the ambient is the adequate land, water and natural resource use planning and working together with all the entities and programs/projects that deal with these crucial aspects. A good land use plan and siting of interventions goes a long way towards achieving impact avoidance and minimization. This is specifically true in the case of Mozambique, which is known for being well endowed in terms of natural resources and relatively low population densities.

Integrated water availability studies at river basin level are crucial to design and define water intake for each of the existing, projected and future projects/sub-projects that use significant amounts of water, at regional level. Regional institutions such as ARAs play a fundamental role in this matter, as it is regional authority responsible for water management.

As previously mentioned at chapter 4.2.1, Table 4-1 estimates IRRIGA's 6 river basins flow/runoff, as well as current and future uses with IRRIGA's additional 5,000 ha of rehabilitated and expanded irrigated land over these 6 river basins where IRRIGA sub-projects will potentially be sited (in Lúrio, Meluli, Licungo, Zambezi, Púngoè, and Buzi river basins); assessing the cumulative impact of current demands plus IRRIGA foreseen water demands at each river basin level. These estimates clearly show that, at river basins level, the future cumulative water demand with IRRIGA ranges from 0.16% to 4.1 %, which is minimal, hence not expected to create significant negative water shortages downstream. It is also important to mention that IRRIGA will create water containment infra-structures, which will help improve water management. Under IRRIGA, as it was done under PROIRRI, it is not expected to be built water containment infrastructures in the main river canals, hence not interfering with the upstream and downstream migration of aquatic fauna

However, at a lower scale, at sub-project level, water availability assessments must be carried out by irrigation/water specialists in close collaboration with and guidance by the regional/local water authorities (ARAs) to assess whether certain tributary accommodates for the sub-project water demand, ensuring fair and equitable levels of water access to other users downstream in different moments. It is worth to mention that whenever it will be concluded that a stream cannot ensure enough water for all water users, then the respective site will not be eligible to accommodate an IRRIGA Subproject. This is already a current practice, which has been under the process of optimization. The ultimate objective is to improve ARAs capacity to monitor water quality and quantity and put in place sound integrated water resources management systems across all river basins. Under IRRIGA ongoing efforts will need to be supported to ensure that ARAs capacity (e.g. expansion of hydrometric stations) also reaches minor rivers and particularly those that will be used to develop irrigation schemes.

Adequate coordination between the IRRIGA and other locally and regionally based projects including strengthening educational actions and active law enforcement against negative practices will constitute an added cumulative benefit. The use of existing and planned spatial, water and land strategic plans, as narrated in Chapter 4 and other sections of this report, to ascertain where and how subprojects should be developed is recommended.

Combined, all the measures related with adequate land, water and resource use planning and coordination, will contribute to reducing the project area vulnerability and increase its resilience to climate change and general degradation of the environment.

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

Potential environmental and social impacts will be adequately addressed through the institutional arrangements and procedures used by the Project interventions for managing the identification, preparation, approval, environmental licensing, implementation, monitoring, evaluation and auditing of sub-projects. A field guide for the implementation of the ESMF will be prepared as part of the Project Implementation Manual (PIM) to guide the PPIU and local implementing institutions on the screening process and subsequent procedures and requirements for approval of subprojects accordingly with the Mozambican legislation and the Bank Policies.

The Project has been classified as Category B according to WB Safeguards Policies, as significant majority of sub-projects under component 2 will fall in this environmental category. On the other hand, according to Mozambique environmental regulation, most of the sub-projects will fall within category B, while some others will fall in Category C. As per both Mozambican and WB regulations Category B projects require less stringent processes (simplified ESIA and ESMP, respectively) since 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. 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 process. 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 and to decide on the level of environmental and social assessment required. 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:

- determine which construction/rehabilitation and operation activities are likely to have potential negative environmental and social impacts;
- 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;
- determine appropriate mitigation measures for addressing adverse impacts;
- incorporate mitigation measures into the development plans for the subproject;
- indicate the need for a Resettlement Action Plan (RAP), which would be prepared in line with the Resettlement Policy Framework (RPF), prepared for the Project;
- facilitate the review and approval of the construction/rehabilitation and operation proposals;
- provide guidance for monitoring environmental and social parameters during the implementation and operation of project activities;

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.

To ensure adequate implementation of IRRIGA ESMF different stakeholders have different roles; the table below (Table 9-1) summarizes roles and responsibilities of different institutions.

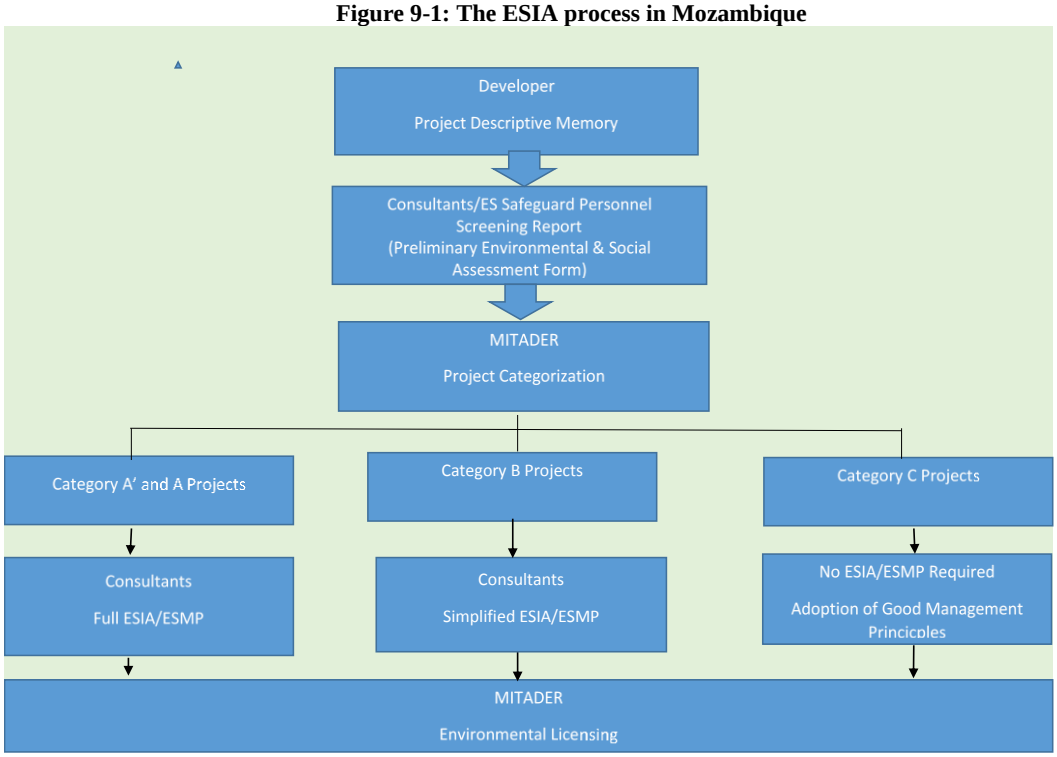
Table 9-1: Roles and responsibility in implementing ESMF and preparing ESIA/ESMP

Roles	Intuitional responsibilities	Assistance/Collaboration
Screening of Project Activities and Sites Environmental and Social Checklist Preparation of the Environmental and Screening Report	MASA/INIR (PIU-ESSS)	ARAs, PPIU-ESSS, SDPI, SDAE and Local Authorities
Assigning the Appropriate Environmental and Social Categories	DPTADER PIU-ESSS for WB requirements	
Preparing the simplified ESIA/ESMP (Category B) Good Environmental and Social Management Procedures (Category C)	MASA/INIR/PIU PIU-ESSS	Registered consultant PIU-ESSS ARAs, PPIU-ESSS, SDPI, SDAE and Local Authorities
Subproject Review and Approval	DPTADER WB (for Bank requirements)	PIU-ESSS
Participatory Public Consultation and Disclosure	MASA/INIR/PIU WB (for Bank requirements)	District/Local authorities PIU-ESSS Hired Service Providers
Grievance Mechanism	PIU/INIR	District/Local authorities Hired Service Providers
Monitoring/Inspection Reports and review	MASA/PIU, Hired Service Providers, DPTADER	PPIU-ESSS District/Local authorities
Environmental and Social Audit	DPTADER/WB	PIU-ESSS

9.1 Screening of Project Activities and Sites

Mozambican ESIA regulation is similar to WB OP 4.01 – Environmental Assessment. Depending on the size, nature and perceived environmental consequences of a project Mozambican Regulation for ESIA (Decree 54/2015) provides for four project categories, namely A+, A, B and C, with Decree 54/2015. Category A+ is more stringent and ESIA is subject to review by professional assessors and under normal A the ESIA is to be reviewed by a national inter-ministerial committee. Where project activities fall under Category B, a simplified ESIA and RAP [in the case of this project Abbreviated RAP (A-RAP), under WB requirements] needs to be carried out. The screening process will be used to determine the appropriate types of studies to perform, as well as follow-up measures, depending on the nature, scope, and significance of the expected environmental and social impacts from each of the Project subproject activities. Figure 9-1, below is a graphic representation of the process.

Figure 9-1: The ESIA process in Mozambique



A preliminary negative list of project activities not to be financed are the following: (i) activities inside protected areas; (ii) any activities that would lead to conversion or degradation of critical natural habitats or their supporting areas; (iii) sub-projects involving logging in natural forests, or processing of timber other than from plantations; (vi) dams more than 10 meters high; (vii) sub-projects requiring the use of agrochemicals in WHO categories IA, IB or H; (viii) sub-projects that would damage non-replicable cultural property.

Both the Environmental and Social Screening Form (ESSF in Annex 4) and the Annex 5 of Decree 54/2015 will be completed by Project Environmental and Social staff. The Environmental and Social Checklist in Annex 6 will also be completed by the two qualified Environmental and Social Specialists of the Project Coordination Unit. Most of the subprojects will be categorized as Category B, which do not require a full ESIA, and will benefit from the application of mitigation measures outlined in the checklist. In situations where the screening process identifies the need for land acquisition, a RAP shall be prepared and disclosed consistent with OP/BP 4.12 guidelines.

For more complex subproject external consultants can be hired. 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, a freestanding ESMP and/or to prepare Resettlement Action Plans (RAPs) where required or determined.

The responsible MITADER structure at Provincial or District level will need to confirm the abovementioned screening process to comply with Mozambican environmental legislation, the screening process will be conducted according to figure 9-1.

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

After 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 or hired consultants. The District Environmental Officers, stationed at the SDAE/SDPI and/or municipalities, will do the verification. Subsequently, they will oversee the preparation and implementation of the required measures. In case doubts or expertize is needed the provincial safeguard specialist or the central safeguard specialist shall go on site to identify and assess accordingly.

9.2 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 subproject. The Provincial Departments of Environmental Impact Assessment in collaboration with the Environmental and Social Specialists from the Project Coordination/Provinces will be responsible for categorizing a subproject as either B or C. No category A subprojects will be eligible for IRRIGA financing, either under Bank safeguard policy OP 4.01 or under Mozambican legislation.

Category A (A+ and A) is more complex and sub-project activities would have significant and long-term adverse environmental and social impacts and therefore would require an ESIA and/or RAP, in accordance with Mozambican legal requirements and Bank safeguard operational policies. 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; under Mozambican regulation, category B sub-project requires a simplified ESIA (which includes an ESMP) or a stand-alone ESMP when lower impacts are foreseen. 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 and Social Management Procedures (GESMP), including any applicable Environmental and Social Clauses[28] to be included in the Contractor's Contracts. The recommended and simple way to adhere to good environmental and social practices is through a simplified ESMP. The assignment of the appropriate environmental category for the subprojects will be based on the provisions of the Mozambican ESIA Guidelines (Decree 54/2015) and in parallel following WB OP 4.01.

When IRRIGA rehabilitation and expansion of already existing traditional irrigation schemes are likely to fall between 100 ha and 350 ha it is likely that DPTADER may ask for a stand-alone ESMP, rather than a simplified ESIA, as it is not a new irrigation scheme in a non-agriculture land, but rather a rehabilitation of an existing traditional one[29] expanding over an area already dominated by rain-fed agriculture. This approach ends up matching the same type of environmental and social assessment as WB Safeguard policy OP 4.01 require, which is a stand-alone ESMP (and A-RAP if needed).

[28] No matter what Category a sub-project fall, bidding documents for contractors (also applied to subcontractors) must request for Worker's Code of Conduct. Minimum requirements for Workers Code of Conduct are presented at Annex 13.
[29] Whenever it is not inside a sensitive area or requiring resettlement; if that was the case it would turn it into an A.

9.3 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 (DPTADER) in close collaboration with the Project Coordinating Unit will determine whether (a) the application of simple mitigation measures outlined in the Environmental and Social Checklist (Annex 6) and Environmental and Social Clauses for Contractors[30] (**Error! Reference source not found.**) 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); For subprojects categorized as B, either the ESMP or the Simplified ESIA, should be prepared by an environmental and social consultant certified by MITADER.

It is not expected that there will be subprojects falling under any of the A categories in IRRIGA. Should this happen the subproject will have to be restructured (resized, relocated and/or subject to other measures) to fall under Category B or C or just be abandoned, should these measures fail.

9.4 Environmental and Social Impacts Assessment (ESIA)

Certain subprojects may be found to require a (simplified) ESIA[31], according to category B projects under Mozambican legislation, although that is expected to be rare as most expected situation will be to prepare only an ESMP, also under Mozambique legislation, because of the potential downgrading of IRRIGA subprojects when they are rehabilitating and expanding over already agricultural (rain-fed) land; under these circumstances it is expected that DPTADER downgrades form category B requiring simplified ESIA to category B requiring stand-alone ESMP, or even a category C. In the case of having to prepare the (simplified) ESIA, this 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 (simplified) ESIA Document.

Where required, preparation of the (simplified) ESIA that includes an ESMP and the preparation of the RAP 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 DINAB and on behalf of the District Governments or Municipalities, will arrange for the (i) preparation of (simplified) ESIA/ESMP or RAP terms of reference; (ii) recruitment of a consultant to carry out the (simplified) ESIA/ESMP or RAP; (iii) public consultations and participation; and (iv) review and approval of the (simplified) ESIA/ESMP or RAP following the national ESIA and RAP approval process. Simplified ESIAs, ESMPs and RAPs also need to be sent to the World Bank for approval and disclosure.

[30] Indeed, Environmental and Social Clauses will apply to all civil works contracts, regardless of the category of the subprojects, i.e., it will apply to both category B and C. Moreover the Procurement documents need to be in full respect to Environmental, Social, Health and Safety (ESHS) Procurement Enhancements that are applicable from 2017 tenders onward. The Code of Conduct (Annex 13) must also apply to all civil works contracts as part of complying with the Environmental and Social Clauses and the ESHS Procurement Enhancements.

[31] IRRIGA will not finance any category A subproject, which entails a full ESIA, either under Mozambican legislation or under WB safeguard policy OP 4.01.

9.5 Subproject Review and Approval

The Environmental and Social Specialists at the Provincial level 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 to classify the sub-project. The final decision on the environmental category of the subproject is the responsibility of the environmental authority at the provincial level. Where an simplified ESIA/ESMP or a freestanding ESMP has been carried out, the Environmental and Social Specialist in collaboration with the Provincial Project Coordinators, as well as the Directorate of Environment/DINAB 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. Once the simplified ESIA or ESMP is approved; an environmental license will be issued by the environmental authority, after payment of environmental license fees.

Based on the results of the above review process, and discussions with the relevant stakeholders and potentially affected persons, the Environmental and Social Specialists, in case of sub-projects that do not require an simplified ESIA/ESMP or a freestanding ESMP will make recommendations on Environmental and Social Good Management Practices to the Municipal or District Government to go ahead with the subproject implementation; these are the cases where sub-projects fall at C category under Mozambican legislation.

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 or SDAE 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 Provincial Community Management Officials, with assistance of World Bank safeguard specialists.

9.6 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. Mozambican legislation on land issues and environment places public consultation and participation at the top of the agenda. These must be strictly followed by the Project. 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 simplified ESIA/ESMP;
- 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.
- Lastly, support the social dialogue and identify from the onset, stakeholders' perceptions and expectations, which can contribute to the action planning and effective

communication to minimize the impacts of the project. The process also allows for rethinking the project's technical aspects.

PPP will support a Stakeholder Engagement Plan and for it to be effective there are norms and procedures to be observed throughout. Annex 8 presents the preliminary document that has already been under use to guide the PPP and Engagement of Stakeholders. During the subsequent phases of the project this initial document should be further developed by the Project's Safeguard Specialists to respond to issues as they come to light.

The ESIA/ESMP process emphasizes the clear need for frequent interaction and communication between the public, parties affected by the proposed Project, local NGOs, external interested and concerned organizations, as well as Project scientists and engineers. Local people and other stakeholders should be organized into a Social Committee to easily articulate the various aspects in an organized and continuous fashion.

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 54/2015 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/ESMP 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' (agriculture) 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.

The Project must not contribute in any way to create land conflicts and/or exacerbate any such conflicts. The objective of creating jobs, construct infrastructure and introduce modern technologies, should not be offset by increasing the number of landless people, make local food insecurity worse, cause environmental damages, stimulate rural-urban migration, etc. due to inadequate planning

In compliance with both the GoM regulation and World Bank guidelines, before a sub-project is approved, the applicable documents (ESIA, ESMP and/or ARAP) must be made available for public review at a place easily accessible to beneficiary communities (e.g. at a local government office, at the DPASA/DPTADER/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. Especially as part of ESIAs/ESMPs and ARAPs public consultation and participation

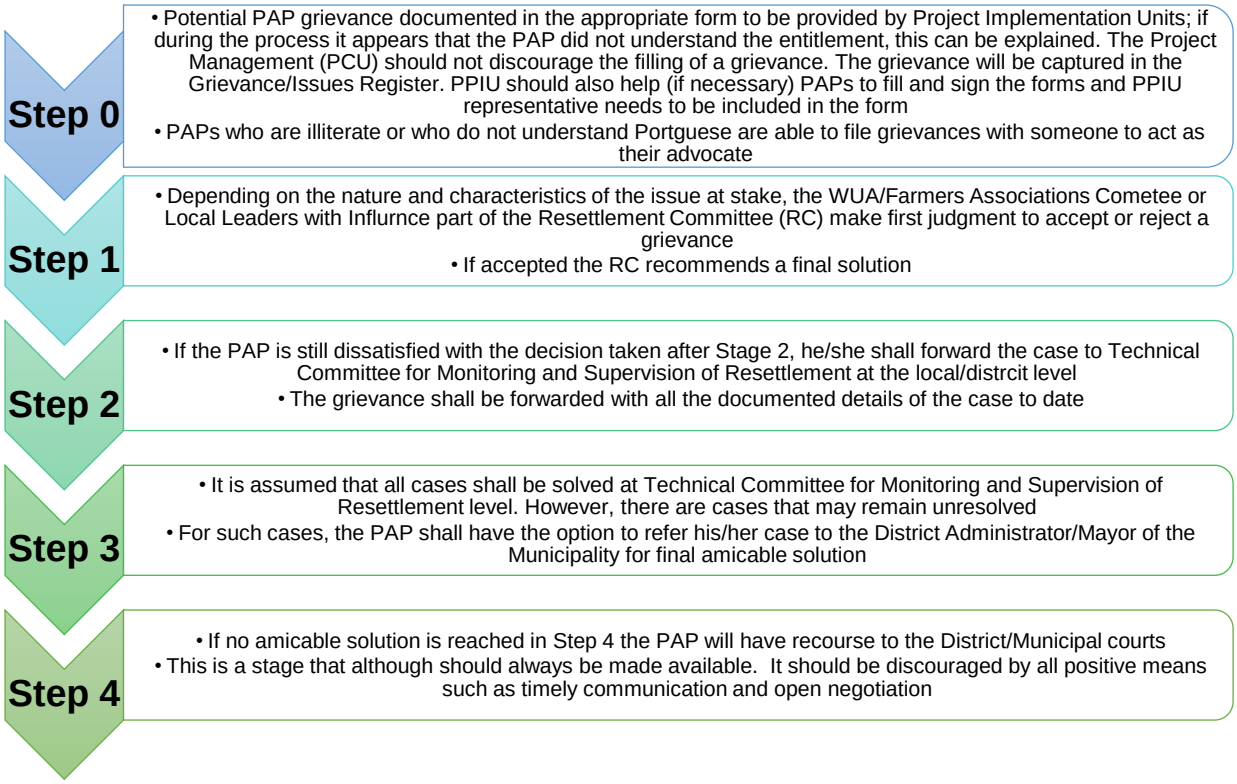
processes, Mozambican guidelines also have similar pre-requisites, which should be strictly followed under the Project.

9.7 Grievance Redress Mechanism

Grievance Redress is fully addressed in the Resettlement Policy Framework for the project. As a way of ensuring that PAPs can present their grievances and that project managers can adopt timely corrective measures to deal with the issues, the grievance mechanism will be available to all Project Affected Persons, not just to those affected by resettlement, and available throughout life of project.

The process can be summarized by the following flowchart:

Diagram 9-1: Snapshot of the grievance procedure and stages (step-by-step)



The design, implementation, monitoring and evaluation of all aspects of IRRIGA should be legitimate; accessible; predictable; equitable; transparent; rights compatible; enable continuous learning; and be based on engagement and dialogue. This covers the design and implementation of a local communication strategy stressing awareness-raising activities about the sub-project(s) and resettlement procedures and entitlements.

A grievance redress mechanism should be implemented from the beginning of any IRRIGA subproject. At first there will be a need to create this capacity, to actively capture and anticipate grievances. This should continue during the operational phase, which is anticipated to be more passive.

A stakeholder action plan (SAP) and stakeholder engagement plan (SEP) should be prepared early in the project and reviewed and approved by the PIU. This document should be adjusted throughout the process of project implementation as more issues become known. The SAP and SEP must consider inclusion of women's groups and representatives of other vulnerable populations (elders, youth and disabled). Consultation should be initiated early in the project, which provides stakeholders and members of the public adequate time to comment, voice concerns, or share ideas that may enhance the project. A grievance mechanism should be developed during project inception and shared with stakeholders and community members, so they can share concerns without fear of reprisals.

The main objective of stakeholder engagement and public participation is to ensure that the concerns and issues raised by the Interested and Affected Parties (PI&As), organizations or individuals are considered during the ESIA, allowing for PI&As to discuss the proposed IRRIGA subproject and the results of the environmental and social studies. The Public Participation Process grants an open channel of communication between the public, the

consultants, IRRIGA PIU and MASA/INIR at all levels, which will be of extreme importance in managing potential conflicts.

9.8 Annual Monitoring Reports and review

Monitoring of the compliance of project implementation with the mitigation measures defined in its ESIA/ESMP, PMP and/or RAP will be carried out jointly with communities, the Environmental and Social Specialist, and the Provincial Community Management Specialists, MASA/INIR's local representatives, extension workers and the Service Provider (i.e. CSO) responsible for implementing the Project.

District (SDPI or SDAE) 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 ESMP, PMP and/or RAP are being implemented. This type of monitoring is like the normal tasks of a supervising engineer whose task will be by contractual arrangement to ensure that the Contractors are 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.

The annual monitoring report on environmental and social safeguard performance report shall be prepared by the ESSS of the PIU and sent to MITADER and WB for review.

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 review should evaluate the annual monitoring report from district authorities and the annual inspection report from DPTADER/DNA-DLA.

Of note is that annual reviews are not normal for ESIAs/ESMPs under the current practices. The Project Coordination Unit at central (PPCU) and provincial levels need to work for this work to be done properly.

9.9 Environmental and Social Audit

Audits to environmental and social safeguard performance of subprojects are expected to be made regularly by the ESSS, as well as by MITADER, throughout the year.

Biennial external independent audits to environmental and social safeguard performance of IRRIGA shall be made by an external independent entity (independent local consultants, local NGOs or other service providers). In addition to MASA/INIR the audit team will report to MITADER and the World Bank, who will deal with the implementation of any corrective measures that are 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, RAPs, PMP 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 project description;
- Indicate the objective, scope and criteria of the audit;
- Verify the level of compliance by the developer with the conditions of the ESMP, PMP, RAP, Environmental and Social Clauses, Workers's Code of Conduct and Contractor ESMPs;
- Evaluate the developer's knowledge and awareness of and responsibility for the application of relevant legislation;
- Review existing project documentation related to all infrastructure facilities and designs;
- Examine monitoring programs, parameters and procedures in place for control and corrective actions in case of emergencies;
- Examine records of incidents and accidents and the likelihood of future occurrence of the incidents and accidents;
- Inspect all buildings, premises and yards in which manufacturing, testing and transportation takes place 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.

9.10 Other Important Issues

9.10.1 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. These 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 enormously 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.

Often, due to a combination of reasons existing plans are not of the best quality and the Project should assist in revising the plans to bring them up to standard.

The subprojects will also comply with the requirements of the integrated water resources management in their area. This is the work under the leadership of the water resources management entities and particularly the ARAs, which will also oversee dam/weir safety and assist in the development of INIR/IRRIGA personnel to work on these matters.

10 GUIDELINES FOR ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN AND MONITORING REQUIREMENTS

10.1 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), 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[32]:

- **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 (category B) and the Good Environmental and Social Management Procedures (category C) for simple sub-projects. In any case, Environmental and Social Clauses (ESCs – please see recommendations at Annex 7) and a request for establishing a Code of Conduct for workers (contractors and subcontractors – please see minimum requirements at Annex 13) will be included in the bidding documents and in the various contractual clauses for the design, construction and supervision of the interventions to be adopted. All construction contracts should comply with the

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

Environmental and Social Clauses and if relevant with the ESMP, Contactor Camp ESMP or Good Environmental and Social Management Procedures (GESMP) 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, CESMPs or GESMP. Sub-projects the contractors will be required to employ experienced environmental, health and safety specialists for the purpose. The Supervising Engineers will be required by contractual arrangement to supervise the adequate implementation of these Contractor ESMPs, other ESMPs or GESMP and should employ an experienced environmental, health and safety officer. Procurement documents need to be reflect full respect to the Environmental, Social, Health and Safety (ESHS) Enhancements, summarized in annex 17.2.

Agriculture under the Project will follow the best practices. Annex 9 provides a checklist of issues to be considered as part of Good Agricultural Practices - Hygiene and Safety (Environmentally and Socially Friendly Agricultural Farming Systems), which should be followed and adapted to specific interventions, together with Annex 10 that shows a typical example of issues covered under an ESMP related with planning, design, construction and operation of irrigation schemes.

The additional management actions may include the preparation of Integrated Pesticides Management Plans (PMPs) and/or Resettlement Action Plans (RAPs).

10.2 Pest Management Plan

While promoting intensification IRRIGA will also promote increase use of fertilizers and pesticides. Agricultural subprojects can raise a host of pest management issues, such as:

- New land-use development or changed cultivation practices in an area;
- Expansion of agricultural activities into new areas;
- Diversification into new agricultural crops, particularly if these tend to receive high usage of pesticides - e.g. cotton, sugar cane, vegetables and rice, as well as increased doses of chemical fertilizers;
- Intensification of existing low-technology agriculture systems

Both the WB and the GOM support strategies that promote integrated pest management (IPM) approaches, such as biological control, cultural practices, and the development and use of crop varieties that are resistant or tolerant to the pest. The purchase of pesticides may be permitted when their use is justified under an IPM approach and if sufficient capacity exists for pest and pesticide management.

In addition to agricultural insect pests and plant diseases, pests also include weeds, birds, rodents, and human or livestock disease vectors.

Mozambican regulation on pesticides and World Bank Safeguard Policy on Pest Management OP 4.09 conform to the specifications of the World Health Organization (WHO) and Food and Agriculture Organizations of the United Nations (FAO). There are no specific policies about pest management and crop protection in the context of IPM approaches in Mozambique. Research into plant health and to a certain extent IPM approaches are carried out by IIAM (National Agrarian Research Institute) and the Faculty of Agronomy and Forestry (FAEF) of

the Eduardo Mondlane University (UEM). Under these agencies, IPM research will continue and the knowledge will be passed on to extension services as it becomes available.

Given the complexities of the pest management issues under a project like this a separate Pest Management Plan (PMP) has been prepared and disclosed, which should be used, monitored and reported as part of this ESMF.

10.3 Involuntary Resettlement (Resettlement Action Plan)

Both, the Mozambican legislation **Decree 31/2012** ("Regulation on the Resettlement Process Resulting from Economic Activities") and other relevant national laws and regulations (see Chapter 5) as well as the World Bank Safeguards Policy on Involuntary Resettlement (OP/BP 4.12) will apply to any sub-project with implications on land expropriation. In cases where the Mozambican regulation differs from OP/BP 4.12, therefore OP/BP 4.12 prevails.

The policies in force require that the following approach be adopted in dealing with resettlement issues:

"*Involuntary resettlement should be avoided where feasible, or minimized, exploring all viable alternative project designs. Where it is not feasible to avoid resettlement, resettlement activities should be conceived and executed as sustainable development programs, providing sufficient investment resources to enable the persons displaced by the project to share in project benefits. Displaced persons should be meaningfully consulted and should have opportunities to participate in planning and implementing resettlement programs.*

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

The WB adopts a broad view and the phenomenon "is not restricted to its usual meaning - that is "physical displacement," it also includes economic displacement, namely adversely affecting people's livelihoods even when they do not have to relocate. Depending on the cases, a resettlement action may include (i) loss of land or physical structures on the land, including business, (ii) the physical movement, and (iii) the economic rehabilitation of project affected persons (PAPs) in order to improve (or at least restore) the levels of income or livelihood prevailing before the action causing the resettlement has taken place". This is also endorsed by the Mozambican authorities.

Based on an analysis of desktop information and project lessons from the related PROIRRI project, it has been confirmed that physical displacement, although unlikely, may be possible as a result of sub-project implementation, particularly if government-owned irrigation schemes are included in the scope of the Project. Compensation, however, will be required for loss of property.

Given the complexity of issues to be dealt with under involuntary resettlement a Resettlement Policy Framework (RPF) has been prepared and must be used together with this ESMF.

11 TRAINING AND CAPACITY BUILDING REQUIREMENTS

Effective implementation of the environmental and social management measures outlined in the ESIAs/ESMPs, PMP and RAPs will determine the success of the ESMF and the project in general. 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.

11.1 Institutional Capacity Assessment and Analysis

Descriptions made in Chapter 5 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 challenge.

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.

After needs identification a specific institutional and human capacity-building program for environmental and social management will be developed as part of the Project. Beneficiary institutions will be MASA/INIR, MOPHRH, MITADER at the various levels, mainly the provincial and district levels, 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 and RAP processes. Up until now, these processes are managed mainly at the provincial and central level. Only limited number of districts is in position of being competently involved in ESIA/ESMP and RAP processes. Lessons learned from successful experiences in the districts should be replicated in the project area as part of the Project planning and implementation.

The safeguards specialists at central and provincial levels will be responsible for championing this work.

11.2 Proposed Training and Awareness Programs

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

- sensitize the various stakeholders on the linkages between environment and social impacts and Project subprojects;
- demonstrate the role of the various key players in the implementation and monitoring of the safeguards instruments (ESMF-ESIA/ESMP, RPF/RAP, PMP, 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 can provide leadership and guidance as well as supervise the implementation of their components in the ESIA/ESMP, RPF/RAP, PMP, etc.;
- ensure that participants can analyze the potential environmental and social impacts, and competently prescribe mitigation options as well as supervise the implementation of management plans;
- strengthen local NGOs and teams of extension workers to provide technical support to the farmers.

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, PMP and RAP and to monitor its implementation; and
- comprehensive training for participants who will need to understand the potential adverse environmental and social impacts (mainly focused on construction of infrastructures – project component 2 and 3) and who will at times supervise implementation of mitigation measures and report to relevant authorities, focusing on their areas of expertise (e.g. water resources management, pesticides, soil conservation, climate change), etc.

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*"[33] approach in relative detriment of studies and other forms of advice and assistance will be given priority. 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 PROJECT.

11.3 Technical Assistance (TA)

During the implementation of PROIRRI substantial progress was made in building capacity of relevant actors to undertake sound environmental management of irrigation interventions. IRRIGA implementation will build on these developments. As can be seen from Annex 2, except for two projects that are still in the process of obtaining their environmental licenses the remaining 30 have such licenses and this was the result of the work done by PROIRRI Safeguards Personnel in collaboration with relevant stakeholders.

IRRIGA will also have to deal and decisively resolve the inconsistencies witnessed during PROIRRI implementation as documented in Chapter 7.

Against this background the need for short, medium and long term Technical Assistance will be assessed carefully. The results will be used to devise the best approach to engage and deploy

[33] 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.

TA to the project (e.g. temporary TA under specific circumstances) or just not involve it altogether.

Where it will be engaged TA will be to ensure that the various external inputs from different providers of goods and services to the project are aligned and harmonized with the Project's ultimate goals. Capacity building and transference of knowledge and skills for MASA, MPOHRH, and MITADER and the overall environmental and social sector will be at the center of the activities to be carried out. The provincial and district levels will be crucial as it is at this level that capacity is usually low,

12 ESMF MONITORING REQUIREMENTS

Monitoring will be systematically conducted to ensure that the objectives set forth in the ESMF and the ESMPs, PMP and RAPs are being achieved satisfactorily and where there are non-conformities to, timely, introduce changes. This continuous process 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.

Project Management Team, especially the ESSS officials at the provincial level, will have the overall responsibility for coordinating and monitoring the implementation of the ESMF, under supervision of the ESSS at the PIU HQ. They will have to conduct sensitization programs to inform stakeholders about the framework, how it works and what is expected from 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, PMP and RPF 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 Project Management Team (PMT) will consult and coordinate with the appropriate government agencies on social, 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, as per the ESHS Procurement Enhancements, and
- Efficiency of Supervising Engineers in fulfilling their environmental, social, health and safety monitoring contractual obligations, as per the ESHS Procurement Enhancements.

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.

The following ESMF implementation indicators are suggested in order to monitor project environmental and social performance:

- Number of Screening Forms filled, submitted to the WB and approved
- Number of Categorization process submitted to DPTADERs and approved
- Number of ESMP elaborated, submitted and approved by the WB and DPTADERs
- Number of environmental licenses issued
- Number of ESMP monitoring reports elaborated and submitted to DPTADERs
- Number of Environmental audits/inspection conducted by DPTADERs or other government authorities
- Number of Non-conformities unveiled by DPTADERs or other government authorities
- Number of Non-conformities corrected
- Number of penalties imposed by DPTADERs or other government authorities
- Number of penalties or other sanctions imposed to the Contractor due to ESHS violations
- Number of penalties or other sanctions imposed to the Consulting Engineer due to ESHS violations
- Number of well documented ESHS trainings undertaken
- Number of well documented awareness campaigns conducted
- Number of accidents/incidents occurred
- Number of GRM set up
- Number of complaints received
- Number of complaints correctly, and timely addressed
- Number of farmers (men and women) trained on pest management control
- Number of farmers (men and women) trained on water management
- Number of farmers (men and women) trained on Conservation Agriculture
- Number of meetings held with beneficiaries
- Number of meetings held with local institutions (SDAE, SDPI, etc…)

Annex 12 shows an example of a potential safeguard performance monitoring matrix.

13 PROPOSED ESTIMATED IMPLEMENTATION BUDGET

At this stage the initial budget lines and estimate of lump sum amount necessary to cover ESMF implementation of the Project is calculated based on percentage of the total project budget dedicated to environmental and social management. The percentage is estimated at 2.7%. The total amount to cover ESMF preparation and implementation costs stands at **US$ 2,202,500.00**. A preliminary distribution along budget lines is made. In due course the distribution of this amount will be adjusted but one area that is going to mobilize most of the funds will be safeguard staffing and the provision of various types of services, including the formulation, implementation and monitoring and evaluation of ESIA/ESMP, training and capacity building to ensure adequate selection, design, siting, etc. of subprojects in a way that will institutionalize

basic principles of avoiding/minimizing project impacts and managing them adequately where they will exist. Project funds will also cover the payment for environmental licenses to MITADER/Government.

Below, the items and allocated amounts to implement the ESMF including preparing and implementing ESIA/ESMPs, monitoring, evaluation, auditing and capacity building.

Table 13-1: Estimated budget for ESMF implementation

IRRIGA Safeguard Costs	Total Costs (USD)
2 (Env. and Soc.) Safeguard specialists, Central level	528 000
4 Safeguard specialists, Province level (½ time)	330 000
IRRIGA Safeguard instruments (ESMF preparation)	120 000
Environmental and Water permits fees	80 000
DUATs	100 000
Training Safeguard HR at Central, Provincial and District level	30 000
Capacity building to other IRRIGA departments (Central and Provincial)	12 000
Capacity to WUA on Safeguards	50 000
Training Safeguards on Farmer Field Schools	100 000
Preparation of: simplified ESIA, ESMP, PBPGA	462 500
Implementation (Contractor) and Supervision (Fiscal)	300 000
Horticulture processing Plant ESIA	40 000
Safeguard external independent Audits	50 000
Safeguard traveling costs (flights, trips, *per diem*, …)	123 550
TOTAL	**2 202 500**

While preparation costs for submitting Environmental licenses and Water Abstraction Licences will be assumed by IRRIGA budget, it is expected that expenses related to Environmental license and Water Licence fees will be a counterpart (GoM) expense. The same applies to any Land tenure (DUAT) costs needed at beneficiary's level.

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ANNEXES

Annex 1: Public Consultation Report

REPUBLIC OF MOZAMBIQUE

MINISTRY OF AGRICULTURE AND FOOD SEGURITY

NATIONAL INSTITUTE OF IRRIGATION

SMALLHOLDER IRRIGATED AGRICULTURE AND MARKET ACCESS PROJECT - MOZAMBIQUE IRRIGA P156559

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK (ESMF), RESSETLEMNT POLICY FRAMEWORK (RPF) AND PEST MANAGEMENT PLAN (PMP)

Public Consultation Report

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Maputo, February 2018

1. Introduction

The Government of Mozambique, through the Ministry of Agriculture and Food Security (MASA), is negotiating $ 80.00 million World Bank financing to carry out the Irrigation and Market Access Project for Small Farmers (IRRIGA). This project aims to (i) increase the technical capacity to develop and operate irrigated agricultural production systems; (ii) expand the area under small-scale irrigation; (iii) introduce productivity-enhancing technologies, and (iv) develop market linkages for inputs and products as well as market access. The project will be implemented in the provinces of Manica, Sofala, Zambézia and Nampula for a period of six years (2018- 2024).

The Proposed project is a continuation and draws on the experiences of the World Bank-funded Sustainable Irrigation Development Project (PROIRRI), which aims to develop about 3,000 ha of new irrigated land at the end of the project in June, 2018. The IRRIGA project will capitalize on the achievements of PROIRRI, incorporating the main priority lessons that emerged from the analytical work carried out in the sector, specifically the Priorities for Performance and Sector Policies and Institutions and Investments in Agriculture and discussions with the government, MASA, INIR, small farmers and other stakeholders, considering the prevailing constraints to developing irrigated agriculture.

IRRIGA funding will provide improved irrigation services and market links to small farmers on 7,000 hectares of irrigated land cultivated by about 14,000 small farmers in the provinces of Manica, Sofala, Namupla and Zambézia. In addition, the project will provide enhanced agriculture and improved market links to 3,000 ha of land that will/have been developed under PROIRRI. The project will also contribute to the establishment and strengthening of Water User Associations (WUAs), improve service delivery and market linkages to increase the sustainability of these systems.

As part of the project design and preparation, an integrated consultancy service was contracted to support INIR in developing three management instruments, namely:

- Environmental and Social Management Framework (ESMF);
- Resettlement Policy Framework (RPF), and
- Pest Management Plan (PMP).

The elaboration of ESMF, RPF and PMP is a result of principles established by the World Bank (the funding agency) and the Mozambican Environmental Law, establishing that the financing of development plans and programs is subject to evaluation and mitigation of potential negative environmental and social impacts and enhancement of the positive ones.

The ESMF and RPF are analytical processes that facilitate the prior identification of potential impacts associated with actions and activities in the implementation of plans, policies and programs with a view to simplifying the identification of best practices alternatives through communication between planners, decision makers and people/affected public. These processes increase the credibility and sustainability of the decisions taken, thus minimizing the time and cost of carrying out the Environmental Assessment and Resettlement Action Plan in the specific project phases (Marsden, 2008).

These instruments (QPGAS, QPR and PGP) aim to anticipate the potential environmental and social impacts associated with the implementation of the activities planned under IRRIGA. The instruments should minimize negative environmental and social impacts of projects such as soil erosion, water and soil pollution, generation of solid waste and effluents, and other factors relating to the installation, operation and maintenance of agricultural activities, and related infrastructures such as irrigation schemes. The instruments should also describe the environmental categorization processes of the proposed projects, the institutional arrangements, responsibilities and timing for the implementation of mitigation/enhancement measures and the monitoring process for the implementation of such measures. Thus, ESMF, RPF and PMP have the following objectives:

- Propose clear procedures and methodologies for environmental and social assessment, review, approval and implementation of irrigation projects and market access for small farmers;
- Clarify the roles and responsibilities of project stakeholders and present accountability procedures for the management and monitoring of environmental and social impacts of proposed projects;
- Determine training and technical assistance needs for a successful implement action of ESMF, RPF and PMP recommendations;
- Estimate the financial resources needed to implement the ESMF, RPF and PMP recommendations;
- Provide information necessary for the implementation of ESMF, RPF and PMP.

As part of ESMF, RPF and PMP preparation under the Smallholder Irrigated Agriculture and Market Access Project (IRRIGA), the consultant undertook Public Meetings and Stakeholders Consultation with the aim to gather opinions and contributions from Affected and Interested Communities/People. The public consultation meetings were undertaken in five provinces (the project targeted provinces of Manica, Sofala, Zambezia and Nampula) and Maputo city. The public consultation meetings had the following objectives:

- To provide project's information to the project beneficiaries, local communities, civil society organizations and governmental structures;
- To identify the project's potential negative impacts to the environment and socioeconomic spheres;
- Register the participant's contributions, concerns and clarify doubts about the proposed IRRIGA project.

2. Methodology

Any participatory process require that project proponents avail relevant information related to the subject matter under discussion. On behalf of INIR, the consultant prepared Baseline Information Document (BID) in Portuguese, which was shared with the key stakeholders across the targeting province (***See the BID in annex 7.1***). The BID contained key project's information, including the concept, geographic area, specific activities and the potential impacts upon the environment and human health.

With support of INIR, the consultant prepared a list of key stakeholders in each province. It was through this lists that the BID was shared with stakeholders at provincial and district level prior to the undertaking of the public meetings.

The consultant prepared an announcement of the public meetings released through the press (*Jornal Noticias*) indicating the objectives, the venue, date, location and contacts for more information. The announcement was realised 15 days prior to the first public meeting as recommended by Public Participation Ministerial Diploma No. 130/2016 of July 19**).**

In addition, a stakeholder consultation process was undertaken with INIR/PROIRRI representatives in the targeting provinces to register their contribution to the process with their knowledge and experience from PROIRRI. The consultant spoke with each PROIRRI /SPA representatives from the targeted provinces prior and after the public meetings. As a matter of fact, contacts and invitation to the provincial and district's stakeholders were facilitated by PROIRRI/SPA's focal points proposed by INIR.

Additionally, selected stakeholders from the targeted provinces (five in each province) were contacted and interviewed with the aim to identify positive and negative aspects of PROIRRI based on their experiences and draw lessons to inform the IRRIGA project. Additional positive and negative environmental and social potential impacts were discussed during the stakeholder consultation. The information collected was critical to inform the preparation of draft ESMF, RPF and PMP that were submitted to INIR on **February 8** prior to the public meetings held from **February 16 - 22**.

The consultants prepared a power point presentation based on the draft ESMF, RPF and PMP submitted to INIR. The presentations in Portuguese (***See Annex 7.2***) was shared with key stakeholders prior to the public consultation meetings.

The public meeting where then held as scheduled and the participation of stakeholders and their contribution where positively integrated in the management instruments.

3. Stakeholder Consultations

Stakeholder consultants was undertaken across the targeted provinces/districts. As a matter of fact, a total of 28 people were contacted to get their contributions to the elaboration of the three management instruments (ESMF, RPF and PMP). See the list below.

Table 1 - List of Stakeholders Contacted

Nr	Nome	Provincia	Distrito	Sector	Cargo	Contacto/Email
1	Isac Armando	Nampula	Mecubure	SDPI	Director	84 269 2713
2	João Messicu	Nampula	Nampula	SDAE	Supervisor	84 439 5485
3	Diogo Antonio Diogo	Nampula	Lalaua	SDPI	Director	84 432 0298
4	Ismael Castigo	Nampula	Larde	SDAE	Director	84 055 5538
5	Elisio Duarte	Nampula		SPASA	Tecnico	84 409 1297
6	Joaquim Tomás	Nampula		SPA	Director	82 875 9880
7	Cantíflas Jeronimo	Nampula	Moma	SDAE	Director	82 690 5590
8	Acácio Alferes Costelo	Zambézia	Dere	SDPI	Director	84 025 8008
9	Eusebio Gabriel	Zambézia	Milange	SDAE	Director	84 980 4860
10	João Jaime Alfredo	Zambézia	Maganja da Costa	SDAE	Director	84 387 4346
11	Carlos Guedes Jamal	Zambézia	Quelimane	FIPAG	Responsavél de Projectos	84 431 2602
12	Antonio Joaquim Tcheco	Zambézia		PROIRRI	Coordenador da PROIRRI	84 516 0371
13	Pascoal Linda	Zambézia		SPA		pascoallinda@gmail.com
14	Eduardo Cardo	Zambézia	Gurué	SDPI	Director	84 390 9564
15	Francisco Costa	Sofala	Caia	Representaçao da Associação de Arroz	Representante	84 748 2623
16	Lucio Jacob Namuca	Sofala	Machanga	SDAE	Director	82 912 3779
17	Caetano Benedito	Sofala	Nhamatanda	SDAE	Director	82 841 8810
18	Emanuel Samussone Miguel	Sofala	Chemba	SDAE	Director	86 615 2159
19	Edson Almeida	Sofala		SPA		82 307 0788
20	Manuel da Costa Sebastião	Sofala		PROIRRI	Coordenador da PROIRRI	82 816 0460
21	Miguel Domingos	Sofala	Buzi	SDAE	Director	82 797 2770
22	Critovão Elias Nhamalete	Manica	Barué	SDAE- Apoio a produção	Eng. Agronómo	82 685 5787
23	José Luis João Domingos	Manica	Guro	SDAE	Director	82 886 5026
24	Marta Regina Chicava	Manica	Vanduzi	SDAE	Directora	82 537 8040
25	Leonardo Lucas Manhique	Manica		PROIRRI	Coordenador da PROIRRI	82 877 000
26	Zacarias Muzaja	Manica		SPA		zacariasmuzaja@yahoo.com.br
27	Ruben Botão Murombo	Manica	Mossurize	SDAE	Director	87 164 0904
28	Deolinda João Chitsumba	Manica	Machaze	SDEA	Directora	86 143 7763

The following are the key contributions gathered from the stakeholder consultation process.

- Land availability – It was confirmed during the stakeholder consultation the availability of arable land and water recourses for development of small-scale irrigation systems. These are areas currently under use by the local population. However, it was pointed out that there are cases of unused land (reserve) that can be directed to the IRRIGA project. Thus, the designs of clear and transparent land accessing criteria to the IRRIGA's initiative will be critical to avoid misunderstanding or dispute between districts and localities in the same provinces.
- Land Conflicts – Although in some districts, stakeholder suggested that the land conflict would not be a problem as there is enough land for agriculture, the respondents pointed out that there were land conflicts in the districts across Zambézia and Nampula provinces. IRRIGA will have to cope with this problem by effectively communicating the project's opportunities and how communities can benefit from participating in the IRRIGA projects. The respondents also pointed out that there is a trustworthy local mechanism to deal with land conflict and this mechanism should be at the centre of resolving any land conflict that may arise under the IRRIGA project.

- ***The positive and Negative aspects/experience of PROIRRI:***

Table 2 - PROIRRI Positive and Negative Aspects

Aspects/ Experiences	Manica	Sofala	Zambézia	Nampula
Positive	Operationalization of irrigation schemes Technical assistance & support to producers, Access to irrigation schemes, inputs & training	Involvement of smallholders farmers in agribusiness, Public consultations with producers, monitoring of PROIRRI	Increase of producers income and Operationalization of irrigation schemes	They don't know about PROIRRI
Negative	Areas left uncovered by PROIRRI, Non-compliance with projects guidelines due to lack of funds	PROIRRI made no progress: Many were producers uncovered by PROIIR and Lacking Credit	Not mentioned	

- ***The potential environmental and social impacts of IRRIGA as motioned by consulted stakeholders:***

Table 3 - Positive and Negative Potential Impacts of IRRIGA

Potential Impacts of IRRIGA	Manica	Sofala	Zambézia	Nampula
Positive	Control of production areas Breeding of cattle and goats Improvement of road access which will trigger easy movement of people and goods)	Job creation Community awareness of IRRIGA project design Capacity building of farmers Good flow of people in agricultural areas	Improving family incomes and living conditions of local communities Increased water reserves for future use by communities Increase in rice production Improved road access and marketing of products	Increase in agricultural sector & family incomes; Increased productivity
Negative	Conflicts with Hippos and Elephants (man vs wildlife animals conflict) Soil erosion Lacking/reduced water supply due to irrigation activities Deforestation (cutting of trees)	Soil degradation due to the use of pesticides to combat pests Erosion and contamination soils Increased Salinity Failure to comply with the IRRIGA project requirements Lack of water near fields prone to rice production	Contamination of water and soil due to the use of fertilizers Loss of flora due to the opening of agricultural fields Soil handling and contamination Involuntary resettlement of people Loss of small terrestrial fauna Reduction of the water flow in Licungo river Degradation of vegetation and contamination due to the use of chemicals	Drowning of people in the rehabilitated dams; Deforestation; Contamination of soils and water due to the use of chemical fertilizers; Reduction water flow of the rivers and ponds due to excessive water use; Land conflicts resulting from IRRIGA's encroachment of land occupied by the local population; Water conflict between irrigation need and consumption, Erosion of soils Scarcity of water and fish resources due to reduced flow of rivers and lakes

The figure below shows the consultant, after a meeting at the PROIRRI Delegation in Chimoio.

Figure 1 - Meeting with PROIRRI's Representative in Chimoio

4. Schedule and Participation in the Public Meetings

Given the tight deadline to deliver the consultant services the public consultation meetings were planned and undertaken in the same period of time. Therefore, a multi-disciplinary team with experience in public meeting facilitation was involved. Table below indicate the public meeting schedule in four targeting provinces and Maputo city.

Table 4 - Public Meetings Schedule

Nº	Local	Sala	Data	Hora
1	Cidade Chimoio	Hotel Inter Chimoio	16/02/2018	10h-12h
2	Cidade da Beira	Rainball Hotel (Ex. Hotel Moçambique)	20/02/2018	10h-12h
3	Cidade de Quelimane	Hotel Chuabo	21/02/2018	10h-12h
4	Cidade de Nampula	Hotel Milénio	16/02/2018	10h-12h
5	Cidade de Maputo	Hotel VIP	22/02/2018	08:30-10:30

The level of participation was as well satisfactory. As matter of fact, a total of 326 people from targeted cities, districts and municipalities in the targeted provinces including Maputo attended the public meetings and 24.23% had change to voice out their concerns and contributions. The meetings were facilitated by different people as indicated in the table below.

Table 5 - Facilitation and Participation in Public Meetings

Nº	Public Meeting Site	Facilitator of the Meeting	Number of Participants	Number of Contributions
1	Chimoio city	Eduardo Macuácua	95	22
2	Beira city	Adalberto Matusse	62	22
3	Quelimane city	Duartina Francisco	71	10
4	Nampula city	Ermínio Jocitala	74	14
5	Maputo city	Eduardo Macuácua	24	11
	Total		**326**	**79**

5. The Presentation Content.

The consultant provided an integrated *Power Point* presentation based on the information compiled in the drafts ESMF, RPF and PMP. It informed the participants about IRRIGA project, notably the project's key objectives, targeted provinces, components, funding agency and amounts. The presentation included information on the preliminary assessment of positive and negative social and environmental potential impacts, across the project interventions/components, the binding legislation and the World Bank Environmental and Resettlement Safeguards, displayed similar project pictures drawn from PROIRRI to better illustrate project's actions, discussed voluntary and involuntary project resettlement possibilities and implications. Finally, there were discussions on critical issues related to pest management in agricultural project and the way forward in terms of prevention and treatment procedures, including the need for adopting Integrated Pest Management (IPM) to control pests (***For detailed presentation see in annex 7.2***).

6. The Public Meeting Outcomes

The contribution from the public meetings across the five cities are presented in the table below by province (***See detailed minutes in Annex 7.3***).

Table 6 - Key Impacts and Challenges raised in Public Meetings

Positive Impacts	Negative Social and Environmental Impacts	IRRIGA Challenges
• Increase on production and level of family incomes. • Powe-lines will trigger rural development. • Road rehabilitation will boost the movement of people and goods • Emergency of agro-processing activities • Generation of employment. Hiring the local labour under IRRIGA will help avoiding social	• Deforestation may increase the wind speed and triggering socio-economic impacts. • Water contamination resulting from the inappropriate use of agro-toxics. • Water mismanagement may trigger conflicts between different users (people and animals; up and down stream). • Unclear criteria may trigger project dissatisfaction	• Output deterioration as result of lacking commercialization infra-structure. • Limited acceded to funding's may affect some producers who have no backup funding option. • Lacking communication may affect the project performance • Waterless districts may have difficulties to benefit from IRRIGA and this can lead to social conflicts

Positive Impacts	Negative Social and Environmental Impacts	IRRIGA Challenges
conflicts and will improve incomes of the beneficiaries • Community compensation from extracted local resources may lessen the social rebellious • Construction of rural infrastructures will boost development • The project will help to improve the health nutritional of the population. • Will help develop districts with electrical services access • Will help the private sector to increase their business • Beneficial for communities in exploiting community-owned resources • Identification and use of local suppliers of materials and training and qualification of personnel for the maintenance of machines • Use of other energy sources with lower costs for farmers • Rehabilitation of old infrastructures • Extension of irrigation to new production areas	• Erosion and abandonment of irrigation schemes may occur as consequence of IRRIGA, particularly when maintenance is not guaranteed. • The project may affect sacred places such as graves/cemetery. • Water contamination by recently disinfected cattle • Agro processing activities may cause pollution, noise and Health and Safety requirement. • Migratory pest may affect IRRIGA • Water pumping may generate noise • Sparrow may affect negatively the rice production • Lack of hygiene and food contamination may result in public health problems as result of inappropriate location of toilets and absence of clean water. • If these is not considered, floods and other impacts should be expected • If these are not taken care of then, there is a potential for human and animal accidents • This may imply losses on the producers. • Social conflicts between the involved and not involved association	• Lacking of clear drinking water may be problem in the project areas • Excessive production, without a guaranteed market lead deterioration of the produce and poverty. • Water mismanagement and people may think water resource is free (is God's gift) and that no one should pay for water use. • Gender issue redress • No road maintenance budget, no accessible roads and produce get deteriorated. • Definition of specific IRRIGA targeting areas will trigger disapproval by uncovered districts. • We may have situation of overproduction with no markets. • There is a risk that irrigation infrastructures may not be sustainable. • Careful observance of environmental and social issues in the design and implementation of projects • Need to have contingencies in the projects in order to finish the works • Need to carry out comprehensive hydrological studies • Projects designed that do not fit the local reality. • Gender mainstreaming in the projects

Positive Impacts	Negative Social and Environmental Impacts	IRRIGA Challenges
• Participation of other institutions in projects • Definition of crops for pest control. • Definition of markets for the marketing of agricultural products • Use of other sources of water abstraction for irrigation • Use of small irrigation systems and other irrigation systems • Increased dam capacity and expansion of irrigation areas • Opening access roads to production sites.	• Risk of soils depletion during the implementation of project. This is related with type of pesticides used to mitigate pests which are not compatible with type of soils • Environment degradation • Social conflicts between the involved and not involved actors • Different water need/use conflicts • Potential risks of using child labor • Pest related to different type of crops • Conflicts in the exploitation of resources • Treatment of solid waste’	• Projects not completed for various reasons • Reduced agriculture profits margins • Project information discloser • Construction of new hydraulic infrastructures for the storage of water • Lack of environmental impact studies in implementation projects • Maintenance of agricultural infrastructure • Feasibility study of projects before implementation • A detailed study on the materials used in the construction of access roads • Definition of responsibilities for who pays environmental licenses.

Annexes

Baseline Information Document

Presentation Made during the Public Consultation Meetings

Detailed Minutes of the Public Meetings

Minutes of Public Meetings (Manica, Sofala, Zambézia, Nampula and Maputo)

REPUBLIC OF MOZAMBIQUE

MINISTRY OF AGRICULTURE AND FOOD SEGURITY

NATIONAL INSTITUTE OF IRRIGATION

SMALLHOLDER IRRIGATED AGRICULTURE AND MARKET ACCESS PROJECT

MOZAMBIQUE IRRIGA P156559

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK (ESMF), RESSETLEMNT POLICY FRAMEWORK (RPF) AND PEST MANAGEMENT PLAN (PMP)

Public Consultation Meeting Minutes


N


Public Consultation Meeting - Manica

Venue and Date: Inter-Chimoio Hotel, Chimoio, 16/02/2018

As part of ESMF, RPF and PMP design under the Smallholder Irrigated Agriculture and Market Access Project (IRRIGA) currently under negotiation between the Government of Mozambique and the World Bank, a Public Consultation Meeting (PCM) was called through an announcement launched on 1st of February 2018 in Notícia Newspaper. As the IRRIGA covers the four central provinces (Manica, Sofala, Zambézia and Nampula), five PCM were planned to take place, one in Maputo and another four in the capital cities of the four IRRIGA beneficiaries provinces.

The objectives of the public consultation meeting were set in three levels as follow:

- To provide information to the project beneficiaries, local communities, civil society organizations and governmental structures;
- To identify the project impacts to the environment and socioeconomic sphere; and
- Register the participant's contributions, concerns and clarify misunderstandings about the new project.

The meeting in Manica province took place on 16th of February 2018, as planned, and a total of 90 people from different sectors and districts took part of the meeting (See the List of Participants, in the annex).

Below presented are the minutes of the meeting held in Chimoio.

The meeting program had the following design:

- Registration of Participants;
- Welcome speech and participants' presentation by the participants;
- Brief presentation of IRRIGA;
- Presentation of ESMF, RPF and PMP process design (context, governing Mozambican laws and WB safeguards, potential project impacts, resettlement process and key issues on pest management);
- Contribution by participants and clarification of issues by the consultant
- Closing out and refreshment.

The opening remarks were delivered by the Provincial Director for Agriculture and Food Security in Manica. After introducing herself she asked everyone present to state their names and respective institutions they represent. Then she noted that Agriculture is a key activity in Mozambique and the current presidential mainstream policy is to increase agriculture production and productivity. She indicated that the Government has placed tremendous efforts to support producers in that regard. PROIRRI is one example of the government commitment and as it ends, the Ministry of Agriculture and Food Security (MASA) is currently negotiating the IRRIGA project which will take over when PROIRRI comes to an end on June 2018. She encouraged participants to speak out their concerns and contribute to identify positive and negative impacts, challenges and concerns that would affect the upcoming IRRIGA project.

The presentation of IRRIGA project was, then, under the responsibility of PROIRRI Coordinator in Chimoio. He focused on the project objectives, components, amounts evolved and geographical areas covered as well as the project duration. In addition, the PROIRRI Coordinator pointed out that although IRRIGA is still under negotiation, it has a huge potential to increase the irrigated areas by 7,000 ha and will benefits about 14.000 people with new constructed/rehabilitated irrigation system and improved access roads, training, market access and small grants provision.

Mr. Macuácua in his ability as consultants took the floor and presented the context under which the ESMF, RPF and PMP are being prepared. He stressed that the three documents are part of the WB environmental safeguards and Mozambican legislation that require development projects to have such forward planning instruments. Then, he presented potential positive and negative impacts on IRRIGA across people and environment in general, as drafted in the BID document. Shared some images from PROIRRI and newly identified pest. The consultant, after his presentation asked the participants to contribute to IRRIGA preparation thought raised their hand and ask a floor. The table below summarize the key issues raised by the participants and the impacts, in the last column, drawn by the consultants.

Figure A – Pictures from the Public Meeting held in Manica

Nr.	Participants	Organization	Discussion	Impacts
1	Conde Augusto Artur, representative	Provincial Directorate of Industry and Commerce	He mentioned that IRRIGA should incorporate the commercialization component which include the construction of market place (trade fair) at district level so as to facilitate the buyers. Extension agents have been supporting the producers to increase their production. However, due to lack of access to markets, output from producer's decline/deteriorate. In term of financial access, he said it is very difficult for producers to get funding. Banks, through which the funding are channeled, require physical guarantees. As much he now local population has no guarantee to show and that would limit their ability to get funding.	Output declines as a result of lack of access to markets (i.e. no commercialization). Limited access to funding may affect some producers who have no guarantees.
2	David Franque, Adminstrator	District Government of Guro	He called on the IRRIGA project to perform communication awareness to the local communities so as to avoid project failure. He added that when people are informed in advance about the project objectives and engagement mechanisms they will have a sense of ownership in projects. He mentioned that in Guro district are no overpassing river and the only river passing through Guro is Zambezi in a certain corner of the District. This has triggered a very intense demand for water. He asked if it was possible that IRRIGA brought water from Zambezi River into the district.	Lack of communication may influence project performance Water-scarce districts may experience difficulties in benefitting from IRRIGA and this can result in social conflicts.

Nr.	Participants	Organization	Discussion	Impacts
9	Inês Cipriano, representative	DPTADER-Manica	Deforestation in some areas traversed by the project. Using the PROIRRI project as an example, the mismanagement of agrochemicals by producers resulted in water contamination. This is likely to happen under IRRIGA if the correct measures are not implemented. She referent a potential rise of water conflicts for different and differing uses. Finally, she suggested the use of clear and transparent criteria to select IRRIGA sub-project location.	Deforestation may increase the wind speed triggering socio-economic impacts Water contamination resulting from the inappropriate use of agro-chemicals. Water mismanagement may trigger conflicts between different users (people and animals). Unclear criteria may trigger project dissatisfaction
3	Abu Jone	RAMA-BC	He congratulated the IRRIGA project and called for drawing lessons from PROIRRI. He stressed the need to avoid the erosion problems and the widespread relinquishment of irrigation schemes due to lack of maintenance.	Erosion and abandonment of irrigation schemes may occur as consequence of IRRIGA.

Nr.	Participants	Organization	Discussion	Impacts
4			Requested that local/districts authorities be involved in the process of selection of contractors for IRRIGA sub-projects. Noted that erosion has become a big problem for irrigated lands. He mentions the need to preserve graves/cemeteries as it is regarded as sacred places by the local communities	Erosion may occur due to irrigation schemes development. The project may affect sacred places such as graves/cemetery.
5	Augusto Joaquim Gravata, representative	IAV	He recommended the maintenance of irrigation scheme in order to evade or lessen the erosion problem.	If not maintained irrigation scheme may trigger erosion problem
6	Alberto Nola Alfredo, representative	Universidade Catolica de Moçambique	He noted that there is a lot of production going on in Manica province. However, markets are lacking and IRRIGA should address market development so as to avoid the situation of products getting spoiled/squandered. He called for the need to develop processing and conservation /storage facilities to maintain quality of the products. He explained that construction of weir and irrigation schemes become an attractive drinking spring for cattle. Cattle are a potential source of contaminated water due to the drugs cattle use. Specific cattle drinking points should be constructed and mechanisms established to avoid contamination, he concluded.	Excessive production without a guaranteed market leads to waste of produce and poverty. Water contamination by recently disinfected cattle.

Nr.	Participants	Organization	Discussion	Impacts
7	José Manuel Silvestre	DPASA/DER	He spoke of the need to guarantee the ecological water flow, in order to ensure equitable water distribution for different uses. When a weir is built, one should pledge that there is still a water flow for downstream users. If non-contaminated water is not guaranteed for downstream users, then we have social conflicts and public health problems.	Public health problems and social conflicts may arise as directly related to lacking of non-contaminated water downstream.
8	João Chaúque	PANNAR Distribution	He explains the need for a Production Plan / Production Area's setup so that the entire population does not concentrate on producing the same crops at the same time. In addition, he suggested the attraction of investments in agro-processing industries so as to avoid the deterioration of agriculture output. He draws the attention to the existence of migratory pests as an important point for the elaboration of the project.	Agro-processing facilities/industries to reduce deterioration of produce Migratory pest may affect IRRIGA

Nr.	Participants	Organization	Discussion	Impacts
9	Carlos Maulia Mutar, Administrator	Manica District Government	He applauded the IRRIGA project and acknowledged the introductory notes from the DPASA which placed agriculture at the center of developing agenda and presidential discourse of Mozambique. However, he wanted to know about the specific districts that will benefit in Manica. As much as he knew, Manica District has 430,100 ha of land of which only 96,914ha are currently under use. This represents an average of 2.4ha per household. He added that following the introductory notes made by the PROIRRI Coordinator, he has come to the conclusion that IRRIGA project will benefit about 416,000 households in Manica province if an unbiased method is used to distribute the benefits across the four targeted provinces. He added that Manica province has 12 districts and 28 irrigation schemes making it a potential agriculture province. Finally, he saluted the fact that the issue of employment under IRRIGA must include the local labor force. ***Mr. Macuácua, the consultant, explained that the specific sites for IRRIGA development have not yet been decided and the decision will be taken out afterwards using consultations and transparent methods.***	Hiring the local labor under IRRIGA will help avoiding social conflicts and will improve incomes of the beneficiaries

Nr.	Participants	Organization	Discussion	Impacts
10	Jose Monteiro, representative	ITC	He thanked the presenters for clearly stating the meeting objectives and for providing the background information. However, for him as a former consultant, the presenters should clearly indicate what are the specific project look like and in which areas will the projects be implemented, so that the participants are able to discuss the impacts on a specific project site. He added that listing potential impacts may mislead the final outcome, ending up listing impacts that will never occur. Then, he contributed with two challenges: • The need for water management under the new developed schemes, suggesting that communities should be part of water management; • Water charges, suggesting that small irrigation schemes should generate revenue from water use. ***Mr. Macuácua explained that at this time we are working out at policy level and interested on potential impacts. He noted that it is part of the WB/Government project design procedures. However, when specific projects become known, an EIA and RAP will be developed and all the impacts will be mapped and taken care of. He added that water management and water charges is part of IRRIGA concerns.***	Water mismanagement and people may think water resource is free (is God's gift) and that no one should pay for water use.
11	Afonso Tiago, representative	FIPAG	He noted that on the centrally planned projects, contractors are normally hired through a public tender at the national level. What happens is that they win the tender but do not know the local reality and when the contract comes to the end they go away without leaving any contact behind. We have seen, he added, many irrigation schemes that got spoiled and there was no local capacity to fix it. He suggested that the contracts should contain maintenance clauses so that irrigation schemes are not abandoned.	Lack of maintenance plan becomes a problem when schemes get spoiled and abandoned.

Nr.	Participants	Organization	Discussion	Impacts
12	Venâncio Veremo, President	Municipality of Sussundenga Village	Drawing from the visits he usually pays to the existing irrigation systems, he reasoned that: • When there is heavy rainfall, the irrigation systems normally break and all the piping is unearthed. • When the irrigation system works well, the problem becomes another. The lack of conservation of production, eventually rotting, generating hunger among the population. He noted that currently the population use very traditional food conservation methods but these are not efficient when they have good harvesting. • He noted that some of the irrigation schemes are gravity-based irrigation system. However, he noted that, the province has much more water that cannot be channeled to the upper land. He asked if IRRIGA will include water pumping equipment?! ***Mr. Macuácua, explained that one of the IRRIGA's component is to provide the beneficiaries with small grants which can be used to acquire water pumps to irrigate upper lands.***	Deterioration of harvest Water pumping may generate noise

Nr.	Participants	Organization	Discussion	Impacts
13	Tiago Ludimba	ITC	His intervention was more concerned with the type of pest highlighted during the presentation. According to him, pest listed are more insects and virus. However, the most concerning pest when it comes to the rice production, is the House sparrow (a type of bird with scientific name *Passer domesticus*) and its control has been very difficult. In addition, he said that did not hear during the presentation any reference with regard to gender issues under IRRIGA design and implementation. ***Mr. Macuácua, retorted that it is good that was the sparrow has been mentioned and it will be part of the PMP redress. He added that gender issues are critical in development project will featured in the final policy guidelines. He added that gender are critical subject matter to feature in IRRIGA.***	Sparrow is a challenging pest in some rice producing area gender redress

Nr.	Participants	Organization	Discussion	Impacts
14	Maria Raice, Head of Muhoa Administrative Post	Muhoa Administrative Post	Drawing from PROIRRI project she brought the following issues: • The toilets in the production area are set distant and this has a negative impact both on the evaluation made by the visitors and by the clients. She suggests that IRRIGA project should bring the toilets much closer to production areas. • Accessing roads is a challenges to reach production site. These increase cost of commercialization and if it rains the product gets spoiled as it cannot be transported to the markets. She recommended selective intervention on road rehabilitation to allow easy movement of people and goods. • Lacking drinking water is a big problem in the irrigation schemes areas. Producers and buyer have no clear water to drink and to wash their hands. She suggested that that IRRIGA should provide clear water near to the production sites (opening boreholes). • She called for safe and fixed markets within the scope of the project area.	Hygiene and food contamination may result in public health problems as result of inappropriate location of toilets and absence of clean water. Product deterioration may lead to reduced production in the next seasons.
15	Luis Camisola, Extension Agent	DPASA/DER	He suggested the use of animal's scribes for the fertilization of the soil as irrigated areas consume huge quantity of organic materials. This will require that livestock project be developed near to the irrigated land so as to get the scribes. In addition, he suggested that IRRIGA should have a component of conservation and storage. The government keep stirring producers to increase their output but there is no absorption capacity. High transportation costs versus depressed price of tomatoes (100 mts a box) and lacking conservation conditions are the key limitations.	Inappropriate handling of animal scribes may contaminate water and agricultural products.

Nr.	Participants	Organization	Discussion	Impacts
16	Nelson Tsanzana	ANE-Manica	He called for the need to include the road maintenance budget for the project. What normally happen is that the projects focus on opening access road and no maintenance is planned. ANE and local authority cannot afford to maintain roads outside their plans. When an access road is built under IRRIGA, he recommends, the signing of a maintenance protocol and funds secured.	No road maintenance budget, no accessible roads and produce get deteriorated.
17	Egas Edgar Bila Administrador	Tambara District Government	He mentions the existing District's potential to build irrigation schemes based on the availability of water resources. He commented that a 300 ha irrigation project was developed and submitted for funding to the provincial Government. However, they did not get a single reply.	
18	Arnaldo Luis Manuel	SDPI-Manica	He stressed that the project must guarantee improvement of access roads. Additionally, any project should have a social component such as water supply. ***Mr. Macuácua commented that IRRIGA will provide electricity access in some areas which is a social component, in some extent.***	
19	José Argola	ITC	How do the resources extracted from a community A to be used in community B benefit the former community? If appropriate compensations are not planned this will trigger social struggles. He recommended IRRIGA to draws from the lessons and experiences from PROIRRI. This would facilitate the task of mapping out the potential impacts.	Community compensation from extracted local resources may lessen the social rebellious
20	Gidifri Chipaumire, Administrador	Macossa District Government	He called for the establishment of agro-industries for crop processing as well as consecrated output. He recommended IRRIGA project to emulate the experience used in game farming (cotada) where water is accumulated via weir	

Nr.	Participants	Organization	Discussion	Impacts
21	Fernando Samuel, Administrator	Machaze District Government	He saluted the project and mentioned that Macossa, Sussundenga and Matchaze Districts have been receiving little attention from the Government development programs. He recommended that under-privileged districts in terms of agriculture potential should qualify for special attention under IRRIGA project.	Selection of IRRIGA sites may trigger disapproval by districts not selected.

The meeting was then closed by PROIRRI coordinator who thanked the participants for valuable contributions to IRRIGA project. At end all participants were invited for refreshment.

Public Consultation- Nampula

Venue and Date: Milénio Hotel, Nampula 16/02/2018

As part of the ESMF, RPF and PMP design under the Smallholder Irrigated Agriculture and Market Access Project (IRRIGA) currently under negotiation with the World Bank, a public consultation meeting (PCM) was called through an announcement on 1st of February 2018 issue in Notícia Newspaper. As the IRRIGA cover the four central provinces (Manica, Sofala, Zambézia and Nampula), five PCM were planned to take place, being one in Maputo and the other four in the capital cities where the actual project will be implemented.

The objectives of the PCM were to:

- Provide information to the project beneficiaries, local communities, civil society organizations and governmental structures;
- Identify the project impacts to the environment and socioeconomic sphere;
- Register the participant's contributions, anxiety and clarify doubts about the new project.

The PCM in Nampula took place on the 16th of February 2018, as planned, with a total of seventy-four (74) participants drawn across various economic and social sectors, and districts.

Below is the description of the PCM proceedings in form of minutes:

The meeting program had the following design:

- Registration of Participants;
- Welcome speech and presentation by the participants;
- Brief presentation of IRRIGA;
- Presentation of ESMF, RPF and PMP process design (context, governing Mozambican laws and WB safeguards, potential project impacts, resettlement process and key issues on pest management);
- Contribution by participants and clarification of issues by the consultant;
- Closing out and refreshment.

The welcome speech was delivered by the Representative of the Provincial Director for Agriculture and Food Security in Nampula, Mr. Joaquim Tomás. It is worth noting a delay in the start of the meeting due to changes of meeting room to accommodate for more participants who turned out beyond the initial expectation of 40 participants. To save time, the introduction of participants was made in groups of participants, and these included farmers, members of civil society organizations, member of district governments, universities and traditional leaders.

In his welcome remarks, Mr. Joaquim Tomas thanked the presence of everyone at the event and underlined how their presence was relevant for both the design and future implementation of IRRIGA. He explained the project design process and the involvement of the provincial government in the process, more specifically the involvement of the Provincial Directorate of Agriculture and Food Security as well as the rationale for the choice of the project target districts. He further indicated that project expectations were high given the relevance of irrigation in a country/province where there is 100% dependence on rain fed agriculture. The project presents an opportunity for agriculture production throughout the year which will potentially lead to diversification of crops and increased agriculture production and productivity.

After Mr. Joaquim Tomas's opening remarks, the convener invited Mr. Tcheko, the representative of the IRRIGA project to take the floor for a brief on the project. Mr. Tseko briefed about the project design, purpose, scope and its components.

He indicated that the Government has placed tremendous efforts to support producers in relation to irrigation in Mozambique. PROIRRI is one example of the government commitment and as it ends, the Ministry of Agriculture and Food Security (MASA) is under negotiation of IRRIGA which will take over when PROIRRI comes to the end in June. He encouraged participants to speak out their concerns and contribute to identify positive and negative impacts, challenges and concerns that would affect upcoming project.

Mr. Jocitala in his capacity as consultant took the floor and presented the context under which the ESPF, RPF and PMP are being prepared. He stressed that the three documents are part of the WB requirements and Mozambique government requirement for project of this magnitude to move on with the approval process. Then he presented potential positive and negative impacts across people and environment in general, as drafted in the BID document. After this brief presentation, Mr. Jocitala invited participants to contribute to IRRIGA preparation, especially focusing on potential positive and negative impact from environmental and social standpoint. The table below summarizes key issues raised by the participants, and where possible, the impacts drawn by the consultants.

Nr.	Participant and Position	Institutions	Key Issues raised	Associated environmental and social impacts
1	Ismael Castigo	SDPI	The design should take into consideration topographical nature of each district to effectively draw both the positive and negative impacts	If these is not considered, floods and other impacts should be expected
2	António Ipo	SDAE	How the project is going to protect the pits dug during the building of infrastructures	If the pits are not covered, there is a potential for human and animal accidents.
3	Olinda Ernesto	ANE	IRRIGA will contribute to increased productivity. The project should take into consideration the market aspect. Therefore, roads construction should be a priority too and coordination with concerned institutions is paramount.	We may have situation of overproduction with no markets. This may imply losses on the producers.
4	Carlitos Omar	ARA- Norte	Take negative lessons from PROIRRI project as opportunities to make IRRIGA a successful project. The case of PRIORI in Manica should serve as an example in the learning process. Involve ANE for road construction or rehabilitation. The other aspect relates to management of irrigation infrastructures by assigned associations. It is relevant that associations are established/empowered before any infrastructure is put in place.	There is a risk that irrigation infrastructures may not be sustainable.
5	Alberto Paulo	Producer	Importance of monitoring and supervising the infrastructure built to guarantee sustainability	

Nr.	Participant and Position	Institutions	Key Issues raised	Associated environmental and social impacts
6	Joaquim Matias	União de Camponeses	How will conflicts be minimized between associations in many projects in communities?	Social conflicts between those involved and those not involved in associations association
7	Adelino Manuel	SDPI	Involve community leaders in the process of resettlement of population to avoid conflicts. Involve community leaders in the project development	
8	Cristiano Pires	SUSTENTA Project	Who own the DUATs of areas to be used for the project? What was the criteria used to select the targets districts? What was the criteria to integrate associations in the project to avoid conflicts? During Environment Assessments was the aspect of hydrology and topography characteristics of targets districts considered? How the negative environment impact will occur? How were issues of negative health impacts on communities treated? Will the training that will be delivered in communities incorporate precautions regarding diseases?	These aspects had been already clarified by both Mr. Joaquim Tomas and Mr. Tcheko (*see above*)
9	Sergio Vasco	Farmer	IRRIGA will reduce malnutrition in the target districts	

Nr.	Participant and Position	Institutions	Key Issues raised	Associated environmental and social impacts
10	Mamudo Ibrahimo	SDAE	What are the mechanisms to deal with or treat water contamination? This should be clear in the documents	
11	Bonifacio Nassila	DPIC	Is there any possibility that the project should look beyond rivers for irrigation projects? For instance, boreholes and other underground waters are also key to irrigation	
12	Cantifalas Jerónimo	SDAE	IRRIGA will promote food cultures or product diversification. How will the sustainability of infrastructures be secured? What is the plan to deal with corruption issues during the project implementation?	
13	Mr. Domingos Ajuda	FAO	Create infrastructures that population can have water access for socials activities. How the project will protect the infrastructures to be built, especially considering they equally pose threat to human beings due to drowning. The question is how these infrastructures will be protected to avoid these impacts. Experience from Ethiopia suggest these infrastructures should have a protection, a kind of a buffer zone to restrict access for both animals and human beings. Water management should also be considered to avoid conflict between communities upstream and downstream	

Nr.	Participant and Position	Institutions	Key Issues raised	Associated environmental and social impacts
14	Amândio Sipanela	SDPI	How the project will de deal with land conflicts? Will be important if the project can define a pilot area to implement the project before to expand to all 8 districts The project should anticipate impacts on water use.	

Public Consultation-Zambézia

Venue and Date: Hotel Chuabo, Zambézia 21/02/2018

As part of the ESMF, RPF and PMP design under the Smallholder Irrigated Agriculture and Market Access Project (IRRIGA) currently under negotiation with the World Bank, a public consultation meeting (PCM) was called through an announcement on 1st of February 2018 issue in Notícia Newspaper. As the IRRIGA cover the four central provinces (Manica, Sofala, Zambézia and Nampula), five PCM were planned to take place, being one in Maputo and the other four in the capital cities where the actual project will be implemented.

The objectives of the PCM were to:

- Provide information to the project beneficiaries, local communities, civil society organizations and governmental structures;
- Identify the project impacts to the environment and socioeconomic sphere;
- Register the participant's contributions, anxiety and clarify doubts about the new project.

The PCM in Zambézia took place on the 21th of February 2018, as planned, with a total of sixtieth-four (68) participants drawn across various economic and social sectors, and districts.

Below is the description of the PCM proceedings in form of minutes:

The meeting program had the following design:

- Registration of Participants;
- Welcome speech and presentation by the participants;
- Brief presentation of IRRIGA;
- Presentation of ESMF, RPF and PMP process design (context, governing Mozambican laws and WB safeguards, potential project impacts, resettlement process and key issues on pest management);
- Contribution by participants and clarification of issues by the consultant;
- Closing out and refreshment.

The welcome speech was delivered by Provincial Director for Agriculture and Food Security in Nampula, Mr. Jabula Zibia. It is worth noting a delay in the start of the meeting due to find more chairs to accommodate for more participants who turned out beyond the initial expected 40 participants. To save time, the introduction of participants was made in groups of participants, and these included farmers, members of civil society organizations, member of district governments, universities, private companies, ONGs and traditional leaders.

In his welcome remarks, Mr. Joao Zibia thanked the presence of everyone at the event and underlined how their presence was relevant for both the design and future implementation of IRRIGA. He explained the project design process and the involvement of the provincial government in the process, more specifically the involvement of the Provincial Directorate of Agriculture and Food Security as well as the rationale for the choice of the project target districts. He further indicated that project expectations were high given the relevance of irrigation in a country/province where there is 100% dependence on rain fed agriculture. The project presents an opportunity for agriculture production throughout the year which will potentially lead to diversification of crops and increased agriculture production and productivity.

After provincial director opening remarks, the convener invited Mr. Tcheco, the representative of the IRRIGA project to take the floor for a brief on the project. Mr. Tcheco briefed about the project design, purpose, scope and its components.

He indicated that the Government has placed tremendous efforts to support producers in relation to irrigation in Mozambique. PROIRRI is one example of the government commitment and as it ends, the Ministry of Agriculture and Food Security (MASA) is under negotiation of IRRIGA which will take over when PROIRRI comes to the end in June. He encouraged participants to speak out their concerns and contribute to identify positive and negative impacts, challenges and concerns that would affect upcoming project.

Ms. Duartina in her capacity as consultant took the floor and presented the context under which the ESPF, RPF and PMP are being prepared. She stressed that the three documents are part of the WB requirements and Mozambique government requirement for project of this magnitude to move on with the approval process. Then she presented potential positive and negative impacts across people and environment in general, as drafted in the BID document. After this brief presentation, Ms. Duartina invited participants to contribute to IRRIGA preparation, especially focusing on potential positive and negative impact from environmental and social standpoint. After that the Mr.Tcheco reemphasized the importance of contributions of all participants since they well their districts and best position to evaluate what possible impact can occur during IRRIGA project implementation. The table below summarizes key issues raised by the participants, and where possible, the impacts drawn by the consultants.

Nr.	Participant and Position	Institutions	Key Issues raised	Associated environmental and social impacts
1	Ossumane Amade	SDPI-	What districts are targeted for the project? What is the project focusing on? What areas are expected to be used by the project?	This questions answered by both provincial director and Mr. Tcheco.
2	Remígio Borges	DPA	There is a considerable number of negative impact comparing with positive impacts. It it safe to implement a project with all these negative impacts?	Ms. Duartina answered the questions explain the importance to have both positive and negative impacts in the document so that can have MMP for each negative impact. Also these impacts will not become a surprise during the implementation period
3	Pio Matos	CAME	In my option the first project wasn't a success. Take negative lessons from PROIRRI project as opportunities to make IRRIGA a successful project. Make a list of impacts will not help. We need a clear explanation of what is IRRIGA, the area that will be used for the project, how to access the project etc. The other aspect relates to management of irrigation infrastructures by assigned associations. It is relevant that associations are established/empowered before any infrastructure is put in place. The population need the project that will help them to produce more and also find a way to sell their products	The project will help to improve the health nutrition of the population. Will help develop districts with electrical services access Will help the private sector to increase their business

Nr.	Participant and Position	Institutions	Key Issues raised	Associated environmental and social impacts
4	Moldi Ali Ibraimo	SDPI	Some districts have serious problems of soils salinization. The project of irrigation can be successful the first 2 years. But after that soils will be affected by salinization issues. What is the plan to avoid these issues? Producers are suffering with mice and elephant grasshopper plagues. How the project will mitigate this issue?	Risk of soils of soils depletion during the implementation of project. Soil depletion because of types of pesticides used to mitigate mice and grasshoppers that is not compatible with type of soils
5	Jabula Zibia	DPA	We care about the environment where we live develop many activities. That is why the document presented by consultant there is PMP which in the future will be detailed depending on the types of pesticide to be used.	Environment degradation
6	Moldi Ali Ibraimo	DPAZ-TECH	Importance of involving all actors when the project starts to avoid conflicts or negative impacts of the project. Importance of sharing with all participants the criteria used to select districts	Social conflicts between the involved and not involved actors
7	Isaque Mundai	SDPI	Importance of detail all impacts in each districts. In his opinion looking for district the social negative impact are not relevant	Ms. Duartina explain what social negative impacts in this context are.
8	Mussafo Manecas Ferraz		Importance of conduct AIA during the project implementation and draft an MMP for each impact identified. Detail the PMP for each pest that is likely to occur	
9	Mr. Tcheko	INIR	The purpose of that meeting was to share with participants the IRRIGA Project and collect contributions of possible positive and negative impacts	Team is available to receive contributions by email or phone

Nr.	Participant and Position	Institutions	Key Issues raised	Associated environmental and social impacts
10	Mr. Jabula Zibia	DPA	Thanked everyone for attending the meeting and mentioned that question regarding the number of districts and the criteria of selection will be shared as soon as possible as team continue working in the project for approval	

Public Consultation-Maputo

Venue and Date: VIP Hotel, Maputo 22/02/2018

As part of the ESMF, RPF and PMP design under the Smallholder Irrigated Agriculture and Market Access Project (IRRIGA) currently under negotiation with the World Bank, a public consultation meeting (PCM) was called through an announcement on 1st of February 2018 issue in Notícia Newspaper. As the IRRIGA cover the four central provinces (Manica, Sofala, Zambézia and Nampula), five PCM were planned to take place, being one in Maputo and the other four in the capital cities where the actual project will be implemented.

The objectives of the PCM were to:

- Provide information to the project beneficiaries, local communities, civil society organizations and governmental structures.
- Identify the project impacts to the environment and socioeconomic sphere
- Register the participant's contributions, anxiety and clarify doubts about the new project.

The PCM in Maputo took place on the 22nd of February 2018, as anticipated, and total of 24 participants from various public and private institutions attended the PCM.

The meeting program had the following design:

- Registration of Participants;
- Welcome speech and presentation by the participants;
- Brief presentation of IRRIGA;
- Presentation of ESMF, RPF and PMP process design (context, governing Mozambican laws and WB safeguards, potential project impacts, resettlement process and key issues on pest management);
- Contribution by participants and clarification of issues by the consultant;
- Closing out and refreshment.

The meeting begun with the Facilitator taking the floor to apologize for the delay of about 15 meetings as scheduled. The delay, he explained, was due to late arrival of participants, and therefore, there was a need to allow for more time to have a reasonable number of participants. Then, he presented the agenda of the meeting following the explanation of the objectives of the PCM. This was followed by the introduction of the participants (see list of participants in the annex).

At this point, Mr. Eugénio Nhone, the national coordinator for PROIRI was invited to take the floor and address participants on behalf of the INIR. He first thanked the participants for showing up, and then provided information on the context under which IRRIGA is being developed. He made it clear that IRRIGA was being developed based on lessons learned from PROIRI project implemented between 2011-2018; and that IRRIGA is a true and unequivocal manifestation of government and lender's commitment to maximize gains from the PROIRI project. He also indicated that the PCM was meant to support and inform the process of preparation of project safeguard framework policies. He especially acknowledged and thanked the presence of representatives from relevant institutions to the matter under discussion, namely the Ministry of Land, Environment and Rural Development (MITADER). In the end, wished the participants good luck and engagement in the discussions to be followed.

Later, Mr. Macuacua returned to the floor for presentation of the key findings from the draft documents under development — Environmental and Social Management Policy Framework (ESMF), Resettlement Policy Framework and Pest Management Plan (PMP). He described the legal framework governing the project namely — the World Bank Safeguards Policies and the Mozambique legal framework. With reference to the World Bank Safeguards Policies, he specifically indicated potential policies to be triggered under the project would primarily be Environmental Assessment (PO 4.01), Pest Management (OP 4.09) and Involuntary Resettlement (OP 4.12). Relating to Mozambique legal framework relevant for the project, Mr. Macuacua indicated among others the following —Decree 54/2015 on EIA, Water Law 43.2007, Land Law 19/1997, Labor Law 23/2007 and the Law 19/2007 on land use planning, to mention few.

On the potential project impact, Mr. Macuacua he focused the presentation on infrastructure component and divided the impact analysis into environmental and social but also looking at both positive and negative aspects. He stressed that major impacts may arise from the development of road and energy projects, where potentially much of the World Bank Polices (specially resettlement) and national legislation may be triggered. He further indicated that the impacts presented were not related to a specific project; but rather; to a general framework under which the implementation of different projects should consider with respect to World Bank Safeguards and the national legislation. Therefore, specific studies will be required for each project in a specific location, depending on the projects' categorization.

Later, Mr. Macuacua tackled the issue of Pest Management Framework (PMF). He indicated that the proposed PMF was developed based on ecological principles to ensure sustainable agriculture production and preservation of the environment. As part of this, Mr. Macuacua highlighted two relevant aspects to deal with pest, namely, management methods and chemical control. Further he mentioned some common types of pest as to highlight impact of agriculture production on potential emergency of pest due to the use of different agriculture pesticides and chemicals.

At this point, the presentation was concluded, and Mr. Macuacua invited participants to provide their view of the likely social and environmental project impacts based on their experience with similar projects in the past.

The table below summarize key issues raised by the participants, and where appropriate, the impacts drawn by the consultants.

Nr.	Participant and Position	Institutions	Key Issues raised	Associated environmental and social impacts
1	Eugénio Nhone-PROIRI	PROIRRI	He sought to make it clear that the main project focus is not roads and energy infrastructure, but rather small irrigation system. Roads are an extension to the core project issues and the energy in question is not for street lighting. He also sought to clear the concept of land acquisition used by the moderator during the presentation, implying that some of project would require that land be acquired by the project. Mr. Nhone pointed out that no land will acquired and that the small irrigation project will be set up in areas that belong to community or members of communities (farmers) who are willing to be supported by the irrigation system within the areas identified by the project. Therefore, the concept of "land acquisition" should be replaced with another that does not create confusion both on the reader but especially on the community. Lastly, Mr. Nhone indicated that the presentation had not tackled cross cutting issues such as how it would deal with gender issues and child protection.	

Nr.	Participant and Position	Institutions	Key Issues raised	Associated environmental and social impacts
2	César Dimande	PROIRRI	He sought to clarify the concept of resettlement. He pointed out that it does not only imply the movement of people, but it should include the loss of assets, therefore there is a need that the documents view the concept widely	
3	Pinto Matable	Constructor	Mr. Matabele as a constructor, raised some of the challenges that they faced with similar projects. This is especially relating to delays resulting from cultural issues. For instance, when the constructor encounter graveyard or any other place of cultural relevance within the construction areas. He proposed the study provides a clear and effective guidance to deal with these events.	

Nr.	Participant and Position	Institutions	Key Issues raised	Associated environmental and social impacts
4	Carlos Zandamela	IRRI- Rice Research Institute	Mr. Zandamela stressed there was a need for the project to draw lessons beyond the PROIRI projects. He indicated there other equally important project from which lessons can be drawn from. For instance, the Absa Project, funded by the World Bank provides a very important platform for drawing lessons on pest management. Further, there is a need that the project expands its scope beyond the small producers. It must encompass the entire chain and integrate bigger producers upstream the production chain. He also questioned whether the IRRIGA project does exist or no.	
5	Eduardo Macuacua	Facilitator/Consultant	As Facilitator, Mr. Macuacua sought to clarify some of the issues raise above. Essentially on land acquisition Mr. Macuacua indicated that what was presented is just a framework and not a command that land will be acquired; but rather; an anticipation of how the project should deal with in cases where land should be acquired.	

Nr.	Participant and Position	Institutions	Key Issues raised	Associated environmental and social impacts
6	Rosana Francisco	MITADER/ DINAB	In the presentation, Mr. Macuacua had indicated that projects under IRRIGA would be only of categories A and B. Thus, Ms. Rosana questioned the rational for such assumption and inquired why the documents do not anticipate C category projects. He also indicated that the documents presented should provide an indicative budget for implementation of the Safeguard Policies.	
7	Neusia Mbine	INIR	Ms. Neusia suggested that emergency of social conflict for the use of water should be added to the documents in preparation as negative impact.	
8	Anorda Checo	INIR	Ms. Anorda suggested that consultant to check the law on irrigation association in the process of designing the documents. She also referred that the PMP should focus on the type of crops and not pest.	
9	Eduardo Macuácua	Facilitator/Consultant	Again, Mr. Macuacua in his capacity as Facilitator/Consultant intervened to clarify and answer some of the issues raised above. He indicated that gender issue will be integrated into the documents as well as the need to rephrase "land acquisition" word. He accepted that no reference to a specific project category will be mentioned in the report in response to Ms. Rosana concern.	

Nr.	Participant and Position	Institutions	Key Issues raised	Associated environmental and social impacts
10	Cesar Dimande	INIR	He again raised to clarify the issues brought up by Mr. Zandamela concerning the existence or not of the project "IRRIGA". Mr. Dimande indicated the project is still under negotiation.	
11	Mr. Jan de Moor	ZAMIRRI	The need to address the issue of contamination of water stream/rivers due to artisanal mining activities.	Issue addressed in the report as cumulative impact

Public Consultation - Sofala

Venue and Date: Moçambique Hotel, Beira, 20/02/2018

As part of ESMF, RPF and PMP design under the Smallholder Irrigated Agriculture and Market Access Project (IRRIGA) currently under negotiation between the Government of Mozambique and the World Bank, a Public Consultation Meeting (PCM) was called through an announcement launched on 1st of February 2018 in Notícia Newspaper. As the IRRIGA cover the four central provinces (Manica, Sofala, Zambézia and Nampula), five PCM were planned to take place, one in Maputo and another four in the capital cities of the four IRRIGA targeting provinces.

The objectives of the public consultation meeting were set in three levels as follow:

- To provide information to the project beneficiaries, local communities, civil society organizations and governmental structures;
- To identify the project impacts to the environment and socioeconomic sphere; and
- Register the participant's contributions, anxiety and clarify doubts about the new project.

The meeting for Beira province took place on 20th of February 2018, as planned, and a total of 90 people from different sectors and districts took part of the meeting (See the List of Participants, in the annex).

Below presented are the minutes of the meeting held in Beira.

The meeting program had the following design:

- Registration of Participants;
- Welcome speech and presentation of participants;
- Short presentation of IRRIGA;
- Presentation of the ESMF, RPF and PMP process project (context, governance of Mozambican laws and World Bank safeguards, potential project impacts, resettlement process and key issues on pest management);
- Contribution of the participants and clarification of questions by the consultant;
- Closing and refreshment.

The welcoming speech was delivered by the Provincial Director for Agriculture and Food Security in Sofala. After presenting her greeting, she asked everyone to present to the states from which the names and institutions came. He greeted everyone present in the meeting room and spoke about the reason for the meeting saying that this is the public consultation meeting on environmental and social safeguards of the **Irrigation and Access to Markets Project for Small Farmers**, and said that this program belongs to to the Government of Mozambique and funded by the World Bank to improve the agricultural productivity of smallholders and access agricultural markets in areas with irrigation infrastructure and to provide immediate and effective responses to a possible crisis or emergency at eligible sites in the area center of the country. He also said that the public meeting that is held is aimed at listening to the present that is to create the foundations of the project irrigates in environmental, social aspects and integrated management of pest and disease control. He spoke of the potential of the province of Sofala in agricultural production, production and agro-processing of livestock products, fish production and other seafood.

He discussed the extension of the area for agricultural production, said there is a potential of 3.3 million hectares of which 120,000 are potentially irrigable and in these it is possible to implement irrigation infrastructures.

He spoke of the objectives of the project, which aims to develop a market-oriented approach in institutional and administrative strengthening of the public and private sector in the area of irrigation, expand the irrigation area of small farmers and introduce technologies that aim to increase production and productivity agricultural and also give approach in the value chain through funding for the development of small-scale irrigation and also make cost-sharing what is called reimbursement to improve production and creation of added value.

He also spoke about the expected results of the project, the first is to strengthen the sustainable irrigation construction environment, the second is to plan the development and participatory management of the irrigation system and the third is to strengthen the organization of producers and increase production levels of irrigation systems. products, rice, horticulture and sugar cane.

He also said that the materialization of this 6-year project will contribute to the fulfillment of the main objectives of the PESA (Strategic Plan for the Development of the Agrarian Sector), thus guaranteeing an increase in the production of irrigable crops and in improving food and nutritional security. In the end, he asked the participants to contribute and support the identification of aspects considered sensitive to the implementation of the project, especially in the strict observance of the activities that contribute to the possible damage to the environment.

The presentation of the IRRIGA project was the responsibility of the PROIRRI Coordinator in Sofala. He gave general information about project in the following items, in the Project Objectives, the Project Components which include the following: Institutional Capacity Development, Development of Irrigation Infrastructures for Small Producers (7000ha), Intensification of Agricultural Production and Connections of the Market, Project Management, Emergency Contingency and Project Beneficiaries.

Mr. Matusse, as a consultant, took the floor and presented the context under which ESMF, RPF and PMP are being prepared. He stressed that the three documents are part of the environmental safeguards of the World Bank and Mozambican legislation that require development projects to have such management tools. It then presented potential positive and negative impacts on IRRIGA between people and the environment in general, as outlined in the IDB document. He shared some images of PROIRRI and the newly identified pest. The consultant, after his presentation, asked the participants to contribute with comments, recommendations and suggestions for the preparation of the IRRIGA Project. There were many contributions and recommendations given by the participants of the Public Meeting. The table below summarizes the main issues raised by the participants and the impacts in the last column drawn by the consultants.

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Figure A – Pictures from the Public Meeting held in Beira

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Nr.	Participants	Organization	Discussion	Impacts
1	José Argola	ITC	He began by congratulating INIR on the initiative to gain insights from the partners on the proposal being drafted for the World Bank. He called attention to the World Bank's environmental and social requirements, saying that the Bank had very strict criteria to be followed, spoke of the criteria related to the impacts that projects have on social, environmental, economic and other areas and said although when these projects are linked the communities are more discerning. He commented on the contingencies presented by the proposal and said that he thought it should be a lesson through the PROIRRI project because there were projects that did not end or because there were economic policy changes during the project and said that the manager of PROIRRI did not know how to deal with the change and suggests that it should be a lesson that should be extrapolated from phase 1 to phase 2. In relation to the impacts, the hydrological flows of the rivers must be taken care of because in solving an upstream problem we can create another problem downstream of the river, because there will be changes in ecological, hydrological terms that may affect the population. Another problem that is predicted is related to the loans of banks of area because where there are constructions there is need to seek sand in other places to make use. He spoke of communities claiming benefits from the removal of sand in their communities; he proposed that if proposals were revised because it could create conflicts. She said that one of the issues that the World Bank demands is the gender issue that was not highlighted in this project, asked how this issue will be addressed in the area of construction, implementation and management.	Careful observance of environmental and social issues in the design and implementation of projects Need to have contingencies in the projects in order to finish the works Need to carry out comprehensive hydrological studies Beneficial for communities in exploiting community-owned resources Gender mainstreaming in projects

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Nr.	Participants	Organization	Discussion	Impacts
2	Gomes Magombe José	President of the Association of Irrigators of Chicucua - Buzi	He said that they benefited from the construction of an irrigated land that has not yet been rehearsed. He said the project is welcome and also stated that projects that were not completed during the execution of PROIRRI 1 could be corrected to finish in the new project being designed. He thanked the Government for the construction of the irrigation system in his district. He said that many aspects of the project designed were not in accordance with the local reality, spoke of the old irrigation projects that were designed and implemented that until today are still in operation. He said that in technical terms and drawings everything was beautiful but when they wanted to give their contributions were not well received as they drew attention to aspects that could give problems in the future and that at this time has had problems of erosion.	Projects not completed for various reasons Projects designed that do not fit the local reality.
3	Anastâncio Tamele	Consultant	He said that he would like to raise the issue of repair and maintenance of irrigation equipment because the presentation may have been summarized this aspect was not addressed, but from his point of view should create conditions to assist producers of equipment maintenance and repair as has been done in the area of agricultural inputs, some local actors should be identified at the district level or in the provinces benefiting from subsidies that could be behind producers and associations to give them real-time assistance that may require maintenance of irrigation equipment that is very specialized and many mechanic electricians do not master the repair of these equipment.	Identification of suppliers of materials and training and qualification of personnel for the maintenance of machines
4	Sergio Pinga	Farmer and Manager of the Machine Park in Nhamatanda	He said that what is being said is that the irrigation equipment will use electricity. But they have noticed in some points how Buzi, who has had problems with the payment of electricity in some centers, asked why not opt for photo voltaic energy or solar panels in order to minimize the costs for the associations.	Use of other energy sources with lower costs for farmers

Nr.	Participants	Organization	Discussion	Impacts
4	Isafo Tome Chiafungo	Macequessa Mute Association	He presented the problems that have been encountered with the pumps that capture water in the river Muda and due to the weight that in rainy weather that due to current the river these pumps are dragged. Second, it says that PROIRRI has finished in the middle of the project Muda Macequesse has 100 hectares and for the moment 58 hectares are being explored by 36 members and it has not had enough profits in the sale of the sugar cane at the end of the campaign.	Lack of profits in the marketing of agricultural products
5	Florindo Chibanga	Acaboco Association	He said that they were in the irrigation construction phase but the works are stopped because the contractor gave up. Our pumping station was put in a ditch where the Chinese also seek water, in my view, the new project was due to the irrigation system in the river and not in the trench where the Chinese draw water and we may have problems because the water will not be sufficient in also enters tidal water.	Conflicts in the exploitation of resources
6	Clésio Miguel	Provincial Directorate of Agriculture and Food Security of Sofala	He said that he saw the presentation but during this, he cannot see the proposal of the districts for each province or in particular for the province of Sofala that is very important to evaluate according to the potentials for each culture, among others. On this point, I said that I would like to point out that I did not see the strategy for achieving the objectives either. We have many goals but we cannot see what the strategy is. At least for horticulture I could not see what the strategy is, at least for the production, we only have the number of hectares, it is not detailed how the production and conservation will be done.	Providing complete information about the project How will the production be conserved

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7	Lucio Jacob Tomas Mamuca	Substitute Director of SIDAE Machanga	He said that the old project almost did not benefit us, only small irrigation systems. They received a team that came to prospect of the areas, we took to the irrigation of the valley of Pea-pea that has but an area of 1000 hectares and has infrastructures but during evaluation these were disapproved. We have new areas where it is possible to build irrigation I am referring to the valley of Djavani which has twice the area that was the old irrigated land in colonial times that it is possible to build the new irrigated land. Our district does not have energy photo voltaic energy would be beneficial to our district.	Rehabilitation of old infrastructures Extension of irrigation to new production areas
8	Zacaria Fardim Chilingue	Representative of the Kulima Nakufuia Association	Our association was approved in 2016, the registration was done by the district, the Indians came to do the same. Our irrigation was to be rehabilitated but due to the conflict everything was stopped. So we ask that the new project contemplate our irrigation.	Extension of the project to other production areas
9	Carlos Joaquim João	Community Leader of Caia District	This project is welcome to our district because we have an area for rice cultivation mainly in the Administrative Post of Murraça.	
10	Helton Fernando Murripa	Young Africa	I saw the presentation made and saw that within this had the Pest Management Plan would be important within the project to include the Erosion Management Plan. *Mr. Matusse replied that the erosion management plan would be included in the Environmental Management Plan of the Project (EMP)*	Inclusion in the Environmental Management Plan of the erosion component
11	Castro Junior	ARA Centro	He made a comment on the consultant's presentation regarding the Water Law in relation to the Decrees. I would like the consultant to explain in relation to the International Waters Projects. I would like the IRRIGA project to do detailed hydrological studies to see if there is water available for irrigation because we can find water shortages if we do not do these studies. In relation to water storage, I would also like to know if they are going to build hydraulic infrastructures like small dams, dams to avoid situations of water shortage.	Construction of new hydraulic infrastructures for the storage of water

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Nr.	Participants	Organization	Discussion	Impacts
12	Teco Tomas	SIDAE - Caia	The intervention of institutions such as ARA center as well as ARA Zambeze should be a non-complementary element but a participatory element in the project. The other issue is about the production chain, integrated pest management, the system found to maintain the systematic pest control system is governed by systematic crop production, our crops are annual and our crops are persistent, the integrated management requires a host continuity and pest. In many cases we cannot control the plague because we have an annual culture and we spend a lot of time without culture and when the crop appears the pest comes with great force. If we want to do biological control, it will get complicated. The other part is about the definition of the production system in these projects, from the experience counted that is being watched in Buzi, the intention was to give water to the peasant, but we face difficulties of tackling the market, that is, the processing factory that always denied the kind of grain the peasant produced because he did not agree with the kind of technologies that the processing company did. I wish the same thing did not happen in the next situations. Another issue is about the use of small systems, we are to stick around in the big systems, irrigation policies should not be based on large systems alone. We are on the bank of the Zambezi but we do not have a drop to leave the river for the terrain. Irrigation policies should not only be based on large systems. I was in Chemba and saw a system placed that is producing sugar cane through solar powered pumps, managed to open a river channel to a community for a community and to supply water in elevated tanks, this system can also be done for irrigation. We have seen small irrigation systems in Kenya and other countries in North Africa that can be introduced by tapping small inland water reserves which can increase irrigation capacity. We only stick to fluent ones and these fluent ones are seasonal and often require a lot of investment.	Participation of other institutions in projects Definition of crops for pest control. Definition of markets for the marketing of agricultural products Use of other sources of water abstraction for irrigation Use of small irrigation systems and other irrigation systems Use of other energy sources more accessible to peasants .

EEE

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13	Carlos Zaqueu	SDPI - Caia	I would like to know if the project is contemplating the maintenance of existing dams and dams, because we have witnessed the silting up. Another aspect is related to the resettlement of communities that are in the areas of irrigation, I would like to know the consultant what procedures will be used.	Maintenance of agricultural infrastructure
14	Teodoro Cassamo	DIPTADER	He said that the first license for each project, the first license is environmental and then are followed by other licenses. Maybe a lot of problems are happening because we do not follow rigidly what the regulations say we often go through with the projects after which we look for the measures. For this IRRIGA project, the work before the construction of the irrigation system must first be carried out in a more in-depth way, having the Environmental Management Plan (EMP) and the studies that are in accordance with the technical projects. The builders must do their works according to what is in the EMP. I do not know if this project will be approved due to lack of this environmental component of PROIRRI, there is a lot of wrong done in the previous project and that now it is trying to correct. Work should be done for each irrigation system in greater depth in the social environment component. Through this new project should take advantage of correct irrigation. The irrigation systems that are in Metuchira 1, 2 3 and 4 are not irrigating and have advanced in the construction of more irrigation systems but the others are not working.	Lack of environmental impact studies in implementation projects .

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15	Caetano Benedito	Director of SIDAE of Nhamatanda	Upstream of the river Muda was built a Dam in 2007, this dam irrigates about 3,000 hectares downstream from sugar cane to Mafambisse and to association of Mozambican sugar cane farmers as well as the association. There is an area for irrigation along the river only the capacity of the dam is regarded as a problem. At PROIRRI we have done a study to increase the dam capacity through a new dam on the Munda river that is affluent of Muda, I would recommend for this phase of the project that we have more areas to irrigate the Muda river.	Increased dam capacity and expansion of irrigation areas
16	João Alfadimo	Director of SDPI – Machanga	In this project that will start, a feasibility study must be done on the projects that will be carried out. I had the opportunity to participate in the southern part of the Chimuda irrigation project is a project that has spent a lot of money but now the project is dormant, the government spent a lot of money for lack of a feasibility study because they did the project on a seasonal river and this river depends of the seas and when the tide is high the water rises, they saw this water as if it were good for agriculture. I think that with the new project the district of Machanga will get out of poverty because we have the BP valley that from colonial time produced rice using the water of that course. If the consultant does an exhaustive work we will have a feasible project and the investment will bear fruit. In Machanga we do not have electricity from the national grid, it is necessary to use other sources of renewable energy.	Feasibility study of projects before implementation

GGG

Nr.	Participants	Organization	Discussion	Impacts
17	Miguel Rabeca	SIDAE - Buzi	He said that raised because the discourse center took as base the district of Buzi to invite the consultant to take experience for the future project, was spoken Buzi and various environmental aspects and believe they were planned, probably could have happened is was not followed properly, for example the question of access routes was mentioned, I would like to know if the access roads refers to those of the perimeter of the irrigated area or would be access roads to the production areas . What happened in relation to the access roads to the irrigated areas, were removed from the mud lodges, muddy soils to make access roads and it is difficult to circulate perimeter of irrigation. If we are discussing environmental issues for irrigation, it is also important to have the scale of what will actually be done, which is intended to be done in irrigation terms for a better analysis. ***Regarding the access routes, Mr. Matusse said that for the project of this size it is not important to have only local roads, it is important to have roads that go to the places of production in order to transfer the production to other markets.***	A detailed study on the materials used in the construction of access roads
18	Mague Alfredo	42/5000 Community Leader of the District of Machanga	He said that Machanga does not have irrigation, what they have are small associations and these associations have not had impact for several reasons because when they produce the product ends up rotting because they have no market. I do not know if it's because of the road that buyers do not enter. We're talking about fighting the plagues, but we have serious problems with hippos	
19	Teodoro Cassamo	DIPTADER	Studies that are done should be specifically for that irrigation. If the study that is done the purpose is to have the license, who pays this license in the end, is the farmer or is the project? There are approved projects and the licenses do not form issued because it is not known who pays the licenses.	Definition of responsibilities for who pays environmental licenses

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20	Armando Mabunguissa	Director of SDPI - Buzi	He said he saw the presentation but in the presentation there was no mention of the formation of the associates. If we are to give machines to operate these machines will be given responsibilities to people without any training so I think that should include training of associates to manage this system that is complex. ***Mr. Matusse answers that all the workers that are to operate with machines will be trained, it is a practice that will be recommended in the Environmental Management Plan. In the Hygiene, Health and Safety at Work component, it is required that workers working with the machinery must be trained in a way that minimizes the risk of accidents at work.***	Opening access roads to production sites
21	Mários Morias	RHDHV/PROIRRI	He said that in the study is also important the Solid Waste Management plan. During the project it is necessary to give lectures related to the treatment of solid waste to the population in general and still in the construction sites.	Treatment of solid waste

The meeting was then closed by Provincial Director for Agriculture and Food Security in Sofala who thanked the participants for valuable contributions to IRRIGA project. At end all participants were invited for refreshment.

Lists of Participants in the Public Meetings

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GOVERNO DA PROVÍNCIA DE MANICA

DIRECÇÃO PROVINCIAL DE AGRICULTURA E SEGURANÇA ALIMENTAR

REUNIAO DE CONSULTA PUBLICA DO IRRIGA
MANICA, 16 DE FEVEREIRO DE 2018

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Reunião de Consulta Pública

Nampula, 16 de Fevereiro de 2018

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INSTITUTO NACIONAL DE IRRIGAÇÃO

MOZAMBIQUE IRRIGA P156559

Quadro de Políticas de Gestão Ambiental e Social (QPGAS), Quadro de Políticas de Reassentamento (QPR) e Plano de Gestão de Pragas (PGP)

Reunião de Consulta Pública

Quelimane, 21 de Fevereiro de 2018

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REPÚBLICA DE MOÇAMBIQUE

MINISTÉRIO DA AGRICULTURA E SEGURANÇA ALIMENTAR

INSTITUTO NACIONAL DE IRRIGAÇÃO

MOZAMBIQUE IRRIGA P156559

Quadro de Políticas de Gestão Ambiental e Social (QPGAS), Quadro de Políticas de Reassentamento (QPR) e Plano de Gestão de Pragas (PGP)

Reunião de Consulta Pública

Maputo, 22 de Fevereiro de 2018

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Public Consultation Meetings Advert

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REPÚBLICA DE MOÇAMBIQUE
MINISTÉRIO DA AGRICULTURA E SEGURANÇA ALIMENTAR
INSTITUTO NACIONAL DE IRRIGAÇÃO

PROJECTO DE IRRIGAÇÃO E ACESSO A MERCADOS PARA PEQUENOS AGRICULTORES (IRRIGA)

QUADRO DE POLÍTICAS DE GESTÃO AMBIENTAL E SOCIAL (QPGAS), QUADRO DE POLÍTICAS DE REASSENTAMENTO (QPR), E PLANO DE GESTÃO DE PRAGAS

CONVITE PARA REUNIÃO DE CONSULTA PÚBLICA

O Governo de Moçambique, através do Ministério da Agricultura e Segurança Alimentar (MASA) está a negociar um financiamento pelo Banco Mundial no valor de US$80,00 milhões com vista a levar a cabo o Projecto de Irrigação e Acesso a Mercados para Pequenos Agricultores (IRRIGA). Este projecto se propõe a:

- Aumentar a capacidade técnica para desenvolver e operar sistemas de produção agrícola irrigada;
- Expandir a área sob irrigação de pequena escala;
- Introduzir tecnologias de aumento da produtividade, e
- Desenvolver ligações de mercado de insumos e produtos bem como o acesso a mercados.

O IRRIGA está a ser desenhado para ser implementado nas províncias de Manica, Sofala, Zambézia e Nampula durante um período de seis (6) anos (2018-2024).

O financiamento ao IRRIGA irá oferecer serviços de irrigação e ligações de mercado aprimorados a pequenos agricultores abrangendo uma área de 10 mil hectares, sendo 3 mil já desenvolvidos no âmbito do Projecto de Desenvolvimento de Irrigação Sustentável (PROIRRI) e outros 7.000 hectares de novas áreas. O projecto irá igualmente contribuir no estabelecimento e fortalecimento de Associações de Regantes, melhorar a prestação de serviços e as ligações de mercado para aumentar a sustentabilidade desses investimentos.

O Proposto projecto, sendo uma continuação do PROIRRI, financiado pelo Banco Mundial, cujo término é Junho de 2018 com uma abrangência de 3,000 ha, e pelo facto de se basear nas suas experiências, será implementado pelo Ministério da Agricultura e Segurança Alimentar (MASA), com forte envolvimento do Instituto Nacional de Irrigação (INIR) como agência pública de implementação. Também estarão envolvidos na implementação a Direcção Nacional de Agricultura e Silvicultura (DINAS), a Direcção Nacional de Extensão Agrária (DNEA), o Instituto Investigação Agrária de Moçambique (IIAM) e o Fundo de Desenvolvimento Agrário (FDA). Ao nível local, outras agências, tais como as Direcções Provinciais da Agricultura e Segurança Alimentar (DPASAs), Os Serviços Distritais de Actividades Económicas (SDAEs) entre outros parceiros públicos e privados também desempenharão um papel importante. Uma Unidade de Implementação do Projecto (PIU) será estabelecida dentro do MASA alojada no INIR e será dotada de pessoal técnico qualificado para uma implementação adequada no que respeita a padrões técnicos e ao cumprimento dos procedimentos administrativos nacionais aprovados e do Banco Mundial.

Desta forma, urge a elaboração de um Quadro de Políticas de Gestão Ambienta e Social (QPGAS) com vista à eliminação ou redução dos potenciais impactos negativos associados às actividades do projecto proposto, como resultado de princípios estabelecidos pelo Banco Mundial e pela própria Legislação Ambiental e Social Moçambicana que estabelece que o financiamento de planos e programas de desenvolvimento está sujeito a avaliação e mitigação dos potenciais impactos ambientais e sociais que podem decorrer da sua implementação. No entanto, o QPGAS, o Quadro de Políticas de Reassentamento (QPR) e o Plano de Gestão de Pragas (PGP) não irão substituir os Estudos de Impacto Ambiental e Social para cada sub-projecto específico que deverão ser definidos em resposta às actividades concretas no âmbito do IRRIGA nas províncias cobertas, tal como previsto no Regulamento do Processo de Avaliação de Impacto Ambiental (Decreto 54/2015, de 31 de Dezembro).

Neste contexto, ao abrigo do Diploma Ministerial n.º 130/2006, de 19 de Julho, sobre o Processo de Participação Pública e do Decreto n.º 54/2015, de 31 de Dezembro, vimos informar que foi contratado um Consultor Independente para a elaboração do QPGAS, QPR e PGP e que o mesmo se deslocará às províncias envolvidas para a realização das reuniões públicas de apresentação do IRRIGA, divulgação de informação sobre potenciais impactos ambientais e sociais ligados às actividades do proposto IRRIGA, auscultação das pessoas interessadas e afectadas, e recolha de subsídios que deverão enriquecer o projecto, conforme o calendário seguinte:

Calendário das Reuniões

Nº	Local	Sala	Data	Hora
1	Cidade Chimoio	Hotel Inter Chimoio	16/02/2018	10h-12h
2	Cidade da Beira	Rainball Hotel (Ex. Hotel Moçambique)	20/02/2018	10h-12h
3	Cidade de Quelimane	Hotel Chuabo	21/02/2018	10h-12h
4	Cidade de Nampula	Hotel Milénio	16/02/2018	10h-12h
5	Cidade de Maputo	Hotel VIP	22/02/2018	08:30-10:30

Assim, na qualidade de instituição coordenadora desta actividade, cumpre-me convidar V. Excia, a participar na reunião acima referida.

As informações de base sobre o projecto podem ser obtidas junto às instituições relevantes e cobertas por este acordo, nomeadamente:

Instituto Nacional de Irrigação (INIR), Rua da Resistência, 1746, 3.º Andar – Maputo; Tel: 21 41 53 80, PROIRRI (Eugénio Nhone – Coordenador).

Direcção Provincial de Agricultura e Segurança Alimentar de Manica, Coordenador do PROIRRI - Eng.º Leonardo Lucas Manhique: 82877000, lucasmanhique@yahoo.com.br, jucasmanhique66@gmail.com; Serviço Provincial de Agricultura, SPA (Manica: Zacarias Muzaja – zacariasmuzaja@yahoo.com.br).

Direcção Provincial de Agricultura de Segurança Alimentar de Sofala, Coordenador do PROIRRI – Eng.º Manuel da Costa Sebastião Magombe: 828160460, 823070788, magombe1@yahoo.com.br; Serviço Provincial de Agricultura, SPA (Edson Almeida, almeidedson@gmail.com).

Direcção Provincial de Agricultura de Segurança Alimentar de Zambézia – Coordenador do PROIRRI- Eng.º António Joaquim Tcheco: 843160371 e tcheco.a.tcheco@gmail.com; Serviço Provincial de Agricultura, SPA (Pascoal Linda, pascoallinda@gmail.com).

Serviço Provincial de Agricultura (SPA) da Direcção Provincial de Agricultura e Segurança Alimentar (DPASA) de Nampula: Joaquim Tomás (Chefe): 828759880 e joaquim5tomas@gmail.com e Elísio Duarte (Técnico): 844091297, 863977718 e 829040630 e eduarte@yahoo.com.br.

Quaisquer dúvidas, esclarecimentos e coordenação do trabalho poderá ser através do Consultor Independente (Eduardo Macuácua, 845774196; edmacfirst@gmail.com).

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Annex 2: Overview of Location and Characteristics of PROIRRI Projects

Subprojecto	Area (ha)	Província	Localização Distrito	Natureza do Sistema	Fase (Construção/ Exploração)	Licença Ambiental
1. Move/Mugender	90	Sofala	Buzi	Bombagem	Exploração	Sim (em pagamento)
2. Chicumbua 1	200	Sofala	Buzi	Bombagem	Construção	Sim (em pagamento)
3. Chicumbua 2	190	Sofala	Buzi	Bombagem	Construção	Sim (em pagamento)
4. Samora Machel	80	Sofala	Buzi	Bombagem	Exploração	Sim (em pagamento)
5. Kupedja Urombo	150	Sofala	Buzi	Bombagem	Exploração	Sim (em pagamento)
6. Chirimonio ACABOCO	314	Sofala	Buzi	Bombagem	Construção	Sim (em pagamento)
7. Limane	120	Zambézia	Mopeia	Bombagem	Exploração	Sim
8. Chiverano	100	Zambézia	Mopeia	Bombagem	Construção	Sim
9. Morire	180	Zambézia	Morrumbala	Gravidade	Exploração	Não (Processo submetido a DPTADR Zambézia)
10. Mziva 1	160	Zambézia	Nicoadala	Bombagem	Construção	Sim
11. Paz	165	Zambézia	Mopeia	Bombagem	Construção	Não (Processo submetido a DPTADR Zambézia)
12.Muchue ye Mpondoro	74	Manica	Sussundenga	Gravidade	Exploração	Sim
13. Kubatana pa Rubudiriro	56	Manica	Sussundenga	Gravidade	Exploração	Sim
14.Piscina	56	Manica	Barué	Gravidade	Exploração	Sim
15.Murombyana Chinha	237	Manica	Sussundenga	Gravidade	Construção	Sim
16.Kugutha Ibadza	77	Manica	Sussundenga	Gravidade	Construção	Sim
17.Kugutha Kushanda	137	Manica	Sussundenga	Gravidade	Construção	Sim
18.Kufa Ndaedza	126	Manica	Sussundenga	Gravidade	Construção	Sim
19.Murorwe	124	Manica	Sussundenga	Gravidade	Construção	Sim
20. Nhaumbwe	50	Manica	Vanduzi	Gravidade	Exploração	Sim
21. Nhamanhembe	25	Manica	Vanduzi	Gravidade	Exploração	Sim
22. Campo 4	29	Manica	Vanduzi	Gravidade	Exploração	Sim
23. 7 de Abril 1	29	Manica	Vanduzi	Gravidade	Exploração	Sim
24. Munda Ndiche	13	Manica	Sussundenga	Gravidade	Exploração	Sim
25. Mukai Kwedza	27	Manica	Sussundenga	Gravidade	Exploração	Sim
26. Dzidzai Muvu	13	Manica	Sussundenga	Gravidade	Exploração	Sim
27. Munharari	34	Manica	Vanduzi	Gravidade	Exploração	Sim
28. Badza Rotanda	76	Manica	Sussundenga	Gravidade	Exploração	Sim
29. Kubatana Mutsen	46	Manica	Sussundenga	Gravidade	Exploração	Sim
30. Nhararai Muone	44	Manica	Sussundenga	Gravidade	Exploração	Sim
31. Simukai Chirodzo	80	Manica	Sussundenga	Gravidade	Exploração	Sim
32.Muda Massequece	60	Sofala	Nhamatanda	Bombagem	Exploração	Sim

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Annex 3: Areas of work under the SADC Revised Protocol on Shared Watercourses, of August 2000

N.º	Areas of operation	Meaning	Adequate institutional set up to deal with the issues concerned	Remarks
1	Exchange of information and consultation	Because decisions will be based on solid information and agreements resulting from adequate consultations	DRI/MNEC in representation of Mozambican stakeholders champions the process of maintaining regular exchanges and communication of the country's shared watercourse issues to other States and SADC in general	Other water sector bodies to be involved as set out under the SADC Protocol include Mozambican representatives in (i) the Committee of Water Ministers; (ii) the Committee of Water Senior Officials; and (iii) the Water Resources Technical Committee or sub-Committees[34].
2	Notification on planned measures that might have adverse effects	Any State willing to implement or permit the implementation of any measures which may have adverse impact on other State(s) will notify the potentially affected State(s), providing technical data and information including results of environmental and social assessment (ESIA). The potentially affected State(s) has/have six months + six (if needed) to respond after the necessary assessment	Where Mozambique is the Developer (i.e. the country that takes the initiative of undertaking such measures) DRI and MNEC in representation of Mozambican stakeholders champion the process of notification on planned measures that might have adverse effects on other States and SADC in general Technical details and assessments including ESIAs are obtained directly from the relevant developers (MASA, MIREME, MTC, MITADER, MMAIP, including Basin Committees, etc.) who will follow national legislation including regional/international provisions ratified by Mozambique	In the same way as above and depending on the circumstances other water sector bodies to be involved include Mozambican representatives in (i) the Committee of Water Ministers; (ii) the Committee of Water Senior Officials; and (iii) the Water Resources Technical Committee or sub-Committees
3	Examination/assessment of the notifications	The notified State(s) make a comprehensive analysis/assessment of the notification including engaging the notifying State(s) if necessary before responding	From the technical point of view academic and research institutions including Private Service Providers may be engaged in examining/assessing notifications of potential interventions DNGRH/DRI/ARAs prepare the TOR and oversee the assessment processes The above entities will collaborate with ARAs and the technical areas (MASA, MIREME, MTC, MITADER, MMAIP	Adequate planning and financial resources are needed to engage technical entities in analysis/assessment of the notification

[34] Details of how these are organized in Mozambique are presented below.

N.º	Areas of operation	Meaning	Adequate institutional set up to deal with the issues concerned	Remarks
			including Basin Committees, etc.) in making the assessments and providing technical feedback to relevant authorities in-country	
4	Responses to notifications	The notified State provide feedback to the notifying State(s) accepting/rejecting/recommending further action(s)	After obtaining and confirming validity of technical feedback from academic and research institutions including Private Service Providers DRI/MNEC provide formal response to relevant entities	This can also be reinforced by Mozambican representatives in (i) the Committee of Water Ministers; (ii) the Committee of Water Senior Officials; and (iii) the Water Resources Technical Committee or sub-Committees
5	Consultations and negotiations	In the face of an issue requiring action concerned States engage in constructive consultations and negotiations with a view to reach agreement(s)	In the same way as 1 and 2 DRI/MNEC in representation of Mozambican stakeholders champion the process of regular consultations and negotiations of the country's shared watercourse issues with other States and SADC in general	In the same case as 1 and 2, above, and depending on the circumstances other water sector bodies to be involved include Mozambican representatives in (i) the Committee of Water Ministers; (ii) the Committee of Water Senior Officials; and (iii) the Water Resources Technical Committee or sub-Committees
6	Regular monitoring – data collection, exchange/communication	Each State and States sharing water courses will have regular monitoring in the form of data collection, processing, reporting and exchange to ascertain the extent to which water parameters (quantity, quality and processual) set out in the Protocol and specific agreements are being met. Joint work (regional and/or inter-State) is also encouraged	ARAs in close collaboration with water users including Water Basin Committees champion the process of regular monitoring of water resources (focusing mainly on quality, quantity and processual issues). They carry out critical, systematic and regular data collection, processing and reporting Where relevant ARAs can be assisted by academic and research institutions including Private Service Providers In critical areas ARAs/academic and research institutions collaborate with regional entities DRI/MNEC in representation of relevant in-country stakeholders communicate	Communication can also be done by other water sector bodies to be involved include Mozambican representatives in (i) the Committee of Water Ministers; (ii) the Committee of Water Senior Officials; and (iii) the Water Resources Technical Committee or sub-Committees

N.º	Areas of operation	Meaning	Adequate institutional set up to deal with the issues concerned	Remarks
			relevant information to relevant external parties	
7	Complaints related to findings (obligations set out in the protocol and related special agreements) that have not been met by the other State(s)	Where obligations set out in the protocol and specific agreements are not being met affected State(s) have the right to lodge complaints based on objective, shared and verifiable findings	Using the results of regular monitoring of water resources (focusing mainly on quality, quantity and processual issues) ARAs in close collaboration with water users including Water Basin Committees champion the process of identifying issues that need to be communicated as complaints to relevant State(s) for non-compliance of obligations	Water users need to be educated and trained and provided with basic analytical skills to participate in water resources monitoring to be able to know, identify and communicate non-compliance to ARAs and/or other relevant domestic entities
8	Decision, communication and implementation of urgent/emergency measures	Certain situations (public health, safety, etc.) may require State(s) to make quick and urgent decisions to counteract emergencies. These need to be communicated without delay to concerned State(s), where possible before implementation or soon after implementation	Technical areas (MASA, MIREME, MTC, MITADER, MMAIP including Basin Committees, etc.), and public service (MAEFP/INGC) will liaise with ARAs/DNGRH to communicate and decide on urgent/emergency measures where needed. DRI/MNEC in representation of the in-country technical areas will communicate with concerned State(s)	Communication can also be done/reinforced by other water sector bodies that include Mozambican representatives in (i) the Committee of Water Ministers; (ii) the Committee of Water Senior Officials; and (iii) the Water Resources Technical Committee or sub-Committees
9	Harmonisation of policies, laws, institutional set up, monitoring systems and instruments	Ideally Member States should adopt policies, laws, institutional set up, monitoring systems and instruments that are harmonized among themselves to facilitate communication, verification and validation	In line with the technical areas (policies, laws, institutional set up, monitoring systems and instruments) members of the National Water Council (CNA) and other relevant entities will work towards harmonization of the way the country undertakes these areas with the rest of SADC. Reference is made to MASA, MIREME, MTC, MITADER, MMAIP, ARAs, including academic and research institutions as well as Private Service Providers, which can be involved in specific tasks of developing agreed standards	Although moving rather slowly the harmonization of standards within the SADC goes beyond the water sector and it is unavoidable if regional integration is to go ahead. The process is meant to facilitate communication, monitoring, verification and validation of parameters across areas Interventions in these areas can also be done/reinforced by Mozambican representatives in (i) the Committee of Water Ministers; (ii) the Committee of Water Senior Officials; and (iii) the

N.º	Areas of operation	Meaning	Adequate institutional set up to deal with the issues concerned	Remarks
				Water Resources Technical Committee or sub-Committees
10	Prevention and mitigation of adverse effects	Adverse effects resulting from interventions in the water sector within and around State(s) should be prevented and where prevention fails they should be mitigated in a way that is satisfactory to all parties involved It is linked to (i) Exchange of information and consultation (1); (ii) Notification on planned measures that might have adverse effects (2); (iii) Notification on planned measures that might have adverse effects and other similar actions (e.g. 4, 5 e 6). It emphasises the importance of in-country and regional careful assessment of any measures to be undertaken with the potential of affecting water resources and Member States	DRI/MNEC in representation of Mozambican stakeholders champion the process of maintaining regular exchanges and communication of the country's shared watercourse issues to other States and SADC in general	Other water sector bodies to be involved as set out under the SADC Protocol include Mozambican representatives in (i) the Committee of Water Ministers; (ii) the Committee of Water Senior Officials; and (iii) the Water Resources Technical Committee or sub-Committees[35].
11	Preparation, implementation and monitoring of specific agreements pertaining to specific shared watercourses	Member States are encouraged and are free to prepare and enforce (implement/monitor) specific agreements pertaining to specific shared watercourses	Based on solid evidence ARAs in close collaboration with water users including Water Basin Committees champion the process of regular monitoring of water resources (focusing mainly on quality and quantity issues) and are also expected to systematically identify issues that need to be considered in the preparation, review, implementation and monitoring of specific agreements and/or clauses of existing agreements related with shared watercourses.	A solid process of water resources monitoring and communication championed by ARAs in coordination with water users and academic and research institutions can be expected to go a long way towards providing DRI/MNEC with the issues that need to be considered to prepare, review, implement and monitor specific agreements and/or clauses of existing agreements related with shared watercourses

[35] Details of how these are organized in Mozambique are presented below.

N.º	Areas of operation	Meaning	Adequate institutional set up to deal with the issues concerned	Remarks
			Where relevant ARAs can be assisted by academic and research institutions including Private Service Providers DRI and MNEC in representation the country's stakeholders communicates relevant issues to relevant external parties and champion negotiations to prepare, review, implement and monitor specific agreements and/or clauses of existing agreements related with shared watercourses	
12	Settlement of disputes, involving a host of aspects such as identification, communication, negotiations, response, negotiations settlement and recourse to tribunal where an issue is not resolved amicably	Where disputes arise these need to be promptly communicated, negotiated and settled amicably. Where amicable settlement fails the aggrieved State(s) can and should resort to court to resolve the dispute(s)	Based on solid evidence ARAs in close collaboration with water users including Water Basin Committees through the process of regular monitoring of water resources (focusing mainly on quality and quantity issues) systematically identify issues and disputes that need to be object of settlement in regard to shared watercourses (general and specific). Where relevant ARAs can be assisted by academic and research institutions including Private Service Providers to consolidate evidence DRI and MNEC in representation the country's stakeholders communicates relevant issues to relevant external parties and champion negotiations to reach amicable settlement Where amicable settlement fails DRI/MNEC get the necessary legal advice to lodge formal complaints with the SADC Court	All measures will be taken to try and resolve disputes amicably, including using different forms of mediation, arbitration, etc. It is only after exhausting all the channels to reach an amicable settlement that recourse to court will be adopted. Relevant entities in close collaboration with DRI/MNEC and represented by these will seek sound legal advice to lodge formal complaint with the courts. Financial resources will be needed to obtain legal advice.

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Annex 4: Environmental and Social Screening Form for Subprojects

Name of the Project:

Sub-project Name:

Sub-project Location:
(please include fotos from different views and Google maps location)
……
……

Sub-project Description:
……
……
……

Community Representative and Address:
……

Extension Team Representative and Address:
……

Site Selection:
When considering the location of a sub-project, rate the sensitivity of the proposed site in the following table according to the given criteria. Higher ratings do not necessarily mean that a site is unsuitable. They do indicate a real risk of causing undesirable adverse environmental and social effects, and that more substantial environmental and/or social planning may be required to adequately avoid, mitigate or manage potential effects.

Issues	Site Sensitivity			Rating
	Low	**Medium**	**High**	
Natural habitats	No natural habitats present of any kind	No critical natural habitats; other natural habitats occur	Critical natural habitats present	
Water quality and water resource availability and use	Water flows exceed any existing demand; low intensity of water use; potential water use conflicts expected to be low; no potential water quality issues	Medium intensity of water use; multiple water users; water quality issues are important	Intensive water use; multiple water users; potential for conflicts is high; water quality issues are important	
Natural hazards vulnerability, floods, soil stability/ erosion	Flat terrain; no potential stability/erosion problems; no known volcanic/seismic/ flood risks	Medium slopes; some erosion potential; medium risks from volcanic/seismic/ flood/ hurricanes	Mountainous terrain; steep slopes; unstable soils; high erosion potential; volcanic, seismic or flood risks	
Cultural property	No known or suspected cultural heritage sites	Suspected cultural heritage sites; known heritage sites in broader area of influence	Known heritage sites in project area	
Involuntary resettlement	Low population density; dispersed population; legal tenure is well-defined; well-defined water rights	Medium population density; mixed ownership and land tenure; well-defined water rights	High population density; major towns and villages; low-income families and/or illegal ownership of land; communal properties; unclear water rights	

Completeness of Sub-projects Application:

Does the sub-project application document contain, as appropriate, the following information?

	Yes	No	N/A Or Comments
Description of the proposed project and where it is located			
Detailed design of subproject in ongoing stage			
A map or drawing showing the location and boundary of the project including any land required temporarily during construction			
The plan for any physical works (e.g. layout, buildings, other structures, construction materials)			
Any new access arrangements or changes to existing road layouts			
Any land that needs to be acquired, as well as who owns it, lives on it or has rights to use it			
A work program for construction, operation and decommissioning the physical works, as well as any site restoration needed afterwards			
Construction methods			
Resources used in construction and operation (e.g. materials, water, energy)			
Information about measures included in the sub-projects plan to avoid or minimize adverse environmental and social impacts			
Details of any permits required for the project			

Environmental and Social Checklist[36]

[36] Please see below Supporting Information at Screening stage on Small irrigation schemes and small dams/reservoirs. This supporting information can also be use at ESMP preparation level.

		Yes	No	N/A Or Comments
A	**Type of activity – Will the sub-projects :**			
1	Involve the construction or rehabilitation of any small dams, weirs or reservoirs?			
2	Support existing traditional irrigation schemes?			
3	Build or rehabilitate any rural roads?			
4	Build or rehabilitate any electric energy system?			
5	Involve food processing?			
5	Build or rehabilitate any structures or buildings?			
6	Support agricultural activities?			
7	Be located in or near an area where there is an important historical, archaeological or cultural heritage site?			
8	Be located within or adjacent to any areas that are or may be protected by government (e.g. national park, national reserve, world heritage site) or local tradition, or that might be a natural habitat?			
9	Depend on water supply from an existing dam, weir, or other water diversion structure?			
	If the answer to any of questions 1-9 is "Yes", please see the reasonable mitigation measures to propose for the Detailed design of the Subproject and for the ESMP on how to avoid or minimize environmental and social impacts and risks.			
B	**Environment – Will the sub-project:**			
10	Risk causing the contamination of drinking water?			
11	Cause poor water drainage and increase the risk of water-related diseases such as malaria or bilharzia?			
12	Harvest or exploit a significant amount of natural resources such as trees, soil or water?			
13	Be located within or nearby environmentally sensitive areas (e.g. intact natural forests, mangroves, wetlands) or threatened species?			
14	Create a risk of increased soil degradation or erosion?			
15	Create a risk of increasing soil salinity?			
16	Produce, or increase the production of, solid or liquid wastes (e.g. water, medical, domestic or construction wastes)?			
17	Affect the quantity or quality of surface waters (e.g. rivers, streams, wetlands), or groundwater (e.g. wells)?			
18	Result in the production of solid or liquid waste, or result in an increase in waste production, during construction or operation?			
	If the answer to any of questions 10-18 is "Yes", please see the reasonable mitigation measures to propose for the Detailed design of the Subproject and for the ESMP on how to avoid or minimize environmental and social impacts and risks.			
C	**Land acquisition and access to resources – Will the sub-projects :**			
19	Require that land (public or private) be acquired (temporarily or permanently) for its development?			

		Yes	No	N/A Or Comments
20	Use land that is currently occupied or regularly used for productive purposes (e.g. gardening, farming, pasture, fishing locations, forests)			
21	Displace individuals, families or businesses?			
22	Result in the temporary or permanent loss of crops, fruit trees or household infrastructure such as granaries, outside toilets and kitchens?			
23	Result in the involuntary restriction of access by people to legally designated parks and protected areas?			
	It the answer to any of the questions 19-23 is "Yes", please consult the ESMF and, if needed, prepare an Resettlement Action Plan (RAP)			
D	**Pesticides and agricultural chemicals – Will the sub-project:**			
24	Involve the use of pesticides or other agricultural chemicals, or increase existing use?			
	If the answer to question 24 is "Yes", please consult the ESMF and, if needed, prepare a Pest Management Plan (PMP).			
F	**Dam safety – Will the sub-project:**			
25	Involve the construction of a dam or weir?			
26	Depend on water supplied from an existing dam or weir?			
G	**Others – Will the sub-project:**			
27	Generate labour influx of ground force near rural villages?			
28	Increases already existing social issues in near by communities?			
29	Consult local communities about subproject design, risks and impacts?			
30	Affect downstream water users?			
	If the answer to any of questions 1-9 is "Yes", please see the reasonable mitigation measures to propose for the Detailed design of the Subproject and for the ESMP on how to avoid or minimize environmental and social impacts and risks.			

CERTIFICATION

We certify that we have thoroughly examined all the potential adverse effects of this sub-projects . To the best of our knowledge, the sub-projects plan as described in the application and associated planning reports (e.g. ESMP, RAP, PMP), if any, will be adequate to avoid or minimize all adverse environmental and social impacts.

Community representative (signature): ……

Extension team representative (signature): ……

Date: ……

REVIEW

Subproject Category:

A ☐ B ☐ C ☐

Applied Environmental and Social Assessment tool:

A: ESIA ☐

B: Simplified ESIA ☐

B: ESMP ☐

C: Good Environmental and Social Management Procedures ☐

IRRIGA Environmental Safeguard Specialist and Social Safeguard Specialist (signature):

…… ……..……

Date: ……

MMMM

FOR OFFICIAL USE ONLY

Desk Appraisal by Review Authority:

☐ **The sub-project can be considered for approval.** The application is complete, all significant environmental and social issues are resolved, and no further sub-project planning is required.

☐ **A field appraisal is required.**

Note: *A field appraisal must be carried out if the sub-project:*

- *Needs to acquire land, or an individual or community's access to land or available resources is restricted or lost, or any individual or family is displaced*
- *May restrict the use of resources in a park or protected area by people living inside or outside of it*
- *May affect a protected area or a critical natural habitat*
- *May encroach onto an important natural habitat, or have an impact on ecologically sensitive ecosystems (e.g. rivers, streams, wetlands)*
- *May adversely affect or benefit an indigenous people*
- *Involves or introduces the use of pesticides*
- *Involves, or results in: a) diversion or use of surface waters; b) construction or rehabilitation of latrines, septic or sewage systems; c) production of waste (e.g. slaughterhouse waste, medical waste); d) new or rebuilt irrigation or drainage systems; or e) small dams, weirs, reservoirs or water points.*

The following issues need to be clarified at the sub-project site:

……
……
……

A Field Appraisal report will be completed and added to the sub-project file.

Name of desk appraisal officer (print):
……...

Signature: ……

Date: ……

SUPPORTING INFORMATION FOR SCREENING

SMALL IRRIGATION SCHEMES

Scope of projects

Small irrigation schemes can serve a few families or an entire community. They can involve new irrigation for existing rain-fed agriculture, the development of uncultivated areas, and changes or expansions to existing schemes. Water may be pumped from lakes, ponds or underground, or be diverted from streams or rivers. Pipes, channels or ditches carry the water to farmers' fields where it is distributed to crops by gravity on the soil surface, by hand, or by other means.

Irrigated agriculture involves complex soil-water-plant relationships, and should not be undertaken without thorough informed planning, even at a small-scale. While the benefits of irrigation can be obvious and impressive, the adverse environmental effects can be significant, long-term, and perhaps permanent.

The most significant environmental issues with small irrigation schemes concern threats to human health and soil productivity. Health effects arise from stagnant water in canals, ditches or fields that provide habitats for water-borne disease carriers. Losses of soil productivity result from over- irrigation or poor soil drainage. These lead to waterlogging and salinization of the soils, and a reduction or complete loss of their usefulness for cropping. Salinization is the build-up of mineral salts in the soil as water evaporates from the soil surface.

Some of the environmental impacts and mitigation measures that can apply to the target areas are presented in **Table 9**.

Table 14-1: Potential environmental impacts and mitigation measures for small irrigation schemes that may apply to IRRIGA target areas.

Potential environmental Adverse effects	Mitigation measures
Human Environment * Upsetting existing social and economic community management relationships, land tenure system, security of livelihoods and gender division of labor	* Avoid sites that require: Resettlement, Displacement of other important land uses, or Encroachment on historical, cultural, or traditional use areas.
* Conflicting demands on surface or groundwater supplies	* Locate and size irrigation schemes: - Where water supplies are adequate and the scheme will not conflict with existing human, livestock, wildlife or aquatic water uses, especially during dry seasons - So that withdrawals do not exceed "safe yield" from groundwater resources - Encourage crops with lower water demands - Ensure effective community organization for equitable distribution of water
Human Health	
* Creating habitats in canals and ditches for disease carriers such as mosquitoes and snails responsible for spreading diseases such as malaria and schistosomiasis (bilharzia) * Spreading infection and disease through the inappropriate use of irrigation canals	* Assess ecology of disease carriers in the project area, and employ suitable prevention and mitigation measures, e.g.: - Site and orient water works, fields and furrows to ensure adequate natural drainage of surface water, - Use lined canals and pipes to discourage vectors - Avoid unsuitable gradients, and creating stagnant or

for water supply, bathing or human waste disposal	slowly moving water, - Construct straight or only
* Health effects from improper storage, handling, use or disposal of agro-chemicals (pesticides and herbicides)	slightly curved canals, - Install gates at canal ends to allow complete flushing, - Ensure adequate sub-surface drainage of fields, - Avoid over-irrigation, - Maintain water works, and clear sediment and weeds regularly Provide/ensure alternate facilities for domestic water supply, bathing and human waste disposal Provide education and training for farmers and other community members on: - Irrigation health risks, - Efficient use of irrigation water, - Maintenance of irrigation and drainage works, - Proper storage, handling, use and disposal of agro-chemicals, - Integrated pest management * Monitor disease/infection occurrence and public health indicators, and take corrective measures (e.g. physical changes to irrigation scheme, education, medical) as needed
Soils - Waterlogging	* Thoroughly assess project soils and their management needs under irrigated agriculture * Apply water efficiently. Consider drip or dawn/evening sprinkler irrigation. * Install and maintain adequate surface and subsurface drainage * Use lined canals or pipes to prevent seepage
- Salinization	* Avoid waterlogging (above) * Mulch exposed soil surfaces to reduce evaporation * Flush irrigated land regularly * Cultivate crops having high tolerance to salinity
- Erosion	* Design and layout of furrows appropriately - Avoid unsuitable gradients - Avoid over-irrigation - Install sediment traps in fields and canals to capture sediment for return to fields - Minimum tillage, contour cropping, terracing and other methods of conserving soil moisture
Water Bodies and Aquatic Ecosystems * Loss or damage to wetlands and their environmental services, biodiversity, and ecological productivity	* Avoid: - Locating irrigation schemes on or near important wetlands (Special attention should be given to Marromeu), - Developing irrigation water sources that may reduce wetland water supply, - Draining irrigated fields into wetlands
* Reduced quality of surface and groundwater receiving excess irrigation	* Follow *Soils* mitigation measures (above) to minimize risks of waterlogging and * Use agro-chemicals appropriately (see *Human*

water or drainage (nutrients, agro- salinization chemicals, salts and minerals)	*Health* above) * Prevent surface drainage of fields into nearby water bodies (streams, ponds, etc.)

ENVIRONMENTAL STANDARDS	**ENVIRONMENTAL QUALITY INDICATORS**
National legislation on protected areas (natural, cultural and built environments) National legislation on protecting natural resources (e.g. fish, wildlife, forest cover) International environmental protection conventions (e.g. RAMSAR, Biodiversity) National water quality standards and controls National controls on storage, handling, use and disposal of agro-chemicals	***Pollution:*** Water quality (nutrients, agro-chemicals, pH, Conductivity, turbidity, Sodium Absorption Rate -SAR) in water supply and drainage canals, and wells; Physical and chemical properties of irrigated soils; ***Environmental Health:*** Water table levels in project area (including wetlands); Rate of extinction of existing resources (e.g. fish, wildlife, forest cover); Rate of occurrence of disease carriers ***Human Wellbeing:*** Incidence of human and animal illness or disease; Poverty levels

SMALL DAMS/RESERVOIRS

Scope of Projects

Small dams and reservoirs can have many purposes, for example to provide water for irrigation, water supply and aquaculture, to control erosion or floods, and to generate micro-hydropower. They may involve relatively low structures (weirs) to divert water to other uses without creating a reservoir. Higher structures raise water levels and flood land upstream, and can significantly alter the timing and perhaps temperature of downstream flows. The latter may require resettlement of people, land clearing, and the relocation of roads. Structures that divert water to other uses reduce downstream flows with consequent effects on surface and groundwater hydrology, aquatic habitats, and water users. Even small dams can have complex and significant environmental effects. Planning and design need to be comprehensive and thorough, and will likely involve specialists in a variety of fields (e.g. engineering, hydrology, aquatic ecology, soil and water conservation, sociology, economics).

Table 14-2: Potential environmental impacts and mitigation measures for small dams and reservoirs that may apply to IRRIGA target areas.

Potential environmental Adverse effects	Mitigation measures
Human Environment * Loss of productive land (e.g. agriculture, grazing and forestry) Displacement of people and families Loss of local livelihood * Reduction of water available to downstream water users	* Consider alternatives to a new dam and reservoir for example: Upgrading and renovating existing water supply and irrigation systems; Alternate locations and/or dispersed smaller dams in less sensitive areas; Watershed improvement program to enhance retention of precipitation in soils (see below) * Compensate for taken land and structures, and resettlement (including re- housing, reestablishment of livelihood activities, water and sanitation, training) * Avoid areas of significant economic or cultural value to local people * Ensure that downstream water users (e.g. water supply, irrigation, livestock watering) are partners in planning the dam and mitigation/compensation measures
Human Health * Creating habitats for disease carriers such as mosquitoes and snails * Increases in water-related diseases such as malaria, schistosomiasis (bilharzia), onchocerciasis (river blindness), and dysenteries, fevers and worms)	* Assess the ecology of disease carriers in the watershed * Employ suitable prevention and mitigation measures, including education of local people, construction workers, e.g.: Ensure all construction sites, borrow pits and quarries are properly drained, Finish and manage reservoir

	margins for proper drainage, Vary the reservoir water level design and operation of dam spillways and gates (timing and volume of discharges) * Monitor disease and public health indicators, during and after construction, and take corrective measures (e.g. education, medical) as needed
Natural Environment *(General)* * Loss of natural areas, important habitats, and number and variety of species * Threatened water source(s) for the reservoir (sedimentation)	* Avoid: Protected natural areas (biodiversity); Critical habitats or areas with significant biodiversity (e.g. wetlands) * Assess state of the watershed, and plan the reservoir (e.g. siltation, evaporation losses) to implement appropriate water conservation program, perhaps including: Watershed improvement measures (e.g. revegetation, reforestation, afforestation, controlled use) to reduce erosion and increase infiltration of precipitation, Training to ensure effective tending of improvement measures (e.g. watering, protection from grazing), Agricultural methods that maximize soil moisture conservation (e.g. mulching, terracing, contour cropping, maintaining soil cover)
Aquatic Environment - River/Stream Reduced or altered timing, quantity, quality and temperature of downstream water flows Altered rates and locations of bed and bank erosion and deposition downstream Reduction in quantity and quality of aquatic habitats and fish production Reduction/loss of downstream subsistence or commercial fisheries Blockage of fish migration and access to upstream spawning areas by dam; decreases in fish populations downstream	* Ensure thorough analysis and assessment of potential impacts to develop and plan, as part of the project, an acceptable combination of: water releases required to sustain habitats and fish production, habitat improvements to sustain production and fisheries, development assistance to people de pendent on reduced fisheries * Consider alternate dam locations and possibility of fish around dam
Aquatic Environment - reservoir Conversion of aquatic species in reservoir from those that require flowing water to those that need still water, and resulting effects on fishing activities Deterioration of reservoir water quality	*Assess fish production potential of reservoir, and implement feasible measures to enhance production (e.g. habitat design, stocking, aquaculture) * Provide development assistance to local people to benefit from reservoir fisheries * Provide areas for bathing, laundering, and animal watering away from reservoir * Ensure local sanitation facilities do not release pollutants to surface or groundwater reaching the

* Deterioration of reservoir water from: - Decomposition of flooded vegetation flooding; - Nutrients in eroded soils and agrochemicals	reservoir Prevent livestock access to reservoir Clear vegetation from reservoir area before * Train farmers in soil and water conservation, agricultural fertilizers and in appropriate use of fertilizers
Terrestrial Environment * Raised water table around the reservoir, waterlogging and salinization of soils, and lowered agricultural productivity	* Project support to improve agricultural land drainage and production around reservoir * Develop tolerant fodder and crop species around reservoir

ENVIRONMENTAL STANDARDS	**ENVIRONMENTAL QUALITY INDICATORS**
* National legislation on protected areas (natural cultural and built environments) * National legislation on protecting natural resources (e.g. fish, wildlife, forest cover) * International environmental conventions (e.g. waters and heritage, wetlands) * National water quality standards and controls * National controls on use of fertilizers * Health and safety standards for construction Activities	***Pollution*:** Fish deaths, concentrations of suspended sediments and contaminants (e.g. pesticides) in surface reservoir, Reservoir oxygen levels ***Environmental Health:*** pesticides and herbicides, Degree of biodiversity (numbers of plant, fish, animal and bird species) in the watershed, Extent of critical habitats ***Human Wellbeing*:** Incidence of human and animal illness or disease, Poverty levels

Annex 5: Screening from under Decree 54/2015

Ficha de Informação Ambiental Preliminar (FIAP)[37]

Nome da Actividade

_____
_____
_____
_____

Tipo de Actividade
Turística ☐ Industrial ☐ Agropecuária ☐ Energética ☐ Serviços ☐ Outra ☐
(especifique)

_____
_____
_____
_____

Nova ☐ Reabilitação ☐ Expansão ☐ Outro ☐
(especifique)

_____
_____
_____
_____

Identificação do(s) Proponente(s):

_____
_____
_____
_____

Endereço/Contacto
Av./Rua:

_____
_____
_____

Telefone Fixo: _____; Fax: _____
Celular: _____ /_____/ _____
E-Mail _____

Localização da Actividade
Localização Administrativa
Bairro: _____ Vila _____
Cidade _____
Localidade _____ Distrito _____
Província _____

Coordenadas Geográficas:
1. _____, 2. _____
1. _____, 2. _____

Meio de Inserção
Urbano ☐ Rural ☐ Periurbano ☐

Enquadramento no Instrumento de Ordenamento Territorial
Espaço habitacional ☐ Industrial ☐ Serviços ☐ Outro ☐
(especifique)

_____
_____
_____
_____

[37] Appears as Annex VI of Decree 54/2015 of December 31st, which regulates the environmental impact assessment process in Mozambique

Descrição da Actividade:
Infra-estruturas da actividade, suas dimensões e capacidade instalada (juntar sempre que possível as peças desenhadas e descritas da actividade).

Actividades Associadas

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 quantidade de matéria-prima e sua proveniência

7.7. Produtos químicos citados cientificamente a serem usados (caso a lista seja longa deverse-á 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

Posse de Terra (situação legal sobre a aquisição do espaço físico)

_____
_____
_____

Alternativas de localização da actividade: (motivo da escolha do local de implantação da actividade indicando pelo menos dois locais alternativos)

_____
_____
_____

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

_____
_____
_____

Características físicas do local de implantação da actividade

Planície ☐ Planalto ☐ Vale ☐ Montanha ☐

Ecossistemas predominantes

Fluvial ☐ Lacustre ☐ Marinho ☐ Terrestre ☐

Zona de localização

Costeira ☐ Interior ☐ Ilha ☐

Tipo de vegetação predominante

Floresta ☐ Savana ☐ Outro ☐

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

Agropecuário ☐ Habitacional ☐ Industrial ☐ Pretecção ☐ Outro ☐
(especifique)

_____
_____
_____
_____

Infra-estruturas principais existentes ao redor da área da actividade

_____
_____
_____
_____

Informação Complementar

Mapa de localização (a escala conveniente)

Mapa de enquadramento da actividade na zona de localização (a escala conveniente)

Outra informação que julgar relevante.

Valor Total de Investimento:

_____
_____
_____

Annex 6: Checklist for Environmental and Social Impacts

Project Activities	Issues to be addressed	Yes	No	If yes,
Agricultural development, rehabilitation of rural feeder roads, construction of water mains and construction and operation of storage, packaging and agro-processing facilities	Will there any loss of vegetation during the construction and operation of the agricultural subprojects?			If yes, in one of these issues, draw appropriate mitigation measures described in Chapter 9
	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., agro-industry processes?			
	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 agricultural 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?			

Annex 7: Environmental and social clauses

Annex 7.1: Environmental and Social Clauses for Contractors[38]

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

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

Meeting before starting works

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

Identification of concessionaire networks

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

Release of public and private domain

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

Environmental and social management program

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

[38] Environmental and Social Clauses for Contractors shall be applied to all civil works contracts regardless of the category of the subprojects, i.e., it will apply to both category B and C.

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.

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 regarding respect for customs and traditions of the people of the area where the works are being performed and the risks of STDs and HIV/AIDS.

Use of local labor

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

Child labor

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

Respect for working hours

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

Protection of site personnel

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

Person(s) Responsible for Health, Safety and Environment

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

Appointment of staff on duty

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

Measures against traffic blockage

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

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.

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

Protection of sacred sites and archaeological sites

The Contractor shall take all necessary measures to respect the cultural and cultural sites (cemeteries, sacred sites, etc.) existing 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 limited land clearing for project facilities, 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 nature or in monetary value, depending on the existing laws.

Liquid Waste Management

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

Solid waste management

The Contractor shall provide an ample number of well-located waste bins for use by all construction workers and other project personnel. He shall strictly prohibit and punish any littering or unauthorized waste dumping by all employees. The Contractor shall also deposit the garbage in bins to be emptied and sealed periodically. In case of evacuation of the site by trucks, bins should be sealed to prevent the waste spillage. For hygiene reasons, and 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 hardhats, uniforms, boots, and other appropriate footwear and equipment; and (ii) systematically install a medical clinic at the construction site and provide free medications necessary for emergency care on site for the staff.

Site journal

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

Equipment maintenance and equipment project

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

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

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

Dust control

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

Worker behavior

The Contractor shall strictly prohibit, and specify transparent penalties for, any environmentally problematic or socially inappropriate activities by construction workers or any other project personnel.

Examples of activities to be prohibited include hunting, bush-meat purchase, wildlife capture, plant collection, vegetation burning, or inappropriate interactions with local people.

Only properly trained and licensed security personnel may possess firearms.

Annex 7.2: Summary of Environmental, Social, Health and Safety (ESHS) Procurement Enhancements

The following table summarizes the key Procurement enhancements in contracts

	Subject	**Enhancement/s**
1	Declaration of contract suspension or termination	Applicants/Bidders/Proposers are required to make a declaration listing any civil works contracts that have been suspended or terminated by an employer and/or performance security called by an employer, for ESHS reason/s. This information will be used to inform enhanced due diligence.
2	Strengthened specifications/ employer's requirements	The Employer is required to set out clearly the minimum expectations of ESHS performance from the outset, to ensure that all Bidders/Proposers are aware of the ESHS requirements.
3	Workers' ESHS Code of Conduct	Bidders/Proposers are required to submit, as part of their Bid/Proposal, an ESHS Code of Conduct that will apply to their employees and sub-contractors, and details of how it will be enforced. The suitability of the Code of Conduct can be assessed and discussed as part of the Bid/Proposal evaluation and negotiations. The successful Bidder/Proposer is required to implement the agreed Code of Conduct upon contract award.
4	Contractor's ESHS Management Strategy and Implementation Plans	• Bidders/Proposers are now required to submit, as part of their Bid/Proposal, ESHS Management Strategies and Implementation Plans required to manage the key ESHS risks of the project. • The suitability of these strategies and plans can be assessed as part of the Bid/Proposal evaluation, and discussed during pre-contract discussions, as appropriate. • These strategies and plans will become part of the Contractor's Environmental and Social Management Plan (C-ESMP). • Particular Conditions of Contract now include provisions relating to the (C-ESMP), e.g.: - a requirement that the Contractor shall not commence any Works unless the Engineer is satisfied that appropriate measures are in place to address ESHS risks and impacts; • at a minimum, the Contractor shall apply the plans and ESHS Code of Conduct, submitted as part of the Bid/Proposal, from contract award onwards.
5	ESHS Performance Security	• The successful Bidder/Proposer is now required to provide, in addition to the standard Performance Security, an ESHS Performance Security (the sum of the two "demand" bank guarantees, normally not to exceed 10% of the contract price). • The ESHS performance security is in the form of a "demand" bank guarantee."

		• The application of this provision is at the Borrower's discretion. It is recommended for contracts where there is significant ESHS risks as advised by Social/Environmental specialist/s.
6	ESHS Provisional Sum	• An additional provisional sum, specifically for ESHS outcomes, may be included in the Request for Bids/Proposals documents, and eventual contract. Normally, the payment for the delivery of ESHS requirements shall be a subsidiary obligation of the Contractor covered under the prices quoted for other Bill of Quantity/price items.
7	Key ESHS Personnel	• Bidders/Proposers are now required to demonstrate that they have suitably qualified ESHS specialists among their Key Personnel. • Key Personnel must be named in the Bid/Proposal, and in the contract. • The quality of the proposed Key Personnel (including ESHS specialists) will be assessed during the evaluation of Bids/Proposals. • The Contractor shall require the Employer's consent to substitute or replace any Key Personnel. • The Engineer may require the removal of Personnel if they undertake behaviour which breaches the ESHS Code of Conduct, e.g. spreading communicable diseases, sexual harassment, gender-based violence, illicit activity, or crime.
8	ESHS Reporting	• Contracts now contain specific ESHS reporting requirements. These relate to: - ESHS incidents requiring immediate notification • ESHS metrics in regular progress reports.
9	ESHS considerations during contract variation	• As part of variation procedures, the Contractor shall provide relevant ESHS information to enable the Engineer to evaluate the ESHS risks and impacts.
10	Ability to withhold interim payment	• Contracts now contain provisions allowing interim payments to be withheld where there is a failure to perform an ESHS obligation.
11	ESHS considerations included in civil works Consulting Services	• The standard Request for Proposals for consulting services now include ESHS considerations to apply to the supervision of civil works.

Annex 8: Public Participation Process to be Followed under the Project

1 Overview

Public participation and communication will be conducted mainly to meet the requirements of the environmental regulator in Mozambique, i.e. the Ministry of Land, Environment and Rural Development (MITADER) as stipulated by Decree 54/2015, which regulates the environmental impact assessment process and Diplomas 129/2006 and 130/2006, on public participation as well as Decree 31/2012 that regulates "*Resettlement Process Resulting from Economic Activities* and other related regulatory instruments. The process will also be in line with the WB regulations and guidelines on the same subject.

Under the above-mentioned regulations adequate environmental and social management processes, as set in in the various instruments such as ESMF, RPF, PMP, PF, ESIA/ESMP, RAP, etc. emphasise the clear need for frequent interaction and communication between project developers and the public, parties affected, external interested and concerned organisations, 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 should be communicated as appropriate to external parties. Project implementation and monitoring as well as phasing out should also be characterized by solid engagement of all interested and affected parties.

The main objectives of the public consultation and involvement are to:

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

From the environmental and social management point of view it is planned that IRRIGA will adopt the following work phases (most of the requirements of the first phase were fulfilled in February 2018):

Environmental and social management phases

Phase 1: Formulation and adoption of umbrella environmental and social management instruments (ESMF, RPF and PMP)

- **Definition**: Primary environmental and social safeguard instruments to ensure IRRIGA subprojects are designed and implemented d in a way that is environmentally and socially sound
- **Functions**: (i) set out systematic procedures for participatory screening for sub-projects (ii) step-by-step procedure for predicting and managing the main potential environmental and social impacts of the planned sub-project ; (iii) general identification of impacts, definition of guidelines for project management

Phase 2: Formulation and adoption of site specific subprojects environmental and social management instruments (ESIA/ESMP and RAP and/or their simplified abbreviated versions)

- **Definition**: IRRIGA specific subproject environmental and social safeguards instruments to ensure all aspects of subproject design adhere to sound environmental and social management principles
- **Functions**: (i) subproject assessment in terms of impact on the environment and on human beings, indicating both beneficial outcomes and adverse effects; (ii) proposal on measures to avoid, mitigate and eliminate adverse effects at the planning, design and installation stages, and during operation and decommissioning; (iii) setting up of management structures of the project.

Phase 3: Subproject implementation, monitoring and evaluation

- **Definition**: Verification of compliance with previous definitions during subproject installation, operation and decommissioning
- **Functions**: (i) ensure that the principles and guidelines set forth in the previous instruments are adhered to and adjusted as found fit; (ii) maintain a constructive dialogue among all affected and interested parties about project and subproject outcomes

Phase 1 – Formulation and Adoption of the ESMF, RPF and PMP: these are the primary (umbrella) environmental and social safeguard instruments aimed at ensuring that IRRIGA subprojects are designed, approved, implemented, monitored and evaluated in a way that adheres to sound management principles, systems and procedures. These safeguard instruments are usually relevant where there is still an unclear definition of the project (i.e. specific definition of subprojects) interventions. Among other aspects they set out (i) systematic procedures for participatory screening for sub-projects; and (ii) a step-by-step procedure for predicting and managing the main potential environmental and social impacts of the planned sub-project activities. It is going to be at this stage that public participation and involvement with the project will be initiated in a systematic way. IRRIGA is at this phase now, i.e. February/April 2018.

Phase 2 – Formulation and adoption of site specific subprojects environmental and social management instruments (ESIA/ESMP and RAP and/or their simplified abbreviated versions): at this stage safeguard instruments are aimed at (i) assessing the proposed development in terms of impact on the natural and social environment, indicating both its beneficial outcomes and adverse effects; (ii) proposing measures to be taken in order to mitigate and eliminate adverse effects both at the planning, design and installation stages and during operation and possible decommissioning.

Depending on the magnitude of project impacts the following sub-stages can be involved in the preparation of these instruments:

- Inception Phase - Pre-Assessment Application Form and Project Categorization (mandatory)
- Scoping Phase and Definition of Detailed ESIA Terms of Reference (for Categories A and B Projects)
- Environmental and Social Impact Assessment and Environmental and Social Management Plan Phase (for Categories A and B Projects)
- Resettlement Action Plans (RAPs) and/or their abbreviated version are required where subprojects result in involuntary resettlement of people and/or their assets.

2 Public Participation Process

2.1 Principles and General Orientation

The public participation regulations and guidelines require that in addition to interviews and meetings with individuals (e.g. key informants), each one of the above-mentioned phases should be marked by a series of public meetings and where appropriate focus groups discussions in which relevant Interested and Affected Parties (I&APs) are actively involved.

During the meetings the environmental and social management teams in close collaboration with the Developer (MITADER) representatives will maintain I&APs informed of the main issues and findings of each phase and collect concerns and interests expressed by the various project stakeholders.

All the public meetings will be non-technical and are expected to contribute to get stakeholders' inputs in terms of avoiding/minimizing possible negative impacts and optimizing the positive impacts of the project.

Community consultation and participation should be at the centre of the entire process as a way of providing an opportunity for all relevant stakeholders and particularly affected/beneficiary households, communities, public and private organizations to get informed about the project. The process is also designed to instil a sense of ownership for the project and to provide an opportunity for all concerned parties to present their views and interests and expand options for dealing with sensitive matters.

It is important to include the affected communities at the grass root level as integral part of the project development and the environmental and social management process. Therefore, communities must have their own representatives and should be clustered in an appropriate way to ensure social cohesion in addressing the various issues. Considering the different social roles of men and women, it is likely that the impact of the project will be felt differently by men and women and therefore they should be consulted separately. Separate focus group discussions should be held with women and men in each project phase, in each community influenced/affected by the project.

Community leaders must be people with leadership capacity and accepted by local people as their representatives. They shall get involved in the communication and participation process to integrate community wishes and institutional arrangements to reach agreements.

At the same time, the community participation process will play an important role in community organization, allowing for the identification of people within communities that can be used in the various aspects of project development and implementation.

There will be a need to ensure that a practical communication system is established in order to strengthen the ability of all project beneficiaries and affected people to articulate, disseminate and make their own decisions.

In order to empower the communities and the beneficiaries the communication systems to be adopted should embrace the "rights-based approach".

2.2 Methodologies

Communication should be conducted in different ways and using different methods as found fit for each case and circumstance, such as:

- Public meetings with groups of interested and affected people. These meetings are publicly announced using national newspapers of major circulation and are open to all those who wish to attend;
- Community and local meetings target to certain communities and groups identified are crucial in the project's communication strategy at a given point;
- Focus group discussions separately with women, men, youth, business people, company managers, farmers, etc.

Each meeting should be properly documented. The minutes of such meetings should, among other aspects, contain:

- Date
- Venue - City/Bairro/Quarter
- Summary of the main issues presented during the meeting by the developer and/or their representatives (Environmental and Social Workers and/or Engineering teams)
- Summary of the main issues presented by the participants (Note: All concerns and interests expressed should be recorded)
- Feedback given
- List of participants including the names and position of the organizers as well as contact details of all who attended the meeting.

Meetings should be conducted in both languages, Portuguese and local languages. Local languages relevant for each city/bairro/quarter will be identified in due course, particularly during Phase 1, i.e. of Formulation and Adoption of the ESMF, RPF and PMP. Where needed, local interpreters will be engaged to facilitate this process.

Other means of communication should also be used to disseminate information and all different kinds of instructions to affected and concerned people. These should include but not be limited to:

- radio – national, provincial, municipal and community
- television – national, provincial, municipal and community
- newspapers and news bulletins – national, provincial, municipal and community
- leaflets
- letters
- word-of-mouth
- other media and channels.

Women have often limited or no access to written and audio/audio-visual information channels. It is therefore important to find out, already at the initial phase, how/where women can be reached most efficiently. It is likely that market places, health posts, public standpipes, farms, etc. become strategic meeting points for reaching women in large numbers.

Communication material produced specifically to foster project interests should be circulated in both languages, Portuguese and local languages, using the most appropriate channels for men and women.

The exact venues and the people and entities to be involved in the meetings as well as the way in which the various stakeholders will be grouped will be identified and specified at an opportune time.

In line with the regulations hard copies of the Drafts of main reports, i.e. ESMF, RPF and PMP and later ESIA/ESMP and RAP and/or their simplified abbreviated versions as well as Non-Technical Summaries should also be made available to the public in certain places such as MITADER and other ministries directly involved, e.g. agriculture, public works, etc. (at the central and Provincial level) Municipalities, etc.

3 Gender and Poverty Alleviation Sensitive Communication Process

Women play a crucial role in agriculture and rural development as well as natural resources management. The communication process and strategy to be adopted should be deliberately sensitive to both aspects. In order to be responsive to those aspects it should be informed by adequate knowledge and understanding of gender division of roles and poverty issues within the communities and households to be involved.

To prepare a more detailed gender-sensitive participation and communication plan, the consultant and project implementation teams need to gain a thorough understanding of the gender roles, responsibilities and needs in the communities influenced/affected by the project. Focus should be on issues as such:

- Daily division of labour between women and men/young girls and boys at household level. Gender (and age) roles related to production and consumption at household level.
- Are women/men informed of the planned project? How will it affect their activities and living standards?
- What proportion of men and women use the resources related with the project? How often do they use them on a daily, weekly, monthly and yearly basis?
- What concerns/constrains women and men have in relation to current natural and agricultural resources?
- Will the project under consideration solve the agricultural and rural development problems women/men encounter now in the conduct of their public, family and social activities?
- Which solutions could be envisaged under the project, to reduce prevailing constraints?
- How can the women/men participate in the implementation of the project?
- Will the project bring about changes in job opportunities as well as improvement in social services particularly appropriate for women and children?
- What impact (positive and negative impact) will the project have on the activities and living conditions of women and men during construction/rehabilitation and operation?
- What impact can construction workers have on local population – women vs. men – and socio-economic activities, including the possible spread of STDs and HIV/AIDS?

To have in place adequate measures to deal with the HIV/AIDS epidemic that may escalate during the construction/rehabilitation process, a communication program and strategy will be developed. This will be aimed at:

- Educating workers and local people – women and men – and communities during construction
- Opening of active STDs/HIV/AIDS voluntary counselling and testing centres to prevent and treat infected and affected people.

The formulation of the Safeguard Instruments will be particularly important to get an initial understanding of the social dynamics resulting from the answers to those questions. But the investigative approach will

continue in an appropriate manner throughout the various phases of the project, including during its implementation and post-implementation.

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Annex 9: Good Agricultural Practices - Hygiene and Safety
Environmentally and Socially Friendly Agricultural Farming Systems

Technical steps	Environmental and social measures
Clearing (felling of trees and shrubs)	• Reforestation of the waste land areas as a compensation • Development of low-lying flood plains for crop production, but leaving high biodiversity wetland areas untouched
Fertilization	• Development of improved farming system by applying improved technology • Training on the safe selection, use, storage and disposal of agricultural inputs • Training on compost making techniques • Train communities on how to improve their nutrition • Reduction of agricultural production losses and wastage • Reuse of agricultural by-products • Integration of short-cycle crops, i.e. 3 months, short stem rice
Treatment plant	• Promotion of integrated pest management • Training on safe pesticide selection, use, storage and disposal • Application of knowledge to get healthy crops, avoid or manage diseases • Adoption of best practices for monitoring insects and knowledge of the life cycle of pests • Use of natural predators and ecological characteristics • Practice of Biological Control • Adoption of short cycle varieties selected for durable resistance to pests
Cropping systems	• Development of agricultural systems and irrigated lowland systems for year-round production • Regular monitoring of the quality of water for irrigation to avoid contamination of food crops • Recycling of crop residues and animal waste • Use of animal traction and shelterbelts • Promotion of home gardens

Measures of good agricultural practices integrating environmental and social sustainability aspects

- Improving seed quality (seed production techniques)
- Enhance the features of improved seeds taking the environmental and dimensions into account, i.e. good ground cover to reduce erosion, short growing season so that more crops per year are feasible
- Organize the production and dissemination of improved seeds
- Disseminate intensification techniques to improve the competitiveness of produced crops
- Improve harvesting and post-harvest techniques to reduce losses
- Improvement of production systems and natural resource base:
- Control erosion with legumes
- Improved fertility including alley cropping with legumes
- Use of cover crops
- Reduce the decline of soil fertility through a better agriculture - livestock integration
- Monitoring of Soil Fertility
- Program for Research on Integrated Management of soil nutrients
- Research Programs on more Sustainable Agricultural Systems leading to an Enhanced and Sustainable Production System
- Dissemination of technical erosion control
- Sustainable agricultural crop production
- Controlling erosion and rapid depletion of soil organic reserves, the restoration of soil fertility and sustainable land management
- Develop research on technologies that optimize the use of new sources of accessible and sustainable organic fertilizers
- Minimize the effects of mechanized practices (choice of agricultural machinery and equipment suited to the agro-ecological zones for cultivation, etc.).
- 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)

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Generic Environmental and Social Management Plan Template for IRRIGA Sub-Projects

Sub-Project Title: Indicate that this is the ESMP for XXXX sub-project

Purpose

The ESMP provides a set of good environmental practices that should be followed by the Contractor(s) to be hired to implement the project. It is in line with the international best practices and environmental requirements in force in Mozambique.

The general purpose of an ESMP is to ensure that all project activities are conducted and managed in an environmentally responsible manner. Specifically, it aims to:

- Provide the entity that oversees the environmental area (currently the Ministry of Land, Environment and Rural Development - MITADER), with a tool to facilitate environmental monitoring and auditing of all project activities in line with the Mozambican and World Bank environmental and Social Policy Framework;
- Provide clear guidelines to the Developer/Superviosing Engineer/Contractors (employees, service providers and others) with a tool to facilitate environmental monitoring of all project activities in line with the Mozambican and World Bank environmental legislation;
- Provide clear guidelines to the Developer/Contractors (employees, service providers and others) with the domestic and international legal requirements of sustainable environmental and social standards;
- Incorporate environmental and social considerations in the Supervising Engineer’s/Contractor's operating procedures;
- Serve as an action plan for environmental and social management and monitoring;
- Provide a framework for implementation of mitigation measures related with the environmental impacts, and
- Prepare and maintain environmental performance records of project activities.

Scope

The ESMP is applicable for the Rehabilitation/Construction of XXXXX Irrigation Scheme.
The ESMP is a dynamic document and subject to change and is intended to give more details to the Contractor about the environmental conditions and obligations regarding the project.

Proposed Structure of the ESMP

Title: specific for each sub-project/specific irrigation scheme

1. Introduction

1.1. Context
1.2. Objectives
1.3. Importance

2. Description of the project

2.1. Activity identification
2.2. Location of the activity
2.3. Description of the activity
• Construction Phase
• Operation Phase
• Deactivation/Decommissioning Phase

3. Legal Framework

3.1. National
3.2. International (Bilateral, Regional, Conventions, Protocols, …)
3.3. World Bank Policy Framework

4. Legal Compliance Analysis

4.1. Socio-environmental
4.2. Institutional
4.3. Legal (National, International and World Bank Policy Framework)
4.4. Implementation

5. Diagnosis of the Social and Environmental Status
5.1. Geographical context of the irrigation scheme
5.2. Biophysical description (including identification of environmental issues)
5.3. Socio-economic description (including identification of socio-economic issues).

6. Identification and Assessment of Environmental and Social Impacts

6.1. Identification of Expected Impacts (biophysical, socio-economic, positive and negative)
6.2. Assessment of the Impacts (nature: positive/negative; magnitude: low/medium/high, reversibility: reversible/irreversible, and significance: insignificant/significant/very significant), …

7. Environmental Management Measures

7.1. Mitigation and Enhancement Measures
7.2. Environmental Management Programmes
7.2.1. Water Resources Management Programme
7.2.2. Soil Management Programme
7.2.3. Waste Management Programme
7.2.4. Air Quality Management Programme
7.2.4. Pest and Pesticide Management Programme
7.2.5. Risk and Emergency Management Programme
7.2.6. Socio-economic Management Programme
. Child Labour
. Gender Based Violence
. Labour Influx Incidence
. Conflicts in the use of natural resources

8. Training and Capacity Building

9. Implementation Structure of the ESMP

10. Conclusions and Recommendations:

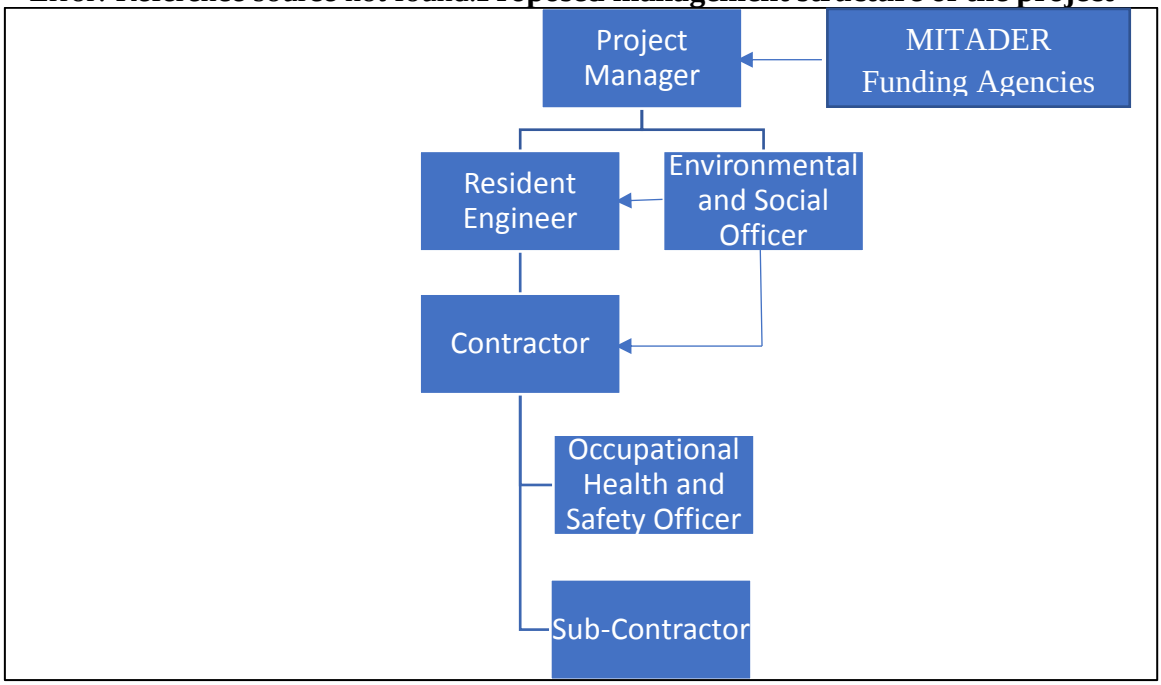
11. References

Proposed ESMP Institutional and Organizational Arrangements

Compliance with the instructions in this document is the responsibility of the Project Developer (IRRIGA/PIU). However, to ensure the sound development and effective implementation of the ESMP, it will be necessary to identify and define the responsibilities and authority of the various persons and organizations that will be involved in the project.
The following entities will be involved in the implementation of the present ESMP:
Lead Authority: INIR/IRRIGA/PIU
Other Relevant Entities:

- Ministry of Land, Environment and Rural Development (MITADER);
- Project Manager or Developer (INIR/IRRIGA);
- Resident Engineer (RE);
- Environmental and Social Officer (ESO);
- Contractor;
- Occupational Health and Safety Officer (OSHO);
- Sub-contractors.

Error! Reference source not found.**Proposed management structure of the project**



Roles and Responsibilities:

The Developer (INIR/IRRIGA/PIU) will hire a resident construction engineer (RE) and an environmental and social specialist (ESS). The first will be responsible for overall construction and second to ensure implementation of the ESMP. The Contractor will receive instructions from the RE and will be responsible for implementation of all environmental and social specifications. The Contractor should hire an occupational, health and safety officer (OHSO) to ensure implementation of all preventive measures to the workers. Contractors should make available the terms and conditions to their sub-contractors.

The following descriptions represent the minimum level of roles and responsibilities of above actors to implement the ESMP. The roles and responsibilities described below can be updated as necessary.

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N.°	Entity	Roles and responsibilities
1	**MITADER**	• ensure the implementation of the environmental policies. • participate in meetings with the Project Developer and other stakeholders at the start of the ESMP process to reach agreement on the approach to the ESMP; • review the draft ESMP submission. Based on the review, the authority will either (i) approve the ESMP (with or without conditions), (ii) return the ESMP for further improvement and re-submission, giving guidance on what needs to be revised or added, or (ii) reject the ESMP, giving reasons; • process and issue the environmental license for construction and operation of the project; • review monitoring and audit reports, if required; • perform random controls to check compliance with the ESMP. In case of persistent non-compliance, the Project Developer will be required to provide an action plan with corrective measures and have them approved by the authorities.

N.°	Entity	Roles and responsibilities
2	Project Manager (PM)	Assisted by the IRRIGA ESS and the Project Engineer IRRIGA Project Manager will: • take up overall responsibility for the environmental and social aspects of the project. An important part of this role will be to: o ensure that the ESMP approved by MITADER and the Funding Agency is included in the bid documentation for selection of contractors; o audit the implementation of the ESMP by the Contractor; o report on the implementation of the ESMP to MASA/INIR senior managers, MITADER and/or the funding agencies as and when necessary. o hire the Contractor and supervision team (resident engineer and environmental control officer); o establish and maintain regular and proactive communication with the resident engineer, contractor, etc.; o undertaking periodic site visits and site inspections to perform an environmental audit of the implementation of the project ESMP; o review and comment on environmental reports produced by the Resident Engineer, Contractor, etc.; o report to Funding Agencies (WB and other) and/or MITADER as and when required on the state of the environmental and social for the project ESMP; o ensure that the Generic ESMP is reviewed and updated as necessary.

3	Resident Engineer (RE)	The PM and will be required to oversee the construction program and construction activities performed by the Contractor. Roles and responsibilities include: • review and approve method statements by the Contractor in connection with the ESMP; • oversee the general compliance of the Contractor with the ESMP and other pertinent site specifications; • liaise between and with the contractor and the PM on environmental and social matters, as well as any pertinent engineering matters where these may have environmental consequences • be familiar with the contents of the ESMP; • monitor the Contractor's compliance with the Environmental Specifications daily, through the Site Diary; • communicate to the Contractor, verbally and in writing, necessary advices to perform environmental and social management of the works; • request for, review and approve the Method Statements prepared by the Contractor; • review and approve drawings produced by the Contractor in connection with, for example, the construction site layout, access/haul roads and so on; • advise on materials that may be used to designate working areas and materials to be used for the works as and when necessary; • undertake damage assessments where incidents, accidents and serious infringements have occurred on/off site; • review and approve all areas that have been rehabilitated by the Contractor; • review complaints received and make instructions as necessary; • accompany PM Team during site inspections and/or inform it in writing of any infringements of the Environmental Specifications and to issue instructions to the Contractor; • discuss with the PM Team the application of penalties for the infringement of the Environmental Specifications, and other possible enforcement measures when necessary; • issue or motivate for penalties to be issued as and when necessary; • implement Temporary Work Stoppages where serious environmental infringements and non-compliances have occurred;

N.°	Entity	Roles and responsibilities
		• maintain a record of complaints from the public and communicate these to the Contractor and the PM; • facilitate proactive communication between all role-players in the interests of effective environmental and social.

4	Environmental and Social Specialist (ESS) At central and provincial levels Environmental and Social Officers (ESO) can also be hired on temporary basis for more complex subprojects	The ESSs will be required to liaise with the PM on the level of compliance with the ESMF, RPF and PMP including specific ESIAs, **ESMP** and RAP achieved by the Contractor on a regular basis for the duration of the contract. This will be a full-time position to deal with the overall project and specific ESMPs to: • advise the RE on the interpretation and enforcement of the Environmental Specifications, including discussions on non-compliances; • supply environmental information as and when required; • review and approve Method Statements produced by the Contractor with the RE; • demarcate particularly sensitive areas and pass instructions through the RE concerning works in these areas; • monitor any basic physical changes to the environment because of the construction works – e.g. evidence of erosion, dust generation and silt loading in runoff; • undertake regular inspections and submit reports on the Contractor's compliance with the Environmental Specifications. These reports shall be copied to the RE and to the PM; • undertake quarterly audits of the construction works and submit audit reports to the PM for review; • communicate frequently and openly with the Contractor and the RE to ensure effective, proactive environmental and social, with the overall objective of preventing or reducing negative environmental impacts and/or enhancing positive environmental impacts; • undertake damage assessments with the RE where incidents, accidents and serious infringements have occurred on/off site; • advise the RE on remedial actions for the protection of the environment in the event of any accidents or emergencies during construction, and to advise on appropriate clean-up activities; • review and approve all areas that have been rehabilitated by the Contractor; • review complaints received and make instructions as necessary; • identify and make recommendations for minor amendments to the ESMP as and when appropriate; • maintain the material for the Environmental Training Awareness courses and Environmental

N.°	Entity	Roles and responsibilities
		Information Posters as part of the overall environmental training for the contract; • ensure that the Contractor, his employees and/or Sub-Consultants receive the appropriate environmental awareness training prior to commencing and during activities; • establish and maintain an Environmental Site Diary to record all environmental incidents related to the construction of the Project.

5	Contractors and Subcontractors	The PM will appoint a Contractor to undertake the construction of the given project. The 'Contractor' will be contractually required to undertake his/her activities in an environmentally responsible manner, as described in the ESMP. Roles and responsibilities include: • be familiar with the contents of the ESMP; • implement, manage and maintain the ESMP for the duration of the contract; • designate, appoint and/or assign tasks to personnel who will be responsible for managing all or parts of the ESMP; • assign appropriate authority, accountability and responsibility for these personnel to carry out their duties; • provide appropriate resources, budgets, equipment, personnel and training – for the effective control and management of the environmental risks associated with the construction. • comply with the Environmental Specifications contained in the ESMP and subsequent revisions; • confirm legislative requirements for the construction works, and ensure that appropriate permissions and permits have been obtained before commencing activities; • ensure that access to the land for the construction site and works has been acquired; • prepare Method Statements, program of activities and drawings/plans for submission to the RE; • undertake daily site inspections (with the RE) to monitor environmental performance and conformance with the Environmental Specifications; • review the site inspection reports and take cognizance of the information/recommendations contained therein; • notify the RE, verbally and in writing, immediately in the event of any accidental infringements of the Environmental Specifications and ensure appropriate remedial action is taken; • ensure environmental and social awareness among his employees, sub-contractors and workforce so that they are fully aware of, and understand the Environmental Specifications and the need for them; • maintain a register of environmental training for site staff and sub-contractor's staff for the duration of the contract;

		• undertake rehabilitation of all areas affected by construction activities to restore them to their original states, as determined by the RE; • undertake the required works within the designated working areas;

N.°	Entity	Roles and responsibilities
6	Occupational Health and Safety Officer (OHSO)	The Occupational Health and Safety Officer (OSHO) will be hired by the Contractor to ensure the health and safety of both workers and the community. Roles and responsibilities include: • ensure compliance with the specifications; • conduct workers' induction and regular sessions on occupational health and safety, including emergency procedures; • ensure that the material and human conditions for response to accidents at work are available and on standby.
7	Other entities	Other authorities may be involved in activities relating to the ESMP. For example, local authorities may be involved in monitoring activities. Other authorities may also be involved in the development, implementation, review and approval of the ESMP, e.g. the ARAs regarding water resources, DNSAS/Plant Disease Unit for IPM, MOH for health, etc. The reason for their involvement is primarily to verify the accuracy and comprehensiveness of the information provided from the viewpoint of their specific mandates and areas of responsibility (e.g. permits, licenses and compliances).

The following table provides an example of how the generic ESMP can be implemented for some environmental and social descriptors.

Environmental / Social Aspect	Environmental and Social Impacts	Mitigation/Potentiation Measure	Responsibility for the measure		Timeframe
			Implementation	Monitoring	
Changes in the flow of rivers	Changes in the flows of rivers may have significant impacts on water availability to downstream users; negative impacts on aquatic biodiversity.	Integrating low flow release strategies into dam operation protocols or watershed management plans	PIU, Beneficiaries & Contractor.	PIU, ARA & DPTADER	To be monitored on a monthly basis
	Sediment accumulation may lessen the operational life of reservoirs; Floods may result in the loss of seasonal wetlands.	Protection of flood plains which function as groundwater recharge zones and attenuate peak discharges downstream. These are additional positive functions of wetlands.	PIU; Beneficiaries & Contractor.	PIU, ARA & DPTADER	To be monitored on a monthly basis
	Fall of water table as a result of excessive abstraction and negative impacts on people and biodiversity.	Licensing of ground- and surface water use.	PIU; Beneficiaries & Contractor.	PIU, ARA & DPTADER	To be monitored on a monthly basis
	Rise of water table; waterlogging as a result of poor irrigation efficiencies.	Good irrigation infrastructure, good drainage, etc.	PIU; Beneficiaries & Contractor.	PIU, ARA & DPTADER	To be monitored on a monthly basis.

Environmental / Social Aspect	Environmental and Social Impacts	Mitigation/Potentiation Measure	Responsibility for the measure		Timeframe
			Implementation	Monitoring	
Solute dispersion	The changing hydrological regime associated with irrigation schemes may alter the capacity of the environment to assimilate solutes/pollutants; Reduced flood flows may remove beneficial flushing, and reservoirs may cause further concentration of pollutants.	Measures propose for low flow impacts are also applied to mitigate the impacts of solute dispersion, i.e. licensing of ground- and surface water use; good irrigation infrastructure; good drainage, etc.	PIU; Beneficiaries & Contractor.	PIU, ARA & DPTADER	To be monitored periodically as per the approved ESMP.
Agro-chemical pollution	The run-off of fertilizers and pesticides into water bodies may lead to eutrophication and upset aquatic biota and ecosystems.	Chemicals and fertilizer used must be monitored; a Pest Management Plan to be implemented.	PIU; Beneficiaries & Contractor.	PIU, ARA & DPTADER	To be undertaken periodically; monthly.
Input of nutrients to the water bodies.	Accumulation of organic matter in water produces eutrophication	Reservoirs should be cleared of organic matter to limit eutrophication. Use crop varieties with low water needs, higher yield per hectare thus reducing the extent of waterlogged area.	PIU; Beneficiaries & Contractor.	PIU, ARA & DPTADER	To be undertaken periodically; monthly.
Soil salinity and properties	Increased use of agrochemicals and fertilizer can result in salinity and accumulation of high levels of toxics in soils.	Careful management to reduce the build-up of salts; sub-surface drainage and good tillage techniques; etc.	PIU; Beneficiaries & Contractor.	PIU & DPTADER	Periodically as per ESMP

Environmental / Social Aspect	Environmental and Social Impacts	Mitigation/Potentiation Measure	Responsibility for the measure		Timeframe
			Implementation	Monitoring	
Erosion and sedimentation	Upstream erosion may result in the delivery of fertile sediments to delta areas (this is however a measure of the loss of fertility of upstream eroded lands).	Mitigation measures include: • Providing good vegetative cover to dissipate water energy; • Contour drainage to slow down surface runoff; • Terrace and contour cultivation and the construction of field bunds; • Improved water management practices related to surface irrigation methods (for example by using gates, siphons, checks). • Irrigation infrastructure needs to be designed to ensure that localized erosion, e.g. gully formation, does not occur. • Following the completion of construction work, vegetation cover should be established around structures so that bare soil is not left exposed.	PIU; Beneficiaries & Contractor.	PIU & DPTADER	During set up of irrigation infrastructure, and monthly thereafter.
People influx	People moving into areas as a result of the increased economic activity; an increase in the number of livestock; greater use of forests, particularly for fuel wood.	Planting deeper rooting crops and trees in the higher lands; allowance should be made for livestock, fuel wood or vegetable gardens within the layout of an irrigation scheme.	PIU; Beneficiaries & Contractor.	PIU & DPTADER	During set up of irrigation infrastructure, and monthly thereafter.

Environmental / Social Aspect	Environmental and Social Impacts	Mitigation/Potentiation Measure	Responsibility for the measure		Timeframe
			Implementation	Monitoring	
Changes in river morphology	Reductions in river flows may significantly alter the river morphology, reducing the capacity to transport sediment and thereby causing a build-up of sediments and possibly a shrinking of the main channel	Flushing of sediment and maintaining a functional minimum flow of rivers to mitigate the adverse impacts on the sediment transport, hydrologic and hydraulic regimes of the affected river or stream.	PIU; Beneficiaries & Contractor.	PIU, ARA & DPTADER	During setup of irrigation infrastructure and monthly thereafter.
Sedimentation	Reservoir siltation and increased sediment loads	Canal desilting; maintaining grass and bush cover along stream courses; preventing gulley formation; etc.	PIU; Beneficiaries & Contractor.	PIU, ARA & DPTADER	During setup of irrigation infrastructure and monthly thereafter.
Biological and ecological changes	Overall habitats and ecologically sensitive areas highlighted in the report may be negatively affected by agricultural practices that may impact negatively on drainage, altered morphology of rivers, increased sedimentation and eutrophication, etc.	The creation of compensation areas or habitat enhancement within and/or outside the irrigation area may be useful mitigation measures where the natural habitat change is assessed as detrimental; The creation of reservoirs and channels provides the possibility of enhanced aquatic habitats. Bird sanctuaries and wildlife parks can be created around reservoirs.	PIU; Beneficiaries & Contractor.	PIU & DPTADER	During setup of irrigation infrastructure and monthly thereafter.

Environmental / Social Aspect	Environmental and Social Impacts	Mitigation/Potentiation Measure	Responsibility for the measure		Timeframe
			Implementation	Monitoring	
Competition for natural resources	Impacts on land rights - conflict among water users over water allocation, land rights, or maintenance issues; conflict may arise between users and the authority responsible for the project over inappropriate design of infrastructure, conflict between project beneficiaries and non-beneficiaries is often inevitable	User participation at the planning and design stages of both new schemes and the rehabilitation of existing schemes, as well as the provision of extension, marketing and credit services, can minimize negative impacts and maximize positive ones. Consultations with local communities and the assistance of NGOs can also greatly minimize adverse socio-economic impacts. The RAP that is part of the RPF should be followed whenever necessary.	PIU; Beneficiaries & Contractor.	PIU & DPTADER	During setup of irrigation infrastructure and periodically thereafter.
	Income generation; human health; human migration.	Improved planning with user involvement; siting reservoirs away from human settlement areas.	PIU; Beneficiaries & Contractor.	PIU & DPTADER	During project setup, and periodically thereafter.
	Cultural property; issues of involuntary resettlement; gender issues.	Protection of cultural properties during civil works; implement measures outlined in RFP to deal with issues of resettlement; prioritising the inclusion of disadvantaged groups in all project activities.	PIU; Beneficiaries & Contractor.PIU	PIU & DPTADER	During project setup, and periodically thereafter.

Voluntary Land Donation Protocol

To meet World Bank safeguard policies, the principles governing voluntary donation are as follows.

Voluntary land donation refers to a process by which an individual or communal owner agrees to provide land or property for project-related activities. In general, voluntary land contribution is undertaken without compensation. Voluntary contribution is an act of informed consent, made with the prior knowledge of other options available and their consequences, including the right not to contribute or transfer the land. It must be obtained without coercion or duress.

Voluntary land donation requires a declaration by the individual, household or group that they are donating either the land or the use of the land, for a specific purpose and a specific duration of time. It is noted that the project proposes permitting voluntary *use* of land but not *transfer of ownership*. This must include both women and men. It is provided freely and without compensation, and is acceptable only if the following safeguards are in place:

1) Full consultation with landowners and any non-titled affected people at the time of site selection (including the consultation with both women and men)

2) Voluntary donations should not severely affect the living standards of affected people based on the World Bank definition

3) Any voluntary donation will be confirmed through written record and verified by an independent third party such as customary leaders, non-governmental organization (NGO) or legal authority

4) Adequate grievance redress mechanism should be in place.

If involuntary acquisition cannot be avoided, a Resettlement Action Plan is to be prepared according to the principles in the Resettlement Policy Framework.

Compensation Approach – Voluntary Land Use Consent

OP 4.12 defines "involuntary" as "actions that may be taken without the displaced person's informed consent or power of choice". If a clear choice exists, and if land is not transferred, there is no land acquisition (compulsory or otherwise). Notwithstanding this, INIR is cognizant of the potential perceived or real risks associated with this approach. Accordingly, an Abbreviated Resettlement Action Plan (ARAP) will be prepared to provide a full explanation of the design process, consultation process and an explanation of the land ownership and land management arrangements in the project area. Documentation of consultation and the legal agreements between the land owners and the GoM will be appended to the A-RAP.

An assessment of the key aspects of Voluntary Land Donation is included in the following table.

Key consideration	Application to this project
What the land is going to be used for, by whom and for how long?	The land will be used by local communities for Irrigation infrastructure. Benefits are primarily to the local community.
Will they be deprived of the ownership or right to use the land? What does this really mean?	No transfer of land ownership will take place. Land use rights will however be agreed and transferred to the GoM for the project. to reduce impacts on land, structures and crops. INIR will undertake consultation with affected communities during project implementation. .

Key consideration	Application to this project
Do they have the right to refuse to donate the land?	Yes. If the community does not request (or want) the infrastructure, it would have every right to say so, and refuse to let the GoM to use the land.
Are there proposals which would allow other land to be used?	A key aspect of project implementation will be options assessment which will be undertaken in close consultation with the affected/beneficiary communities. Options will be appraised by both INIR and communities to develop and agree on preferred outcome .
What would the community need to do to donate the land, and what costs are involved?	The communities would sign an agreement allowing INIR to use the land for the purpose of the investment project. All costs would be borne by the project.
What effect may the donation have on their family? What can they do if they (or their family or heirs) want the land back?	Once the beneficiaries have agreed to the voluntary land donation arrangement, there would be no ability to get the land back for another purpose.

VOLUNTARY LAND DONATION (OR LAND LEASE[39]) FORM[40]

This form or an equivalent document is to be used to record the consent of landowners who offer private land for a community good activity. The essentials of voluntary donation are that the donors have been freely consulted prior to the donation, were not pressured or coerced, that the donation will not affect a significant proportion (more than 10%) of their productive assets, and that they have the right to refuse and to lodge a complaint if they have a grievance about the process.

Consent Form for Voluntary Donation

I/We: _____ male household head _____female household head, and/or person(s) exercising customary rights over land described as (legal description, GPS coordinates if available) in

Village _____ Name of Association_____

District_____

Province _____

hereby declare that I/we/the group are the owners/users of the land required for (description):

_____

I/we are voluntarily donating the use of land and or/ land-based assets (land area, type of assets /trees/crops etc) _____

_____

for the purpose of: (specify activity)

_____

_____

We agree to this purpose from (date)_____ for as long as the purpose is served *or* until (specify end date, typically the life expectancy of the facility)_____

I/we make this donation of My/Our own free will. I/We are waiving My/Our right to compensation of any kind for the specified duration of the activity.

I/We affirm that we have been fully and freely consulted and informed about the activity prior to agreement, have not been subject to any form of coercion, understand that I/we have the right to refuse, and to seek redress for any grievance concerning this transaction.

Signed:

Male household head _____ /Female household head_____

Chief or Local Custom Authority_____

Representative of concerned Government Agency _____

Date:

_____

[39] If leased land is to be used, this form may be adapted to record the agreement of both lessor and lessee
[40] This form will be translated to Portuguese and further adapted.

Annex 12: Example of Monitoring Matrix

For monitoring environmental and social safeguard performance of IRRIGA a matrix of indicators shall be used. Below an example is proposed:

Monitoring ESMF									
Scheme		**Under Construction**	**Construction Completed**	**Environmental License**	**Water License**	**ESMP**	**A-RAP**	**Audit**	**Penalties**
Scheme 1		✓	-					1	0
Scheme 2		-	✓					0	0
Scheme 3		✓	-					0	0
Scheme 4		✓	-					1	0
Scheme 5		✓	-					0	0
…									
TOTAL	**5**	**4**	**1**	**2**	**1**	**4**	**0**	**2**	**0**
Legenda:		In place (i.e. issued, disclosed)							
		Pending							
		Pending more than 6 months							

Annex 133: Minimum requirements for Workers Code of Conduct

(Contractor and Subcontractors)

A minimum requirement for the Code of Conduct should be set out, taking into consideration the issues, impacts, and mitigation measures identified in:

- *project reports e.g. ESIA/ESMP*
- *consent/permit conditions*
- *required standards including World Bank Group EHS Guidelines*
- *national legal and/or regulatory requirements and standards (where these represent higher standards than the WBG EHS Guidelines)*
- *relevant standards e.g. Workers' Accommodation: Process and Standards (IFC and EBRD)*
- *relevant sector standards e.g. workers accommodation*
- *grievance redress mechanisms.*

The types of issues identified could include. risks associated with: labor influx, spread of communicable diseases, sexual harassment, gender based violence, illicit behavior and crime, and maintaining *a safe environment etc.*

The minimum Code of Conduct requirement may be based on the following:

CODE OF CONDUCT REQUIREMENTS

A satisfactory code of conduct will contain obligations on all project staff (including sub-contractors and day workers) that are suitable to address the following issues, as a minimum. Additional obligations may be added to respond to particular concerns of the region, the location and the project sector or to specific project requirements. The issues to be addressed include:

1. Compliance with applicable laws, rules, and regulations of the jurisdiction
2. Compliance with applicable health and safety requirements (including wearing prescribed personal protective equipment, preventing avoidable accidents and a duty to report conditions or practices that pose a safety hazard or threaten the environment)
3. The use of illegal substances
4. Non-Discrimination (for example on the basis of family status, ethnicity, race, gender, religion, language, marital status, birth, age, disability, or political conviction)
5. Interactions with community members (for example to convey an attitude of respect and non-discrimination)
6. Sexual harassment (for example to prohibit use of language or behavior, in particular towards women or children, that is inappropriate, harassing, abusive, sexually provocative, demeaning or culturally inappropriate)
7. Violence or exploitation (for example the prohibition of the exchange of money, employment, goods, or services for sex, including sexual favors or other forms of humiliating, degrading or exploitative behavior)
8. Protection of children (including prohibitions against abuse, defilement, or otherwise unacceptable behavior with children, limiting interactions with children, and ensuring their safety in project areas)
9. Sanitation requirements (for example, to ensure workers use specified sanitary facilities provided by their employer and not open areas)

10. Avoidance of conflicts of interest (such that benefits, contracts, or employment, or any sort of preferential treatment or favors, are not provided to any person with whom there is a financial, family, or personal connection)
11. Respecting reasonable work instructions (including regarding environmental and social norms)
12. Protection and proper use of property (for example, to prohibit theft, carelessness or waste)
13. Duty to report violations of this Code
14. Non- retaliation against workers who report violations of the Code, if that report is made in good faith.

The Code of Conduct should be written in plain language and signed by each worker to indicate that they have:

- received a copy of the code;
- had the code explained to them;
- acknowledged that adherence to this Code of Conduct is a condition of employment; and

understood that violations of the Code can result in serious consequences, up to and including dismissal, or referral to legal authorities.