

# REPUBLIC OF MALAWI

MINISTRY OF AGRICULTURE IRRIGATION AND WATER DEVELOPMENT ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK FOR PROGRAMME FOR RURAL IRRIGATION DEVELOPMENT IN MALAWI (PRIDE)

> FINAL VERSION November 2015

# List of Acronyms

ADD	Agricultural Development Division	
ALDDC	Agricultural Livelihood Diversification & Development Centre	
ASAP	Adaptation for Smallholder Agricultural Programme	
ASWAp	Agriculture Sector Wide Approach	
AWPB	Annual Work Plan and Budget	
СА	Conservation Agriculture	
CAADP	Comprehensive Africa Agriculture Development Programme	
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora	
CBNRM	Community Based Natural Resource Management	
COSOP	Country Strategic Opportunity Programme	
DADO	District Agriculture Development Officer	
DOI	Department of Irrigation	
DPIST	District Planning and Implementation Support Team	
DPD	Director of Planning and Development	
EAD	Environmental Affairs Department	
EC	Environmental Coordinator	
EIA	Environmental Impact Assessment	
EIB	European Investment Bank	
EMA	Environment Management Act	
ESIA	Environmental and Social Impact Assessment	
ESMP	Environmental Social Management Plans	
EU	European Union	
GAPs	Good Agricultural Practices	
GoM	Government of Malawi	
HIV/AIDs	Human immunodeficiency virus infection and acquired immune deficiency syndrome	
IFAD	International Fund for Agricultural Development	
IPM	Integrated Pest Management	
IRLADP	Irrigation Rural Livelihoods and Agricultural Development Programme	
MoAIWD	Ministry of Agriculture Irrigation and Water Development	
MoFEPD	Ministry of Finance Economic Planning and Development	
MLGRD	Ministry of Local Government and Rural Development	
MoNREM	Ministry of Natural Resources, Energy and Mining	
NEAP	National Environmental Action Plan	
РСО	Programme Coordination Office	
PDO	Programme Development Objective	
PRIDE	Programme for Rural Irrigation Development	
PSC	Portfolio Steering Committee	

PTSC	Portfolio Technical Steering Committee
RAP	Resettlement Action Plan
RLEEP	Rural Livelihoods Economic Enhancement Programme
SAPP	Sustainable Agriculture Production Programme
SESA	Strategic Environmental and Social Assessment
SHFS	Smallholder Food Security
SSCF	Small Scale Commercial Farmers
STD	Sexually Transmitted Diseases
ТА	Technical Assistance
WUA	Water User Association

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Thanks are also due to the design team of PRIDE, and IFAD officials and technicians.

## **Executive Summary**

### Introduction

IFAD is supporting the Government of Malawi (GoM) to implement a Programme for Rural Irrigation Development (PRIDE) starting in 2016 and with an expected duration of 7 years. PRIDE will target support to the Northern and Southern Regions of Malawi.

The PRIDE consists of two components:

- Component 1: Irrigation Development and Catchment Management
  - Sub-component 1.1 Land and Water Governance
  - o Sub-component 1.2 Irrigation System Development
  - Sub-component 1.3 Soil and Water Conservation
- Component 2: Agriculture and Market Linkages
  - o Sub-component 2.1 Improved Agricultural Practices
  - Sub-component 2.2 Market Linkages
  - Sub-component 2.3 Malawi Innovation Challenge Fund / Irrigation window
  - Sub-component 2.4 Improved Cooking Stoves

The catchment management activities will benefit smallholders with land plots in the wider catchment areas and target irrigation schemes. Ministry of Agriculture Irrigation and Water Development (MoAIWD) will be the lead implementing agency. Department of Irrigation (DOI) will have the responsibility of coordinating implementation. DOI has limited resources and therefore MoAIWD will host a Programme Coordination Office (PCO) tasked with the responsibility of PRIDE coordination and management using Technical Assistance (TA) when needed.

## **Objectives of the ESMF**

The main objectives of the ESMF are:

 Identification and establishment of procedures and methodologies for the environmental and social assessment, review, approval and implementation of investments to be financed under the project;

- Specification of roles and responsibilities including the necessary reporting procedures, for managing and monitoring environmental and social concerns related to project investments;
- Identification of necessary training, capacity building and technical assistance to ensure the implementation of the ESMF provisions;
- Provision of information resources for implementing the ESMF.

## **Approach and Methodology**

This Environmental and Social Management Framework (ESMF) was developed as part of the design of PRIDE aiming to address all relevant environmental and social safeguards. Information has been collected through a number of research methods, which include review of related literature from published and unpublished documents, field investigations and consultation with key stakeholders (national/local/district officers, individual farmers and associations) during field visits.

### ESIA/ESMP preparation, review and appraisal process

The ESMF establishes the environmental and social impact assessment procedures, reporting systems, and responsibilities to be adopted by the implementing agencies for the duration of the PRIDE, including:

- Environmental and social screening of sub-projects of proposed subprojects
- Steps to be taken for an ESIA, including an application for environmental approval;
- An annual environmental and social audit ;
- Guidelines on the environmental and social impact of potential subprojects;
- Compliance mechanisms; and
- Descriptions of roles, including terms of reference.

### Main environmental and social impacts of the PRIDE

The interventions proposed under the PRIDE are not likely to result in significant adverse environmental or social impacts if carefully managed as their main objective is to provide local small farmers with adequate irrigation infrastructures and capacity with integrated water resources management. However, if not carefully designed and implemented, the proposed subprojects can lead to negative environmental and social impacts, particularly those which entail investments in infrastructure development (rehabilitation and new construction) as well as the intensification of agriculture which may lead to deforestation and soil and water contamination. Furthermore, weak or inadequate capacity for designing, managing and monitoring subprojects can lead to poor design and implementation and exacerbate adverse impacts.

Impacts can be divided into environmental and social impacts associated with construction and operation, which depends specifically on the size and nature of the subproject and the environmental and social context where the subprojects will be situated. The implementation of the proposed PRIDE will result in a number of environmental and social impacts. Some of these impacts may be negative or adverse while others are positive and beneficial. Annex VIII provides preliminary information on social, environmental and climate change related issues collected during the field visits and consultations established during the ESMF development. These notes will be useful as orientation to the ESMPs.

More specific considerations such as ensuring a close consultation process with the beneficiaries, changing demand and use patterns, designing for management and safety and securing reliable geo-hydrological data need to be made to ensure the quality of design for the dams. This would provide mitigation measures and also enable best practice to be followed. In addition, accompanying measures at a larger scale to secure sustainability of the infrastructure should be anticipated.

The potential environmental and social impacts (both direct and indirect) of the proposed PRIDE include the following:

#### During the construction phase

**Impacts on landscape, habitats and biodiversity** – During the construction phase it is likely damages to the vegetation cover will occur due to installation of new structures for the irrigation schemes, localised land clearing, removal of the trees and shrubs for construction of dams, canal alignment, disposing of excavated materials and land levelling, digging of canals and construction of water off-take points. Losses of soil and landscape degradation are also impacts associated with these activities. Habitat fragmentation and wildlife disturbance may also occur depending on the sites. **Specific impacts induced by construction of dams** – potential changes in flow patterns, negatively impacting wildlife and natural habitats, capture of sediments, water-borne diseases, flooding and soil loss of farmlands.

**Noise, vibration and emissions** – Noise, vibration and emissions will occur in the course of activities such as transportation and operation of machinery. Dust emissions and fuel combustion emissions from vehicles and other equipment will also occur during this phase resulting in loss of air quality and inducing human health implications.

**Generation of waste, including construction waste**– Construction and road rehabilitation works will generate spoil materials and construction waste. Concentration of workers will also contribute to localized increase of waste.

**Impacts on archeological sites** – Although no registered or known cultural heritage sites were identified for the areas of intervention the potential risk of encountering archeological sites should be considered, including graveyards.

**Social impacts** – Impacts on informal land and water use may be caused in the course of roads rehabilitation and access to new irrigation sites. The construction and in-field land preparation will create opportunities for employment at the local level.

HIV/AIDS and other STDs will likely increase due to influx of people to the areas in search of employment opportunities.

Physical displacements, cultural assets relocation and temporary economic loss are expected due to the construction of irrigation schemes and expansion of farmlands.

**Work related accidents** – Weak technical capacity and negligence on operation of vehicles and machinery are likely to induce accidents. Lack or inadequate use of safety gear may also contribute to accidents that may result in trauma and other casualties.

### **During Operation Phase**

**Environmental and Natural Resources Management** – Rehabilitation of irrigation and drainage schemes will bring significant positive impacts for the rural population and to the global environmental and natural resources management, in particular water and landscape management. Integrated management of water ensuring efficiency and best practices will generally contribute to reduce the loss of natural resources and to ensure a sustainable management of the landscape

**Specific impacts induced by construction of dams** – expected positives impacts such as water security and increase of adaptation to droughts and floods, will result from permanent availability of water.

**Socio-economic** – Irrigation and drainage schemes will result in a highly positive impact on the rural communities engaged in agriculture. Increase in yields of existing crop production and diversification into higher value crops requiring irrigation, will result in higher incomes and consequently better life conditions.

Rehabilitation of roads will improve safety and access to markets and social services centers amongst the communities bringing improvement of their livelihoods.

The WUA, and community based natural resources management, will increase monitoring and general water and natural resources capacity.

**Human Health** – Agro-production in well-supported irrigated areas will lead to increased use of agrochemicals. Poor handling and application of agrochemicals will increase risks to the health of people exposed to pesticides and the consumers of the agriculture products.

Disposal of dredged materials resulting from the maintenance of irrigation infrastructures may contribute to public health problems.

New crops will promote new food habits introducing new nutrients in the diet of the communities and contributing to a healthier nutrition.

**Soil and water pollution** – the use of agrochemicals will contribute to soil and water (surface and groundwater) contamination with hazardous pollutants. Maintenance of irrigation infrastructures such as dams and canals will generate dredged materials whose disposal may result in soil contamination.

**Dams** - dams are obstacles to the flow patterns interrupting animal migration routes, capture of sediments leading to the reduction of the nutritional value of the water for the aquatic life. Dams also are potential sources of water-borne diseases, soil degradation and flooding of productive land.

**Erosion and water logging** – weak maintenance of irrigation infrastructures may lead to local flooding, inducing soil erosion.

**Optimum use and safety monitoring of dams** - The multiple uses of water should be encouraged based on feasibility, including by upstream and downstream water users particularly where competition exists. Appropriate O&M arrangements can avoid or mitigate conflicts and should take into account capacity building for in order to optimize overall reservoir efficiency. A dam safety plan is essential and should be disclosed to relevant officials. The plan should be commensurate with the risk.

**Biodiversity and habitats conservation** – The identification and implementation of conservation measures for special conservation areas, habitats and relevant species will contribute to the preservation of biodiversity at species, habitats and ecosystem levels. Nevertheless there is also a potential of conflicts with wildlife that may invade farmland (monkeys, Hippos)

**Climate change resilience** – Agricultural best practices and the introduction of crops adapted to the changing climate conditions will contribute to soil management and restoration and the implementation of reforestation and other conservation activities, increasing social and natural resilience.

### **Environmental and Social Management Plans**

As part of the ESIA/ESIA process, Environmental and Social Management Plans (ESMPs) will need to be prepared and implemented. The ESMPs will ensure that the appropriate mitigation measures have been employed to avoid and/or minimize any potential impacts resulting from the proposed activity. Annex II provides a proposal of contents and structure to be used during the development of the ESMPs and Annex III gives a sample of an ESMP and Monitoring Plan.

A Resettlement Action Framework was also prepared as a standalone document aiming to guide the preparation of Resettlement Action Plans (RAPs).

#### Institutional Strengthening, Capacity building and Training

Within the PRIDE arrangements, an Environmental Coordinator (EC) as part of the Programme Coordination will be appointed for the overall coordination of the environmental and social components, including management and supervision of the safeguard provisions (ESMF). The Environmental Coordinator should be able to manage and monitor the implementation of the ESMF and liaise with the all relevant

other stakeholders (national, regional and district) on environmental and social issues related to the PRIDE. The environmental related activities will also be part of the training and sensitizing actions of the project beneficiaries thus contributing to their awareness and implementation of environmental and climate change related best practices.

It is recommended the allocation of funds to provide the technical assistance to support the capacity needs of the implementing agencies to apply the ESMF tools and requirements. This will include workshops, trainings and ESMF monitoring which are needed to ensure effective implementation of the ESMF throughout the life of the Project. All this activities should involve the EAD district officers contributing to their enhancement and development of monitoring and follow up capacities.

### Monitoring

The ESMF outlines a number of indicators as part of its implementation, which will be included in the overall project monitoring. In addition, an Annual Audit on ESMF, ESIA, ESMPs and RAFs implementation will be prepared by the POC with support from the EAD as well as IFAD's annual supervision will also include implementation assessment and review if necessary. In this regard, monitoring of the indicators is recommended to safeguard against specific impacts.

### **Proposed implementation budget**

It is estimated that the implementation of the ESMF including the required provisions, training and capacity building and the mitigation measures at each of the sites will cost approximately **\$1,673,000**.

The costs of preparing and implementing the safeguards aspects of the project are estimates as the size, type and location of the subprojects are not fully determined at this stage

### **Conclusion and recommendations**

Recommendations for mitigation and monitoring made in this report will have to be further elaborated during early implementation phase when the actual schemes have been established, the location of the various bulk infrastructure components determined, and design specifications availed, particularly for the proposed dam. At that time the environmental and social impacts induced by the establishment and construction of infrastructure will have to be re-assessed. Further studies have been recommended in order to:

Prepare a Resettlement Action Plan to address the issue of land acquisition if found necessary, and loss of property, trees and crops for the schemes, including land to be taken for the dam or other water storage facilities. The RAP will have to identify the exact number of project affected people/parties and affected property, and will have to comply with national and IFAD requirements for compensation and resettlement, including valuation of affected properties, livelihood restoration plans, and grievance mechanisms

As part of the initial implementation of the programme it is vital to ensure the development of specific studies to establish detailed baselines i.e. water quality in the river, daily flow levels in the rivers, soil quality (nutrient content and soil structure), and a socio-ecological including heritage, assessment of the scheme areas in order to determine the impacts on sites of cultural importance (if any).

### Introduction

This document corresponds to the updated version (May 2015) of the Environmental and Social Management Framework (ESMF) for the Programme of Rural Irrigation Development (PRIDE), in Malawi. That was initially developed in October-December 2014.

PRIDE will target support to the Northern and Southern Regions of Malawi. The catchment management activities will benefit smallholders with land plots in the wider catchment areas and target irrigation schemes. MoAIWD will be the lead implementing agency. DOI will have the responsibility of coordinating implementation. DOI has limited resources and therefore MoAIWD will host a PCO tasked with the responsibility of PRIDE coordination and management using TA when needed. The programme is expected to be implemented over a seven year period.

The ESMF aims to provide guidance for effective management of environmental and social issues in the PRIDE by enhancing the positive development impacts of the project and mitigating identified and potential adverse impacts. The ESMF is in line with the Government of Malawi (GoM) and IFAD's policies, guidelines and procedures on management of environmental and social development issues.

The ESMF provides the basis for the preparation of eventual Environmental and Social Impact Assessments (EIAs) and/or Environmental and Social Management Plans (ESMPs), if required.

## **Programme Background and Description**

PRIDE's general objective is to help enhance the resilience of rural communities to climate change effects and economic shocks and ensure food security. Its development objective is that smallholder farmer households increase income and nutritional intake from sustainable agricultural production.

### **Programme location**

PRIDE will target support to the Northern and Southern Regions of Malawi. The catchment management activities will benefit smallholders with land plots in the wider catchment areas and target irrigation schemes. The selection criteria for all sites will be based on previous experiences from similar initiatives (Irrigation Rural Livelihoods and Agricultural Development Programme - IRLADP) and will include: (i) irrigation

potential, dry season water availability and number of beneficiaries; (ii) demand for irrigation by the district and willingness and readiness to participate by potential beneficiaries; (iii) documented poverty levels; (iv) geographical concentration of schemes for maximum impact, cost efficiency and supervision; (v) technical readiness of the identified site in terms of available system designs; and (vi) synergies with the IFAD country portfolio and other programmes.

Poverty rates in the candidate districts range from 37% to 67%, of whom 11% to 33% are described as ultra-poor. Most of the remainder are near poor, and at risk of slipping backwards into the ranks of the poor due to frequent shocks. The Ministry of Agriculture Irrigation and Water Development (MoAIWD) categorises smallholder farmers into three groups: (i) Commercial Farmers are generally male, economically active, hire labour, market-oriented and tend to be the first to adopt new technologies; (ii) Small-Scale Commercial Farmers (SSCFs) usually attain food security, are skilled, and market oriented, but have limited assets. They are easily mobilised into farmers' clubs/groups and able to access services with the aim of farming as a business. When supported technically and financially with loans and access to markets, this group is responsive and facilitates wider spread of Good Agricultural Practices (GAPs) and will be targeted by PRIDE to initiate commercial farming in an irrigation scheme; and (iii) Smallholder Food Security (SHFS) farmers are productive men and women who have the potential to achieve household food security, but due to limited land and resources find it difficult to produce a surplus. They aim at food security and need technical and financial support in terms of basic inputs such as seed and fertiliser to increase food crop yields. This group constitutes 80% of smallholder farmers, and will be supported by PRIDE to follow the lead of the SSCFs.

PRIDE is expected to benefit approximately 17,500 smallholder farm households in the Programme areas. Assuming an average household size of 5 people, total beneficiaries would be about 87,500 people. There will also be indirect beneficiaries, primarily the large population of maize producers who will benefit indirectly from the Programme through improved access to information and improved agriculture technologies. Consumers would also benefit from more, better quality vegetable products, with positive effects in terms of improved nutrition and overall food security.

PRIDE will help mobilise concerned government agencies at District level, and will outsource services that presently cannot be supplied by the government agencies.

The communities will initially be represented by their leadership and their existing structures at village level in a 'combined village committee'. This committee will be asked to select beneficiaries for planned activities and to assist these to form groups or organisations that are responsible (in case of complex activities such as irrigation scheme development) to contribute to the further preparation of an activity; and (for well-prepared activities) to contribute to the subsequent implementation.

#### Malawi

Programme for Rural Irrigation Development (PRIDE) Design report



Fig. 1 - PRIDE Geography (adapted from the PRIDE PDR)

The northern and southern regions, where PRIDE priority sites are situated, include different ecological zones such as the lowlands, highlands, mountains and escarpment areas. The lowland areas are below 600m in elevation and correspond to the lakeshore and floodplain areas. Marshy areas, which are flooded in the rainy season are located in the mainly in the floodplains in the southern region. The soil in these areas is deep well drained latosols on higher parts of the catena, with poorly drained sand and clay in the hollows. The highland areas, of 900 to 1,400m in elevation, are underlain with relatively thick laterites thus soils are predominantly leached latosols. Mountain areas generally constituted of massive igneous rocks have elevations of 1,400 to 2,500m in the northern region, while in the southern regions; the mountains of over 2,000m high tend to exist in isolation. Residual soils or weathered rocks are very thin and vegetation growth is poor. Escarpment areas comprise steep slopes between highlands and lowlands on the west side of Lake Malawi where some of the northern region sites are located. The subsoil, which are mainly latosols, is generally thin and vegetation is relatively poor compared to the highland and lowland areas (Water Resources Master Plan, 2013).

Malawi has a sub-tropical climate with two distinct seasons; a long rainy season (usually from November to April), and a dry season (May to October). Malawi also straddles equatorial east Africa and subtropical southern Africa, which are dominant modes of climate variability. This potentially results in separate climate drivers influencing the northern and southern parts of the country (Behera et al., 2005; Pohl et al., 2007). The rainfall patterns are influenced by the Inter- Tropical Convergence Zone and the Congo Air Mass. Other factors influencing the climate of Malawi include anti-cyclones, easterly waves, occasional tropical cyclones as well as orographic and topographic effects. The mean annual temperatures range from below 12°C (minimum) in the plateaus and hills to above 32°C in the lowlands (maximum) and mean annual rainfall ranging from 725mm in some low-lying areas, to above 2,500mm in high altitude areas. The humidity ranges from 50% in the dry months to 87% in the wet months.

In terms of surface water quality, there are variations in the various waterbodies that PRIDE potential sites will use as sources. The water quality monitoring points are located on the main rivers and thus specific tests would be required on the smaller rivers during the detailed design of the irrigation schemes. The concentrations of phosphate downstream of the Shire River in the southern region are especially high

and exceed the upper limit defined by the Malawi standard. Turbidity and suspended solids on the Shire River go over the thresholds and are approx. fifty times as higher than in other areas, which suggests that land erosion has occurred in serious levels on the upstream watersheds. The quality in the water bodies in the northern region is generally better with concentrations of phosphates and nitrates within acceptable limits. However, the levels of suspended solds and turbidity also show increasing trends downstream of areas where agricultural developments have occurred. Water hyacinth covers some of the water surfaces interfering with the free flow of water and its dense mats reduce the amount of light that penetrates through it affecting the growth of plankton (Water Resources Master Plan, 2013).

### **Main objectives**

PRIDE aims to enhance resilience of rural communities to climate change and market risks to ensure their food security. Its development objective is to enable farmers to sustainably produce for household nutritional demands and income generation from viable markets. Sustainability is pursued under PRIDE, as this asks for outputs to be delivered that are socially just, environmentally sound, financially viable, institutionally embedded and technically well-designed. A special concern under the environmental dimension is to enhance resilience of the scheme cluster areas (i.e. irrigation scheme plus territory of concerned villages) to anticipated climate change effects.

#### **Components and outcomes**

PRIDE comprises two components: one aiming for irrigation development and catchment management; and a second one developing agriculture and market linkages. Both components are designed anticipating the exit of Programme support, and therefore address questions of long-term access to and management of resources; and of viability of farming systems beyond the Programme support period. The components and outcomes organization of the PRIDE are the following:

- Component 1: Irrigation Development and Catchment Management
  - o Sub-component 1.1 Land and Water Governance
  - Sub-component 1.2 Irrigation System Development
  - Sub-component 1.3 Soil and Water Conservation
- Component 2: Agriculture and Market Linkages
  - Sub-component 2.1 Improved Agricultural Practices
  - Sub-component 2.2 Market Linkages

- Sub-component 2.3 Malawi Innovation Challenge Fund / Irrigation window
- Sub-component 2.4 Improved Cooking Stoves

### **Components description**

**Component 1 – Irrigation Development & Catchment Management.** This component aims to develop resilient land and water management systems for smallholder households on both rain-fed and irrigated lands.

A Community Planning and Investment Agreement (CPIA) process will be initiated in scheme cluster areas, which includes free prior and informed consent (FPIC) procedures and precedes any investment decision. PRIDE will set up a multidisciplinary CPIA team in each district to guide the preparation activities, comprising of concerned government agencies at District level and specialized service providers where required. The communities will during initial consultations be represented by their leadership and their existing village development committees, who will be asked to convene a Combined Village Committee for the scheme cluster area. Following an appraisal process, increased knowledge on the proposed investments will enable the farmers to elect a WUA formation committee for the Water Users' Association. The formation committee will take a lead role in the establishment of land and water agreements, overseen by the Combined Village Committee.

An initial selection of irrigation schemes has been made from available pre-feasibility and feasibility studies in the Irrigation Master Plan and Investment Framework (IMPIF). Schemes outside the 40 - 850 ha bracket have been excluded; as have been Districts engaged in the Lower Shire Project. Priority has been given to schemes generating an EIRR of above 10%. Finally, schemes have been clustered to realise efficiencies during implementation; with preference given to a series of three schemes to be developed within one district. Thus, three schemes are developed in series, with a one-year overlap between them; bringing the total Programme implementation period to seven years. Sequencing scheme development in one area allows for efficiencies in staff, contracts and cross learning. To reduce the risk of delays over the total Programme period, the larger – and often more complex – schemes would generally be the first to be developed; allowing possible delays to be recovered over the subsequent years. The selection of schemes (table below) has been reviewed and confirmed by the Department of Irrigation.

Table 1	- Selected	schemes
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			Command
Scheme	District	Region	Area (ha)
Marko	Chitipa	North	727
Mafinga Hill	Chitipa	North	43
Mwenilondo	Karonga	North	524
Kasimba	Karonga	North	162
Kasano	Karonga	North	95
Msenga	Nkhata bay	North	836
Mpamba	Nkhata bay	North	788
Chipofya	Nkhata Bay	North	369
Kadewere	Chiradzulu	South	300
Nkhulambe / Wowo	Phalombe	South	310
Lingoni	Machinga	South	189
ChanyunguMposa	Machinga	South	114
Matoponi	Zomba	South	73
Mlooka	Zomba	South	138
Nazombe	Chiladzulu / Zomba	South	470

Total: 5138

**Component 2 – Agriculture and Market Linkages**. This component aims to develop environmentally and economically sustainable agricultural production systems managed by smallholder households on both rain-fed and irrigated lands. Attention will be paid to both production for nutrition and to linking production to market demands. In general, introduction of good agricultural practices for rain-fed maize, legumes and vegetable production will help bolster local nutrition levels, whereas production and marketing support for potatoes, legumes, rice and green maize would enable farm households to generate income. Regional variation in the choice of crops and value chains to be supported will be reflected during implementation. It is noted that presently unmet national demands exist for amongst others legumes and cereals.

The consultative planning process described under component 1 also helps select crops and value chains, and the beneficiaries to be engaged in them. General background information on crops and value chains will be complemented with local experiences and views, in order to decide which specific Good Agricultural Practices (GAPs, including a/o conservation agriculture, integrated pest management and post-harvest care) and value chains will be supported in a specific scheme cluster

area. Criteria for beneficiary selection will include further targeting on poorer households and on specific opportunities for women and youth.

Component 2 builds on the experiences and approaches of RLEEP and SAPP; it will include a systematic approach towards consultative planning of interventions with (female) farmers and the private sector; and will address both production and marketing in all selected scheme cluster areas; as well as cater for crops and value chains under both rain-fed and irrigated conditions. Emphasis will be given to off-the-shelf technology and to value chains which have been assessed already; some resources will be earmarked for adaptive research and on-farm demonstration; and for the exploration of additional value chains. Future GAPs and value chains could include small livestock options.

#### **Organisational Framework**

MoAIWD will be the lead implementing agency. The Programme will be implemented by a stand-alone Programme Coordination Office (PCO) established under the lead Ministry and staffed by dedicated and highly qualified personnel who are from government or recruited from the labour market. Recruitment of key PCO staff requires prior consent from IFAD. The PCO will include a senior Programme Manager, a Procurement specialist, a Financial Management specialist, community mobilisation and targeting specialist, an Irrigation Specialist, an Agriculture & Value Chain Specialist, a Planning, Monitoring and Evaluation specialist and, as proposed in the ESMF, an Environmental coordinator. The latter will be responsible for integrating environmental, social and climate change issues in the daily management of the programme and the coordination/implementation of ESMPs, RAPs and all ESIA related initiatives, including training, capacity building monitoring and reporting. The PCO will mobilise agencies – either by enabling existing services or outsourcing required services - to work with the communities in the scheme cluster areas. The work of the local agencies of MOAIWD (irrigation, extension) and the Department of Land will be facilitated by investments in transport, communication and service delivery. Where these agencies lack adequate numbers of staff or the prerequisite competence, the PCO will engage other service providers, such as NGOs working on agricultural development and specialised engineering services.

The WUAs to be formed or strengthened under PRIDE will be members of the Catchment Management Committees that will be created under the National Water

Resources Authority. Thus the NWRA will have an oversight role for the activities that relate to catchment management.

## **Environmental Management Requirements and Practices**

This ESMF complies with both the IFAD's SECAP and the relevant GoM legislation as summarized below. In general there are no significant differences between the national regulations and IFAD's policies. When finding any particular difference, the PRIDE will aim to apply the more stringent requirements.

### **IFAD'S Guiding Values and Principles for SECAP**

In support of IFAD's mission, investing in rural people in order to enable poor rural people to overcome poverty, IFAD is committed to adopting the following guiding values and principles:

A. Address the vulnerability and adaptation priorities of rural people. Examine the cause-effect relationship between rural poverty, environmental degradation, and climate change. Ensure the efficient use of natural resources, subject to their regenerative capacity. Promote approaches to (re)build social cohesion and good governance of natural resources. Respect and make use of endogenous knowledge & gender-sensitive technologies drawing especially on the unique knowledge of women and Indigenous Peoples. [ENRM Policy and Climate Change Strategy]

B. **Promote the sustainable use of natural resources and protection of key ecosystems in an integrated manner**. Ensure that IFAD operations do not lead to natural or cultural resource degradation, including clearing of tropical forests, unsustainable use of natural resources, the threat/loss of biodiversity or threats to resources of historical, religious or cultural significance. This applies especially to agricultural intensification activities and value chain development. [ENRM Policy]

C. **Incorporate externalities and minimize social costs.** Avoid or mitigate any potential diseconomies imposed by an IFAD-financed operation on the environment external to the project boundaries. Where possible, address the affected areas through joint projects (which may constitute an entire command area or watershed) and partnerships to minimize social, economic and environmental costs in the affected area and, where possible, to incorporate the externalities. [ENRM Policy]

D. Implement participatory approaches, with special emphasis on the participation of and benefits to women and youth. Strengthen local institutions including user groups, essential for promoting environmental sustainability and social cohesion. Promote appropriate incentive systems at all levels and maximize the opportunities for local grassroots organizations and clients, with special emphasis on equal participation of women and youth in project/programme design and implementation, as well as in cost recovery and delivery systems. [Gender and Targeting Policy]

E. **Promote the development of Indigenous Peoples and other marginalized groups.** Enhance their livelihoods: secure ownership/access to ancestral land and territories; strengthen their institutions; promote free, prior and informed consent; and value indigenous knowledge systems. Apply the principles and procedures in the IFAD Engagement with Indigenous Peoples Policy. [Indigenous People's Policy]

F. **Avoid involuntary resettlement wherever possible**. While working on 'doing good', IFAD will adhere to a 'do no harm' principle at all times, so as to minimize physical and potential economic impacts. Explore viable alternative project designs to address risks, restore livelihoods to improve the standards of living of affected persons. The approach and level of measures taken will be proportional to the range of IFAD's operations. [Land Policy]

G. **Promote sound agricultural and manufacturing processes.** These include traditional, indigenous, and climate-smart technologies, integrated pest management, and use of biological control. When the use of agrochemicals is necessary, ensure (through enhanced environmental awareness, farmer training, improved field extension services, etc.) that their application, storage, and disposal is in line with international standards. Encourage clients to promote safe and healthy working conditions. [ENRM Policy].

H. **Promote SECAP compliance monitoring.** Focus on projects identified as 'at risk' or in 'sensitive areas' to ensure continued diligence in pursuing the project's development objectives. [ENRM Policy]

I. Ensure stakeholder consultation, transparency and accountability in programme/project operations. Engage the full range of stakeholders in formulation, implementation and monitoring of programmes/projects. Maintain transparency and accountability by disclosing draft environmental and social

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assessments and other relevant documents (at Quality Assurance stage) to stakeholders and by responding to their concerns/complaints in a timely manner. [Disclosure Policy]

### IFAD's social, environmental and climate assessment procedures

The above values and principles are put in practice through a set of procedures which are critical for ensuring that potentially adverse environmental and social consequences are identified, minimized, and properly mitigated.

IFAD also carries out an environmental and social screening of sub-projects of each proposed project to determine the appropriate extent and type of Environmental and social Assessment (ESA) to be undertaken and whether or not the project may trigger other safeguard policies.

IFAD's environmental and social categorization of projects/programmes comprises the following categories:

- Category A: The programme/project may have significant adverse environmental and/or social implications that: (i) are sensitive, irreversible or unprecedented; (ii) affect an area broader than the sites or facilities subject to physical interventions; and (iii) are not readily remedied by preventive actions or mitigation measures.
- Category B: The programme/project may have some adverse environmental and/or social impacts on human populations or environmentally significant areas, but the impacts: (i) are less adverse than those for Category A; (ii) are site-specific and non-irreversible in nature; and (iii) can be readily remedied by appropriate preventive actions and/or mitigation measures. While no formal ESIA is required for Category B programmes/projects, in many cases further environmental analysis could be undertaken during project preparation or implementation.
- Category C: The programme/project will have negligible or no environmental or social implications – no further environmental analysis is required.

In addition, the environmental and social screening of sub-projects exercise is used to determine the exposure of the programme objectives to climate-related risks (High, Moderate or Low). SECAP provides guidance statements on biodiversity and protected area management; agrochemicals; energy; fisheries and aquaculture; forest resources; water; small dams; physical cultural resources; rural roads; development of value chain, microenterprises and small enterprises; and physical and economic resettlement – all of which are applicable in the context of the PRIDE Programme. Where resettlement or economic displacement is envisaged, SECAP requires that the principles of "do no harm" and "free, prior and informed consent" are adhered to at all times and for all beneficiaries for any intervention that might affect the land access and user rights of communities.

The PRIDE has been assigned an Environmental and Social Category "A" given that it will promote irreversible land use change in the development of the areas for irrigation including land levelling and changes in the immediate hydrology of the intervention areas (particularly run-off) as well as expansion of the cultivated land. This categorisation was based on the potential impacts expected particularly due to the large-scale irrigation schemes. As a programme, a full ESIA should be developed in line with IFAD environmental procedures and guidelines as well as with the national regulations in Malawi.

The programme has a "moderate" climate risk classification as the interventions are expected to be vulnerable to floods and drought which are likely to increase in frequency impacting agriculture production, irrigation infrastructures, and ultimately impacting the farmer communities' livelihoods. Information available on climate risk for Malawi informed the design on PRIDE and adaptation measures have been incorporated to be financed mainly by the Adaptation for Smallholder Agriculture Programme.

A Environmental and Social Review Note was developed during the design of the Programme, as part of the environmental screening and scoping. A Social, Environmental and Climate Assessment Procedures Review Note following the establishment of the new IFAD's Social, Environmental and Climate Assessment Procedures (SECAP), which came into effect on 1 January 2015, later replaced this note. A Resettlement Action Framework was also developed providing guidelines for the later development of Resettlement Action Plans.

When necessary, ESIA and SEA are also developed for projects and programmes, respectively.

Malawi Policy and Legal Framework for Environmental Management

The Constitution of the Republic of Malawi

The Constitution of the Republic of Malawi (1995) sets a broad framework for sustainable environmental management at various levels in Malawi. A sustainable development vision is ensured with the call for prudent management of the environment and accords future generations their full rights to the environment. The Constitution also provides for a framework for the integration or application of international environmental and foreign case law into the national legal system.

#### **National Environmental Action Plan (1996)**

The National Environmental Action Plan (NEAP – 1996) is the Malawi framework mainstreaming environmental planning and management into the country's socioeconomic development, including stakeholders' participation.

The main environmental drivers that shape the NEAP are deforestation, natural resources, including biodiversity loss and habitat degradation, soil depletion and erosion, deforestation combined with social issues such as demographic growth, poverty and general lack of human environment conditions.

Stakeholders at national and local level, public and private, are called by the NEAP as relevant actors for environmental planning and management, following guidelines provided by the NEAP.

#### National Environmental Policy (1996 & 2004)

Following the National Environmental Action Plan, the National Environmental Policy (NEP) was established in 1996 and revised in 2004, providing a comprehensive policy framework on environmental planning for development programmes introducing environmental impact assessment for projects. The NEP aims at the promotion of sustainable development through an efficient and sound management of the country's Environment.

The NEP has as goals:

- secure for all persons resident in Malawi now and in the future, an environment suitable for their health and wellbeing;
- promote efficient utilization and management of the country's natural resources and encourage, where appropriate, long-term self-sufficiency in food, fuel wood and other energy requirements;
- facilitate the restoration, maintenance and enhancement of the ecosystems and ecological processes essential for the functioning of the biosphere and prudent use of renewable resources;

From the NEP there are direct implications that should be considered by PRIDE requiring the development of appropriate environmental and social management plans (ESMP). The ESMPs will need to be implemented covering the different stages of project's implementation and shall include actions and measures to mitigate the potential negative impacts and enhance the positive impacts induced by the PRIDE.

#### **Environment Management Act (1996)**

The EIA legislation contained in The National Environment Management Act No. 23 of 1996 outlines the specific legislation providing guidelines and procedures. EIA is a statutory requirement and listed projects cannot be licensed and implemented until a satisfactory EIA study has been completed and approved.

EIA provisions in the Environment Management Act (EMA) are found in Sections 24, 25, 26, 27, 29 and 63, 69 and 76.

### **Guidelines for Environmental Impact Assessment (1997)**

In line with the Environmental Management Act, Guidelines for Environmental Impact Assessment (EIA) were established in 1997. All programmes and projects should follow the Guidelines for EIA, integrating environmental considerations in line with the national development strategies. The Guidelines outline specific roles for institutions in managing environmental impact assessment, the mechanisms for integrating in project planning. The Act provides a list of prescribed projects that require an EIA and a list of projects that may require an EIA in all sectors. Standards for formatting and structuring the environmental impact assessment reports are also provided by the Guidelines.

### Other relevant environment related legislation

### Land Act, (1965)

The Land Act, 1965, covers ownership, land transfer, use of land, and compensation. It states that every citizen has a natural dependency on land and that it is therefore important that Government provides for secure and equitable access to land as a multipurpose resource and an economic asset by defining issues of security of tenure.

The Land Act establishes 3 classes of land:

1 - Public Land defined as all land which is occupied, used or acquired by the government and any other land not being customary or private land and includes:

- Any land which reverts to the Government on the termination, surrender or falling in of any freehold or leasehold title under which any parcel of land concerned is held; and
- Notwithstanding the revocation of the existing orders, any land which was immediately before the coming into operations of this Act not public land within the meaning of the existing orders.

2 - Private Land, defined as all land, which is owned held or occupied under a freehold title or a leasehold title or a Certificate of Claim or which is registered as private land under the Registered Land Act.

3 - Customary Land, defined as all land, which is held, occupied or used under customary law but does not include public land, and falls within the jurisdiction of a recognized Traditional Authority and which has been granted to a person or a group of persons and is used under customary law.

### Town and Country Planning Act, (1998)

This Act provides that no general right to compensation shall accrue in respect of any action, decision or plan taken or made under the Act that does not involve or amount to a taking or deprivation of property. It entitles the Minister with the power to acquire land on his own motion or on request from a responsible authority.

In Section 65 establishes that the Minister in accordance with the Second Schedule to the Act shall assess compensation and an assessment of compensation by the Minister shall be final and shall not be subject to any appeal or review by any court. However this later statement is not in accordance with the Constitution.

### The Land Acquisition Act (1971)

The Lands Acquisition Act (Cap 58:04) sets out in detail, the procedures for acquisition of customary land and freehold land. The general processes and procedures for proclamation of land to be acquired for a project are provided for in the Land Acquisition Act (Cap 58:04).

The Land Acquisition Act outlines procedures to be followed for land acquisition by individuals or Government. The procedures include the steps to be undertaken for government to acquire land starting from issuance of formal notices to persons with existing land interests to payment of compensation for formal land ownership transfer. Further, under section 14 of the Act, the Minister has power to re-enter for breach of conditions contained or implied in a lease. The developer will work closely with the local community and will inform them and where required, obtain consent

from chiefs, Village Heads, area councillors and local authorities for the construction works.

### Water Resources Act (2013)

The Water Resources Act establishes the Water Advisory Council that advises the Minister on:

- water policy development and review;
- water resources management;
- water abstraction and use;
- any matter about water raised by a basin management committee on which the Council considers it advisable to provide advice;
- any matter relating to the administration of this Act referred by the Minister to the Council for advice or on which the Council considers it advisable to provide advice.

Basin Management Committees are created under the Water Resources Act, the Minister, after consultation with institutions and other stakeholders and persons having an interest in water resources in a basin or part of a basin, may recognise a group of representatives of such institutions, stakeholders and persons who are organised or associated for the purpose of organising, planning or dealing with matters relating to the development, management, protection and enhancement of water resources in the basin or part of the basin, to be a basin committee for the purposes of this Act in furtherance of the Government's objective in achieving an integrated management of water resources.

The Act introduces the Water Regulator which has the capacity, among others, to determine the tariffs of fees and charges, or the maximum tariffs of fees and charges and to monitor the performance of water services providers and other water suppliers and evaluate their efficiency with respect to achieving the operational targets set in accordance with paragraph The water Regulator provides advise the Minister on any matter relating to compliance by a water services provider or other water supplier with its water services plan and conservation and demand management strategies

### Forestry Act (1997)

The Forestry Act outlines the protection and management of forests as well as protected areas, establishing the authority of the Department of Forestry. The

Forestry Act acknowledges the role of communities' participation on forest conservation and sustainable use.

Major problems of forest management in Malawi include deforestation due to cutting and extraction of timber for cooking, building, charcoal, and general use. Bush fires and encroachment resulting from cultivation close to forest reserves are also threats to sustainable forest management.

### Irrigation Act (2001)

The Irrigation Act acknowledges the protection of the environment from irrigation related degradations and establishes provisions for the development and management of irrigation, and protection of the environment from irrigation related degradations. From the governance level, it proposes the establishment of the National Irrigation Board and an Irrigation Fund and provides for local community participation in the development and management of irrigation and drainage as well as provisions for the registration of irrigation consultants permitted to practice in Malawi.

The Act provides for the development and management of smallholder irrigation schemes. It provides for the formation of irrigation management authorities to promote local community or farmers' participation in the development and management of irrigation and drainage, and proper utilization of the available water resources.

#### Pesticide Act (2000)

The main objective of the Pesticide Act is to minimise the potential adverse effects from pesticides to the people or non-target species and the environment in general. The Pesticide Act provides a comprehensive legal and administrative framework for registration, procurement, distribution, export, importation, storage, usage and disposal of the pesticides and related materials. Public campaigns on proper usage, storage, importation, export and safe disposal of pesticide containers in Malawi are also considered by the Pesticide Act

#### **Occupational Safety, Health and Welfare Act (1997)**

The Occupational Safety, Health and Welfare Act deals with the regulation of conditions of employment in workplaces with regard to safety, health and welfare of employees; for the inspection of certain plant and machinery; for the prevention and

regulation of accidents occurring to persons employed or authorised to go into the workplace, and for some related matters, including environmental concerns.

### The National Decentralization Policy and the Local Government Act

The National Decentralisation Policy through the Local Government Act (LGA) Number 42 of 1998 establishes district authorities, which are responsible for local planning management and development. Environment management and agriculture are among the sectors under the direct responsibilities of the district authorities. Pursuant to the requirements under The National Decentralization District Environmental Offices have been established, and are responsible for the implementation of the District Environmental Action Plans.

### **International Conventions and Treaties**

The Government of Malawi has signed various international environmental conventions:

- The Convention on International Plant Protection;
- The Convention on Wetland of Significant Importance;
- The Convention Concerning the Protection of the World Cultural and Natural Heritage;
- The Convention on the Conservation of Migratory Species of Wild Animals;
- The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES);
- The African Convention on Conservation of Nature and Natural Resources;
- The FAO International Undertaking on Plant and Genetic Resources;
- The United Nations Convention on the Law of the Sea;
- The Montreal Protocol for Protection of the Ozone Layer;
- The Convention on Biological Diversity;

## **Objectives of the ESMF**

The main objectives of the ESMF are:

 Identification and establishment of procedures and methodologies for the environmental and social assessment, review, approval and implementation of investments to be financed under the project;

- Specification of roles and responsibilities, and outlining the necessary reporting procedures, for managing and monitoring environmental and social concerns related to project investments;
- Identification of necessary training, capacity building and technical assistance to ensure the implementation of the ESMF provisions;
- Provision of information resources for implementing the ESMF.

## **Approach and Methodology**

This Environmental and Social Management Framework (ESMF) was developed as part of the design of PRIDE aiming to address all relevant environmental and social safeguards. Information has been collected through a number of research methods, which include review of related literature from published and unpublished documents, field investigations and consultation with key stakeholders (national/local/district officers, individual farmers and associations) during field visits.

Scheme/site	District
Marko	Chitipa
Matoponi	Zomba
Nhkulambe/Wowo	Phalombe
Nazombe	Chiradzulu
Mafinga Hill	Chitipa
Chipofya	Nkhata Bay
Kadewere	Chiradzulu

Fable 2 - Sites visite	ed during the ESM	IF development
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Discussions with the PRIDE design team and several ministry and department officers as well as previous and ongoing similar projects (IRLADP, Shire River, and Songwe) provided the opportunity to collect and review of relevant data analysis. Consultations with farmers provided information about the perception of local climate change patterns, in special related with rain season and rain patterns. In general, and for all sites, farmers identify changes in rain season duration and patterns (including dry spells during the rainy season). Reduction of the rain period, less rain and increase in heavy rain events are the main trends identified by the farmers.

The sites visited include already existing irrigation schemes requiring repair and expansion as well as ensuring water storage capacity and/or access to water by pumping or gravity. The sites were selected from the list included in the Irrigation Master Plan and Investment Framework (IMPIF) and the field visits confirm their suitability for irrigation scheme development with some environmental and social implications that are identified below. Annex VII provides selected photos of some site visits.

### **Potential Impacts**

The PRIDE will be implemented nationwide and if adequately managed the proposed interventions are not likely to result in significant adverse environmental or social impacts.

However, if not carefully designed and implemented, the subprojects can result into negative environmental and social impacts, particularly those which entail investments in infrastructure development and new construction (e.g. irrigation and drainage schemes, road rehabilitation, deforestation and expansion of cultivated areas, small dams, land levelling) and changes in the immediate hydrology of the intervention areas (particularly run-off).

Weak or inadequate capacity for designing, managing and monitoring subprojects can lead to a low environmental and social performance of the project, exacerbating adverse impacts and limited enhancement of the positive impacts.

The early identification of potential risks during the preparation and design stages of the project, considering two levels, is of extreme importance: a) the project's overall design and, b) the specific activities.

More specific considerations, which are outlined below, need to be made to ensure the quality of design for the dams. This would provide mitigation measures and also enable best practice to be followed.

- Secure a close consultation process with the beneficiaries (including the multiple water users differentiated by space, use, season, gender and required levels of reliability of water security) with the disclosure of data and grievance redress mechanisms.
- Be conscious of changing demand and use patterns (e.g. small dams designed for local irrigation may turn into drinking water reservoirs for expanding towns and settlements).

- Design-for-management, i.e. consider local management capacities for O&M (including major repairs).
- Design for safety. Ensure that a qualified civil engineer either prepare or reviews and approves the dam design and periodically checks the quality of construction.
- Minimize future operation constraints and maximize flexibility of future water use: additional benefits may offset a higher cost, and a good understanding of the full costs contributes to contain procurement costs.
- Secure reliable geo-hydrological data both for precipitation as well as surface, sub-surface and groundwater(s) in the context of the climate risk analysis
- Anticipate accompanying measures at a larger scale to secure sustainability of the infrastructure: for example, an integrated watershed management approach will naturally anticipate various options to address erosion and sedimentation issues.

The potential positive and negative environmental and social impacts of the PRIDE are described below, for the construction and operation phases.

### **Impacts during Construction Phase**

**Impacts on landscape, habitats and biodiversity** – During the construction phase it is likely damages to the vegetation cover will occur due to installation of new structures for the irrigation schemes, localised land clearing, removal of the trees and shrubs for construction of dams, canal alignment, disposing of excavated materials and land levelling, digging of canals and construction of water off-take points. Losses of soil and landscape degradation are also impacts associated with these activities. Habitat fragmentation and wildlife disturbance may also occur depending on the sites.

**Specific impacts induced by construction of dams** – potential changes in flow patterns, negatively impacting wildlife and natural habitats, capture of sediments, water-borne diseases, flooding and soil loss of farmlands.

**Noise, vibration and emissions** – Noise, vibration and emissions will occur in the course of activities such as transportation and operation of machinery. Dust emissions and fuel combustion emissions from vehicles and other equipment will also occur during this phase resulting in loss of air quality and inducing human health implications.

**Generation of waste, including construction waste** – Construction and road rehabilitation works will generate spoil materials and construction waste. Concentration of workers will also contribute to localized increase of waste.

**Impacts on archeological sites** – Although no registered or known cultural heritage sites were identified for the areas of intervention the potential risk of encountering archeological sites should be considered. This includes graveyards.

**Social impacts** – Impacts on informal land and water use may be caused in the course of roads rehabilitation and access to new irrigation sites. The construction and in-field land preparation will create opportunities for employment at the local level.

HIV/AIDS and other STDs will likely increase due to influx of people to the areas in search of employment opportunities. Physical displacements, cultural assets relocation and temporary economic loss are expected due to the construction of irrigation schemes and expansion of farmlands.

**Work related accidents** – Weak technical capacity and negligence on operation of vehicles and machinery are likely to induce accidents. Lack or inadequate use of safety gear may also contribute to accidents that may result in trauma and other casualties.

### **Impacts during Operation Phase**

**Environmental and Natural Resources Management** – Rehabilitation of irrigation and drainage schemes will bring significant positive impacts for the rural population and to the global environmental and natural resources management, in particular water and landscape management. Integrated management of water ensuring efficiency and best practices will generally contribute to reduce the loss of natural resources and to ensure a sustainable management of the landscape. Potential impacts on environmental flows of watercourses are expected particularly for the larger schemes with larger command areas.

**Specific impacts induced by construction of dams** – expected positives impacts such as water security and increase of adaptation to droughts and floods, will result from permanent availability of water.
**Socio-economic** – Irrigation and drainage schemes will result in a highly positive impact on the rural communities engaged in agriculture. Increase in yields of existing crop production and diversification into higher value crops requiring irrigation, will result in higher incomes and consequently better life conditions.

Rehabilitation of roads will improve safety and access to markets and social services centers amongst the communities bringing improvement of their livelihoods.

The WUA, and community based natural resources management, will increase monitoring and general water and natural resources management capacity.

**Human Health** – Agro-production in well-supported irrigated areas will lead to increased use of agrochemicals. Poor handling and application of agrochemicals will increase risks to the health of people exposed to pesticides and the consumers of the agriculture products.

Disposal of dredged materials resulting from the maintenance of irrigation infrastructures may contribute to public health problems.

New crops will promote new food habits introducing new nutrients in the diet of the communities and contributing to a healthier nutrition.

**Soil and water pollution** – the use of agrochemicals will contribute to soil and water (surface and groundwater) contamination with hazardous pollutants. Maintenance of irrigation infrastructures such as dams and canals will generate dredged materials whose disposal may result in soil contamination.

**Erosion and water logging** – weak maintenance of irrigation infrastructures may lead to local flooding, inducing soil erosion.

**Biodiversity and habitats conservation** – The identification and implementation of conservation measures for special conservation areas, habitats and relevant species will contribute to the preservation of biodiversity at species, habitats and ecosystem levels. However the expansion of farmlands may induce conflicts with wildlife, including protected species (e.g. hippos, monkeys)

**Climate change resilience** – Agricultural best practices and the introduction of crops adapted to the changing climate conditions will contribute to soil management and restoration and the implementation of reforestation and other conservation activities, increasing social and natural resilience.

**Dams** – dams are obstacles to the flow patterns interrupting animal migration routes, capture of sediments leading to the reduction of the nutritional value of the water for the aquatic life. Dams also are potential sources of water-borne diseases, soil degradation and flooding of productive land.

## Mitigation and Monitoring Measures

Most of the expected negative environmental and social impacts may be effectively mitigated through measures that should be established for the different phases and components of the project. The mitigation measures will ensure compliance with the national and international environmental and social guidelines and procedures. The ESMF presents a generic set of mitigation measures that should be included and complemented in the Environmental and Social Management Plans for each subproject. Each ESMP will be budgeted in the technical specifications of each subproject.

### Mitigation Measures during the Design Phase

Environmental and social issues will be taken into consideration during the design phase for the rehabilitation works and new irrigation infrastructures design in order to avoid or minimize the potential negative impacts and enhance the positive impacts. Specifically for the construction of dams international standards and best practices should be followed ensuring the identification of 5 key decision points as proposed by The World Commission of Dams Report (2000) and IFAD SECAP (2015): 1 - Needs assessment (validating the needs for water and energy services); 2 – Selecting alternatives (identifying the preferred development plan from among the full range of options); 3 – Project preparation (verifying agreements are I place before tender of the construction contracts); 4 – project implementation (confirming compliance before commissioning) and; 5 – Project operation (adapting to changing contexts).

The design documentation will include lists with suggested borrow pits and vendors of construction materials in proximity of sub-project sites for disposal of spoil and waste; suggested locations for construction camps, vehicles and other equipment servicing, and storage facilities as required.

#### **Mitigation Measures during Construction Phase**

Landscape, habitats and soil erosion – Earthwork, including material borrowing implies risks for landscape conservation and may induce soil erosion and habitat

disturbance. Examples of mitigation measures addressing these negative impacts are:

- strip and store topsoil separately in the nearest location without natural vegetation;
- pile up excavated earth separately from topsoil, in the convenient location without natural vegetation;
- backfill excavated material to full extent and remove residual amount to the preliminary agreed upon location;
- reinstate the work site by spreading topsoil and stimulating re-vegetation as appropriate;
- apply slope stabilization techniques terracing, drainage, gabions, greening, etc.- as appropriate on the steep slopes prone to erosion;
- do not extract gravel from watercourses. Mine for the material in the river beds away from water streams and reinstate the areas by leveling;
- ensure proper lining of canals and adequate assembling of pipes to avoid water filtration which may cause erosion along the canals.

In general, landscape degradation may be minimized using the already existing quarries and spoil disposal sites. If required, constructions camps should be located in areas with minimum natural vegetation cover and away from any important or classified area for animal and plant conservation.

**Construction of dams** – secure a close consultation process with the beneficiaries in order to disclose plans, maps and means of grievance redress and in compliance with ESMF, ESMPs and general ESIA procedures and findings. Special attention should be given on procurement and quality oversight in order to ensure capacity building to project technical staff and contractors.

**Waste management** – waste will be temporarily stored in designated locations at the work sites before final disposal at appropriate sites agreed with local authorities.

**Noise and emissions** – dust at construction sites will be minimized, especially closer to residential areas by using closed/covered trucks for transportation of construction materials and debris and watering work sites in dry season. The vehicles and machinery will have proper maintenance and will be checked regularly in order to avoid excessive emissions and noise.

**Construction run-offs** – Accidental spills will be prevented with impermeable flooring of sites for storage of oil and lubricants and servicing of vehicles and machinery. Work camps will be equipped with adequate sanitary facilities avoiding water and soil pollution.

**Dam construction -** A close consultation process with the beneficiaries should be ensured in order to disclose plans, maps and means of grievance redress and in compliance with ESIA procedures and findings. Qualified staff will be required for effective procurement and good quality oversight: capacity building may have to be provided to project technical staff to raise their profile, but also to contractors, even to help them know how to participate in bidding process in a proper way.

**Chance findings** – in the event of any archaeological finds, including graveyards or even individual graves, the contractor will hold activity and inform the PRIDE coordination unit. PRIDE shall contact the national authorities responsible for protection of historical and cultural monuments and seek guidance on the further course of action.

**Workers health and safety** – contractors will ensure that construction materials and equipment are maintained in proper technical conditions. All staff and visitors in work sites must be supplied with adequate personal safety gear and instructed to permanently use it.

**Social impacts and health** – local workers will be targeted for the recruitment of casual labor. As there is a potential increase in STDs (and also HIV/AIDS) following the concentration of workers into the project areas and surroundings, awareness campaigns will be carried out on Sexually Transmitted Diseases (STDs) including HIV/AIDS. The construction workers should be protected against water and waste borne diseases.

### **Mitigation Measures during Operation Phase**

**Managing erosion, flooding and water logging** – In order to prevent the erosion of lands of the irrigation schemes, it is vital to undertake anti-erosion measures on arable lands during cultivation. Awareness and best practices on land management, soil conservation and cultivation will be provided to farmers. Proper maintenance of

irrigation infrastructures is essential for minimizing sedimentation; water logging and flooding which are significant causes of erosion.

**Dams operation** – facilitate users (upstream and downstream users) especially when they are in competition or when they tend to exclude themselves; build capacity for more efficient downstream/in-field use of eater for crops in order to optimize overall reservoir efficiency; ensure that dam safety plans are developed and disclosed to relevant officials when failures of the dam would cause hazard to life and property; develop a management manual including an annual inspection maintenance programme with inspection and maintenance checklists (following FAO Manual on small earth dams – 2010.

**Managing irrigation water quality** – water quality control is important in order to prevent pollution of agricultural lands and products with toxic compounds.

**Pesticide and fertilizers use** – It is expected that the improvement and extension of irrigation services will enhance intensity of agriculture leading to increased use of fertilizers and pesticides. In order to reduce public health and environmental risks of excessive, unsafe or improper use of pesticides and fertilizers, farmers will receive training and awareness on integrated pest management and principles and guidelines on safe storing, handling and application of pesticides and fertilizers.

## **Environmental and Social Assessment and Management Planning**

Following the guiding principles of IFAD's environmental and social policies and the national legislation, activities that are identified during project implementation will be subject to this framework in order to identify potential environmental and social issues and ensure that all required safeguard instruments are included in the ToR for the feasibility and/or design studies. Detailed Environmental Impact Assessments and/or Environmental and Social Management Plans will be developed based on the outlines provided in Annexes I, and II respectively. For all works packages the ESMPs will be included in the tender documents and will later be made part of works contracts.

#### **Responsibilities for implementing and monitoring ESMPs**

Responsibilities of various entities in relation with the implementation and monitoring of ESMP's implementation are summarized below:

PRIDE coordination (Environmental Coordinator - EC) - will organize the development of ESMPs and carrying out of EIAs, if required, and will ensure their compliance with the requirements of national authorities and the IFAD's environmental and social policy procedures. Draft ESMPs and ESIAs reports will be shared with IFAD and public consultation meetings will be conducted following the established guidelines at national level. All environmental and social relevant documents will be disclosed nation-wide and made available for local stakeholders in a convenient format. The EC will also ensure that ESMPs are included into the tender documents for civil works, so that potential bidders are able to incorporate costs related to ESMPs implementation in their bids. ESMPs will be mandatory for implementation like any other clause of works contracts. The EC, in coordination with the EAD, will also be responsible for monitoring ESMPs implementation. Monthly field monitoring checklists will be used for regular environmental and social supervision of works. Annual progress outcomes of environmental and social supervision will be developed by the Programme and submitted to IFAD as part of the regular Programme progress reporting. A template for the Annual Environmental Report is provided in Annex V.

Design Consultants – are responsible for taking into account environmental and social aspects in the process of their work and strive to minimize negative impacts and enhance the positive impacts through the design solutions. If conduct of EIAs and ESMPs is made part of the design consultant tasks, the consultant will also be responsible for conducting this part of work under a participatory approach in consultation with all relevant stakeholders and for incorporating comments and feedback from the Programme the EAD and the IFAD into the final versions of EIA and ESMPs reports.

Environmental Consultants – may be hired by project implementation agency for carrying out ESIAs and ESMPs, training, capacitation and awareness on environmental and social issues.

Works Contractors – are responsible for the incorporation of ESMPs implementation into their bids. ESMPs therefore must be included into all tender packages. Adherence to all requirements of ESMPs, included in their contracts, throughout the

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contract term will be mandatory for work contractors. Contractors shall also possess all necessary licenses and permits.

Technical Supervisor(s) – are responsible for oversight over adequate implementation of civil works including the accomplishment of the measures provided in the ESMPs. The technical supervisor will identify any issues that may arise from inadequate application of mitigation measures suggested in ESMPs, and recommend corrective actions. Technical Supervisors shall verify that the Contractors possess all relevant licenses and permits.

Ministries and District Authorities – are responsible for the control over adherence to the terms of environment permits and natural resource use licenses issued for physical works and any other required authorizations. The Ministry of Natural Resources, Environment and Mining, through its appropriate agencies and departments (e.g. the EAD at central and District level) will play a central role: i) ensuring that PRIDE implementation is in compliance with the Malawi Environmental Act (1996); ii) overseeing the development and implementation of the ESMPs; supporting all climate change adaptation activities; and, iv) having an oversight role of monitoring their implementation to establish whether these outlined measures contribute to the resilience of communities with respect to the identified climatic events, such as droughts and floods.

## Subproject preparation, implementation and monitoring

Environmental and social assessment procedures, reporting systems and responsibilities will be adopted and implemented by the PRIDE. The assessment proposed system complies with both the IFAD's environmental and social policies and the Malawi EIA regulations.

Issues that will be addressed, and actions to be carried out include:

- Steps to be taken for the environmental and social screening of sub-projects, review and appraisal of proposed investments;
- Procedures for preparation of ESIA and/or ESMPs for subprojects;
- Terms of reference for an annual environmental and social audit of the PRIDE;
- Guidelines on the environmental and social impact of project investments; and
- Compliance mechanisms.

Key roles and responsibilities for implementing the subproject screening, appraisal, review, and monitoring requirements under the ESMF are provided in the table below.

Table 3 - Roles and responsibilities in subproject environmental and social planning and implementation

Activity	Responsible person/authority
Initial screening in the field	PCO/EC in coordination with EAD/DPIST/DOI/MoNREM
Assignment of environment category	PCO/EC in coordination with EAD
Analysis of screening findings and preparation of ESIAs/ESMPs and related management plans	PCO/EC in coordination with IFAD MoNREM; DPIST and independent TA
Review and approval of screening forms and ESIAs reports and submission to EAD	PCO/EC, MoNREM and DPIST
Prepare and submit recommendations on ESIAs to EAD	PCO/EC in coordination with MoNREM
Issue environment permit that confirms ESIA is satisfactory	EAD
Public consultation and disclosure	EAD, PCO/EC, MoNREM and DPITS
Environment Monitoring	PCO/EC, MoNREM, MoAIWD, DPIST, DOI, EAD

## **Environmental and social screening of sub-projects and Review Process**

Each subproject to be submitted for financing will have to be screened using the screening form provided as Annex III<sup>1</sup>. The EC will be responsible for carrying out the initial screening in the field and will submit screening forms along with their work plans to the EAD. The screening form will determine what level of environmental and social assessment is required.

In 1997, the Government of Malawi published the Malawi Guidelines on Environmental Impact Assessment aimed at all types of development projects. Subsequently, the need for sector-specific EIA guidelines was recognised, and guidelines have been prepared to deal specifically with the environmental impact assessment of different sectors such as irrigation projects.

In terms of the National EIA Guidelines there are three sets of criteria against which proposed projects are evaluated. These are as follows:

 $<sup>^{\</sup>rm 1}$  The screening form should be previously discussed with EAD and may be adapted according with the specific requirements of each subproject

- Criteria where an EIA is mandatory (List A, Appendix B of the EIA Guidelines, EAD, 1997);
- Criteria where an EIA may be required (List B, Appendix B of the EIA Guidelines, EAD, 1997); and
- General project criteria (Appendix D of the EIA Guidelines, EAD, 1997).

The EC will be responsible for environmental categorization of each subproject, in coordination with the EAD.

## **Appraisal**

After analysing the data contained in the environmental and social screening form and after having assigned an environmental category and level of assessment needed, the EC will make a recommendation to EAD establishing whether: (a) any environmental assessment will be required; (b) the implementation of mitigation measures via an ESMP (and associated management plans, i.e. Pest Management Plan, Dam Safety Plan, and Resettlement Action Plans -RAP) will be enough; or (c) a separate ESIA is required.

In case of need to carry out an ESIA, the ESIA will identify and assess the potential environmental and social impacts for the planned activities, assess alternative solutions and present the mitigation, management and monitoring measures to be adopted. These measures will be quoted in the ESMP that will be prepared as part of the ESIA for each subproject. The preparation of the ESIA and the ESMP will be done in consultation with all relevant stakeholders and project affected people and will follow the structure presented in the Template provided in Annex I that may be adjusted in accordance with EAD guidelines.

### **Preparation of an ESMP**

The format for the ESMPs will follow the requirements under the EAD guidelines document and the IFAD's environmental policy procedures requirements. As part of the EA process, ESMPs will need to be prepared and implemented for Category B projects. For those subprojects, which trigger the issues related with pest management, dam safety or cultural property, associated plans will be required (e.g. a pest management plan or dam safety plan). The ESMP should include the following contents:

- Description of the possible adverse effects that the ESMP is intended to address;
- Identification of project design alternatives that would meet similar objectives, and a description of why these projects are not viable, especially if they have a lesser environmental or social impact;
- Description of planned mitigation measures, and how and when they will be implemented
- Program for monitoring the environmental and social impacts of the project, both positive and negative;
- Description of who will be responsible for implementing the ESMP; and
- Cost estimate and source of funds.

A Template for an ESMP is provided in Annex II. Annex III provides an example of an ESMP and Monitoring Program.

### **Environmental contract clauses for contractor agreements**

Environmental contract clauses should be included in the Technical Specifications and be accounted for as part of the Project investment's overall implementation budget. Annex VI provides a set of recommended contract clauses to include in contractor agreements.

### **ESMP Budget**

The ESMP for each investment scheme will outline the appropriate budget required for implementing measures for mitigation and monitoring. It will also indicate the costs of training and capacity building required. Costs should be calculated based on estimates provided by Contractors for any mitigation measures required during the civil works.

### Approval

The EC in cooperation with the MoNREM/EAD, DOI and DPIST will review the ESIAs/ESMPs, and will make recommendations as to whether the results of the screening process or the ESIA/ESMPs are acceptable.

Following the review the ESIA will be forwarded to EAD for final review and clearance. Once ESIA is approved, EAD issues the necessary environmental permit

that confirms the ESIA has been satisfactorily completed and the project may proceed.

Implementation of subprojects cannot commence until the environmental and social aspects have been reviewed and appropriate mitigation measures have been adopted.

As regards social impacts due to land acquisition, the implementation of subprojects cannot proceed until the resettlement and/or compensation plans have been prepared and implemented.

## **Disclosure of subproject information**

In compliance with IFAD's environmental procedures and Malawi's ESIA regulations, before a subproject is approved, the applicable documents (ESIA, ESMP and/or RAP and associated management plans) must be made available for public review at a place accessible to local people (*e.g.* at a local government office), and in a form, manner, and language they can understand. It is recommended that the ESMPs and RAPs be disclosed in the same location that the community development plans are made public to ensure that there is wide access to the documents and at least one month before the expected date of starting the works.

## **Monitoring and Annual Reports**

Monitoring is done by the Project Coordination, MoNREM, EAD, DPIST, DOI and the WUA. If there are issues related to protected areas, forestry, the relevant authorities should also be involved.

The EC is responsible for undertaking the monitoring exercises in sequences and frequencies stipulated in the Project Implementation Schedule including where appropriate a Maintenance Schedule.

The EC in conjunction with the relevant Districts and Directorates will monitor the implementation of environmental mitigation measures based on the Contractor's work plan for subproject investments.

## Monitoring and Reporting of Subproject Mitigation and Management Plans

Supervision of the ESMP, along with other aspects of the project, will cover monitoring, evaluative review and reporting in order to achieve, among others, the following objectives:

- determine whether the project is being carried out in conformity with environmental safeguards and legal agreements;
- identify issues as they arise during implementation and recommend means to resolve them;
- recommend changes in project concept/design, as appropriate, as the project evolves or circumstances change; and
- identify the key risks to project sustainability and recommend appropriate risk management strategies to the Proponent.

An appropriate environmental supervision plan will be developed aiming to ensure the successful implementation of the ESMP.

Quarterly, the environmental, agriculture and water authorities in collaboration with the EC will monitor the implementation of the environment mitigation measures. Annually, the EC in collaboration with EAD and MoNREM will develop a global assessment of subproject performance in environment and natural resource management as part of the Project's overall monitoring program.

The EC, in collaboration with the EAD, DOI and DPIST will be responsible for the monitoring of the compliance of project implementation with the mitigation measures set out in the ESMPs and associated management plans. These officers will have responsibility for carrying out this monitoring by regularly visiting the projects, and pursuing the following corrective measures as required. Compliance monitoring comprises on-site inspection of construction activities to verify that measures identified in the ESMPs are included in the clauses for contractors are being implemented. This type of monitoring is similar to the normal technical supervision tasks ensuring that the Contractor is achieving the required standards and quality of work.

## **Annual reviews**

An independently commissioned environmental and social audit will be carried out on an annual basis. The audit team will report to EC, EAD, MoNREM, DPIST and IFAD, who will lead the implementation of any corrective measures that are required. This audit will ensure:

• that the ESMF process is being implemented appropriately,

• that mitigation measures are being identified and implemented.

The audit will be able to identify any amendments in the ESMF approach that are required to improve its effectiveness.

The annual audit also provides a strong incentive for the PRIDE to ensure that the ESMF will be implemented, and the individual ESMPs will be developed and implemented.

An annual audit report will include:

- A summary of the environmental performance based on ESIAs and ESMPs;
- A presentation of compliance and progress in the implementation of the subproject ESMPs;
- Number of staff/officers trained in implementation of the ESMF;
- Number of relevant Municipal and/or District Offices' staff attending training courses and workshops in ESMPs and ESIA;
- Number of written warnings of violation of ESIAs/ESMPs issued to project proponents;
- A synopsis of the environmental monitoring results from individual subproject monitoring measures (as set out in the subproject ESIA/ESMPs).

## **Capacity Building, Training and Technical Assistance**

In order to successfully implement the guidelines and recommendations in the ESMF, it is important to ensure that target groups and stakeholders who play a role in implementing the ESMF are provided with the appropriate training and provisions.

## **Institutional Strengthening**

It will be important to integrate in the Programme Coordination Office an Environmental Coordinator (EC) who will be able to manage and monitor the implementation of the ESMF and liaise with other stakeholders (national, district, local) on environmental and social issues related to the PRIDE. The EC will work in close collaboration with the Environmental District Officers (EDOs) as they coordinate environmental matters at this level. Thus joint planning of the activities will be undertaken to ensure the PRIDE activities are integrated in the district planning process and the District Environmental and Social Committees are effectively engaged.

Terms of reference for this Specialist are outlined below and proposed budget for the appointment of this Specialist is included in ESMF Implementation Budget.

## Table 4 – ToR for the Environmental Coordinator

#### ToR for the Environmental Coordinator

#### Role and responsibilities

The main role of the Environmental Coordinator (EC) is to provide technical advice on environmental and social management and mitigation planning and ensure that the ESMF is fully implemented. The EC will report directly to the PCO person responsible for project management activities of the PRIDE. The EC should hold a degree in environmental science and/or related discipline, have a minimum of 5 years' experience working with similar projects, and be highly familiar with Malawi environmental laws and regulations.

Tasks

- Liaise with MoNREM and EAD, DPIST and other institutions on a regular basis;
- Ensure ESIAs/ESMPs are carried out, as required, to meet Malawi and IFAD requirements;
- Provide technical advice on all technical issues related to natural resources and environmental management. These issues will relate to impacts on surface water, groundwater, agricultural resources and vegetation, sourcing of materials used in construction, human health, ecology and protected areas, land and soil degradation;
- Monitor the implementation of safeguard management plans (ESIAs/ESMPs, RAPs) using monitoring indicators provided in the ESMF and prepare quarterly monitoring reports;
- Raise awareness and proactively create demand for this technical advice among District/Local Officers;
- Lead the delivery of capacity-building programs for District/Municipal Officers and communities/affected persons.

### **Environmental Awareness, capacity building and training**

A sound environmental and social general management and an effective implementation of ESMPs imply awareness and training on environmental and social issues. It is required to communicate and work with community and understanding the environmental and socio-political dynamics prevalent in the area under the influence of the programme. Thus it is recommended to provide the technical assistance, training and awareness to support the capacity needs of those charged with implementing the ESMF in order to ensure effective implementation of the ESMF throughout the life of the Project.

During the first year of the project a 5-days training/awareness program should be organized for Project Coordination Unit, Program Staff and other relevant stakeholders at national and district level. The training program outline as detailed below aims to provide attendees with the basic approach to implementing the guidelines provided in the ESMF combined with the use of the appropriate tools, such as the screening form, ESMP, ESIA and related relevant subjects. 2-day refresher courses should also be held as needed during the course of the programme lifecycle. A provisional program for a 5-day workshop is proposed in Table 5.

Subject	Target Group	Method
<ul> <li>Environmental Awareness</li> <li>Environmental Impact Assessment Methods and Process</li> <li>Environmental Regulations, Acts &amp; Legislation</li> </ul>	Senior level officers involved in planning Environmental District Officers (EDOs) as well as DESC (11 districts) All Staff at irrigation schemes sites and EC	Workshops and seminars
<ul> <li>Environmental Management Plan</li> <li>Mitigation and Enhancement Measures</li> <li>Monitoring &amp; Evaluation</li> <li>Environmental Budget</li> </ul>	Water Management Related authorities EDOs All Field Engineers EC	Workshops and seminars
<ul> <li>Environmentally Sound Construction Practice</li> <li>Clean Construction Technology</li> <li>Waste Minimization and Management</li> <li>Storage and maintenance of equipment</li> <li>Control on Soil Erosion</li> <li>Transplantation and Plantation</li> <li>Construction Camp Management</li> <li>Safety Practices</li> </ul>	All Field Engineers Water Management Related authorities Authority EDOs EC	Workshops and seminars

Table 5 – Provisional program for a 5-day workshop

	•	Participatory Irrigation Management Formation of WUA Water Conservation Techniques Record Keeping	All Field Engineers EDOs EC WUA	Workshops, seminars and Site Visits
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As part of best practice, and in order to comply with best practices and international standards for Occupational, Health and Safety (OHS), contractors and supervision consultants should be provided with awareness raising and environmental and OHS training on site. These should focus not only on the construction phase but also operational phase of the Project.

A proposed format for a 1-day training is provided in the following Table.

Table 6 -Awareness raising and training for civil work contractors andsupervision consultants

Торіс	Input
<ul> <li>Awareness raising</li> <li>Environmental awareness and the importance of effective mitigation</li> <li>Practice mitigation measures and environmentally sound construction techniques</li> <li>Compliance with local legislation on OHS, ESIA and ESMP requirements</li> </ul>	0.5 day
<ul> <li>Technical training</li> <li>Implementation of the ESMP (contract clauses)</li> <li>Monitoring of ESMPs</li> <li>Preparation of budgets</li> </ul>	0.5 day
Total	1 day

## **Technical Assistance**

Environmental technical assistance will be provided to support Project Coordination and teams in order to support the ESMF implementation (and review, if required), especially where more detailed ESMPs, ESIAs may be required as well as for training, awareness and capacity building activities. The TA will be contracted to professionals with the relevant technical skills and experience for preparation of ESMFs, EMPs, ESIAs, training and other related inputs.

TA service providers must keep detailed records for use in compiling the annual reports and for undertaking annual reviews.

## **ESMF Implementation Budget**

It is estimated that the implementation of the ESMF including the required provisions, training and capacity building will cost approximately **\$1, 673,000**.

The costs of preparing and implementing the safeguards aspects of the project are estimates as the size, type and location of the subprojects are not fully determined at this stage.

The costs outlined below may vary depending on when and how the ESMF implementation takes place; therefore it can be expected that the proposed ESMF budget may increase or decrease depending on the work plan agreed upon.

Recommendation	Responsible authority	Schedule	Estimated cost
<ul> <li>EC and specialized assistance for annual monitoring of ESMF implementation.</li> </ul>	PRIDE	2015 – 2023	\$600,000
<ul> <li>Preparation, implementation and monitoring of ESIAs, ESMPs and related safeguard management plans</li> </ul>	PCO/EC with TA	2015 - 2023	\$960,000
<ul> <li>5 days training program on general understanding of environmental management and its applications</li> </ul>	PCO/EC in cooperation with MoNREM with TA	2015	\$25,000
<ul> <li>1-day training for contractors and supervision consultants.</li> <li>2-day Refresher trainings on ESMF implementation and other topics such as ESIAs, Environmental Information Systems/Water Catchment Planning, Community Consultation/Participatory Planning, and Water Quality Management to District level Water Management</li> </ul>	EC/MoNREM with TA	2015 – 2020 Annually	\$88,000

## Table 7- Budget Estimate for the Implementation of the ESMF

## References

- 1. Government of Malawi (1997). *Forestry Act*, Forestry Department, Lilongwe
- 2. Government of Malawi (2002). *National Land Policy*, Ministry Of Lands, Physical Planning and Surveys, Lilongwe
- 3. Government of Malawi (1999). *National Water Policy*, Ministry of Irrigation and Water Development, Lilongwe
- 4. Government of Malawi (1998). *Decentralization Policy,* Decentralization Secretariat, Office of the President and Cabinet, Lilongwe
- 5. Government of Malawi (1998). *Local Government Act* Ministry of Local Government, Lilongwe
- 6. Government of Malawi (1997). *Guidelines for Environmental Impact* Assessment (EIA) In Malawi, Department for Environmental Affairs, Lilongwe
- 7. Government of Malawi (1996). *Environmental Management Act*, Number 23, Department of Environmental Affairs, Lilongwe
- 8. Government of Malawi (1995). Constitution of the Republic of Malawi, Lilongwe
- 9. Government of Malawi (1994). *National Environmental Action Plan*. Volume 1, Department of Environmental Affairs, Lilongwe
  - 10. Government of Malawi (2013). *National Water Resources Master Plan,* Ministry of Water Development and Irrigation, Lilongwe
- 11. World Bank (2010). Disaster Risk Management in Malawi Country Note, World Bank, Washington

## Annexes

### Annex I – Generic Terms of Reference for the ESIA

### **Model TOR for the ESIA<sup>2</sup>**

### A. Background Information

Include a brief summary of the poverty-environment nexus and its impact on the rural livelihoods. Also include details of the project area including target groups and highlight that special focus will be on indigenous people, women and youth as well as other vulnerable groups within the above categories.

### Objectives of the Environment and Social Impact Assessment Study

The objectives of the ESIA study are to: (i) identify key linkages between rural poverty and environmental management and assess the potential environmental and social impacts of the proposed project on the natural resource base and livelihoods of communities in the target areas; (ii) explore and identify key options for advancing environmental and social sustainability; and (iii) recommend key opportunities to influence IFAD support towards environmental sustainability and climate smart development. This Study is intended to provide options that would inform and thus improve decision making of the (title of project) design.

The key environmental, climate change and social issues to be addressed include: (i) challenges faced to meet its rural development and food security goals; (ii) the major environmental, climate change and social issues that have a bearing on IFAD operations in the country; (iii) the direct impact and multiplier effect the mentioned issues have on the resilience of ecosystems and productivity of land and crops, natural resource management and rural livelihoods; (iv) the scale of volatility and risks resulting from climate variability and change; and (v) regulatory frameworks which are related to rural development and environmental issues.

The expected results of the ESIA are: (i) an assessment of the environmental (and social/economic/institutional) issues particularly in the agricultural and rural development sector; (ii) the identification of links with relevant ongoing initiatives; (iii) the provision of specific measures, recommendations including opportunities to optimize adaptation, environmental management and resource use; in the project

<sup>&</sup>lt;sup>2</sup> As establisehd in IFAD's Social, Environmental and Climate Assessment Procedures (2014)

area. These results will shed light on the important opportunities available to build resilience and adaptive capacity in the programme/project under development.

The IFAD Climate Change Strategy (2010) calls for the Fund to more systematically respond to increasing demands from our clients for technical support and innovation to better respond to climate change. This means analysing and addressing climate change challenges during the early stages of programme and project design to build resilience and adaptive capacity.

The IFAD Environment and Natural Resource Management (ENRM, 2011) Policy stresses that project designs present new opportunities to improve systematic integration and scaling up of ENRM in the portfolio. Such integration can help IFAD to engage in new and strengthened partnerships with specialized entities for enhanced and effective responses to issues associated with natural resources and, climate variability and change. The Policy provides ten Core Principles and eleven Best Practice Statements to guide IFAD interventions.

### Key Principles to guide the ESIA

(i) Look beyond the traditional "do no harm" safeguards approach to mitigating environmental, climate change and social risks towards "doing good" through greater focus on sustainability and management of environmental (rehabilitating degraded lands, seizing adaptation/mitigation opportunities and transforming the underlying inequalities that undermine inclusive development, etc.) and social impacts and risks;

(ii) Begin the ESIA with a scoping exercise with the objectives of identifying as much as possible the relevant social, environmental, and climate change issues, so that baseline data collection and impact assessment can focus on them and not expend unnecessary resources on issues that are irrelevant.

(iii) Place strong emphasis on identifying opportunities and develop an appropriate management plan to enhance results and impact;

(iv) Identify and compare alternative scenarios to recommend realistic proposals for design mission consideration;

(v) Identify capacity needs required to effectively implement the environmental and social management plan; and

(vi) Produce a realistic monitoring plan, including appropriate change management processes.

(vii) Engage affected communities and other interested stakeholders throughout the ESIA process, from scoping to review and comment on the final draft report prior to decision-making.

### B. Scope of work

The ESIA study will consider economic, natural, and social aspects in an integrated way. The study will take into account obligations of the country pertaining to project activities under relevant (country) laws and international agreements and standards, best practices, and realities of the institutional capabilities related to environment, climate change and social aspects. Specifically, this will involve: (i) engaging a broad range of stakeholders at the national, regional and communal levels, involving as much as possible vulnerable groups wherever possible; (ii) identifying and addressing cross-border issues, as necessary; (iii) identifying environmental, climate change and social opportunities and constraints; (iv) ensuring integration with national policy and planning structures; and (v) including an effective system for monitoring of climate, environmental and social issues. Mainly secondary information and qualitative methods will be used for conducting the ESIA study.

On the basis of data drawn from: (i) IFAD reports, Government studies and documentation from other development partners; (ii) field visits and meetings with relevant stakeholders in the country; and (iii) making use of the suggested questions and ENRM Best Practice Statement on ENRM (see Annex 1 and 2), the consultants will perform the following key tasks:

**Task 1: Determining the Scope of the ESIA.** Based on the Environmental Review Note, preliminary investigation of the project area, consultation with affected communities and concerned, knowledgeable groups or agencies, identify the project-affected area, determine the scope of the ESIA, and prepare a Scoping Report. Following review by the implementing agency (ies) and IFAD, the Scoping Report will be disclosed in accessible locations for comment by interested and affected parties.

Task 2: Description of the environmental conditions of the project area. Guided by the Scoping Report, assemble, evaluate and present all relevant baseline data on the relevant environmental, climate change and social characteristics of the project area. This should include rates of forest and other natural resources degradation, physical cultural resources, river flow and sedimentation rates, pollution sources and levels. Data should be relevant to decisions about project location, design, operation, or mitigation measures.

Physical Environnent: topography, climate, soils, rainfall, infrastructure etc. Biological Environment: flora, fauna, endangered species, sensitive sites and significant natural sites.

Socio-Cultural environment: (population dynamics, land use, poverty trends, community structure and capacities, sources of livelihoods, distribution of income, cultural heritage, goods and services, level of community environmental awareness on issues such as poverty and environment, biodiversity loss and climate change, and extent of community dependence on natural resources for livelihoods.

**Task 3: Legislative and regulatory considerations**. Review current national policies, legislation and legislative instruments governing environmental management, climate change (mitigation and adaptation) and governance with their implementation structures, identify challenges, and recommend appropriate changes for effective implementation. Review and summarize relevant international treaties and conventions to which the country is a signatory.

Task 4: Determination of the potential environmental, climate and social impacts and risks of the proposed project. Identify and analyse (quantitatively where possible) opportunities, potential positive and negative impacts (i.e. associated with development of small dams), direct and indirect impacts and immediate and long term impacts of the proposed project on the natural resource base and livelihoods. Include an assessment of the potential cumulative impacts of the proposed project or programme and other activities that are ongoing, planned or can reasonably be foreseen to occur in the affected area. Assess environmental, climate adaptation and social costs of these impacts. The assessment applies the mitigation hierarchy: if avoidance is not possible, reduce and minimise potential adverse impact; if reduction or minimisation is not sufficient, mitigate and/or restore, and as a last resort compensate for residual impacts.

Task 5: Analyse alternatives and recommend modifications to the project design. Recommend feasible and cost-effective measures to prevent or reduce negative impacts.

### Task 6: Development of an environmental and social management plan:

Formulate an integrated plan to avoid, minimize, mitigate or compensate for the significant potential environmental and social impacts and to avoid or mitigate climate change risks. Prepare a detailed plan to monitor environmental and social impacts and implementation of mitigation plans developed. The plans should specify the actions to be taken for each impact, identify the entity responsible for taking the action, the timing according to the stages of the project, and the estimated cost.

Review capacities of institutions at national, provincial, county and sub-county levels to implement recommended activities and propose ways to strengthen then in order to effectively manage and implement mitigation and monitoring plans proposed. This should include responsibilities, staffing, equipment and training guidance.

Identify and recommend preventive measures to mitigate climate change risks and adverse environmental and social impacts of the project as well as who will implement them and mitigation costs.

**Task 7. Assist in Inter-Agency Coordination and Public/NGO Participation**. Assist in coordinating the environmental and social assessment with other government agencies, in disclosure of documents in accessible locations in appropriate form and language, in obtaining the views of local NGOs and affected groups (especially the marginalized poor), and in keeping records of meetings and other activities, communications, and comments and their disposition.

Personnel: The assignment will be undertaken by a team (add the resource persons) of international experts, with wide experience in conducting Environmental and Social Impact Assessments; and local counterparts (preferably) with good knowledge of environmental and natural resources issues, as well as social and targeting issues, in the project area.

Schedule: The assignment is planned to be undertaken over (to be determined depending on scope of work) \_\_\_\_\_ days between (provide timeline).

Report: The ESIA report should be concise, and limited to environmental and social issues including emerging issues. The main body of the report should be limited to findings, conclusions and recommendations supported by data collected and literature cited. Other documents used should be presented in annexes or appendixes.

For the purpose of public consultation, the ESIA documentation should be translated into material that is accessible, in form and language, to local population.

The ESIA report will be disclosed in accordance with IFAD's Disclosure Policy. List of Data Sources (include others):

- IFAD Climate Change Strategy (2010)
- IFAD Environment and Natural Resource Management Policy (2011)
- IFAD Environment and Social Assessment Procedures (Chapter 1)
- Disaster Risk Management Guidelines
- IMI climate change checklist
- Country Evaluation Report

### **Structure of the ESIA**

- Executive Summary
- Introduction
  - Project description
  - o Environmental and Social Baseline
  - o Expected Impacts and Mitigation/Enhancement
  - o Environmental Management Plan and Monitoring
- Section 1 Introduction
- Section 2 Methodology
- Section 3 Legal and Policy Framework
- Section 4 Project description
- Section 5 Analysis of Project Alternatives

- Section 6 Biophysical and Social Environment
- Section 7 Potential Impacts
- Section 8 Mitigation and enhancement Measures
- Section 9 Environmental Management Plan
- Section 10 Monitoring Plan
- Section 11 Conclusions
- Annex 1 Environmental Management Matrix (environmental and monitoring plans)
- Annex 2 Public Consultation
- Annex 3 References
- Annex 4 Maps, Graphs and Pictures
- Annex 5 ESIA team Composition

## Annex II – Proposed contents and structure of the ESMP reports

The ESMP contents will include the following items:

- Brief description of the project and key environmental and social components, including an environmental (biophysical) and social characterization of the sites of intervention as well as the main related issues with and from the project
- Major environmental and social impacts, discriminating and disaggregating impacts (positive and negative) by intervention, site, environmental and social issue and also including the eventual effects and/or limitations imposed from the environment itself over the project.
- Enhancement and mitigation program, covering each of the impacts and when not applicable explaining why
- Monitoring program and complementary initiatives. The measures to be proposed should be directly aligned with the impacts listed and addressing all relevant issues
- Institutional arrangements and capacity building requirements
- Public consultations and disclosure requirements
- Estimated costs
- Implementation schedule and reporting; in line with the project schedule and reporting scheme

A suggestion for the general structure for the ESMP is provided below:

Example of an ESMP STRUCTURE

- EXECUTIVE SUMMARY
- INTRODUCTION
  - Objectives and scope of the ESMP
- PROJECT DESCRIPTION
  - o Project development objective and expected results
- DESCRIPTION OF THE ENVIRONMENT
  - The physical environment
    - Geography and topography
    - Geology and Soils
    - Climate

- Climate Change
- Hydrology
- The Biological environment
  - Biodiversity (Fauna and Flora)
  - Conservation and Protected Areas
- The human environment
  - Economy
  - Demography and gender equality
  - Agriculture
  - The farming communities and the environment
- INSTITUTIONAL, LEGAL AND POLICY FRAMEWORK
- BENEFICIAL AND ADVERSE IMPACTS OF THE PROJECT ACTIVITIES
- ENHANCEMENT AND MITIGATION PROGRAM
- MANAGEMENT AND MONITORING PROGRAM
  - Waste and Health Education
  - o Education on agriculture best practices
  - o Monitoring water quality and soil conservation
- CONSULTATIONS AND DISSEMINATION
- RESPONSIBILITIES AND INSTITUTIONAL ARRANGEMENTS
- ESTIMATED COST
- IMPLEMENTATION SCHEDULE AND REPORTING
  - Proposed schedule for the main ESMP actions
- ANNEXES
  - Technical Assistance
  - Implementation of the Environmental and Social Mitigation Measures an Monitoring Plan

# Annex III – Sample of ESMP and Monitoring Plan

Environmental/ Social Impacts	Recommended Mitigation	Responsible Institution (Design Phase)	Responsible Institution (Implementation Phase)	Means of Verification/Indicators	Frequency of verification
Relocation or loss of shelter	Preparation and implementation of a Resettlement Policy Framework, which will include compensation plans.	Ministries and District authorities, Commissioner for Lands, Project Coordination	Project Coordination	Number of people relocated Number of people compensated Amount of money spent % of number of complaints	Reference/Baseline during project planning Annually during project implementation
Loss of assets or access to assets	Preparation and implementation of a Resettlement Policy Framework, which will include compensation plans.	Ministries and District authorities, Commissioner for Lands, Project Coordination	Project Coordination	Cost of lost assets / access to assets Number of complaints	Annually Monthly
Loss of income sources, and or means of livelihood	Preparation and implementation of a Resettlement Policy Framework, which will include compensation plans.	Ministries and District authorities, Commissioner for Lands, Project Coordination	Project Coordination	Number of complaints	Monthly
Spread of HIV/AIDS	Strengthen HIV/AIDS Awareness Campaigns in Schools, Training of school administrators and staff in HIV/AIDS issues, encouraging participation of the private and public sectors in HIV/AIDS issues and reinforcement of school curriculum with HIV/AIDS issues.	Ministries Project Coordination, NGOs, Gender and Community Services, Local institutions and committees, Donor community and District Assemblies	Project Coordination Ministries (Health and Education) Local institutions and committees	Number of campaigns % increase in those affected.	Annually Monthly (Monthly statistics from hospital and clinics)
Loss of vegetation	Selective clearing of project sites, reforestation, preservation of protected plant species, use of alternative sources of energy, use of environmental friendly technologies, awareness campaigns.	Contractors, Project staff, District Agric. Officers, District Assemblies	Contractors Project Coordination	Increase in area of land cultivated and deforested	Monthly
Loss of Soil	Stabilization of loose soil, controlled excavation, preservation of vegetation cover, controlled transportation of raw materials, appropriate landscaping.	Contractors, Project staff, District Officers, Forestry Department, District Assemblies	Contractors Project Coordination	Area and size of gullies formed Amount of silt deposited in watercourses	Monthly
Loss of fragile ecosystems	Conduct feasibility studies before construction, use expert knowledge of ecologists, introduction of ecosystem	Project Coordination, District, Forestry Department, District Assemblies	Contractors Project Coordination	Size of area affected	Monthly

	conservation projects, fencing				
Soil and water pollution resulting from the accumulation of solid and liquid waste Soil and water pollution from chemicals & fertilizers	Controlled disposal of wastes and effluent by use of appropriate disposal facilities, use of appropriate drainage structures, use of cleaner technologies, proper storage of materials, awareness campaigns		Contractors Project Coordination	Change in chemical and biological water quality	Bi-annually
Dust, Emissions, Strong Light, Noise and Vibration	Controlled operation times, use of appropriate equipment, proper orientation of lights, use of alternative materials, use water sprinklers to control dust, use of scrubbers		Contractors Project Coordination	Number of complaints Extent of property and vegetation soiling	Monthly
Water-borne and / or water related diseases	Provision of potable water supplies and sanitation facilities, capacity building in sanitation and health issues, awareness campaigns		Contractors, Project Coordination, District Agriculture Officer, NGOs and District Assemblies	Increase in water related ailments	Bi-annually
Loss of natural and cultural heritage.	Conduct feasibility studies, fencing, introduce proper antiquity education programmes	Project Coordination, District Agric. Officer, NGOs and District Assemblies	Contractors Project Coordination	Number or size of property lost	Before project implementation During project implementation
Loss of animals and aquatic life.	Minimize vibrations and strong noise, enforcement of parks and wildlife law, conduct feasibility studies, avoid contamination of soil and water		Contractors Project Coordination, District Agric. Officer NGOs and District Assemblies	Animal count Fish and aquatic life estimates	Before project implementation Annually during project implementation
Disturbance of marginal areas	Avoid extraction of raw materials from marginal areas, no construction of structures in marginal areas.		Project Coordination, NGOs and District Assemblies	Size of area affected	Bi-annually
Incidence of Flooding	Forestation of the catchment areas of the irrigation schemes		Forestry Department Project Coordination, NGO's, District Assemblies	Number of trees planted Area planted with trees Number of people or properties affected by floods	Annually
Exposure to Agro- chemicals	Encourage organic farming, and limit the use of Agro-chemicals. Conduct awareness training & workshops	Project Coordination Ministry of Agriculture Scheme Management	Project Coordination Ministry of Agriculture Scheme Management	Number of people affected by agro-chemicals	Annually
Disruption of footpaths	Good irrigation scheme designs Relocation of the footpaths	Project Coordination Scheme Management	Project Coordination Scheme Management	Number of footpaths in use Problems of accessibility	During design During construction
Salinization	Encourage organic farming, limit the use of agro-chemicals and provide water management training to farmers	Project Coordination DOI	Project Coordination DOI	Farm productivity (per hectare)	Annually

Disputes over water resources	Provide water management training to farmers and introduce alternative sources of water such as boreholes.	Project Coordination DOI	Project Coordination DOI	Water availability Crop productivity Number of complaints	
Water logging	Provide water management training to farmers	Project Coordination DOI	Project Coordination DOI	Prolonged presence of water Poor growth of crops Presence of salts on the soil	Annually
Invasive plant species	Control crop rotation, promote the agricultural practices on the scheme and promote use of herbicides.		Project Coordination District Agricultural Officer Forest Department	Number of exotic species recorded	Annually

# Annex IV – Environmental and Social Screening Form (General Example)<sup>3</sup>

Sub-project name:	
Subproject Location (include map/sketch):	
Type of activity:	(e.g. new construction, rehabilitation, periodic maintenance)
Estimated Cost:	
Proposed Date of Commencement of Work:	
Technical Drawing/Specifications Reviewed:	(circle answer): Yes No

### 1. Site Selection:

Physical data:	Yes/No answers and bullet lists preferred except where descriptive detail is essential.
Site area in ha	
Extension of/or changes to existing alignment	
Any existing property to transfer to sub-project	
Any plans for new construction	

### Insert location map and longitude – latitude coordinates (GPS reading):

 $<sup>^{\</sup>rm 3}$  It is advisable to verify and agree with the EAD the final version to be used

Refer to project application for this information.

Termer	Site Sensitivity			
issues	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	
Indigenous peoples	No indigenous population	Dispersed and mixed indigenous populations; highly acculturated indigenous populations	Indigenous territories, reserves and/or lands; vulnerable indigenous populations	

### 2. Impact identification and classification:

When considering the location of a subproject, 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. The following table should be used as a reference.

#### 3. Checklist of environmental and social impacts

Roads and Footpaths	Potential for Adverse Impacts				
	None	Low	Med	High	Unknown
Soil erosion or flooding concerns (e.g., due to highly erodible soils or steep gradients)					
Number of stream crossings or disturbances					
Wet season excavation					
Creation of quarry sites or borrow pits					
Significant vegetation removal					
Wildlife habitats or populations disturbed					
Environmentally sensitive areas disturbed					
Cultural or religious sites disturbed					
Economic or physical resettlement required					
New settlement pressures created					
Other (specify):					

Irrigation Projects Potential			ial for Adverse Impacts			
	None	Low	Med	High	Unknown	
Existing water sources supply/yield depletion						
Existing water users disrupted						
Downstream water users disrupted						
Water storage requirement and viability (soil permeability)						
Vulnerability to water logging (poor drainage)						
Vulnerability to soil and water salinization						
Sensitive downstream habitats and water						
bodies						
Environmentally sensitive areas disturbed						
Cultural or religious sites disturbed						
Increased agric. chemicals (pesticides, etc.) loading						
Increased social tensions over water allocation						
Local incapacity/inexperience to manage facilities						
Local incapacity/inexperience with irrigated agriculture						
Other (specify):						

Catchment, Forestry, Grasslands	Potential for Adverse Impacts				
Projects	None	Low	Med	High	Unknown
New access (road) construction					
Wet season soil disturbance					
Potential for debris flows or landslides					
Sensitive downstream ecosystems					
Removal of native plant/tree species					

Catchment, Forestry, Grasslands	Potential for Adverse Impacts				
Projects	None	Low	Med	High	Unknown
Introduced plant/tree species					
Invasion of native species					
Wildlife habitats or populations disturbed					
Environmentally sensitive areas disturbed					
Insufficient capacity to manage catchment					
ponds					
Insufficient capacity to prohibit or control					
open grazing					
Insufficient capacity to manage new					
plantations/pastures					
Economic or physical resettlement required					
Other (specify):					

Infrastructure Projects	Potential for Adverse Impacts				
	None	Low	Med	High	Unknown
New access (road) construction					
Alteration of existing drainage conditions					
Vegetation removal					
Wet season soil disturbance					
Construction materials impact on adjacent					
forests/lands					
Quarries and borrow pits created					
Cultural or religious sites disturbed					
Water supply development effects in					
available supply					
Effect of sanitation development on					
existing disposal sites					
Effects of medical waste on existing					
disposal system					
Economic or physical resettlement required					
Number of potential Project Affected					
Persons (PAPs)					
In-migration/settlement induced by					
facilities development					
Local incapacity/inexperience to manage					
facilities					
Other (specify):					

## 4. Detailed questions:

Preliminary Environmental Information:	Yes/No answers and bullet lists preferred except where descriptive detail is essential.
State the source of information available at this stage (proponents report, ESIA or other environmental study).	
Has there been litigation or complaints of any environmental nature directed against the proponent or sub-project	

Refer to application and/or relevant environmental authority for this information.

Identify type of activities and likely environmental impacts:	Yes/No answers and bullet lists preferred except where descriptive detail is essential.
What are the likely environmental impacts, opportunities, risks and liabilities associated with the subproject?	
Refer to ESMF– Impact Mitigation, Disclosure and Monitoring Guidelines	

Determine environmental screening category:	Yes/No answers and bullet lists preferred except where descriptive detail is essential.
After compiling the above, determine which category the subproject falls under based on the environmental categories established by IFAD and EAD	
Refer to ESMF-Screening and Review Process	
Mitigation of Potential Pollution:	Yes/No answers and bullet lists preferred except where descriptive detail is essential.
Does the subproject have the potential to pollute the environment, or contravene any environmental laws and regulations?	
Will the subproject require pesticides/fertilizers use?	
If so, then the proposal must detail the methodology and equipment incorporated in the design to constrain pollution within the laws and regulations and to address pesticide use, storage and handling. Does the design adequately detail mitigating measures?	
Refer to ESMF–Impact, Mitigation and Monitoring Guidelines	
Environmental Assessment Report or environmental studies required:	Yes/No answers and bullet lists preferred except where descriptive detail is essential.
---	---
If screening identifies environmental issues that require an ESIA or a study, does the proposal include the ESIA or study?	
Indicate the scope and time frame of any outstanding environmental study.	
Required Environmental and Social Monitoring Plan:	
If the screening identifies environmental issues that require long term or intermittent monitoring (effluent, gaseous discharges, water quality, soil quality, air quality, noise etc.), does the proposal detail adequate monitoring requirements?	
Refer to ESMF– Impact, Mitigation and Monitoring Guidelines	

Public participation/information requirements:	Yes/No answers and bullet lists preferred except where descriptive detail is essential.
Does the proposal require, under national or local laws, the public to be informed, consulted or involved?	
Has consultation been completed?	
Indicate the time frame of any outstanding consultation process.	
Refer to relevant legislative acts in Malawi.	
Land and resettlement:	Yes/No answers and bullet lists preferred except where descriptive detail is essential.
Will the subproject require the acquisition of land? If so, what is the likelihood of land purchase for the subproject?	
Is the land public or privately owned?	
How will the proponent go about land purchase?	
What is the plot currently being used for? (e.g. agriculture, gardening, etc.) List the key resources.	
Will people need to be displaced, and therefore require compensation and resettlement assistance?	
Are the relevant authorities aware of the need for a Resettlement Process, involving a census, valuation, consultation, compensation, evaluation and monitoring?	
What level or type of compensation is planned?	
Who will monitor actual payments?	
Refer to the Resettlement Policy Framework.	

Actions:	
List outstanding actions to be cleared before subproject appraisal.	
Approval/rejection	Yes/No answers and bullet lists preferred except where descriptive detail is essential.
If proposal is rejected for environmental reasons, should the sub-project be reconsidered, and what additional data would be required for reconsideration?	

## 5. Recommendations

Environmental and social categor	Environmental
----------------------------------	---------------

Requires an ESIA to be submitted on date: Requires a RAP to be submitted on date: Requires an ESMP to be submitted on date: Requires preparation of additional plans (e.g. Pest Management Plan or Dam Safety Plan) Does not require further environmental or social studies

Reviewer:	
Name:	
Signature:	
Date:	

# Annex V - Format of an Annual Environmental Report

Relevant environr	nental authority:						
<b>Reporting dates:</b>							
District/Municipal	lity/Town:						
Subprojects appro	oved:			·			
Subproject title	Activities	Project phase <sup>(1)</sup>	Env.category	ESIA / ESMP completed?	Environmental Permit granted?	Effectiveness of ESMP	Issues <sup>(2)</sup>
(name, location, title or reference)	(new construction, rehabilitation, maintenance)	See note below		Yes, No or N/A	Yes, No or N/A	Good, poor, or needs improvement	See note below
1							
2							
3							
etc.							
Subprojects rejected:							
Subproject title		Activities		Reasons f	or rejection	Rema	rks <sup>(3)</sup>
1							
2							
etc.							

Notes:

- 1 Subproject phase will be one of the following: (a) under project preparation or appraisal, (b) appraised, or (c) implementation.
- 2 Issues: accidents, litigation, complaints or fines are to be listed.
- 3 e.g. if an environmental permit was not granted, explain why.

# Annex VI – Examples of Contract clauses to include in Contractor agreements

Sound environmental management of construction projects can be achieved only with adequate site selection and project design. As such, the EA for projects involving any new construction, or any rehabilitation or reconstruction for existing projects, should provide information as to screening criteria for site selection and design including the following:

Site selection - sites should be chosen based on community needs for additional projects, with specific lots chosen based on geographic and topographic characteristics. The site selection process involves site visits and studies to analyze: (i) the site's, suburban, or rural characteristics; (ii) national, regional, or municipal regulations affecting the proposed sites; (iii) accessibility and distance from inhabited areas; (iv) land ownership, including verification of absence of squatters and/or other potential legal problems with land acquisition; (v) determination of site vulnerability to natural hazards, (i.e. intensity and frequency of floods, earthquakes, landslides, hurricanes, volcanic eruptions); (vi) suitability of soils and sub soils for construction; (vii) site contamination; (viii) flora and fauna characteristics; (ix) presence or absence of natural habitats and/or ecologically important habitats on site or in vicinity (e.g. forests, wetlands, rare or endangered species); and (ix) historic and community characteristics.

The rules (including specific prohibitions and construction management measures) should be incorporated into all relevant bidding documents, contracts, and work orders.

# **Prohibitions**

The following activities are prohibited on or near the project site:

- Cutting of trees for any reason outside the approved construction area;
- Hunting, fishing, wildlife capture, or plant collection;
- Use of unapproved toxic materials, including lead-based paints, asbestos, etc.
- Disturbance to anything with architectural or historical value;
- Building of fires;
- Use of firearms (except authorized security guards);

• Use of alcohol by workers.

# **Construction Management Measures**

Waste Management and Erosion - solid, sanitation, and, hazardous wastes must be properly controlled, through the implementation of the following measures:

Waste Management:

- Minimize the production of waste that must be treated or eliminated.
- Identify and classify the type of waste generated. If hazardous wastes (including health care wastes) are generated, proper procedures must be taken regarding their storage, collection, transportation and disposal.
- Identify and demarcate disposal areas clearly indicating the specific materials that can be deposited in each.
- Control placement of all construction waste (including earth cuts) to approved disposal sites (>300 m from rivers, streams, lakes, or wetlands). Dispose in authorized areas all of garbage, metals, used oils, and excess material generated during construction, incorporating recycling systems and the separation of materials.

Maintenance:

- Identify and demarcate equipment maintenance areas (>15m from rivers, streams, lakes or wetlands).
- Ensure that all equipment maintenance activities, including oil changes, are conducted within demarcated maintenance areas; never dispose spent oils on the ground, in water courses, drainage canals or in sewer systems.
- Identify, demarcate and enforce the use of within-site access routes to limit impact to site vegetation.
- Install and maintain an adequate drainage system to prevent erosion on the site during and after construction.

**Erosion Control** 

- Erect erosion control barriers around perimeter of cuts, disposal pits, and roadways.
- Spray water on dirt roads, cuts, fill material and stockpiled soil to reduce wind-induced erosion, as needed.
- Maintain vehicle speeds at or below 10mph within work area at all times.

Stockpiles and Borrow Pits

- Identify and demarcate locations for stockpiles and borrow pits, ensuring that they are 15 meters away from critical areas such as steep slopes, erosionprone soils, and areas that drain directly into sensitive water bodies.
- Limit extraction of material to approved and demarcated borrow pits.

Site Cleanup

 Establish and enforce daily site clean-up procedures, including maintenance of adequate disposal facilities for construction debris.

# Safety during Construction

The Contractor's responsibilities include the protection of every person and nearby property from construction accidents. The Contractor shall be responsible for complying with all national and local safety requirements and any other measures necessary to avoid accidents, including the following:

- Carefully and clearly mark pedestrian-safe access routes.
- If school children are in the vicinity, include traffic safety personnel to direct traffic.
- Maintain supply of supplies for traffic signs (including paint, easel, sign material, etc.), road marking, and guard rails to maintain pedestrian safety during construction.
- Conduct safety training for construction workers prior to beginning work.
- Provide personal protective equipment and clothing (goggles, gloves, respirators, dust masks, hard hats, steel-toed and –shanked boots, etc.,) for construction workers and enforce their use.
- Post Material Safety Data Sheets for each chemical present on the worksite.
- Require that all workers read, or are read, all Material Safety Data Sheets. Clearly explain the risks to them and their partners, especially when pregnant or planning to start a family. Encourage workers to share the information with their physicians, when relevant.
- Ensure that the removal of asbestos-containing materials or other toxic substances be performed and disposed of by specially trained workers.
- During heavy rains or emergencies of any kind, suspend all work.
- Brace electrical and mechanical equipment to withstand seismic events during the construction.

# Nuisance and dust control

To control nuisance and dust the Contractor should:

- Maintain all construction-related traffic at or below 15 mph on streets within 200 m of the site.
- Maintain all on-site vehicle speeds at or below 10 mph.
- To the extent possible, maintain noise levels associated with all machinery and equipment at or below 90 db.
- In sensitive areas (including residential neighborhoods, health centers, rest homes, etc.) more strict measures may need to be implemented to prevent undesirable noise levels.
- Minimize production of dust and particulate materials at all times, to avoid impacts on surrounding families and businesses, and especially to vulnerable people (children, elders).
- Phase removal of vegetation to prevent large areas from becoming exposed to wind.
- Place dust screens around construction areas, paying particular attention to areas close to housing, commercial areas, and recreational areas.
- Spray water as needed on dirt roads, cut areas and soil stockpiles or fill material.
- Apply proper measures to minimize disruptions from vibration or noise coming from construction activities.

# **Community Relations**

To enhance adequate community relations the Contractor should:

- Following the country and EA requirements, inform the population about construction and work schedules, interruption of services, traffic detour routes and provisional bus routes, as appropriate.
- Limit construction activities at night. When necessary ensure that night work is carefully scheduled and the community is properly informed so they can take necessary measures.
- At least five days in advance of any service interruption (including water, electricity, telephone, and bus routes) the community must be advised through postings at the project site, at bus stops, and in affected homes/businesses.

# **Chance Find Procedures for Culturally Significant Artifacts**

In case culturally valuable materials are uncovered during excavation:

- Stop work immediately following the discovery of any materials with possible archeological, historical, paleontological, or other cultural value, announce findings to project manager and notify relevant authorities;
- Protect artifacts as well as possible using plastic covers, and implement measures to stabilize the area, if necessary, to properly protect artifacts
- Prevent and penalize any unauthorized access to the artifacts
- Restart construction works only upon the authorization of the relevant authorities.

# **Environmental Supervision during Construction**

The bidding documents should indicate how compliance with environmental rules and design specifications would be supervised, along with the penalties for noncompliance by contractors or workers. Construction supervision requires oversight of compliance with the manual and environmental specifications by the contractor or his designated environmental supervisor. Contractors are also required to comply with national and municipal regulations governing the environment, public health and safety.

## Annex VIII – Findings from site visits and consultations

During the two missions the consultant had the opportunity to establish contacts and discussions with individuals and associations of farmers, district and community officers, administrative and informal local leaders and other stakeholders. The visits also lead to the general recognition of some of the selected sites, their current and past types of use and collection of particular information that will be useful for the development of the project. The main findings of these visits are described below and should not be considered exhaustive but, instead, indicative of points that should be addressed during the development and implementation of the ESMF and ESMPs.

All sites visited were already used for irrigated agriculture. However they were small or, when bigger, the infrastructures were poorly designed and not adequately managed leading to the abandoning and mal functioning. In some cases, this leaded to a secondary resettlement of natural and semi-natural habitats that will need to be cleared during the development of the irrigation schemes. Other sites will be expanded into natural or no used areas. In one or another situation, land management, deforestation and erosion are considered as the major concerns. For the remaining social and environmental related issues the main findings are the following:

Social and cultural – individual graves and graveyards were found in some sites (in Chipofya, a graveyard is located right in the middle of the projected irrigation area.

Climate Change perception – in all consultations farmers have demonstrated a substantial perception of local climate change trends and an objective understanding of the immediate impacts. Heavy rain and floods were identified for Nkhulambe/Wowo and Chypofia as a major concern with recent extreme events being responsible for damages in irrigation and water management infrastructures.

Changes in the rain season are well identified in all sites with the general trend being the start of the rain season later than in the past, less total rain and increase of the dry spells. In Matoponi, the rain season moved from November – March to January-March; in Nkhulambe/Wowo, from October-April to January-March, in Chypofia, from November-April to November-March.

Crops – in general all farmers are considering the potential of diversification that will come from the new irrigation facilities. All farmers contacted mentioned the potential to have more crops and the interest in introducing new cultures if water becomes available.

Maintenance – maintenance of irrigation infrastructures and other equipment is a major issue for all farmers consulted. Previous irrigation schemes failed due to weak maintenance and management capacity.

Conflicts with wild life and natural habitats – the expansion of irrigated areas will induce conflicts that are already identified by the farmers in some sites – In Nkhulambe/Wowo, monkeys are expected to invade some agriculture fields while in sites close to rivers Hippos are expected to invade fields.

Herbicides and pesticides – apart the potential impacts on soil and water resources, training and capacity in handling and use of chemicals is an effective need identified by all farmers.

Below are some photographs of the potential sites.



Marko

Consultation with the association of farmers - Marko



General view of Marko future irrigation area

Mafinga Hill



General view of future irrigation scheme site in Mafinga Hill



Existing main irrigation channel in Mafinga Hill



Chipofya

General view of Chipofya future irrigation site



Small rice field close to the Lake Malawi in Chipofya

# Shire River - Matoponi



General view of the future irrigation area in Matoponi, close to the Shire River



Matoponi future irrigation area and possible pumping location in one of the Shire River tributaries



Nazombe

General view of future irrigation area in Nazombe



Existing water source in Nazombe

# Nkhulambe/Wowo



General view of Nkhulambe/Wowo future irrigation area



Existing degraded irrigation infrastructures in Nkhulambe/Wowo

# Annex IX – Terms of Reference for this ESMF

# Malawi: Programme for Rural Irrigation Development Terms of Reference for design support – Environmental and Social Assessment Procedures

# 1. Background

Malawi is overly dependent on rain-fed agriculture and vulnerable to rainfall variation. Large numbers of smallholders remain food insecure with low incomes that lead to persistent high levels of poverty and malnutrition. In an effort to address these issues, the Government of Malawi revised its National Irrigation Development Policy in 2011 to emphasise increasing the area under sustainable irrigation, extending cropping opportunities, facilitating crop diversification, creating an enabling environment for irrigated agriculture, enhancing capacity for irrigated agriculture and promoting a business culture in the small scale irrigated sub-sector. As part of the investments in the irrigation sub-sector the International Fund for Agriculture Development (PRIDE).

PRIDE's specific development objective is to "Organise and empower smallholder farmer groups to sustainably manage land and water resources in the face of climate change; and be responsive to commercial market opportunities". The main thrust of the Programme is to develop or upgrade small to large scale irrigation schemes to enable the smallholder farmer members of the respective Water User Associations to transition from low value to high value crops and from subsistence to commercial farming. Specific attention will also be paid to the management of the wider landscape and enhancing the productivity of rain-fed areas.

The geographic focus will be decided on a catchment basis linked to a potential irrigation scheme. PRIDE will target support to smallholder irrigation schemes and their catchments in the North, Central and South regions of Malawi while maximizing efficiency through the clustering of operations in a limited number of districts.

# 2. Project Locations

The targeted irrigation schemes in PRIDE include one large scheme (2000 ha minimum) in the northern region and clusters of small and medium size schemes in the central and southern regions. A separate ESIA has been undertaken for the large scheme. Another potential large scheme has also been identified as part of a Public Private partnership (PPP) with Malawi Mangoes (2000ha). A separate ESIA will be required for the PPP as water will be abstracted from Lake Malawi, which has significant biodiversity including rare species. The ESIAs for the large schemes are

the responsibility of financing partners i.e. European Union and Malawi Mangoes. However the reports will be reviewed by IFAD to ensure they meet the internal Environmental and Social Assessment Procedures.

The development of the medium and small size schemes is expected to have some adverse environmental and social impacts that can be mitigated through Environmental and Social Management Plans. However as the specific sites are yet to be identified, it is intended to undertake an environmental and social assessment and develop an environmental and social management framework to guide the specific site development plans. The catchment management activities will benefit smallholders with land plots in the wider catchment areas as well as of the target irrigation schemes.

# 3. Implementing Institution

The Ministry of Water Development and Irrigation (MOWDI) will be the lead implementing agency. The Department of Irrigation (DOI) will be responsible for coordinating implementation. As DOI has limited resources and capacity, MOWDI will establish a Programme Coordination Office (PCO) to be staffed by full time personnel engaged on performance-based contracts. The PCO will be tasked with the management of PRIDE using technical assistance when needed.

# 4. Assignment Objectives

In order to minimise the impact of potential environmental and social issues arising from investments in projects of irrigation and to enhance project design and implementation practices, it is proposed to engage an individual consultant to:

- Develop an Environmental and Social Management Framework (ESMF) including technical guidelines for minimising the adverse impact and managing social and environmental risks associated with the investments proposed as part of PRIDE.
- Revise the Environmental and Social Review Note based on the aspects included during the various phases of PRIDE design. The final ESRN should reflect all the activities confirmed to be part of PRIDE.
- Assess the requirement for and if necessary develop an ESMF for the Public Private Partnership (involving Malawi Mangoes) based on the ESIA to be undertaken for the farm.

# 5. Scope of Work

The revision of the ESRN will be informed by the final decision for the PRIDE investments (i.e. inclusion of South Rukuru Scheme and the PPP with Malawi Mangoes or focus only on small and medium scale irrigation schemes).

For the development of the ESMF(s) the consultant to be engaged will undertake an analysis based on available information and field visits if necessary to achieve satisfactorily the objectives of the assessment. The consultant will review and take into account the result of available studies on small scale irrigation development in Malawi. These activities shall be carried out in due consultation with DoI and Environmental Affairs Department, which is responsible for approving Environmental and Social Management Plans. The consultant will also review and take into account the regulatory framework of Government of Malawi and environmental and social policies of IFAD and international best practices on environmental management in rural irrigation schemes in the preparation of ESMF. In accordance with the aforementioned requirements, the scope of consultant services will include, but will not necessarily be limited to the following:

- Screening, management and monitoring tools that would be used during investment planning and implementation of PRIDE.
- Guidance to incorporate environmental/social considerations and plans in the engineering design and cross references the ESMF requirement to the contract clauses linking the adverse impact reduction measures to contract documents for subprojects.
- Present a guideline to enhance the environmental and social features of activities that would evolve during the project including environmental/social best practices based on the significance of environmental/social impacts.
- Present an administrative structure for environmental/social management; environmental capacity building and awareness raising program and environmental/social supervision and monitoring.
- Assess the potential of project impacts on land acquisition and/or alienation of land-based assets within the project affected area and recommend viable alternative measures to avoid, where feasible, or minimise such impacts. This includes an examination of the existing grievance mechanisms (by the Government of Malawi and/or project regions) including their accessibility by persons likely to be affected. The consultant to provide guidance on further work, as necessary.

# Specifically the ESMF would provide guidance for:

a) **Screening:** This would include developing methodologies and procedures for screening of project/sub-project based on specific environmental and social impacts;

b) **Management:** This would include developing management plans based on good practices including mitigation and enhancement measures for negative and positive impacts respectively, followed by effective monitoring plans and estimated costs.

c) **Institutional Arrangements:** This would include identification and development of institutional arrangements and capacity building plans to carry out the assessment, implementation and monitoring. Through these activities the ESMF would ensure subprojects compliance with national & state regulatory policies and bylaws and IFAD's policies throughout the sub-project cycles.

# 6. Deliverables

The assignment outcomes would inter-alia be the ESMF(s) having the following critical components:

- a) A method for screening and categorizing sub projects based on their climate vulnerability, and environmental and social significance;
- b) Information on how environment, climate and social risk management is to be carried out as part of the project management strategy;
- c) The project cycle for DOI and integrate environment and social issues into the cycle;
- d) Checklists, technical environmental and social guidelines to be used for incorporating these considerations into sub-project design, construction and operation;
- e) Information on regulatory requirements and its implications to the sub projects;
- f) Training needs, institutional arrangements, environmental and social supervision, climate change adaptation, monitoring & auditing plan including indicators, management information system, any additional inputs and budget.

The additional deliverable will be the revised ESRN.

# 7. The ESMF can follow the layout suggested below:

- Environmental and social Screening, climate risk analysis and Approval of Sub Projects
- 2. Environment and social Management Implementation and Monitoring
- 3. Mitigation and enhancement or compensatory measures
- 4. Monitoring, Auditing and Supervision Plan
- 5. Responsibilities Institutional or community level for various activities
- 6. Identification of capacity building needs
- 7. Project Cycle
- 8. Suggested Consultant Qualifications:

The consultant should be an Environmental Specialist, preferably an ecologist, environmental engineer or natural resources management specialist, experienced in dealing with environmental and social safeguard issues in irrigation and water infrastructure. S/he should have at least five years of relevant experience.

# 9. Schedule:

The draft Review Report will be completed **15 working days** from the date of signing the contract. The final Review Report will be completed and delivered within **5 working days** after receipt of comments on the draft Review Report.

# Annex X – Consultant's Resume

# António Domingos de Sousa Abreu

Telephone: +351 91 2213098 email: antoniodabreu@gmail.com

## Professional profile

António Domingos Abreu holds a PhD in Biology being an environmental expert and highly versatile professional with expertise in transposing scientific and technical research into international policy management and governance. Works across multiple government and non-governmental stakeholders in building international alliances to help define and shape projects, policies and practices ensuring balanced and practically workable outcomes.

Has an in depth experience with Maritime and Marine issues including research on marine biology and ecology, coastal management, fisheries, biodiversity conservation and protected areas. Member of several organizations and working groups dealing with maritime policy and governance. He is currently Chair of the Marine Working Group of the Network of European Environmental Advisory Councils Skills

- Provides leadership to international forums and advisory councils
- Understands international development agenda, objectives, processes and systems
- Understands multiple international and national stakeholder perspectives
- International environmental, climate change policy and governance expertise
- Research, analysis and report writing
- Culturally aware: visited more than 60 countries worldwide

- Builds and unites networks of diverse interests with strong negotiating ability
- Leads and motivates large and diverse teams directly and remotely
- Builds collaborative international partnerships and alliances
- Objective, politically neutral, diplomatic and highly professional
- Guest lecturer, teacher and supervisor
- Transfers scientific knowledge into policy and practical change

#### Management and scientific research roles

August 2015 – present Programme Manager, responsible for the Principe Trust's environmental, conservation, research and Príncipe Island Biosphere Reserve's projects.

May 2014 – June 2015 Member of the Coordinating Group, responsible for the pillar- Energy, Marine Sciences and Innovation on the preparation of the Strategic Referential for the Cluster of the Sea Economy - Autonomous Region of Madeira, Madeira Chamber of Commerce (ACIF – CCIM)

Aug 2011 – present	Environmental Consultant			
	African	Development	Bank/World	

# Bank/IFAD/UNESCO

Providing leadership and management in directing climate change investment through integrating environmental and social aspects into the design and implementation of projects and programs across Africa in line with the Climate Investment Fund and Global Agriculture and Food Security Programme, among others. Environmental categorisation, impact assessments, production of environmental and social frameworks and plans.

- Malawi: Responsible of development of the Environmental and Social Framework of the Project for Rural Irrigation Development.
- *Gambia:* Designed ground breaking project to meet challenging ambition to link food security and production and still meet climate change goals
- *Mozambique:* Ensured agricultural infrastructure was resilient to vagaries of climate change
- *Mozambique:* Designed environmental and social plan to address environmental issues and meet international climate change obligations through sustainable land and water management
- Angola: Fisheries project bringing together diverse stakeholders to formulate social and environmental management plan
- Angola: Developed environmental and social management plan for Calenga/Bom Jesus smallholder agricultural project to improve infrastructure and create conditions for reliable food production on behalf of African Development Bank and Angolan government
- Angola: Designed and implemented environmental safeguards as part of Market Oriented Smallholder Agriculture Project for World Bank on behalf of Angola government
- *Malawi:* Developed the environmental and social management framework for the Programme of Irrigation Development (PRIDE) IFAD
- Cabo Verde: Design and technical advisor of the application of Maio island to UNESCO Biosphere Reserve Government of Cabo Verde
- São Tomé & Príncipe technical and scientific advisor for the Príncipe Island Biosphere Reserve – Regional Government of Principe Autonomous Region, ST&P

# 2009 – present

# Environmental Expert, Consultant/Co-ordinator UNESCO MaB Programme

Providing leadership, management and technical expertise in the application process for countries looking to create biosphere reserves as part of the MaB programme.

- 2015: Member of the Roster of Experts of the New UNESCO MaB Strategy (2015-2025) and Action Plan (2016-2025).
- 2014: *Ghana Lake Bosomtwe, Ashanti Region*: expert, responsible for the final evaluation of the project "Sustainable Management of the Lake Bosomtwe" aiming the application of a new MAB UNESCO Biosphere Reserve.
- Since 2014: Member of the research team of the Project: "The impact of climate change on Island and Coastal UNESCO Biosphere Reserves" – Global Network of Island and Coastal Biosphere reserves
- Since 2002: *Member of the regional MAB UNESCO network REDBIOS* being responsible for the coordination and organization of annual meetings and projects.
- Caribbean Small Islands: Since October 2012 been working with 10 island states to instigate inter-ministerial conference for the co-ordination applications (expected to be a 3 5 year project)
- *Republic of Cape Verde*: Technical assistance for successful application of biosphere reserve
- Azores: in 2009 coordinated the application for the biosphere reserve of Flores Island

- *Madeira*: in 2011 coordinated the application for the biosphere reserve of Santana
- Príncipe Island and Democratic Republic of São Tomé: Coordinated application for biosphere and organised 11<sup>th</sup> REDBIOS network meeting here in 2013

# Nov 2013 – present Member, Advisory Board NetBiome-CSA Project

Strengthening European research cooperation for smart and sustainable management of tropical and sub-tropical biodiversity in outmost regions and overseas countries and territories.

2009 – present	Chair of the Marine Working Group European Environmental Advisory Councils		
2008 – 2014	Chairman Portuguese Chamber of Biologists Ordem dos		
Biólogos	Fortuguese Chamber of Biologists, Ordeni dos		
2012 – present	Vice President European Environment Advisory Councils Network		
– EEAC Re-elected to this internation	nal position in October 2013.		
2007 – present	Member, Evaluation Committee Scientific and Technological System of Regional		
Govt of Azores	Scientific and rechnological System of Regional		
2009 – present	Member National Council for Environmental and		
Sustainable Development			
2009 – 2012	Advisory Board Member Net-Biome ERANET Project		

Supporting sustainable development in the outermost tropical and sub-tropical territories of Europe.

Sep 2010 – Dec 2011	Vice-Pres	sident			
	Madeira	Tecnopolo -	Madeira	Technology	and

# Science Park

Attracting foreign investment and research in biotechnology based on the unique flora and fauna of the Island.

2009 – 2011	Head of Research Laboratory Ecology and Sustainable Tourism ISLA – Lisbon
2010	Consultant

International Union for Conservation of Nature

# (IUCN)

Working on the revision and status of implementation of the UN CBD Insular Biodiversity Action Plans in European Overseas Entities of Spain and Portugal.

2009	Member, Scientific Evaluation Committee
	German Ministry of Research for Land Planning
and Environmental	Research Programme

2006 – 2009	Member, Scientific Evaluation Committee Biodiversity Programme: Agence National de
Recherche, France	
2004 – 2009	Co-Chairman, Biodiversity Expert Group European Environmental Advisory Councils
<b>2007</b> "Increasing Environmental 47398_06_006). Project und Cyprus only). Northern Cypru	<b>Co-coordinator of the Workshop</b> <b>United Nations Development Programme</b> Civil Awareness Among Society Organizations" (No. der the UNDP – Action for Cooperation and Trust (for
2003 – 2007	Member, Representing the Government of Madeira Portuguese Forum of the Sea
<b>1993 – 2000</b> "Structure and dynamics of th Cost of Madeira"	Head of Research Project ne soft bottom macro invertebrate communities on South
1998 – 2000	Director Marine Biology Station - Funchal
1996 – 1998	Director Museu Municipal do Eunchal (Natural History)
Madeira	
Government and governan	ce roles
2012 – present	Advisor
	Government of Sao Tome and Principe
<ul> <li>Advisor to Government in eff</li> <li>Represented government</li> <li>Organised XI internat</li> <li>reserves on Principe</li> </ul>	ective management of the UNESCO biosphere reserve. nent at the Afri MAB General Assembly in Accra, Ghana ional meeting of REDBIOS network of Biosphere Island

 Represented the UNESCO Biosphere Reserve at 2<sup>nd</sup> and 3<sup>rd</sup> meetings of World Network of Biosphere Reserves in Islands and Coastal Zones

# 2000 – present

# Representative for Madeira Autonomous Region Various national and international committees

- Appointed Senior Officer to the European and International Cooperation Affairs Department in June 2013, responsible for the Marine, Environment and Climate Change affairs
- National Council for the Environment and Sustainable Development
- National Commission for the Ocean and Maritime Affairs
- National Commission for the Climate Change
- Water National Council
- ATHEG (UN) on Insular Biodiversity
- Biodiversity Working Group of the EEAC European Environmental Advisory
   Councils
- RedBios Network of Biosphere Reserves of the Macaronesian Region, UNESCO
- Follow up Committee of the INTERREG IIIB Programme

# Dec 2000 – Oct 2007

# **Regional Director for the Environment** Government of Autonomous Region of Madeira

Leading a team of 60 staff managing all aspects of environmental governance for the Maderian archipelago.

## Teaching roles

#### 2007 – present **Invited Teacher**

ISAL - Madeira

Specialising environment and nature courses for graduate, and Professional training post graduates in environmental management.

1995 – present	Supervisor Universities of Évora, Lisbon, Madeira, Algarve and
<b>Aveiro</b> Supporting, supervising and projects and thesis.	member of the jury of Masters and final year research
2006 – 2009	Invited Teacher University of Lisbon
Specialising environment an management.	d nature courses for post graduates in environmental
2007 – 2010	Invited Teacher Biodiversity and Nature Conservation, University of
Madeira	
2005 – 2007	Invited Teacher Environmental Management and Eco-Tourism at ISLA; Instituto Superior de Línguas e Administração; Lisbon
1996 – 2000	Teacher Professional School Colombo, Funchal, Madeira
Teaching courses in nature mgt technicians.	conservation and biophysical planning to environmental

1995 – 1998	Invited Teacher in Marine Biology
	University of Madeira

#### Academic and professional qualifications Fellow Royal Society of Biology, 2011 UK Environmental Specialist Title – OBio Portuguese Chamber of 2007 Biologists (Ordem dos Biólogos) PhD Marine Biology University of Madeira 2005 Degree in Biology University of Lisbon 1989 Post Grad Formation in Comparative University of Cadiz 1996 Phylogenetic method studies on marine organisms EuroProBiol – European Professional **ECBA** 2000

Biologists Title		
Advanced Management on Public	National Portuguese	2007
Administration	Institute of Administration	
Professional Trainer for Environmental and	DRQP	2008
Natural Resource Subjects (CAP)		
E Tutor Qualification – Long Distance	ACIF – Learn4U	2006
Training		

Publications

Available on request

Languages

Fluent in English • French • Spanish • Native Portuguese

References available on request