



Republic of South Sudan



E4220v3

**ENVIRONMENTAL AND SOCIAL
MANAGEMENT FRAMEWORK (ESMF)**

FOR

**EMERGENCY FOOD
CRISIS RESPONSE PROJECT**

May 2013

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List of Acronyms and Abbreviations

AAHI	Action Africa Help International
CES	Central Equatoria State
CPA	Comprehensive Peace Agreement
EA	Environmental Assessment
EFCRP	Emergency Food Crisis and Response Project
ESA	Environmental and Social Assessment
ESAF	Environment and Social Assessment Framework
ESIA	Environmental and Social Impact Assessment
ESMF	Environment and Social Management Framework
ESMP	Environment and Social Management Plan
FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
GFRP	Global Food Crisis Response Program
GNI	Gross National Income
GoSS	Government of Southern Sudan
HH	House Hold
FHH	Female Headed Household
IPM	Integrated Pest Management
IPMF	Integrated Pest Management Framework
IPMP	Integrated Peoples Management Plan
IPPF	Indigenous People Planning Framework
MAF	Ministry of Agriculture and Forestry
MDTF	Multi-Donor Trust Fund
MDTF-S	The Multi-Donor Trust Funds for Southern Sudan
NGOs	Non-Governmental Organizations
NPA	Norwegian People's Aid
OP	Operation Policy
PDO	Project Development Objective
PIU	Project Implementation Unit
PMP	Pest Management Plan
PTC	Project Technical Committee
RAP	Resettlement Action Plan
RSS	Republic of South Sudan
SS	South Sudan
TOR	Terms of Reference
UN	United Nations
UNDP	United Nations Development Program
WFP	World Food Program

1. BACKGROUND INFORMATION

1.1 Introduction

The Ministry of Agriculture and Forestry (MAF) has been in existence since 2005 and replaced the former Secretariat of Agriculture and Animal Resources (SAAR). The Ministry of Agriculture and Forestry (MAF) was instituted with a vision to ensure food security for all people of South Sudan so as to enable them enjoy improved quality of life, environmental and economic prosperity. The mission of the MAF is to transform Agriculture from traditional subsistence system to achieve food security through scientific, market oriented, competitive and profitable agricultural system without compromising the sustainability of natural resources for future generations at the Central, State, County and farmer levels.

In line with government's emphasis for sustainable agriculture development, the Ministry of Agriculture and Forestry's current strategic plan drafted in 2007 emphasizes the pursuance of sustainable agricultural development and ensuring immediate change in the lives of South Sudanese. Therefore, MAF endeavours to ensure food security for the people of South Sudan at household and regional levels. The MAF also has the responsibility to improve the livelihood of rural South Sudan peoples without compromising the sustainability of its natural resources for future generations.

The Ministry of Animal Resources and Fisheries has the mandate to promote, regulate and facilitate animal production and fisheries, value-addition and access to credit and Regional and International markets for food security, poverty alleviation and socioeconomic development, the operation areas is animal Resources and Fisheries Sector.

The ministry is composed of the following directorates:

- Directorate of Planning, Investment and Marketing
- Directorate of Veterinary Services
- Directorate of Animal Production and range Management
- Directorate of Training, research and Extension
- Directorate of Fisheries and Aquaculture Development

MAF implements various activities geared towards improving agricultural productivity and ensuring sustainable management of forests and utilization of forest resources. MARF also implements activities intended to sustainably utilize animal and fisheries resources so as to improve food security, and contribute to poverty alleviation. This is achieved through government programs prepared by the Ministries. MSRF and MAF also get support from the donor community to implement activities geared towards improving food security and improving livelihoods among the people of South Sudan. This support includes projects such as Support to Agriculture and Forestry Development Project (SAFDP), Emergency Food Crisis and Response Project (EFCRP) and, the Livestock and Fisheries Development Project (LFDP) implemented with funds administered by the World Bank from the MDTF. Implementation of such projects and other Ministry activities may, sometimes, have significant environmental and social impacts which need

to be addressed during project/program development and implementation so as to mitigate or reduce their effects while enhancing the positive aspects and aims of the project activities. Both ministries intend to address environmental and social concerns in all of their activities in a manner that is consistent with the RSS laws and World Bank's safeguards policies.

1.2 Relevance of the ESMF

The ESMF provides general policies, guidelines, codes of practice and procedures to be integrated into the implementation of all projects/programs implemented by MAF. Consistent with the existing Republic of South Sudan (RSS) national legislation and World Bank guidelines, the objective of the ESMF is to help ensure that activities under the Ministry projects and programs benefits to (1) protect human health; enhance positive environmental and social outcomes; (2) prevent or mitigate negative environmental impacts as a result of either individual projects/programs or their cumulative effects; and (3) prevent or compensate any loss of livelihood.

In preparing this document, relevant environment and social safeguard practices from theoretical and empirical sources such as RSS and WB were reviewed. The activity included field visits, different level consultations, qualitative and quantitative assessment towards understanding implementation processes of environmental and social safeguard compliance, capacity assessment of MARF, MAF, MoE etc.

1.3 Objectives of the ESMF

The purpose of this document is to outline Environmental and Social Management to be followed by MARF and MAF. It provides guidelines on how to carry out environmental and social screening/assessment including Initial Environmental Examinations (IEE), Environmental Impact Assessment (EIA), Social Impact Assessment (SIA) and prepare Environmental Management Plan (EMP) to mitigate project/program induced negative environmental/social impacts and to enhance positive environmental/social aspects. This also outlines the process of preparing involuntary resettlement and indigenous people plan. The specific objectives include:

- To establish clear procedures and methodologies for environmental and social planning, review, approval and implementation of MAF projects and programs irrespective of the source of funding;
- To prescribe project arrangements for the preparation and implementation of projects in order to adequately address World Bank safeguard issues;
- To assess the potential environmental and social impacts of the programs/projects;
- To propose mitigation measures which will effectively address identified negative impacts;
- To specify appropriate roles and responsibilities, and outline the necessary reporting procedures for managing and monitoring environmental and social concerns related to sub-projects; and
- To determine the training, capacity building and technical assistance needed to successfully implement the provisions of the ESMF.

This ESMF will also cover institutional/ organizational needs of MAF and MARF to implement the recommendations to mitigate any possible environmental negative impacts and social conflicts.

2 THE MINISTRY OF AGRICULTURE AND FORESTRY

2.1 Mandate and Mission

The Ministry of Agriculture and Forestry has the overall mandate of ensuring food security for all the people of Southern Sudan with improved quality of life, environment, and economic prosperity. This will be achieved through the transformation of agriculture from traditional/subsistence system to achieve food security through science-based, market oriented, competitive and profitable agricultural system without compromising the sustainability of the natural resources for generations to come.

The Ministry of Agriculture and Forestry has three main goals to achieve. These include being food self-sufficient, reducing poverty and contributing significantly to the national GDP.

2.2 Strategic Objectives of the MAF

In order to achieve the above national goals, the Ministry has to undertake and achieve the following key strategic objectives within its own Ministry:

- (i) Priority policies that quickly boost agricultural production
- (ii) Make available agricultural inputs, including credit facility at affordable costs
- (iii) Rehabilitate and expand rural infrastructure including feeder roads, markets etc
- (iv) Develop and provide research and extension services and market linkages
- (v) Develop and strengthen institutional and human resource capacity
- (vi) Protect, regenerate and conserve natural resources; formulate policy incentives for rational and sustainable management and utilization.

2.3 Key Interventions for MAF

The following are key interventions needed to guide South Sudan to sustainable agricultural development and economic growth:

- a) **Provide the Necessary Agricultural Inputs for Increasing Agricultural productivity Using Private Sector Intermediaries and Regional Agricultural Institutions**
 - Improved seeds, seedlings and tissue culture – tested and verified
 - Agro chemicals including fertilizer, pesticides and herbicides – controlled
 - Labor saving and cost-effective farm implements
 - Mechanized equipment for the large scale irrigated fields
 - Credit facility to farmers, associations, and youth and women groups
- b) **Efficient Provision of Agricultural Services**

- **Research:** Technology generation and adaptation by agro-ecological zone and by commodity; Importation of technologies and best practices from neighboring countries; Establishing agro-ecological field stations and research centers
- **Extension:** Advisory and information services to farmers; Linking farmers with technology producers, input suppliers, processors and markets; Involving the private sector and progressive farmers to provide village level extension services; training and recruiting village-level extension agent (High School Diploma); opening farmer training schools.
- **Market Information and linkages to markets**
- **Facilitate agricultural credit and insurance through the establishment of an agricultural bank for Southern Sudan.** Initially MAF will invest in a private commercial bank and subsequently leverage more funds to open a national agricultural bank to serve the rural population in the development of the agricultural sector

c) Improve Rural/Village Infrastructure:

- Rehabilitation and expansion of feeder road networks, phase by phase
- Rehabilitation and expansion of rural markets (market centers, stores, post-harvest facilities, village drying floors, harvesting and handling hangars)
- Development and construction of irrigation schemes, priority by priority
- Reclamation and development of swamplands for commercial agriculture

d) Sustainable natural resources management and protection of the environment:

- Land use study and mapping
- Techniques and improved practices in land husbandry; soil and water conservation; forestry and pasture conservation and improvement
- Sustainable agroforestry/forestry techniques and management
- Mitigating environmental degradation
- Land policy reform
- Integrated natural resource management and the environment
- Inter-sector coordination

2.4 Administrative Structure of MAF

The Ministry of Agriculture and Forestry has the Minister and Deputy Ministers as the political heads of the Ministry and guide policy formulation in the Ministry. The Under Secretaries for Agriculture and Forestry are charged with the day-to day running of the ministry and are double as the accounting officers. The Ministry has five directorates headed by Director Generals. These include Agriculture Research, Training and Extension, Agriculture, Finance and administration, Forestry and Planning and Programming. Figure 2.1 below gives the organizational structure of the Ministry.

Figure 2.1: Organization chart for the Ministry of Agriculture and Forestry

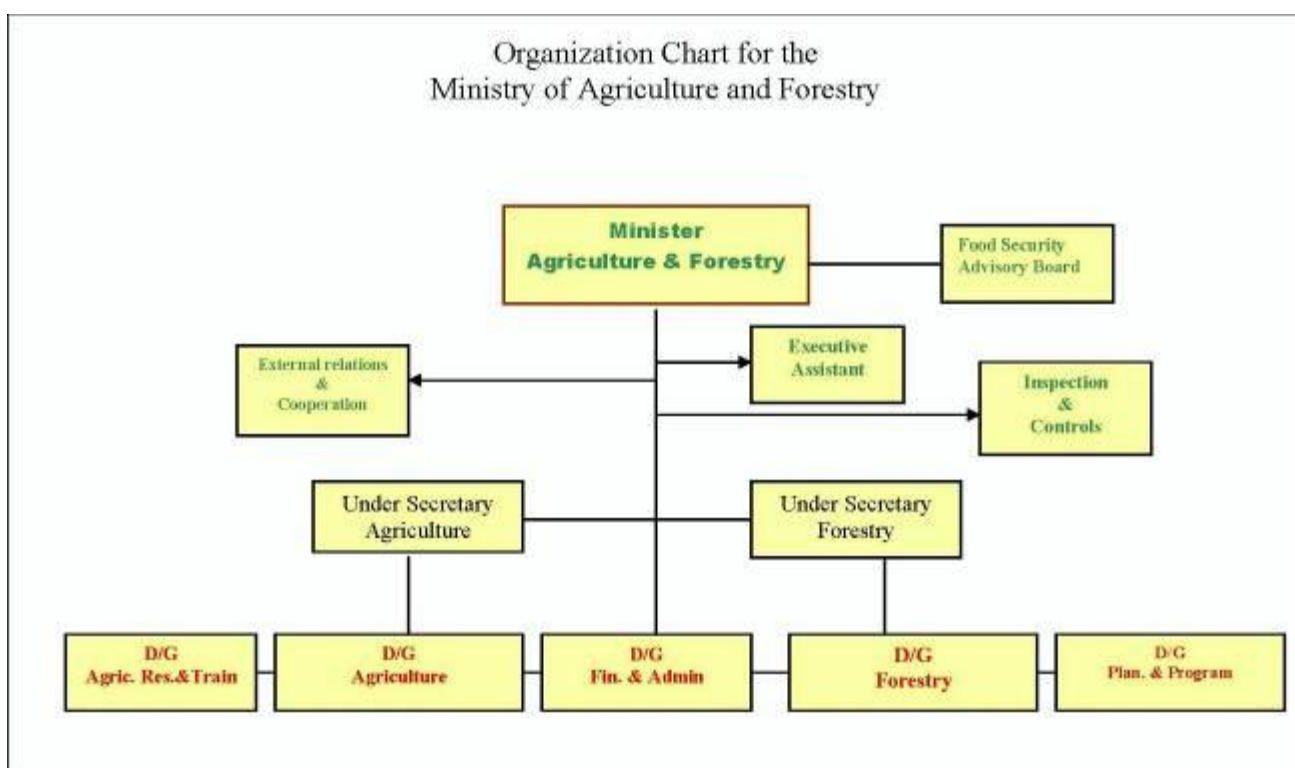


Figure 2.1: Organisation chart for the Ministry of Agriculture and Forestry

2.5 Sector analysis

2.5.1 The Agricultural Sector:

Agriculture in South Sudan is predominantly subsistence characterized by low productivity and low cash income. Although there is vast area of arable land, only a very small percentage of land is cultivated (about 2%) as farmers depend on traditional farming practices with no exposure to modern production technologies and markets. Sources of income from agriculture are very limited since there is no improvement in increasing yield of agricultural products due to lack of access to improved agricultural techniques and services. The problem is exacerbated by lack of roads and market infrastructure to move commodities from surplus regions to deficit areas. Sources of additional income from off-farm activities are also limited since there are no other opportunities for employment. Because of a high rate of illiteracy, the productivity of labor is very low affecting the productivity of both farm and non-farm income.

Because of massive displacement of people, livestock and other assets over a period of three decades, the vast majority of population is left with very negligible assets that they can transform into farm capital, income and food security. Livestock is the one asset owned by the majority of agro-pastoral households with a potential for a primary source of income and farm capital. However, livestock raising is still perceived by many as a social wealth rather than an economic enterprise. Since livestock holders continue to use the traditional unmanaged open-grazing system

over a vast territory, it is becoming more of a problem than a solution to cultivators, communities, local administrators and environmentalists.

With the absence of a viable land tenure system and land law, the question of land would continue to adversely affect the productivity of agriculture, forestry and livestock sectors. The important role that farmers, communities, the private sector and government play in improving productivity in the 3 sectors would only be assured when the question of land is resolved and when any individual or group can have a legal right to own and use land.

Because of the war, the role of the private sector to develop mid-large scale commercial and irrigated agriculture has become insignificant. The problem is complicated by the absence of policies that would allow a private sector to have access to agricultural land, water and forest resources.

High levels of uncertainty and vulnerability are also factors that affect the productivity of agriculture, livestock and forestry. With about 15-20% of the population relying on humanitarian relief assistance, the Government's first priority is to ensure the security and stability of the population through agricultural rehabilitation and recovery programs, good governance, and equitable distribution and use of resources.

Although women have traditionally been the main movers of household farming, their contribution has neither been understood nor appreciated. Understanding the role of women and empowering them with resources, skills and decision-making will undoubtedly be a major factor to improve agricultural productivity in South Sudan. Poor conservation and mismanagement of the natural resources have been detrimental to sustainable growth of both the agricultural and forestry sectors. Exacerbated by the 21year old war, no effort was made by the public, communities, private sector and farmers to protect, conserve and manage our natural resources. Our forests and wild life have been destroyed, and our arable lands and soils have been degraded. The magnitude and frequency of droughts and floods have increased resulting in reduced agricultural productivity. The CPA and the Government of South Sudan has made a pledge to the population of South Sudan that the natural resources and bio diversity will be protected and managed appropriately for use and conservation by the present and future generations.

2.5.2 The Forestry Sector

Southern Sudan is richly endowed with natural forests and plantations. Before the outbreak of the last war in 1983, it was estimated that about 68% total national forest biomass was located in Southern Sudan and formed the base for production of 85% sawn timber used in the whole of Sudan. These forests also play crucial ecological functions in Nile Basin context. Thus, forests and forestry activities in Southern Sudan are of key strategic importance. The existing natural forests and woodlands provide valuable commercial products, including cabinet grade timber trees, but have become severely degraded by wild fires, overgrazing and over cutting during successive wars. Productivity of natural forests and woodlands is low and declining.

Poverty and poor nutrition combine to constrain agricultural production in most states. It is in this background that GOSS has targeted rural poverty and agricultural revitalization as its priority areas for intervention. Forests and forestry have key roles to play in these interventions through provision of both wood and non-wood forest products and a vital source of income to the rural poor. Forest based enterprises offer unique opportunities for transforming rural livelihoods. In addition to direct benefits in the form of income, the forests provide many vital indirect benefits in forms of environmental protection (as shade, wind belts), improved agricultural production (increased soil fertility through mulching and nitrogen fixation), food (Shea butter, fruits, etc), fodder for wildlife and wildlife, etc.

Although fossil oil production is already generating substantial incomes and has the potential to fuel economic growth (oil drilling already on-going in three states (Unity, Jonglei and Upper Nile), it remains the overall GOSS development strategy to promote and sustain agricultural production and processing as the backbone its economy, now and into the long-term future. Thus, GOSS accords highest development priority to rebuilding its human capacity and infrastructure for increased agriculture and forestry production throughout the country.

It is in this particular background that forests and forestry development has pivotal role to play in stabilizing and increasing agricultural production and in supporting agro-industrial processing in all the states of Southern Sudan. On the positive side, it is worthy of stress that, with good planning and adequate resource allocation, all the 10 State have great potentials for socio-economically beneficial forestry enterprises ranging from tree growing, forest extraction and trade in forest products and services. On the negative side, the serious forest resource destruction during the war and the continuing threats to forests (largely due to over cutting and forest fires) pose serious challenges to Southern Sudan realizing its development mission with improved agriculture and forestry production and services being the main driving force for our national socio-economic development while ensuring the sustainability of the rich natural resources for future generations.

Forest sector development will take into account the overall GOSS focus on integrated rural development through approaches which will ensure that the rural population of Southern Sudan shall have access to basic needs which include sustainable household food security, shelter, wood fuel, safe clean water, sanitation and health facilities, primary education, good local governance, empowerment and self reliance. MAF will specifically promote public sector-private sector-community partnerships toward achieving sustainable rural development and conservation of the natural resources and the environment.

In principle, integrated rural development means that the people in every Payam and Boma should implement the best set of development options available to them, measured by the following criteria:

- social: where rural development leads to overall benefits by the provision of social amenities such as education, democratic decision making, recreational facilities, and adequate health care;

- economic: where economic activity is encouraged sufficiently in rural areas to provide job security and a sustainable improvement in living standards and involves simultaneous, harmonious development of several sectors such as agriculture, forestry, tourism, and small enterprises;
- environmental: economic activity can only take place by using natural resources; managing the natural resource base in a sustainable way is critical to both rural and urban economies, the more so for rural people who are directly dependent on natural resources to secure a livelihood; it is therefore critical that environmental planning is done in conjunction with overall development planning in rural areas; and
- technological: careful selection and promotion of appropriate environmentally friendly technologies for forest resource utilization and development strategies.

2.6 Ministry of Animal Resources and Fisheries

The MARF has the responsibility to promote, regulate and facilitate animal production and fisheries, value-addition and access to credit and Regional and International markets for food security, poverty alleviation and socio-economic development, the operation areas is animal Resources and Fisheries Sector.

The main functions of the ministry include:

- Formulate legislation, regulations, policies and standards for the development of the animal and fisheries resources of South Sudan;
- Provide policy guidance and monitor performance of livestock and fisheries activities undertaken in South Sudan;
- Protect against environment degradation through pasture and soil conservation through proper usage of grazing areas;
- Identify and promote investment opportunities in livestock and fisheries in South Sudan;
- Human resource training in the field of animal production and fisheries;
- Provide technical advice on animal health and disease control policies and introduce plans to improve livestock health and production in South Sudan;
- Encourage the private livestock sector and regulate the delivery of veterinary services and supplies;
- Monitor and investigate the prevalence, spread and impact of animal diseases in the livestock populations;
- Support a meat inspection service at appropriate levels of government and the development of abattoirs;
- Promote and coordinate partnership between public institutions and private livestock owners and operators and provide needed technical assistance for the transformation of traditional livestock practices into a modern market-oriented system;
- Promote the improvement of fishing and fish processing technologies to improve the quality and quantity of fish catches in South Sudan;
- Ensure the sustainability of the fisheries sector through the development and enforcement of policies and regulations governing the exploitations of fish stocks;

- Promote and develop aquaculture fish production;
- Promote effective community-based extension programmes in livestock and fisheries production;
- Promote the development of bee-keeping industry and other emerging livestock resources;
- Promote animal welfare; and
- Provide technical assistance and training to state governments and other local governments to build their capacity to assume their responsibilities for animal resources and fisheries matters as defined in the Constitution and GoSS policy.

MARF has five Directorates to carry out the above functions. These include:

- Directorate of Planning, Investment and Marketing
- Directorate of Veterinary Services
- Directorate of Animal Production and range Management
- Directorate of Training, research and Extension
- Directorate of Fisheries and Aquaculture Development

3. ENVIRONMENTAL AND SOCIAL REQUIREMENTS

Usually, according to the World Bank, agricultural investments projects have an environmental rating of B or C. Agricultural projects usually aim to improve agricultural productivity, strengthen agricultural research and extension system in ways that contribute to environmentally and socially sustainable growth and resource management. Environment issues associated with agricultural projects include: (a) loss of natural habitat; (b) use of inappropriate farming practices; (c) agriculture/wildlife conflicts; (d) agro-processing pollution; (e) misuse of pesticides; and (f) forests ecosystem losses.

Social issues sometimes include: (a) resource poor farmers inability to access extension services and inputs; (b) inappropriate technology and thus poor adoption; (c) inadequate access and control of production functions for women and; (d) tribal conflicts that affect agricultural production in some areas of South Sudan.

Safeguard screening procedures

This Environmental and Social Management Framework (ESMF) has been prepared to fully comply with environmental legislations and procedures in South Sudan and with the World Bank's environmental and social safeguard policies. In this chapter, the key safeguard policies that provide the policy context to the ESMF including World Bank policies and South Sudan's legal requirements on environmental assessment have been outlined.

3.1 World Bank Safeguard Policies

The Bank requires environmental assessment (EA) and Social Assessment of projects proposed for Bank financing to help ensure that they are both socially and environmentally sound and sustainable, and thus to improve decision making. The World

Bank's environmental assessment policy and recommended processing are described in **Operational Policy (OP)/Bank Procedure (BP) 4.01: Environmental Assessment**. This policy is considered to be the umbrella policy for the Bank's environmental "safeguard policies" which among others include: Natural Habitats (OP 4.04), Forests (OP 4.36), Pest Management (OP 4.09), Physical Cultural Resources (OP 4.11), and Safety of Dams (OP 4.37). **Operational Policies (OP)** is the statement of policy objectives and operational principles including the roles and obligations of the Client and the Bank, while **Bank Procedures (BP)** is the mandatory procedures to be followed by the Client and the Bank. OP/BP 4.01 issued in January 1999, is the central document that defines the Bank's environmental assessment requirements. Following are the WB's environmental and social/resettlement guidelines:

Environmental Policies

- OP 4.01 Environmental Assessment
- OP 4.04 Conservation of Natural Habitats
- OP 4.09 Pest Management

- OP 4.36 Forestry
- OP 4.37 Safety of Dams
- OP 4.11 Physical Cultural Resources

Social Policies

- OP 4.12 Involuntary Resettlement
- OP 4.10 Indigenous Peoples

Legal policies

- OP 7.50 Projects on International Waterways
- OP 7.60 Disputed Areas

The most relevant policies of World Bank in MAF activities is the OP 4.01 Environmental Assessment. As part of the ESMF process, proposed Projects under the MAF will be designed at the local level to ensure that they are screened for potential impacts and that they comply with the requirements set out under World Bank safeguard policies. The project beneficiaries include the farmers and communities within the operational areas who participate voluntarily in project activities. The key stakeholders include the farmers, communities, CBOs and NGOs, local government, research and environmental management institutions and the relevant sector ministries (agriculture, water, forestry, environment, lands).

Agricultural projects normally affect land use changes to varying degrees and can be categorized under category B or C of the World Bank. The ESMF has been developed based on the inputs generated during consultations with all stakeholders and has formulated appropriate processes for screening for environmental and social safeguards in projects/programs.

The ESMF will include a screening process to assess the potential impacts associated with Ministry projects and programs. The screening and review process for projects will therefore, help determine which of the safeguard policies are triggered and what measures need to be taken to address the potential impacts. The screening and review process determine how and when a particular project will trigger a safeguard policy, and what mitigation measures needs to be put in place. The screening and review process also ensures that projects that may have potentially significant impacts have a more detailed study.

3.1.1 Environmental Assessment (OP 4.01)

Environmental Assessment is one of the ten environmental, social, and legal Safeguard Policies of the World Bank. Environmental Assessment is used in the World Bank to identify, avoid, and mitigate the potential negative environmental impacts associated with Bank lending operations. In World Bank operations, the purpose of Environmental Assessment is to improve decision making, to ensure that project options under consideration are sound and sustainable, and that potentially

affected people have been properly consulted. The Bank requires environmental assessment (EA) of projects proposed for Bank support to ensure that they are environmentally sound and sustainable, and thus to improve decision making. EA is a process whose breadth, depth, and type of analysis depend on the nature, scale, and potential environmental impact of the proposed project. EA evaluates a project's potential environmental risks and impacts in its area of influence; examines project alternatives; identifies ways of improving project selection, siting, planning, design, and implementation by preventing, minimizing, mitigating, or compensating for adverse environmental impacts and enhancing positive impacts; and includes the process of mitigating and managing adverse environmental impacts throughout project implementation. EA takes into account the natural environment (air, water and land); human health and safety; social aspects (involuntary resettlement, indigenous peoples and physical cultural resources); and transboundary and global environmental aspects. The client is responsible for carrying out the EA and the Bank advises the borrower on the Bank's EA requirements.

This OP 4.01 is normally triggered because there is potential that the implementation of the agricultural projects/programs may lead to some negative environmental impacts. There are usually no potential large scale, significant or irreversible environmental impacts associated with agricultural projects. Programme interventions normally focus on implementation of specific activities that improve the long-term sustainability of the ecosystems.

3.1.2 Natural Habitats (OP 4.04)

There are bound to be critical habitats in some of the areas the MAF may wish to implement its activities. MAF projects and activities will not be implemented in protected areas and is not envisaged to target natural habitats ecosystems such as wetlands (swamps, and marshes), and forests. The ESMF provides communities and extension teams with the appropriate checklist tools, resource sheets and planning methods to identify any potential impacts of project activities on natural habitats, reserves, or protected areas, and to develop appropriate mitigation measures to minimize or avoid damage, or compensate for it. Those activities that are not addressed by the ESMF and may have impacts on natural habitats would be identified using the screening and review procedures as outlined in Chapter 6.

3.1.3 Pest Management (OP 4.09)

The MAF will make resources available and strengthen the capacity of agricultural producers and other resource users to: (i) adopt Soil and Land Management (SLM) practices and technologies to mitigate land degradation and achieve greater productivity of crops, trees and livestock; and (ii) adopt sustainable alternative livelihood options to diversify and increase income, and reduce the pressure on the natural resources. A number of activities such as irrigation may result in the introduction or expansion of pest management activities in certain areas. The ESMF includes a brief IPM as a decision-making process for the selection, implementation, and evaluation of pest management practices. Those activities that are not addressed by the ESMF and may use pesticides that are likely to have impacts on the environment would be identified using the screening and review procedures as outlined in section 6.3.

However, MAF projects and activities should adopt integrated pests management strategies (IPM). This will comprise soil pests, weeds, field and post-harvest pests and pest diseases management. Use of certified seeds or seed dressing protects them from soil borne pests. Weed control could either be manual or use of appropriate herbicides. There are pre germination and post germination herbicides. However, extreme care is needed in the use of herbicides in that any wrong or uninformed use is likely to cause total loss of the crops or environmental pollution of water and soil. As a rule farmers should observe strict surveillance of their crop and observe high levels of crop hygiene as a first step to manage the pests and diseases in the field. These include removal and destruction of affected plants and then preventive control of the identified problem. Post-harvest pests are managed even before harvesting by cleaning the stores and destroying the residues from previous harvest. Use of recommended pesticides on the harvested crop before storage contributes immensely to the preservation of the harvested crop against attacks by pests.

3.1.4 Indigenous Peoples (OP 4.10)

This policy is triggered as the overwhelming majority of people in the project area trigger OP/BP 4.10. Per the requirements of OP/BP 4.10, when Indigenous Peoples are the sole or the overwhelming majority of direct project beneficiaries, the elements of an Indigenous Peoples Plan (IPP) should be included in the overall project design; a separate IPP is not required.

3.2 Mainstreaming Safeguard Compliance into Project components Screening

The screening criteria provided in the ESMF includes relevant questions which will help determine if any other safeguard policies are triggered and the measures needed to be taken into account to mitigate impacts. The screening and review process will identify any sub-projects/activities that may have potentially significant impacts which require more detailed study and the need for a sub-project specific Environment Assessment (EA). This will ensure that all concerns related to South Sudan environmental legislation and the Bank's safeguard policies are taken into account during the screening of subprojects for potential impacts, and that the appropriate mitigation measures can be adopted to address them.

3.3 South Sudan environmental legislation

Since attainment of Independence in July 2011, the Government of the Republic of South Sudan has adopted a new Republican Constitution, and a number of new policies and legislation, others still being drafted, with the ultimate aim of enhancing sustainable socio-economic development in the country. The policies and laws provide procedures to be followed in the planning and implementation of government activities in order to utilize resources and execute government programs to maximum benefit.

The following sections highlight some selected policies and laws, which are applicable in the planning and implementation of public sector projects, more especially those projects in the agricultural and forestry sector.

3.3.1 Environment Policy of South Sudan, 2010 (Draft)

The policy provides a wide range of guidance in response to emerging environmental management challenges to enable decision makers and resource users make development choices

that are economically efficient, socially equitable and environmentally friendly to ensure realization of sustainable development.

The goal of the South Sudan National Environment Policy is to ensure protection and conservation of the environment and sustainable management of renewable natural resources in order to meet the needs of its present population and future generations.

The objectives of the RSS environmental policy seek to:

- a. Improve livelihoods of South Sudanese through sustainable management of the environment and utilization of natural resources;
- b. Build capacity of the government at all levels of governance and other stakeholders for better management of the environment;
- c. Integrate environmental considerations into the development policies, plans, and programs at the community, government and private sector levels;
- d. Promote effective, widespread, and public participation in the conservation and management of the environment;

This policy is important to this ESMF because it provides general guidelines and principles to be followed in environmental management during the operations of project especially in the agriculture sector. Some of the specific areas of its relevance include protection of aquatic and other sensitive habitats against both encroachment and pollution.

3.3.2 The Transitional Constitution of 2011

The Transitional Constitution of the Republic of South Sudan of 2011 incorporates numerous provisions that have a bearing on the environment. Article 41 (1) provides that the people of South Sudan shall have a right to a clean and health environment (2) every person shall have the obligation to protect the environment for the benefit of present and future generations (3) Every person shall have the right to have the environment protected for the benefit of present and future generations, through reasonable legislative action and other measures that:

- (a) prevent pollution and ecological degradation;
- (b) promote conservation; and
- (c) secure ecologically sustainable development and use of natural resources while promoting rational economic and social development so as to protect the bio-diversity of South Sudan.

Furthermore, Article 166 (6) expects local governments involve communities in decision making in the promotion of a safe and healthy environment.

3.3.3 The Environment Protection Bill, 2010 Cap 7 (Draft)

Section 32 of the Draft Environment Protection Bill, 2010 Cap 7 intends to introduce the requirement for Environmental Audits. An Environmental Audit, according to this Bill, is defined

as the systematic, documented, periodic and objective evaluation of how well Environmental organization, management and equipment are performing in conserving the Environment and its resources. The guiding principles for an Environmental Audit include:

- (1) The Owner of the Premises or the operator of a Project shall be responsible for carrying out an Environmental Audit of all activities that are likely to have a significant effect on the Environment, in consultation with the Lead Agency.
- (2) An Environmental Inspector may enter any land or Premises for the purpose of determining how far the activities carried out on that land or Premises conform to the statements made in the Environmental Impact Assessment in respect of that land or Premises.
- (3) The Owner of the Premises or the operator of a Project for which an Environmental Impact statement has been made shall keep records and make quarterly and annual reports to the Ministry describing how far the project conforms in operation with the statements made in the Environmental Impact statement.
- (4) The Owner of Premises or the operator of a Project shall take all reasonable measures to mitigate any undesirable effects not contemplated in the Environmental Impact Statement and shall prepare and submit an Environmental audit report on those measures to the Ministry quarterly and annually or as the Authority may, in writing, may require.

3.3.4 Land Act, 2009

One of the key objectives of the Land Act is to promote a land management system to protect and preserve the environment and ecology for the sustainable development of South Sudan. It also provides for fair and prompt compensation to any person whose right of occupancy, ownership or recognized long standing occupancy of customary use of land is revoked or otherwise interfered with by the Government.

The Land Act reinforces government recognition of customary land tenure: ‘Customary land rights including those held in common shall have equal force and effect in law with freehold or leasehold rights.’ Community land can be allocated to investors as long as investment activity ‘reflects an important interest for the community’ and ‘contributes economically and socially to the development of the local community’. It also requires that state authorities approve land acquisitions above 250 feddans (105 hectares) and create a regulated ceiling on land allocations. The Land Act requires government to consult local communities and consider their views in decisions about community land. The Land Act also gives pastoralists special protection: ‘No person shall without permission ... carry out any activity on the communal grazing land which may prevent or restrict the residents of the traditional communities concerned from exercising their grazing rights’. Project proponents must also conduct environmental and social impact assessments (ESIAs) before undertaking any activity that might affect people or the environment.

3.3.5 Forest policy, 2012

The Forest Policy, 2012 was formulated to broadly protect the roles forests play in the ecological stability of rivers, lakes, swamps and agricultural production systems. It also meant to ensure that

there are optimal benefits from forestry and agro-forestry activities for food security and to poverty alleviation among our rural communities.

It also integrates forest sector actions with rural development efforts to ensure that the rural population of South Sudan shall have access to basic needs which include sustainable household food security, shelter, wood fuel, safe clean water, sanitation and health facilities, primary education, good local governance, empowerment and self reliance. This policy is founded on the following guiding principles for a forward-looking and vibrant forest sector in South Sudan:

- All forests and tree resources of South Sudan will be managed sustainably to ensure streams of benefits to present and future generations;
- Permanent forest estates (PFE) will be established and managed to ensure conservation of biodiversity and steady flow of benefits;
- Forests and tree resources will be managed in accordance with set criteria and indicators for sustainable management;
- Appropriate specific policies, legislation, institutional reforms will be implemented to support rapid growth of the forest sector;
- Industrial and other plantations will be sustainably management to meet the growing wood demands;
- There will be increased participation and benefits for communities in forest management through collaborative management schemes;
- Tree based industrial development (forest products processing) will be promoted and supported to increase economic benefits from forest resources;
- Forestry institutions and services will be strengthened to increase productivity, achieve household food security, alleviate poverty and contribute to the macro-economy of South Sudan;
- There will sustained commitment to forest related regional and international agreements and Conventions; and
- Management of forests and tree resources will be guided by best knowledge and information.

3.3.6 The Food and Agriculture Policy Framework, 2007

The Food and Agriculture policy framework of the Ministry of Agriculture and Forestry emphasizes the need to transform agriculture from traditional/subsistence system to achieve food security through science-based, market oriented, competitive and profitable agricultural system without compromising the sustainability of the natural resources for generations to come.

In order to achieve the above, it developed key strategic objectives that include:

- Priority policies that quickly boosts agricultural production
- Make available agricultural inputs, including credit facility, at affordable cost
- Rehabilitate and expand rural infrastructure including feeder roads, markets
- Develop and provide research and extension services, and market linkages
- Develop and strengthen institutional and human resource capacity

- Protect, regenerate and conserve natural resources; formulate policy incentives for rational and sustainable management and utilization.

3.3.7 The Environmental Protection Act, 2001

The Environmental Protection Act of 2001 has the following objectives: i) To protect the environment in its holistic definition for the realization of sustainable development ii) To improve the environment and the sustainable exploitation of natural resources iii) To create a link between environmental and developmental issues, and to empower concerned national authorities and organs to assume an effective role in environmental protection.

Section III of the Act outlines general policies and principles for the protection of the environment. It is worth noting that these policies and principles are not legally binding, but are guidelines to be observed by the authorities concerned when setting development policies. These guidelines are summarized in articles 17 and 18.

Article 17 calls on any individual who intends to implement any project that is likely to have a negative impact on the environment to present an Environmental Impact Assessment (EIA) for approval by the Monitoring and Evaluation Committee of the HCENR. The study should contain the following information:

- The anticipated impact of the project on the environment
- The negative impacts that could be mitigated during implementation of the project
- Alternative options for the proposed project
- A clear undertaking that the short-term utilization of natural resources and the environment will not jeopardize their long-term sustainability
- The precautionary measures to be taken to mitigate the negative impacts of the project

Article 18 lists the duties of the competent authority in complying with the general environmental policies and directives, as follows:

- To lay down quality control standards for the protection of the environment
- To preserve water sources from pollution
- To protect air, food, soil and vegetation cover from pollution and degradation
- To preserve the flora and fauna from extinction as a result of illegal hunting or any other human threat
- To protect food from contamination or pollution by chemicals or any other factor
- To protect the air from pollution caused by physical operations or chemicals
- To preserve the soil from any pollution resulting from harmful industrial and other types of waste

The EFCRP falls under Category B projects and required an ESA. The EIA regulation also provides for Environmental Audits for all projects for which EIA has been undertaken. An individual/institution who wants to undertake a project ought to ensure all practical measures to ensure that predictions made in the EIA are complied with.

3.3.8 Forests and Renewable Natural Resources Act, 2002

As a result of the adoption of the Federal Government System (FGS), the 1989 laws were revised in 2002 and merged into one law, namely the Forests and Renewable Natural Resources Act. Unlike its predecessor, the new Act attempts to follow a more holistic approach by providing a framework for the management and protection of forests and renewable natural resources, including pastures, rangelands and certain aspects of agricultural land use. It also provides a framework governing the management of the forestry sector. Under the Act, federal forest reserves are managed by the FNC and state forest reserves by the state in accordance with FNC policies and technical plans. The law also encourages the establishment of private, communal and institutional forests and retains the FNC's right to provide technical supervision over all types of forests in the country. Control over tree felling outside the reserves was tightened up by introducing a permit system controlled by the FNC.

Investors are obliged to convert the cleared trees into forest products. The Act also obliges any driver of any vehicle used for transporting forest produce to obtain a permit from the respective authority. Furthermore, it imposes a deterrent penalty, namely the confiscation of any property, including the means of transport used in the commission of the forest offence, for the benefit of the corporation. Unsuccessful attempts were subsequently made to revise this Act in the light of the many changes that had taken place in the country, namely the adoption of a new constitution following the signing of the CPA, the federal system adopted by government, the division of authority and wealth among the various levels of government, the development of an oil industry, the risks posed by the current rate of deforestation, including the loss of the country's place in the international gum arabic market, and the growing awareness of forestry's role in environmental conservation.

3.3.9 Wildlife and National Parks Protection Act, 1986

This is the key legal instrument available for wildlife management at federal level. The main features of the Act are as follows:

- i. It defines the national parks and identifies the competent authority that gives permits for entering, staying in and hunting in the parks;
- ii. It lists the prohibited acts inside national parks, namely the felling of trees, the setting of fires, the excision of parkland, the construction of houses, digging or mining, entry of domestic animals, the carrying of guns, the disruption of water courses, and the culling or disturbing of game;
- iii. It indicates the measures and the competent authority for declaring new areas as game reserves and/or is prohibited. The general manager of a park or sanctuary may issue

hunting permits and also has the power to determine the rules that govern hunting in terms of the hunting season, the means and duration of hunting, and the types and ages of animals to be hunted;

- iv. It sets out the regulations for trade in game animals and/or their parts;
- v. It indicates the level of penalties for all wildlife offences; and
- vi. It lists the animals that are prohibited from being hunted, animals that may be hunted under permit, and animals that are prohibited from being exported without a permit.

3.3.10 Pesticides and Pest Control Products Act 1994

Pesticides for all purposes including public health are currently regulated in the Sudan by the same Act namely the Pesticides and Pest Control Products Act 1994 which replaced the Pesticides Act of 1974. The Act regulates all activities related to pesticides registration, importation, storage, transportation, use, formulation and any other related activities in the country through the National Pesticides Council (NPC). The NPC is a multidisciplinary inter-ministerial council which has representatives from all stakeholders within the country including the Ministries of Agriculture, Health, Animal resources, Research Institutions, Customs, Universities, etc. The council is chaired by the Undersecretary, Ministry of Agriculture. The registrar of the council is the Director General, Plant Protection Directorate (PPD). The registrar is responsible for all administrative and executive functions of the council. Twenty six subsidiary state councils are established to cover the 26 states of the country. The main activities of the state council are to oversee the implementation of the NPC decisions and to carry out the necessary inspection and monitoring activities as well.

Pesticides were classified according to WHO regulations as acute, high, moderate and low toxicity based on the LD50 level. According to these criteria the NPC licensed the retailers to deal with the pesticides of low toxicity.

3.3.11 Public Health Act of 1975

This Act protects general public health by regulations issued by the Public Health Council, whose members include the Ministries of Agriculture and Forests, Federal Rule, Animal Health and various administration departments of the Ministry of Health.

The activities and operations of the EFCRP ought to take into consideration the provisions of the Public Health Act to ensure health and safety of the local communities where the project is operating within the context of the Project activities and operations.

3.3.12 Environment Health Act 1975

The Act covers prevention of water pollution, inspection of drinking water, disposal of waste and sewage, inspection of industrial areas and bakeries, prevention of air pollution and inspection of waste dumping places and brick kilns.

The management of wastes and other activities that may pollute the environment including medical waste and acaricides application is important for the LFDP.

3.3.13 Public Health (Water and Sanitation) Acts (2008) for South Sudan

Emphasises the prevention of pollution of air, water and encourages sanitation. Some of the key areas of emphasis include:

Protection of the sanitation of the environment

a) Pollution of Water and air

i) Measures to prevent pollution of water for consumption. ii) Measures destined to prevent pollution of potable water. iii) Anyone who offers the public with water to drink or for human food, and which includes frozen food should ensure that the water conforms to the potability regulations; iv) Management and disposal of hazardous wastes; v) Storage of wastes on the premises of waste generators

b) Atmospheric pollution

i) Enforce regulations and measures necessary to combat all elements of pollution and protect the natural level of the environment and public health; ii) Measures for the prevention and fight against noise and other alternative nuisances have to be observed at the local premise, environment premises and main agglomerations; iii) Allowable toilet systems and excreta disposal methods; iv) Rearing and straying of animals and pets; v) The activities and behaviour of individuals and institutions, which cause or are likely to cause environmental pollution or vector breeding; vi) Individual and communal recycling of wastes; vii) Any other matters that demand local regulation to achieve and maintain a clean and healthy environment;

3.4 International Conventions and Treaties

The objectives of the conventions are to conserve biological diversity, sustainable use of its components and fair and equitable sharing of the benefits arising out of the utilization of the genetic resources including the access to the genetic resources and by appropriate transfer of the relevant technologies, taking into account all rights over those resources and to technologies and by appropriate funding. South Sudan is party to or in the process of ratifying a number of treaties and other such agreements and will, certainly, continue to accept such instruments. Some of the environmental treaties to which South Sudan is a party include:

3.4.1 African Convention on the Conservation of Nature and Natural Resources

The African Convention of Nature and Natural Resources emphasizes the need for conservation, utilization and development of natural resources in Africa in accordance with the scientific principles and with due regard to the best interest of the people. It requires parties to establish land use plans based on scientific investigations when implementing agricultural practices and agrarian reforms. Projects in MAF should utilize agricultural scientific knowledge and interventions in the conservation, utilization and development of natural resources.

3.4.2 Convention on Biological Diversity (1992)

The Convention on Biological Diversity adopts a broad approach to conservation. It requires Parties to the Convention to adopt national strategies, plans and programs for the conservation of

biological diversity, and to integrate the conservation and sustainable use of biological diversity into relevant sectoral and cross-sectoral plans, programs and policies. Programs and projects in MAF are expected to conserve biodiversity, especially the rare and endangered species in the project areas and its environs.

3.4.3 United Nations Convention to Combat Desertification in those countries experiencing serious drought and /or desertification particularly in Africa (1996).

The United Nations convention to combat desertification (UNCCD) was adopted in 1994 and came into force in December 1996. The objective UNCCD is to combat desertification and mitigate the effects of drought in seriously affected countries, especially those in Africa, Latin America, the Caribbean, Asia, and Northern Mediterranean. It seeks to achieve this objective through integrated approaches to development, supported by international cooperation and partnership arrangements, in the affected areas. It lays emphasis on long-term strategies that focus on improved productivity of land and the rehabilitation, conservation and sustainable management of land and water resources, leading to improved living conditions, in particular at the community level. Projects in MAF should be designed to implement the requirements of the UNCCD.

3.4.4 United Nations Framework convention on Climate Change (1992)

The United Nations Framework Convention on Climate Change (UNFCCC) was signed in 1992 at UNCED and it seeks to regulate levels of greenhouse gases (GHGs) concentration in the atmosphere, so as to avoid the occurrence of climate change at levels that would harm economic development, or that would impede food production activities. The Convention is founded on the principle that contracting parties should take courses of action, in respect of their economic and social activities, and with regard to the Convention's specific requirements, that will protect the climate system for present and future generations. MAF projects and programs should assist in the implementation of the specific requirements of the Convention.

3.4.5 Ramsar Convention on Wetlands of International Importance especially as waterfowl habitat (1971)

The Ramsar Convention on Wetlands is primarily concerned with the conservation and management of wetlands and their flora and fauna especially waterfowl by combining far sighted national policies with co-ordinate international action. It was signed at Ramsar, Iran on 2nd February 1971 and amended by the protocol of 3rd December 1982 and the amendments of the 28th May 1987. Parties to the Convention are also required to promote the wise use of wetlands in their territories and to take measures for their conservation by establishing nature reserves in wetlands, whether they are included in the Ramsar list or not. Programs and projects in MAF are expected to adhere to the Ramsar Convention's principles of wise use of wetlands in the project area.

3.4.6 Convention on the Conservation of Migratory species

The Convention on Migratory Species (CMS) was adopted to conserve migratory species of wild animals given that migratory species are seen as an international resource. Such species may be terrestrial or marine. The State Members of the Convention endeavor to conclude agreements for the protection and management of migratory species whose conservation status is unfavourable

and of those whose conservation status would substantially benefit from international cooperation deriving from an agreement. The Convention's Agreement on the Conservation of African-Eurasian Migratory Water birds

is specific on the need to protect the migratory water birds' feeding, breeding and wintering habitats, the main ones being wetlands and open water bodies.

3.4.7 Important Bird Areas

The Sudd of the River Nile in Jonglei, Unity and Upper Nile States have been identified as an Important Bird Area (IBA) of South Sudan. The Important Bird Areas Programme is a worldwide initiative working for the conservation of biological diversity and the sustainability of human use of natural resources. The project is expected to recognize this IBA and to protect them where they occur in the project area or in the environs.

3.4.8 The Nile Treaties

There are about eleven treaties dealing with the consumptive use of the waters of River Nile and Lake Victoria. The riparian countries are under limited obligations under general international law to permit the lower riparian States an equitable share of the water, but then the exact modalities would be subject to fresh negotiations. The Nile Basin Initiative is currently addressing the issue of equitable utilization of the common Nile Basin water resources.

The Nile Basin Initiative seeks to harness the tremendous potential of the Nile for the benefit of the people of the Basin, both for now and for generations to come. This becomes a major challenge because as economic development accelerates, population increases and demand for water grows. NBI's Shared Vision puts economic development at its centre. The Shared Vision is: "To achieve sustainable socio-economic development through the equitable utilization of, and benefits from, the common Nile Basin water resources" or in short "Sustainable development of the River Nile for the benefit of all".

4. BASELINE INFORMATION

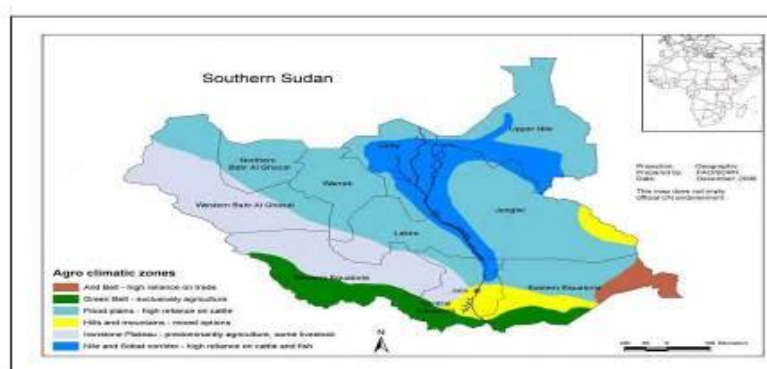
This section describes the biophysical, socio-economic and cultural conditions in South Sudan with more specific information, where available. Data and Information presented here is primary data (i.e. from field observations and interviews). Other pieces of information have also been sourced from various documents.

4.1 South Sudan: General overview

South Sudan, officially called the Republic of South Sudan, is the world's newest country. It is a landlocked country located to the south of the country of Sudan. South Sudan became an independent nation on July 9, 2011 after a January 2011 referendum regarding its secession from Sudan passed with around 99% of voters in favour of the split. South Sudan mainly voted to secede from Sudan because of cultural and religious differences and a decades-long civil war. It has an estimated population of 8.2 m people and an area of 619,745 sq. km.

Since South Sudan is located near the Equator in the tropics, much of its landscape consists of tropical rainforest and its protected national parks are home to a plethora of migrating wildlife. South Sudan also has extensive swamp and grassland regions. The White Nile, a main tributary of the Nile River, also passes through the country (Figure 4.1).

Figure 4.1: Agro-ecological zones of South Sudan



The level of poverty is extremely high and Southern Sudan consistently ranks among the lowest countries in the world in terms of most standard development indicators. Economic livelihoods are largely dependent upon subsistence farming and pastoralism. Public services are weak, leaving people in rural areas isolated in terms of access to basic services.

The overall situation in Southern Sudan is characterized by a fragile peace, an almost complete lack of infrastructure and basic services, a depressed economy, and nascent governance and rule of law structures with significant and urgent capacity-building needs. Translating the Comprehensive Peace Agreement (CPA) into actions and programs that will facilitate sustainable post-conflict recovery, governance and delivery of services is and will be an immense challenge to the Government of Southern Sudan (GOSS) and its development partners. Conditions are improving as GOSS and donors move ahead to implement a range of programs to address these challenges.

A USAID Assessment of its Economic Growth portfolio in September 2007 noted the major constraints in Southern Sudan to be:

- Uncertainty about peace or a resumption of war
- Limited government capacity, weak business environment and rampant corruption
- Minimal infrastructure (e.g., roads, water, electricity, ICT)
- Weak markets and non-existent market information systems
- Informal regional and internal trade linkages
- Unclear land tenure and demarcation
- Weak or non-existent capacity to provide services to develop agriculture and off-farm opportunities (e.g., extension services, agricultural research)

The highest point in South Sudan is Kinyeti at 10,456 feet (3,187 m) and it is located on its far southern border with Uganda. The climate of South Sudan varies but it is mainly tropical. Juba, the capital and largest city in South Sudan, has average yearly high temperature of 94.1°F (34.5°C) and an average yearly low temperature of 70.9°F (21.6°C). The most rainfall in South Sudan is between the months of April and October and the average yearly total for rainfall is 37.54 inches (953.7 mm).

Administratively, Southern Sudan is sub-divided in to 10 States; namely, Central Equatoria, Eastern Equatoria, Jonglei, Unity, Upper Nile, Western Equatoria, Lakes, N. Bahr El Ghazal, Warrap, and Western Bahr El Ghazal States.

4.2 Climate

4.2.1 Rainfall, Humidity and Temperature

Although South Sudan lies within the tropics, the climate ranges from arid in the north to tropical wet-and-dry in the far southwest. Temperatures do not vary greatly with the season at any location; the most significant climatic variables are rainfall and the length of the dry season. Variations in the length of the dry season depend on which of two air flows predominates, dry northeasterly winds from the Arabian Peninsula or moist southwesterly winds from the Congo River basin.

From January to March, the country is under the influence of the dry northeasterlies. By early April, the moist southwesterlies have reached southern Sudan, bringing heavy rains and thunderstorms. In September the dry northeasterlies begin to strengthen and to push south and by the end of December they cover the entire country. Yambio, close to the border with Zaire, has a nine-month rainy season (April-December) and receives an average of 1,142 millimeters of rain each year.

Temperatures are highest at the end of the dry season when cloudless skies and dry air allow them to soar. The far south, however, with only a short dry season, has uniformly high temperatures throughout the year.

4.2.2 Geology

According to Buursink (1971), the following represents an elementary synthesis of the geology of these areas grouped per geologic period:

Precambrian

The largest proportion of the so called Basement Complex in Sudan and South Sudan in general and Ethiopia consists of folded metamorphic rocks which are intruded by foliated and non-foliated metamorphic rocks. The rocks of the Sabaloka series mainly consist of rhyolites and trachytes, and frequently occur in close association with, younger or contemporaneous sodic granites or syenites, which may form ring structures, as at Sabaloka on the Nile (Delany, 1955). The time stratigraphic position of the Basement Complex is not fully established as yet. Delany (1960) considers the Basement Complex of Sudan as Precambrian.

Paleozoic

There are no known Paleozoic rocks overlying the basement in South Sudan. Throughout the Paleozoic and early Mesozoic the rocks of the Basement Complex were exposed to sub-aerial denudation, the resulting topography was accidented, present-day mountain forms partially reflect this 'Tassilian' relief (Delany, 1960).

Mesozoic

The 'Continental Intercalaire' in South Sudan is represented by continental Lower Cretaceous deposits with its characteristic flora and fauna (Furon and Lombard, 1964). At present the tendency exists to correlate the Continental Intercalaire with the 'Nubian Sandstones'. The Nubian formation consists of yellow and brown-bedded sandstones with intercalations of mudstones, varying in thickness from 50 to 600 meters. Both the Continental Intercalaire and the subhorizontal Nubian Sandstones lie with marked unconformity on the Basement rocks (Delany, 1960).

4.2.3 Soils

The country's soils can be divided geographically into two categories. These are the clay soils of the central region, and the laterite soils of the south. Less extensive and widely separated, but of major economic importance, is a third group consisting of alluvial soils found along the lower reaches of the White Nile and Blue Nile rivers.

Agriculturally, the most important soils are the clays in central South. Known as cracking soils because of the practice of allowing them to dry out and crack during the dry months to restore their permeability, they are used for irrigated cultivation. East of the Blue Nile, large areas are used for mechanized rainfed crops. West of the White Nile, these soils are used by traditional cultivators to grow sorghum, sesame, peanuts, and cotton. The southern part of the clay soil zone lies in the broad floodplain of the upper reaches of the White Nile and its tributaries, covering most of Aali an Nil and upper Bahr al Ghazal states. Subject to heavy rainfall during the rainy season, the floodplain proper is inundated for four to six months--a large swampy area, As Sudd, is permanently flooded--and adjacent areas are flooded for one or two months. In general this area is poorly suited to crop production, but the grasses it supports during dry periods are used for grazing.

The laterite soils of the south cover most of western Al Istiwai and Bahr al Ghazal states. They underlie the extensive moist woodlands found in these states. Crop production is scattered, and the soils, where cultivated, lose fertility relatively quickly; even the richer soils are usually returned to bush fallow within five years.

4.2.4 Hydrology

South Sudan is drained by the Nile and its main tributary, the White Nile (Al Bahr al Abyad). The longest river in the world, the Nile flows for 6,737 kilometres from its farthest headwaters in central Africa to the Mediterranean. The importance of the Nile has been recognized since biblical times; for centuries the river has been a lifeline for Sudan.

The White Nile flows north from central Africa, draining Lake Victoria and the highland regions of Uganda, Rwanda, and Burundi. At Bor, the great swamp of the Nile, As Sudd begins. The river has no well-defined channel here; the water flows slowly through a labyrinth of small spillways and lakes choked with papyrus and reeds.

The White Nile has several substantial tributaries that drain southern Sudan. In the southwest, the Bahr al Ghazal drains a basin larger in area than France. Although the drainage area is extensive, evaporation takes most of the water from the slow moving streams in this region, and the discharge of the Bahr al Ghazal into the White Nile is minimal. In southeast Sudan, the Sobat River drains an area of western Ethiopia and the hills near the Sudan-Uganda border. The Sobat's discharge is considerable; at its confluence with the White Nile just south of Malakal, the Sobat accounts for half the White Nile's water.

4.3 Biological Resources

4.3.1 Ecological zones

According to Harrison and Jackson (1958) classification, South Sudan is classified as savannah woodland (high and low rainfall), flood region, montane zone, and semi-desert. Savannah woodland is sub-divided into low rainfall savannah and high rainfall savannah. Low rainfall savannah occurs mainly in the north and is only represented in the south by a small area in the northern parts of Upper Nile State. High rainfall savannah covers most of Southern Sudan with the exception of the floodplain around the Nile and the montane region of Didinga and Imatong Mountains. High rainfall savannah woodland is further divided into two sub-zones, savannah woodland and savannah woodland recently derived from rainforest.

4.3.2 Biodiversity

From a national perspective, the protected areas conserve a substantial portion of the terrestrial areas of South Sudan (10.4%), which is well above the African average (estimated at 9%), and protect an exceptionally high diversity of animals, habitats, and birds. Despite the long drawn out civil war, some of these areas still contain significant wildlife populations. For example recent aerial counts conducted by WCS revealed that some 1.2 million white-eared kob, Mongalla gazelle and tiang migrate between the Boma Park, Bandingilo Park, and towards the Nile River every year. A migration that rivals the world famous Serengeti wildebeest migration. The protected areas of Southern Sudan also conserve important forest species, which are usually associated with the lowland forests of the Congo Basin such as bongo, giant forest hog, chimpanzee, red river hog and forest elephant.

Similarly, a lot of South Sudan's wildlife is found outside of protected areas. According to Salter (2006), a number of South Sudan's wildlife populations (notably White-eared kob and Tiang, but including several other species) undertake seasonal migrations outside protected areas. Even if adequately protected in national parks and game reserves (which is currently not the case), these species are vulnerable to hunting pressure and habitat loss when travelling outside protected areas (Figure 5.9).

4.3.3 Forestry

South Sudan also ranks among the best timber wood exporting countries to the international market. Some of the states with best Teak and natural trees for timbers are Western Equatoria and Central Equatorial states. In Central Equatoria some of the existing Teak plantations are at Kegulu, the other oldest planted forest reserves are Kawale, Lijo, Loka West and Nuni. While Western Equatoria has its resources, Mvuba trees at Zamoi. However, much of the forest cover and biodiversity has been lost due to 50 years war (FAO/WFP, 2008).

Numerous reports have also documented that the status of forests especially in and around towns in South Sudan is decreasing. Deforestation is increasing due to the continuous clearing of land for crops and cutting of wood for energy. Natural forests and woodlands in most areas have been stripped bare of trees leaving landscapes strewn with patchily distributed trees of little value. Most of the products used in most urban areas are collected from nearby teak plantations. Communities in these areas collect their wood products from natural forests.

Moreover, the consumption patterns of households in most of the South Sudan shows that on average a household consumes approximately 0.3 to 0.6m³ of firewood and approximately 50 kg of charcoal per week. As there are few alternatives for fuel or construction, households are dependent on forest resources. However, the status of forests and woodlands for instance around and in proximity to Bahr el Ghazal and Upper Nile are less degraded. *Khaya* (Mahogany), *Milicia*, and *Phoenix reclinata* trees are abundant and extend from Rumbek County to Yirol County.

4.3.4 Critical habitats

By virtue of its size and diverse climatic regimes, the Sudan encompasses seven out of WWF's Global 200 eco-regions, namely Congo Basin Piedmont Rivers and Streams, East African Acacia Savannas, Ethiopian Highlands, Horn of Africa Acacia Savannas, Red Sea, Sudanian Savannas, Sudd-Sahelian Flooded Grasslands and Savannas.

South Sudan is the largest expanse of substantially intact, wild habitat in East Africa – with spectacular high altitude plateaus and escarpments, wooded savanna, grassland savanna, wetlands, and floods plains; it contains the largest intact contiguous savannah in Africa and the largest wetland and perhaps the most important habitat for migratory birds in Africa, the Sudd.

Out of the 22 Important Bird Areas (IBAs) in the Sudan, South Sudan comprises several including Boma, the Sudd, Southern and Bandingilo. The Leer and Panyikang project sites/counties comprise parts of the Sudd where hundreds of species of birds, out of which 12 are endangered such as the Shoebill and Black crowned crane, dwell here or use the area as an important stepping stone on their migration. The Zeraf and Fanyikang Game Reserves occupy sections of the Leer and Panyikang counties respectively.

The protected areas provide protection to a variety of habitats and species and their management will guard against any future soil degradation, deforestation, habitat fragmentation, and species loss. As such, they are an important source of carbon sequestration, watershed protection and biodiversity conservation with two endemic mammal species (Nile lechwe, estimated at 4,300 and

white-eared kob, estimated at 800,000). An estimated 4,000 Shoebills (out of a global population estimated at between 5,000 and 8,000 individuals) are within South Sudan sudds, with the main threats being habitat destruction, disturbance and hunting. Other important bird species include the black crowned cranes, and not to mention a vast range of other species unmatched by most other African countries.

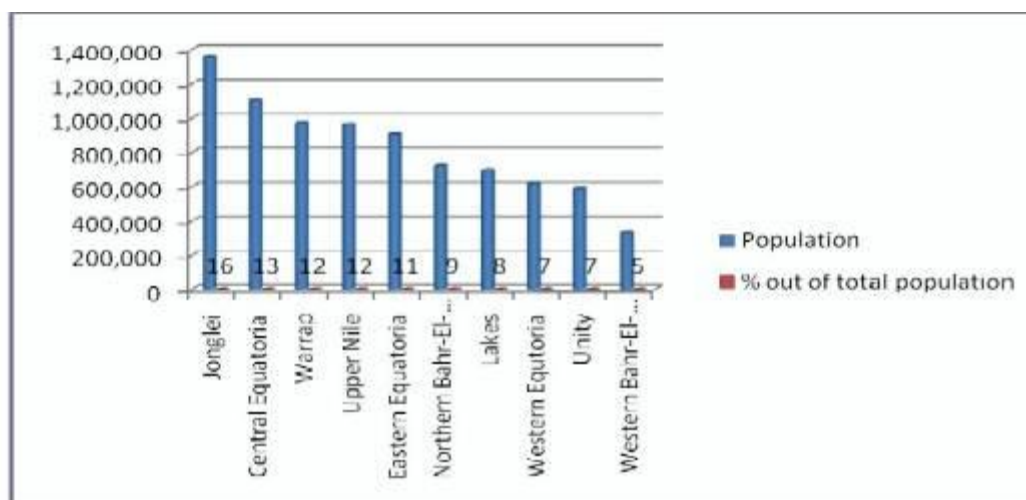
Due to the species richness and presence of species of global conservation concern, the young tropical rainforests in the Green Belt (See Figure 4.1) may be classified as critical habitats for biodiversity conservation. Key large mammals of the forests and some woodland savannah areas include Waterbuck (*Kobus defasa*), Bushbuck, oribi, duiker, Uganda kob (*Kobus kob*), warthog (*Phacocoerus ethiopicus*), hartebeest (*Alcelaphus* sp.), giant eland (*Tragelaphus derbianus*), buffalo (*Syncerus caffer*), and various species of primates including the Black and White colobus monkey. A rich diversity of avifauna, reptiles, amphibians, and invertebrates also occurs here. However, the high levels of illegal hunting have decimated most of the wild life populations in these areas.

4.4 Social-economic environment of South Sudan

4.4.1 Demography

According to the disputed results of the 2007 Population and Housing Census of Sudan, South Sudan has a total population of 8, 260,490 with an average household size of 6.3. The sex composition of the population reveals that the proportion of male is slightly higher (about 52 %) than females (about 48 %). In terms of ethnic composition there are many tribes in South Sudan of which the Dinka, Nuer, Murle, Mundari, Toposa and Boya are the main agro-pastoralist groups.

The distribution of population across the states, presented in Figure 3.2 demonstrates that Jonglei where 16.4 % of South Sudan's population living, Central Equatoria (13.4 %), Warrap (11.8), and Upper Nile (11.7 %) are relatively densely populated states. While Northern Bahr-El-Ghazal, Unity, Lakes and Eastern and Western Equatoria are moderately populated. On the other hand, Western Bahr-El-Ghazal is the sparsely populated State (Figure 5.12).



Source: Compiled from the 2007 Population and Housing Census of Sudan

Figure 4.2: Distribution of Population by States, South Sudan

4.4.2 Socio economic Status

South Sudan remains one of the least developed regions in the world according to the UNDP World Development Index 2005. The Gross National Income per capita is estimated to be less than \$90 per year. Key education and health indicators are among the lowest in the world. Infrastructure is virtually non-existent, and a public administration system has to be developed from almost scratch. Low levels of income and purchasing power, together with disruption associated with conflict and very limited infrastructure, have constrained economic activity and market development.

High levels of vulnerability arising from two decades of civil war, have forced a sizeable proportion of the population to rely on humanitarian relief assistance to meet their livelihood needs.

Inadequate transport infrastructure poses a major problem for movement of people and commodities within and between states. Although efforts have been made to rehabilitate some of the main trunk roads, the conditions of most of the main roads, especially in the wet season, hinder transportation of goods particularly perishable products. High transportation cost is a disincentive to farmers in potential surplus production areas from expanding production. However, the situation of various socio-economic infrastructure and the livelihoods conditions of the people of South Sudan have substantially changed since the signing of the Comprehensive Peace Agreement (CPA) in January 2005.

4.4.3 Health and Nutrition

Health and education are quite rudimentary and almost entirely dependent on humanitarian support. High rates of acute malnutrition above the emergency level continue to occur in South Sudan despite the improvement in food security. Current nutrition programs have focused mostly on Supplementary and Therapeutic Feeding programmes to treat moderate and severe cases of

acute malnutrition, as well as address needs of malnourished pregnant and lactating mothers. It is evident that a comprehensive preventative approach; focusing on all predisposing factors, need to be used in addressing malnutrition instead of only relying on the curative approach. This requires the collaboration of RSS, state governments and all NGOs and UN agencies.

4.4.4 Agriculture: Crop Production and relevance to rural livelihood

The country's economy, like the case in other developing countries, is heavily dependent on Agriculture. The Agriculture sector provides the main source of livelihood to the people and there is a tremendous potential to expand to a commercial scale since about 90% of its total area is considered suitable for agriculture, 50% of which is prime agricultural land. Agriculture in South Sudan is predominantly rainfed with annual rainfall levels increasing from the north to south and from east to west ranging from less than 500 mm/year in the semi-arid lands of Northern Bahr el Ghazal and Western Equatoria to around 1,800 mm/year in the Green Belt zone (areas around Yei, Maridi and Yambio, Tambura to Kajo-Keji).

Soil and climatic conditions allow for a wide variety of food and cash crops. The nature of crop production varies according to different agro-ecological zones of the country. The Green Belt Zone is the main high potential region for crop production, with the highest levels of rainfall. Main crops include maize, sorghum, finger millet, cassava, sweet potato, and groundnuts. Rice production was, before the war, introduced and greatly expanded in the Awel rice scheme. During the war the rice scheme collapsed but rice was adopted by farmers outside the scheme. Soybean and cowpea are common but relatively new crops, introduced to a large extent by emergency seed support interventions. Some white seeded sesame is cultivated, coffee is grown commercially and there are a few tobacco plantations. Fruit trees include banana, plantain, pineapple and citrus. Vegetables include onion, okra, amaranthus, cabbage, carrot and cucumber.

Minor crops such as sweet potatoes, yams, coffee, mangoes, papayas are also grown for home and some localized commercial use. Teak is a common non-native plantation tree species grown for timber. Nonetheless, agricultural production methods remain largely poor, limiting households to cultivate an average of 0.5-3.5 feddans, with each feddan producing only 0.9 ton of cereal per year (FAO/WFP, 2008). In general agricultural production is mainly affected by poor seed supply, timing and methods of weeding, use of inputs, pest and disease and security challenges at local level.

4.4.5 Food Security and Livelihoods

The livelihood system in South Sudan is predominately subsistence small-holder agriculture among which about 12-15% of the population depends on fishing for their livelihoods (FAO/WFP, 2008). Employment opportunities both in the public and private sector are few, but are increasing with the current political stability and economic growth. Petty trading provides a source of income for many household in the rural towns and around market centres. The total land area is over 100 million hectares (FAO/WFP, 2008), of which about half is arable, rainfall is plentiful in most parts of the country and soils are relatively fertile. Sorghum is the most important crop. Livestock production provides an important livelihood base for large groups of people but is hampered by disease and environmental degradation. The road network is poor and many areas of

the country are not accessible by road, particularly in the wet season which provides a major obstacle for marketing and commercialization of agricultural production. Poverty escalates during the dry season and in most parts of the country periods of 3-6 months per year of food deficit is common. During these periods most families move around for income generation, i.e. selling of charcoal, doing casual labour etc.

5. GUIDANCE ON POTENTIAL IMPACTS

5.1 Overall Environmental and Social Impacts and Indicators in Agriculture

The projects and programs in MAF should contribute to the revitalization of the agricultural sector in South Sudan by: facilitating empowerment of farmers to access and adopting profitable and sustainable technologies; laying the groundwork for a pluralistic agricultural extension and learning system; integrating and prioritizing the national agricultural system; and supporting analytical work to inform policy and institutional reform. The ultimate beneficiaries include farmers and communities who are mobilized and participate voluntarily in agricultural activities. The key stakeholders include farmers, communities, CBOs and NGOs, local government, environmental management institutions and the relevant sector ministries and departments (agriculture & forestry, water, environment, and wildlife, lands and communities).

MAF will involve direct interventions in the biophysical and human environments. The potential environmental impacts can be categorized as biophysical, and social. These impacts can occur at various stages of project/program development and can be positive or negative, temporary or permanent, and cumulative. On balance, the potential positive impacts of the project/program outweigh the negative impacts. Therefore, the programs/projects under MAF should have the potential to make a significant contribution to South Sudan's policies to protect and preserve the environment while reducing poverty in rural areas.

In the absence of adequate capacity for environmental and social screening, potential environmental impacts at local, national and global levels may include pollution and eutrophication of water bodies, interference with wetland and animal ecology (particularly birds and fish), erosion and sedimentation. Alternative livelihoods (eg. herbal medicine) and intensification of agricultural production (including livestock) which may result in community well-being, may also lead to an increase in areas brought under cultivation and overall numbers of livestock units which may increase demand on natural resources or degrade the surrounding environment. The stakeholders should be provided with an opportunity to build their capacity in environmental and social screening by learning how to avoid or mitigate localized impacts from project/program activities.

Table 5.1: Environmental issues, impacts and indicators in agriculture and forestry

Environmental issues	Impact	Mitigation strategies	Indicator
Loss of habitat through: (i) Conversion of land to agriculture (ii) Illegal forest and riverine/aquatic habitats encroachment & activities	(i) Loss of vegetation cover (ii) Loss of biodiversity (iii) Impaired catchments function (iv) Increased soil erosion (v) Increased pressure for fuel wood and charcoal burning from remaining forest areas	(i) Agroforestry (ii) Conservation agriculture	• % tree cover • Presence/population density of key species • Erosion rates, water quality, quantity • Encroachment • Fuel wood consumption per household

Use of appropriate farming practices and technologies: (i) Overuse of pesticides/agrochemicals (ii) Cultivation of crops unsuitable to an agroecological zone (iii) Monoculture (iv) Encroachment into forest reserves, protected areas etc.	(i) Loss of vegetation cover (ii) Loss of agrobiodiversity (iii) Impaired catchments function (iv) Increased soil erosion and sedimentation (v) Declining soil productivity (soil and nutrient loss) (vi) Pollution of surface and ground water (vii) Soil contamination (viii) Risks to human health	(i) Crop diversification and intensification (ii) Water catchments protection	• % tree cover • Presence/population density of key species • Erosion rates, water quality, quantity • Encroachment • Fuel wood consumption per household
Development of agroprocessing: (i) Large scale agroindustry (ii) Small scale value added operations at household/community level	(i) Health of neighboring population (ii) Worker health and safety (iii) Land use changes and increased monoculture to meet raw material needs of agroindustries	Value addition of maize, mangoes, sorghum, millet and other crops	• Public health indicators • Land use classification, % land area under different crops
Agriculture-wildlife conflicts: (i) Conflict for food/water other resources between livestock, wildlife and humans (ii) Crop raiding	Reduction in populations of key wildlife species Risk of death/injury to farmers/pastoralists	Negotiating support, conflict resolutions, set penalties, fast compensation and benefit sharing with neighboring communities	• Presence/population density of key species • Crop raiding incidents, human injuries and fatalities
Crop-specific impacts: (i) Nutrient mining (ii) Reduced genetic material (iii) Application of fungicides and pesticides/excess fertilizer	(i) Reduced agro-biodiversity value (ii) Pollution from agrochemicals (e.g. pesticides on rice)	(i) Use recommended organic and inorganic fertilisers for soil improvement (ii) Biodiversity conservation (iii) Pollution control through flushing with excess water	• % tree cover • Presence/population density of key species • Erosion rates, water quality • Soil fertility, water quality, human health indicators
Proneness to climatic fluctuation (especially drought): (i) Crop failure (ii) Flooding	(i) Loss of vegetation cover (ii) Impaired catchment function (iii) Increased soil erosion (iv) Increased pressure on forested/ natural vegetation for fuel wood & charcoal burning	(i) Soil and water conservation techniques (ii) Check dams, planting deep rooted trees (iii) Agro forestry practices (iv) Crop diversification (v) Law enforcement	• % tree cover • Water availability, seasonal variations • Erosion rates, water quality • Fuel wood consumption

Table 5.2: Social issues, their impacts and indicators in South Sudan Agriculture

Social issue	Impact	Mitigation strategies	Indicator
Resource poor farmers not able to access extension services and agricultural inputs: (i) Cost of extension service too high (ii) Lack of credit and micro-enterprise services (iii) Lack of farm inputs (iv) Lack of sufficient service providers (v) Distance to service provider	(i) Food insecurity at house hold level (ii) Poverty	(i) Use of contract service providers (ii) Subsidy on farm inputs by the government (iii) Use radios, TV, and internet services and mobile SMS in passing on messages (iv) Group demonstration of technologies, use participatory methods of technology transfer	The number of small scale farmers adopting agriculture technology through extension services providers
Developed agricultural research technologies are no monitored for adoption, impacts on people's livelihoods and environmental management	(i) Research fails to transform livelihood of the poor (ii) Poor adaptation and utilization of agriculture technology (iii) Inability to scale-up best practices	(i) Use of contract service providers (ii) Subsidy on farm inputs by the government (iii) Use radios, TV, and internet services and mobile SMS in passing on messages (iv) Group demonstration of technologies, use participatory methods of technology transfer	(i) Number of agriculture technology initiatives that are farmer demand driven (ii) Adequate community representation in all consultative foray
(i) Women have inadequate access to and control of production resources even though they play a critical role in agriculture (ii) No ownership of land (iii) No control of production or access to markets (iv) No voice in decision making regarding agricultural technologies and policies at farm level (v) Lack of credit facilities (vi) Cultural gender bias	(i) Poor adoption of agriculture technology (ii) Increased household food insecurity (iii) Lack of control to productive resources and reduced productivity	(i) Change in land use policy (ii) Gender mainstreaming through training	(i) % of women participating in decision making and consultative fora (ii) % of women accessing extension services and controlling benefits accrued from Agriculture
Indigenous people (e.g. the Abangani people in Ezo county, Andali Payam, Western Equatoria)	(i) Poverty (ii) Livelihood insecurity	(i) Change in land use policy (ii) Gender mainstreaming through training	(i) Number of projects that target benefits for indigenous peoples

5.2 Potential Positive Impacts

The MAF activities and programs are expected to generate many positive social impacts that could lead to improvements in alleviation of poverty, improved food security through better crop yields, better extension service, diversified agricultural resource base, and improved household income. The activities should also result in a multiplier effect on the local economy through development of entrepreneurial activities such as access to market outlets. Better managed land resources will result in fewer social conflicts. Productive employment opportunities especially for women and the youth are likely to increase. The effective management and reversal of degradation of natural habitats through soil conservation techniques will lead to conservation of natural habitats and biodiversity. This will result in increased quantities and diversity of goods and services provided by the ecosystems.

At the national, state, county and community levels, the MAF will promote rural development strategies that integrate ecosystem concerns. The MAF will contribute to the decentralization process through community management of natural resources and integrated ecosystem management decision-making processes as enshrined in the Land Act, 2009. At the global level, the MAF will contribute to the reduction of soil degradation, improvement of crop production and sequestration of above and below ground carbon, and reduced siltation, and nutrient runoff to rivers systems draining into aquatic ecosystems.

International waters of the Nile River, associated Sudds and their influent tributaries will be protected from sedimentation through restoration of river bank vegetation. MAF will also contribute to the commitments made under several global conventions and treaties, in particular, Convention on Biological Diversity, Convention on Wetlands, UN Framework on Climate Change, and Convention to Combat Desertification.

Pressure on natural habitats (remnant forests, riparian areas, wetlands, etc.) will be decreased through improved on-farm and off-farm biodiversity. All in all, MAF has the potential to make a significant contribution to South Sudan's policies to protect and conserve the environment while reducing poverty in rural areas.

5.3 Potential negative impacts

On the whole, the MAF interventions will focus on implementation of specific activities that improve the long-term sustainability of the ecosystems. Potential environmental impacts at local, national and global levels that may be anticipated include pollution and eutrophication of water bodies, interference with wetland and animal ecology (especially birds and fish), erosion and sedimentation.

MAF will make effort to safeguard critical habitats that include swamps, wetlands, forests and flood plains so that they are not adversely affected by the MAF activities. MAF will not implement or support activities in protected areas. MAF will focus on efficient technology transfer and conservation strategies to minimise degradation or conversion of habitats.

The potential negative impacts at local, national and global levels that may be anticipated include:

- a) Localized pollution and eutrophication of water bodies, and interference with wetland and animal ecology.
- b) Alternative livelihoods e.g. aquaculture and intensification of agricultural production including livestock may lead to an increase in areas brought under cultivation and overall numbers of livestock units which may increase demand on natural resources or degrade the surrounding environment.
- c) Soil erosion may occur after removing vegetation cover for land clearing, exposing the soil to water and wind erosion.
- d) Localized agro-chemical pollution and reduction of water quality from agrochemical use are likely to occur. Handling of pesticides and disposal of empty chemical containers requires serious attention.
- e) Human-wildlife conflicts are likely to increase.
- f) Increased production may promote internal migration leading to more pressure on land.
- g) As the indigenous peoples (IP) are marginalized there is a high risk, that the project does not work with them, that they do not benefit from the project and even lose their access to resource.
- h) Indigenous People's rights to land and resources may not be recognized and the IPs not represented in decision making bodies, thereby, displacing them physically and economically, and increasing their social discrimination and marginalization
- i) As indigenous peoples are not normally involved in the decision making process it is likely that their rights, livelihoods and needs are not included in the capacity building exercise.
- j) The local people particularly the vulnerable (women, disabled) and the marginalized may not have the capacity to participate in the project.

Table 5 below sets out the factors contributing to these risks and the issues to be considered that will mitigate the risks.

Table 5. MAF's risks requiring mitigation

Risk	Explanation	MAF approach
Rural livelihoods and environments are often complex, unpredictable and fragile (e.g. rural communities are highly subdivided along clan and ethnic lines), and achieving effective participation may not be easy.	Rural livelihoods are diverse and complex in nature hence it is people living in a particular local area who understand the local environment, interactions within their society, and their economy more than outside intervening parties.	MAF activities and programs should be based on a full participatory demand-driven approach containing direct funding for community initiated projects and providing for mobilization of local resources through income generation activities.

Lack of adequate capacity for environmental and social screening of small-scale activities may exacerbate existing environmental and social issues affecting communities within the target areas.	South Sudan lacks adequate qualified staff and mechanisms for the screening and mitigation of impacts induced from its activities. This is especially important since programs will be community driven where such expertise may be lacking. This may exacerbate current environmental stress.	MAG should include a component for training and capacity building for community groups and associations to prioritize their needs and manage the environmental and social aspects of the projects; local government officials and other service providers to assist communities in preparation of project proposals, and to appraise, approve and supervise implementation of projects.
Alternative livelihoods like fish farming, bee keeping, intensification of agricultural production may result in improved well-being and may also lead to an increase in areas brought under cultivation and overall numbers of livestock.	Improved access to markets may increase incentives to increase areas under production or increase animal numbers.	Although alternative livelihood strategies will seek to strengthen and add value to existing systems, MAF needs to call for an integrated systems to ensure counter measures to secure the natural resources base.
There are a significant number of NGOs and Development agency financed projects in South Sudan with considerable rural development experience, and may feel threatened by MAF if not effectively included in the process.	The institutional authority, position and financial size of MAF is significant in comparison to the smaller scale NGO and bilaterally-funded development projects in rural areas. This may have implications for the relation between government administrations and NGOs, between existing projects, and communities, and among staff of government and NGOs.	MAF will work to build capacity within national, provincial, and community administrations, and continue the collaborative approach; and consider making use of NGOs as service providers, in addition to private sector contractors where appropriate.
Rising population pressures, inter tribal conflicts, deteriorating resource base and increasing intensification of the traditional production systems have led to an increase in the number of land-related conflicts, and introduction of investments in such areas may attract outside migrants that will increase pressure on existing resources.	MAF investments may serve to bring back those who had migrated out in search of income earning alternatives into the recipient communities and they will also seek to benefit from the improvements. This could lead to friction or conflict and put additional pressure on limited resources.	MAF will continue to work carefully with communities to devise measures to support sustainable investments and ensure the inclusion of migrants into their communities.

5.4 Environmental Issues in National Agricultural Research

Environment issues in agricultural research may vary across centres due to the different commodity research being undertaken. This means that each station has its needs, activities, products and unique services specific to the needs of the clientele it serves. For example plant pathology under the crop protection section needs “Disaster Preparedness”

in case of fire as requiring urgent attention. Since the sections have laboratories using flammable chemicals and thus the need for adequate management measures to be put in place. The soil chemistry laboratories, and other sections need similar management.

In the weed science and soil chemistry lab disposal of used and obsolete lab chemicals is a priority since they do not have a proper disposal method for already used chemicals. The soil chemistry labs tend to store expired chemicals on their shelves since they lack safe disposal procedures for them. Various programmes in the research centres have either a direct or indirect impact on the environment. There are six environmental issues which need to be observed:

- a) Environmental awareness: this refers to the extent to which the research institutions staff members have knowledge about environmental management and its importance as well as familiarity in general information on environmental issues.
- b) Cost saving opportunities: Has to do with what activities have been put in place to ensure cost reduction in the respective areas. e.g. lighting, recycling paper and water use /re-use
- c) Disposal of used lab or obsolete laboratory chemical: This refers to ensuring that the status and mechanisms for disposing of such chemicals are in line with the available environmental legislation
- d) Disaster preparedness-Refers to the ability of the centre to adequately control and manage any emergencies that would occur in the course of running the institution.
- e) Environmental aesthetics: Involves the continuous maintenance of the centre compound especially the landscaping, cleanliness, ornamentals and maintenance of buildings.
- f) Waste Disposal: Is the method used by the institution to dispose of various wastes which includes; solid materials, fuel, obsolete chemicals and management of sewerage wastes from residential and office buildings.

5.4.1 Environmental Awareness

General information on environmental management systems: In many sections of Research Institutions, there is poor and inadequate awareness and information

dissemination on issues related to the environment. As a result, there is poor environmental management thus a need for developing an environmental management system. Creation of an environmental awareness programme thus is required to ensure all staff members are well enlightened on what environmental conservation entails. It should also be noted that this is very important as it contributes to MAF for instance as a whole by adhering to the Environmental legislation requirements which will ultimately be verified by an EIA&A undertaken in the future. Failure to undertake or adhere to the EIA&A may lead to prosecution and stoppage of ongoing projects by the Ministry of Environment.

5.4.2 Occupational Safety

First aid kits: Some working areas like laboratories should have first aid kits to be used in case of injuries of the workers. These should be regularly checked to ensure that all the necessary items are there.

Laboratory gas fume chambers: These should be regularly serviced to ensure that they function efficiently. In sections where this equipment is used like the labs the fume chambers need to service regularly and as it may endanger the health of staff working in the labs.

5.4.3 Waste Disposal

All disposal methods should adhere to the Environmental legislation. *Solid materials:* Large quantities of solid materials like laboratory glass wares, metal and plastic chemical containers should not be dumped in the open pit as this produces toxic fumes when burned or when it reacts with other compounds in the environment unlike other wastes for example paper. Sorting of wastes should be encouraged as this enables the recyclable wastes to be identified and re-used and the non-recyclable wastes be disposed of safely. *Liquid materials:* A research centre should liaise with the Ministry of Environment to dispose of all the hazardous chemical waste from all the sections that produce them. As a long term project the centre can install an effluent treatment plant to treat waste water to acceptable environmental standards before discharge to the environment.

Gaseous emissions: It's common practice to burn waste materials which are collected while cleaning the centre. This activity increases carbon dioxide in the atmosphere which negatively affects the climate. The incinerator should be used to burn any substance with hazardous chemicals especially from the lab. Therefore all waste from the lab should be sorted out before disposal.

5.4.4 Disaster Preparedness

It's important for the centres to identify possible sources of disasters and put in place measures to mitigate these potential sources. These were identified and they include:

Fires: Fire outbreaks could occur in any part of an institute's infrastructure. In a research centre, some areas are high risk as they are more fire prone compared to others and these are for example the laboratories using the flammable chemicals as opposed to the administration section. In most of the sections participants noted that there's limited awareness as to the usage of several of fire fighting extinguishers. Different types of fires require different fire extinguishers and staff should

be properly trained on how and when to use the available equipment. There's also need to conduct regular fire drills maybe once a year to enhance awareness and response in the event of a disaster. The centres should upgrade the fire fighting equipment at all the sections especially sensitive areas like the laboratory. Maintenance of these should also be improved.

5.4.5 Used and Obsolete micro project waste or laboratory Chemicals

The by-products from the laboratories can be disposed in a way that causes no or less harm to the environment. Decontamination of laboratories can be used to reduce toxicity of these substances. To reduce the water pollution levels of water discharged from the laboratories, the following can be done before water is discharged into the drainage system:

- i. Sedimentation of the effluence to remove the suspended solids.
- ii. Chemical treatment of effluence to precipitate heavy metals.
- iii. Physical treatment of the chemical solutions by filtration to remove the solids.

6. REPORTING AND RESPONSIBILITIES FOR THE ESMF

This chapter sets out the reporting systems and responsibilities of the officers in implementing the ESMF. The chapter commences with details of the issues that will be addressed by the ESMF, and the specific steps to be taken to ensure adherence to the ESMF. It then describes the various elements of the ESMF including:

- i. flowchart for reporting and advice;
- ii. screening checklist for sub-projects;
- iii. annual environmental and social progress report format; and
- iv. description of roles.

6.1 Key Environmental Issues and Proposed Actions for Implementation of ESMF

Box 1 and Table 6 outline the proposed actions and measures to address them. These are:

Box 1: Actions for Implementation of the ESMF

Service providers (CBOs, NGOs, extension workers), will work with communities to identify and fill out sub-project applications/proposals by conducting environmental and social analysis. This will be done by using the screening checklist in the ESMF, the table on potential environmental and social impacts and mitigation measures, as well as the resources sheets.

The application for the sub-projects will clearly state the environmental and social mitigation measures. If a sub-project requires a separate EMP for specific mitigation measures, then the sub-project application will also have an EMP along with it.

All these are sent to the review and vetting committee under the County MAF offices at the local level, which will have environmental and social expertise (e.g. Assistant Commissioners for Agriculture, forestry etc).

Once review is complete, the reviewers will sign off and forward to the approval committee –the MoE/MAF Secretariat at the State level.

At the national level, the MoE/MAF Secretariat will provide lead coordination and ensure that the results meet the targets set by the project.

Day-to-day coordination of project activities will be handled by the County Commissioners for Agriculture and Forestry and the State MoE/MAF-Secretariat.

Table 6: Issues Addressed by ESMF

Issue	Issue Mainstreaming of Mitigation Measures	Responsibility for Action
1. Requirements for mainstreaming of the ESMF	a. Appoint County personnel b. Annual environmental and social progress report.	a. MoE/MAF Secretariat of the ESMF b. Independent consultant
2. Weak capacity for environmental and social management at state and county levels	a. Develop partnerships with. NGOs and CBOs for environmental and social management; b. Stimulate the operation of Payam and County Farmers fora.	a. MoE/MAF national Secretariat b. County officials c. NGOs
3. Opportunity to contribute to positive impact on natural resource management	a. Assign sufficient budget for support to program activities	a. National MoE/MAF Secretariat
4. Mainstreaming WB safeguard policies in the operational areas	a. Provide sufficient training and support to county officials to understand and apply WB safeguard policies	a. National MoE/MAF Secretariat
5. Cumulative impacts on some environmental resources	a. Carry out assessments of cumulative impacts on ground water, surface water resources, pastoral resources and biodiversity. b. Sensitize farmer groups on issue of cumulative impacts	a. NGOs
6. Optimum integration of technical advice with a demand-driven, participatory approach	a. Sensitize communities to the range of technical advice available and their responsibility to choose which technical advice they require	a. County agriculture and forestry assistant commissioners b. Extension officers c. NGOs
7. Need to provide advice on relevant environmental laws to communities	a. Provide information on relevant environmental laws to farmer groups and local communities	a. National MoE/MAF Secretariat and County assistant commissioners for agriculture and forestry

An end phase environmental and social progress report will be prepared under State MoE/MAF coordination. This audit report will be shared with, national MoE/MAF Secretariat, MoE, MAF, the World Bank and other relevant government agencies. The national MoE/MAF Secretariat will regularly brief the national Steering Committee who will in turn sensitize the Ministers and Under Secretaries.

Consultancy inputs will assist in the training of key staff and the transfer of essential technical expertise in such areas as Integrated Pest Management, best management practices and best management technologies.

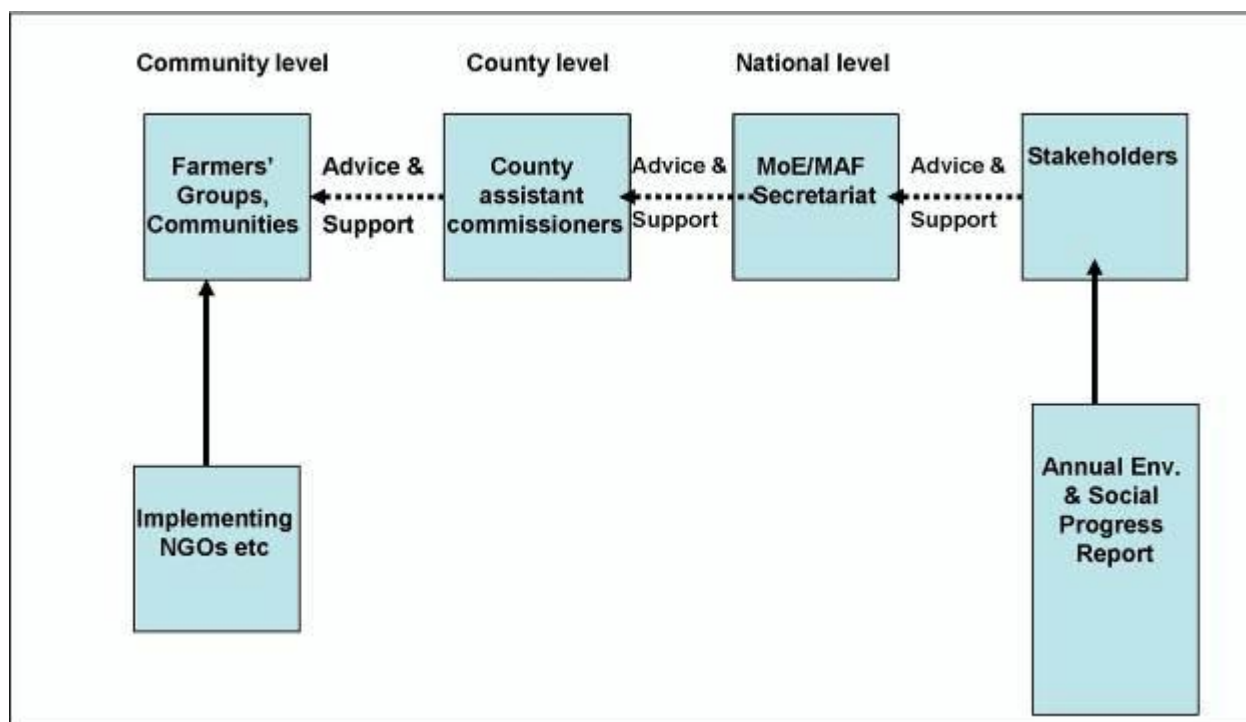
6.2 Flowchart for Reporting and Advice

The proposed reporting lines and advisory and support mechanisms that will be used in the ESMF are depicted in Figure 1, while Box 2 provides the summary.

Box 2: Proposed Reporting lines and support mechanisms

- The County Assistant Commissioners for agriculture and forestry, and implementing NGOs will work with communities and farmer groups to provide guidance and advice on potential environmental and social issues on projects and programs, potential negative environmental impacts and appropriate mitigation measures;
- In turn, the County Assistant Commissioners for agriculture and forestry, and implementing NGOs will receive advice and support from the national MoE/MAF Secretariat;
- An independent team will prepare an annual environmental and social progress report and advice to both the county officials and the national MoE/MAF Secretariat. This audit report will be shared with all stakeholders including the WB, NGOs and relevant government agencies.

Figure 1: Flowchart for reporting and advice



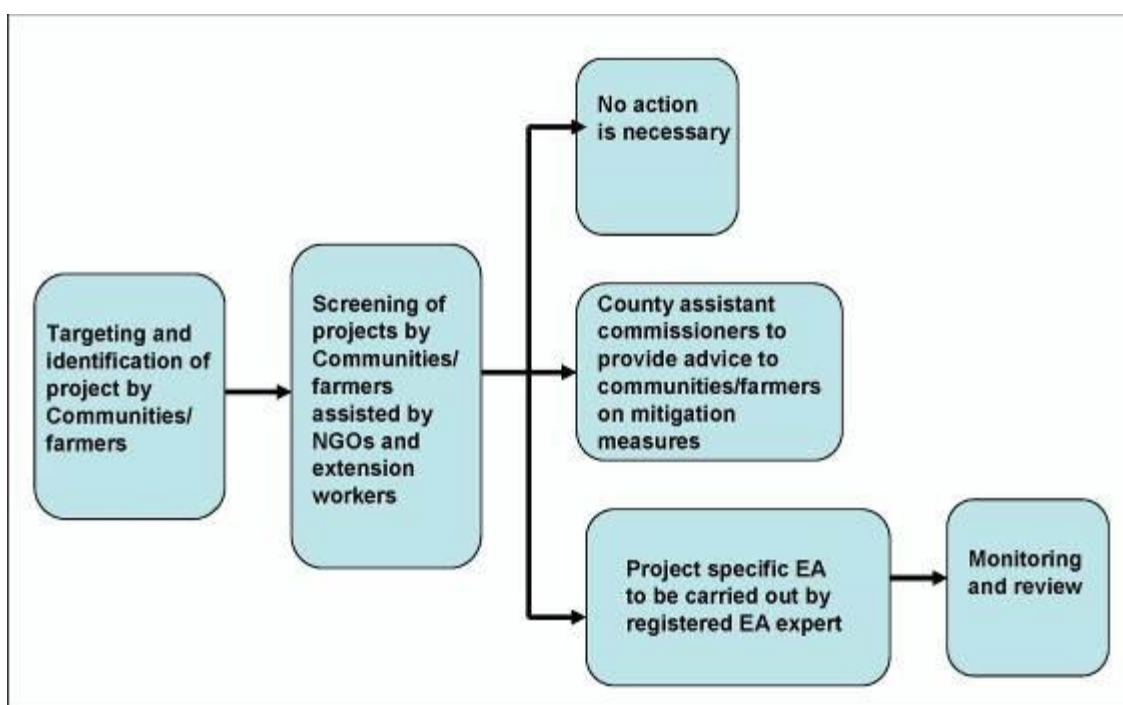
6.3 Screening for projects

This ESMF includes a screening process to assess the potential environmental and social impacts associated with projects. The MAF will encourage integrated projects with the objective of assisting agricultural producers and other natural resource users increasingly adopt profitable and environmentally-sound practices. It is expected that any agricultural project or program should produce net benefits in terms of natural resource management and conservation and, therefore, certain project activities may have environmental or social impacts that require mitigation. The purpose of the ESMF is to cover the unknowns. Using the screening and review process for project identification presented here will, therefore, help determine which of the safeguard policies are triggered and what measures will need to be taken to address the potential impacts.

This screening and review process will determine how and when a particular project will trigger a safeguard policy, and what mitigation measures will need to be put in place. It will also ensure that projects that may have potentially significant impacts will be studied in greater detail. The need for project specific EAs will also be identified by this screening and review process. The county assistant commissioners for agriculture and forestry and their teams will work with communities and farmer groups in preparing project applications to avoid or minimize adverse environmental and social impacts. They will use a checklist (Format 6.1) together with information on typical project impacts and mitigation measures. The checklist contains a certification by the community and extension team that the application includes all measures required to avoid or minimize adverse environmental and social impacts. The projects will be given an environmental rating. This ESMF has included a suggested format for EA in case the need arises where a project is of environmental category A in nature. The county assistant commissioners will be responsible for ensuring that the environmental and social impacts screening and review system set out in this Environmental and Social Management Framework (ESMF) is integrated into the projects cycles.

In order to ensure proper implementation of environmental and social screening, and mitigation measures, the MAF alongside MoE will undertake environmental training and institutional capacity building. Environmental training and sensitization will be required at all levels including farmer groups, extension workers, county assistant commissioners, NGOs etc. The MoE/MAF Secretariat and additional experts will provide a diverse range of technical training on environmental issues to these groups. The screening criteria outlined in this ESMF includes relevant questions which will help determine if any other safeguard policies are triggered and the measures need to be taken to mitigate impacts. This will ensure that projects that may have potentially significant impacts and require more detailed study receive national level approval as well as district level approval. Where an EA has to be carried out, this will be done by a qualified EA expert. Figure 2 depicts the process that the county assistant commissioners and the extension team (CBOs and NGOs) will apply in working with the communities and farmer groups to avoid or mitigate negative environmental impacts for projects.

Figure 2: Screening for agricultural projects



Communities will identify projects with the assistance of the extension teams (CBOs and NGOs) and County assistant commissioners. The proposed projects will subsequently be checked against the screening checklist (Format 6.1). The NGOs and County officials will encourage communities to carry out this task themselves possibly with the help of the facilitators, extension agents, health workers or other literate members of the community. The checklist is a simple yes/no form culminating in whether specific advice to the community on environmental mitigation is required. NGOs will give this advice, or in special cases, will call upon the County officials for specific technical advice.

Format 6.1. Baseline information on the development of ESMF for the proposed MAF projects (Screening Checklist)

1.0	Background Information		
1a	Name of County		
1b	Name of Monitoring officer		
1c	Subproject location (Payam & Boma)		
1d	Approx size of land/feddans available for the project		
1e	Activities/enterprises undertaken		
2.0	Environmental Issues		
	Will the subproject/activity:	Yes	No
2a	Create a risk of increased soil degradation or erosion?		
2b	Affect soil salinity and alkalinity?		
2c	Divert the water resource from its natural course/location?		

2d	Cause pollution of aquatic ecosystems of aquatic ecosystems by sedimentation and agrochemicals?		
2e	Introduce exotic plants and animals?		
2f	Involve drainage of wetlands and other permanently flooded areas?		
2g	Cause poor water drainage and increase the risk of water-related diseases such as malaria?		
2h	Reduce the quantity of water for the downstream users?		
2i	Result in the lowering of groundwater level or depletion of groundwater?		
2j	Create waste that could adversely affect local soils, vegetation, rivers and streams or ground water?		
	<i>If the answer to any of the above is 'yes', there will be need to include an EMP with subproject/activity application</i>		
3.0	Socio-economic issues		
	Will the subproject/activity:	Yes	No
3a	Displace people from their current settlement?		
3b	Interfere with normal health and safety of the worker/employee?		
3c	Reduce the employment opportunities for the surrounding communities?		
3d	Reduce settlement?		
3e	Reduce income for the local communities?		
3f	Increase exposure of the community to HIV/AIDS?		
4.	Will the subproject/activity:	Yes	No
4a	Be located within or near environmentally sensitive areas (e.g. intact natural forests, wetlands) or threatened species?		
4b	Adversely affect environmentally sensitive areas or critical habitats?		
4c	Affect indigenous biodiversity (flora and fauna)?		
4d	Cause any loss or degradation of any natural habitats, either directly (through project activities) or indirectly?		
4e	Does the project affect the aesthetic quality of the landscape?		
4f	Does the subproject reduce people's access to the pasture, water, public services or other resources that they depend on?		
4g	Increase human –wildlife conflicts?		
	<i>If the answer to any of the above is 'yes', there will be need to include an EMP with subproject/activity application</i>		
5.0	Pesticides, fertilizers and agricultural chemicals		
	Will the subproject/activity:	Yes	No
5a	Involve the use of pesticides, fertilizers or other agricultural chemicals, or increase existing use?		
5b	Cause the contamination of water courses by chemicals and pesticides?		
5c	Cause the contamination of soil by agrochemicals and pesticides?		
	<i>If the answer to any of the above is 'yes', there will be need to prepare an IPMP for the subproject/activity application</i>		
6.0	Indigenous Peoples		
	Are there:	Yes	No

6a	Indigenous groups living within the boundaries of, or near the project?		
6b	Members of these indigenous groups in the area who could benefit from the project?		
	<i>If the answer to any of the above is 'yes', there will be need to prepare an Indigenous Peoples Plan (IPP) for the subproject/activity application</i>		
7.0	Land acquisition and access to Resources		
	Will the sub-project:	Yes	No
7a	Require that land (public or private) be required (temporarily or permanently) for its development?		
7b	Use land that is currently occupied or regularly used for productive purposes (e.g. gardening, farming, pasture, fishing locations, forests)		
7c	Displace individuals, families or businesses?		
7d	Result in temporary or permanent loss of crops and fruit trees?		
7e	Adversely affect small communal cultural property such as funeral and burial sites, or sacred groves?		
7f	Result in involuntary restriction of access by people to legally designated parks and protected areas?		
	<i>If the answer to any of the above is 'yes', there will be need to prepare an Resettlement Action Plan (RAP) for the subproject/activity application</i>		

6.4 Annual Environmental and Social Audit Report Format

The format for completion of the annual environmental and social progress report is set out in Box 3 below. The objectives of annual reviews of ESMF implementation are: (a) to assess the project performance in complying with ESMF procedures, learn lessons, and improve future performance; (b) assess the occurrence of, and potential for, cumulative impacts due to project funded activities. These reports will be the main source of information for the World Bank supervision missions and national environmental management authority when needed.

Box 3 Annual Environmental and Social Progress Report Format

1. Introduction;
2. Acronyms
3. Objective;
4. Community sub-projects approved;
5. Key environmental and social issues identified from project screening;
6. Mitigation actions undertaken;
7. Capacity building programs implemented (training sessions held, venues, attendance and training modules);
8. Results of EAs and other required safeguard management plans (e.g., EMP, RAP, PMP, and IPP);
9. Collaboration with NGOs, and Government line agencies;
10. Conclusions (Is the MAF contributing to sustainable land use and community development) Explain;
11. Lessons learnt; and
12. Recommendations that can be implemented for projects that will be implemented the following year.
13. Annexes

6.5 Description of Roles and responsibility in the MoE/MAF Structure

The roles proposed under this ESMF are summarized as follows:

- The national MoE/MAF Secretariat will provide lead coordination at the national level and ensure that the results meet the targets set by MAF activities, programs and projects;
- The County assistant commissioners for agriculture and forestry will handle day-to-day coordination of MAF activities at the counties;
- The implementing NGOs and County assistant commissioners for agriculture and forestry will be responsible for ensuring that the environmental and social screening and review systems set out in this chapter are integrated into the MAF activities and that it is implemented;
- Sensitization of farmer groups and communities about environmental and social issues will be a significant part of ensuring this integration, as will partnerships with government offices associated with the MAF activities;
- The County assistant commissioners for agriculture and forestry will draw on the technical advice of government officers in other departments, and NGOs or upon traditional technical knowledge particularly of natural resource management, land tenure practices, and the use of indigenous plant and animal resources;
- The State MoE officials will provide backstopping technical advice in environmental and social screening of MAF activities and projects and sign off proposals and applications before they are submitted to MoE/MAF Secretariat for approval;
- The County assistant commissioners for agriculture and forestry will coordinate inputs from NGOs etc and provide the key link between the State MoE/MAF projects and national MoE/MAF Secretariat;
- An independent team will prepare an end phase social and environmental audit report for submission to MoE/MAF Secretariat. This audit report will be shared with NGOs, the World Bank and other relevant government and other non-Governmental agencies.

6.6 Monitoring and Evaluation

Two strategies are used to build a simple system for monitoring of environmental and social impacts:

- The MoE/MAF Secretariat, County assistant commissioners for agriculture and forestry and other stakeholders will consider the environmental and social criteria that require measurement (e.g. sediment levels). A list of initial proposals is given below; and

- Using this list of criteria, a set of indicators will be integrated into recording forms to be used in a participatory approach to environmental monitoring and evaluation.

6.6.1 Initial Proposals

The key issues to be considered by MAF should include monitoring of water quality, biodiversity, soil fertility, agricultural production, income generation and population dynamics. The goals of monitoring will be to measure the success rate of the MAF activities and projects, determine whether interventions have resulted in dealing with negative impacts, and whether further interventions are needed or monitoring is to be extended in some areas. Monitoring indicators will very much be dependent on specific project/activity contexts. Monitoring and surveillance of the MAF activities/projects will take place on a “sample” basis as it would be impossible to monitor all the sub-projects. It is not recommended to collect large amounts of data, but rather to base monitoring on observations by MAF/MoE officers and stakeholders to determine trends of the indicators.

6.6.2 Monitoring of the Participation Process

Social Indicator	Methods	Responsibility	Frequency
Demography	Census of farmers	NGOs, County assistant commissioners	Once/year
No. of farmers trained on environmental issues in the county	Training records	NGOs, County assistant commissioners	Twice/year
% of communities adopting environmental conservation measure	Field survey	NGOs, County assistant commissioners	Twice/year
Relative increase in income from crops	Household survey	NGOs, County assistant commissioners	Twice/year
Vulnerable groups involved in identified alternative livelihood practices	Household survey	NGOs, County assistant commissioners	Twice/year
Number of training sessions held on use of fertilizers and chemicals and IPM	Training records	County assistant commissioners	Monthly
Number of social categories represented in the training sessions	Training records	County assistant commissioners	Monthly
Number of indigenous people attending the trainings	Training records	County assistant commissioners	Monthly
Number of justified IP complains about social discrimination etc.	Project records	NGOs, County assistant commissioners	Quarterly
Number of community members	Sensitization meetings records	NGOs, County assistant	Twice/year

Environmental Indicator	Methods	Responsibility	Frequency
Water quality	Sample collection and analyses	NGOs, county assistant commissioners	Quarterly
Sediment load	Sediment analysis	NGOs, county assistant commissioners	Quarterly
Soil organic content	Organic content determination	NGOs, county assistant commissioners	Once/year
Soil salinity	Salinity measurement	NGOs, county assistant commissioners	Once/year
Deforestation/vegetation loss	Vegetation cover determination	NGOs, extension workers	Once/year
Biodiversity richness	Floral and faunal composition surveys	NGOs, county assistant commissioners	Once/year
Wetland size	Visual observation and measurements of size	NGOs, county assistant commissioners	Once/year
Wildlife species	Animal censuses, reports	NGOs, county assistant	Twice/year

6.6.3 Monitoring Indicators

The following are selected indicators for monitoring the participation process involved in the MAF activities:

- Number and percentage of affected households consulted during the planning stage;
- Number of farmers/households participating in implementation of micro-projects
- Levels of decision-making of affected people;
- Levels of understanding of MAF activities impacts and mitigation;
- Effectiveness of local authorities to make decisions;
- Frequency and quality of meetings; and
- Degree of involvement of women or disadvantaged groups in discussions.

7. CAPACITY BUILDING AND TRAINING REQUIREMENTS

7.1 Environmental training and sensitization

In order to ensure proper implementation of environmental and social screening, and mitigation measures, as well as effective natural resource management, MAF will undertake a program of environmental training and institutional capacity building. The objective of the training under the ESMF is to:

- i. support representatives and leaders of community and farmer groups and associations to prioritize their needs, and to identify, prepare, implement and manage the environmental and social aspects of their activities and sub-projects;
- ii. support local NGOs and other service providers to act as extension teams to provide technical support (including basic EMPs, RAPs, IPDP, and PMPs) to communities and farmers in preparing their sub-projects and micro-projects; and
- iii. ensure that County officials in each State have the capacity to assist communities in preparing their sub-project proposals, and to appraise, approve and supervise implementation of sub-projects.

The type of training to be offered includes:

- (i) awareness-raising for sub project implementation participants who need to appreciate the significance or relevance of environmental and social issues;
- (ii) sensitization of participants who need to be familiar enough with issues that they can make informed and specific requests for technical assistance; and
- (iii) detailed technical training for participants who will need to analyze potentially adverse environmental and social impacts, to prescribe mitigation approaches and measures, and to prepare and supervise the implementation of management plans. This training will address such matters as community participation methods; environmental analysis using the ESMF checklist; preparing EMPs, RAPs, PMPs, IPDPs, etc.; ESMF reporting; and sub-project supervision and monitoring.

7.2 Levels of Training and sensitization

Environmental training and sensitization will be required at four levels: (i) community level (farmers, community leaders, workers and indigenous peoples); (ii) service providers (CBOs, NGO, extension workers and indigenous peoples organizations [IPOs]); (iii) review level (County officials), DEOs, and other environment/social officers); and (iv) clearance providers (national MoE/MAF Secretariat). In addition to the above training, specialized/technical training on topics such as IPM, EMP will be provided as required. Table 9 outlines the specific training requirements of these levels.

Level I. Community level

This level includes the communities themselves – farmers, community leaders, workers and indigenous peoples. They will need the first level of awareness training on linkages between environmental, social and natural resource management and sustainable livelihoods. Training will

be conducted at village levels through workshops, on farm demonstration, exchange visits of farmers to see practices by themselves and publications aimed at the farmer. Some of the topics identified for training are potential localized impacts of sub-projects, micro-projects and activities and suitable mitigation measures; use of ESMF and its procedures; and potential environmental and social sub-projects.

The communities will also be sensitized on available natural resource and management including empowering the farmers to develop and implement community action plans for soil and water conservation, tree nursery establishment and integrated pest management. Other topics will include: conservation and utilization of biodiversity, alternative livelihoods (bee keeping, medicinal plants, farm woodlots), and environmental policies. Indigenous Peoples will be provided with technical capacities to participate actively in sustainable land and natural resource management.

Training curricula for the specific needs of the IP will be elaborated or updated. Opinion leaders within the communities will be targeted in the trainings to ensure the widespread adoption of practices as well as understanding of policies. Opinion leaders form an important source of information to the community who often turn to them for interpretation of policies and seek their opinion in important matters and trust them to articulate issues on their behalf.

Level II. Service Providers/CBOs/NGOs, extension workers, indigenous people's organizations

The service providers (CBOs, NGOs etc) and extension workers will assist the communities to formulate sub – project/micro-project proposals and fill out sub-project applications. They will be made aware of the relevant environmental policies. The service providers will also need detailed training on potential localized impacts of sub-projects and suitable mitigation measures. They will require thorough training on the use of the ESMF, its procedures, resources and sub-project screening. In addition, they will be trained on methods of community involvement. IPs will be assisted in capacity building to reduce the loss of traditional knowledge, culture and livelihood patterns. In addition training will be provided to increase organizational, technical and financial capacities of IPOs.

Staff from the relevant governmental structures and ministries including Indigenous Peoples (IPs) will receive training on the implementation of IPP. Capacity building of NGOs and CBOs will be done at the catchment level. Building these capacities will reduce dependence on the government extension agents and provide more sustainable provision of agricultural services.

Level III. Review authorities

This level includes State and County MAF, MARF and MoE officers and other environment/social officers. This group will review sub-project proposals and applications before they are submitted to the national MoE/MAF/MARF Secretariat, for approval. This group will require in-depth training on environmental-social-natural resource-sustainable livelihood linkages, environmental legislation and policies, potential sub-project impacts and mitigation, use of ESMF, cumulative impacts, and intercommunity lesson-learning and review.

Level IV. Approval / vetting Authorities

This level includes the clearance providers or the approval level authorities. They include the national MoE/MAF/MARF Secretariat. The identified fields of training include awareness -raising on available natural resource management technologies, environmental policies and relevant legislation. Other issues include ESMF and its procedures, cumulative impacts, potential environmental and social sub-projects, and IPP. Training for this group will be done through consultative policy meetings, workshops and organized site visits.

The beneficiaries of the environmental and social training (Levels I-IV) in those areas with indigenous peoples will also receive training in intercultural communication and sensitization on the rights and the needs of indigenous peoples. It is important to emphasize that for each sub-project not only an environmental screening will be carried out, but also a social screening which prohibits any sub-project from receiving funding as long as the affected indigenous peoples are not in support of this specific sub-project.

7.3 Specialized /Technical Training

In addition to the above training, specialized/technical training will be offered as required on such topics as:

- (i) Land and water management
- (ii) Conflict management/ resolution
- (iii) Participatory integrated watershed management
- (iv) Agribusiness development and value chain management skills
- (v) Participatory integrated community development
- (vi) Integrated participatory community management
- (vii) IPM
- (viii) Small-scale crop husbandry
- (ix) Small scale agriculture and irrigation schemes

7.4 Training requirements and curriculum

In order to ensure full environmental and social mainstreaming so that all the relevant issues are addressed to the maximum and in the most positive extent, MAF will undertake a program of environmental and social capacity building aimed at MAF Personnel, implementers and stakeholders. Training and awareness raising of various types will be required for personnel in the following MAF institutions and groups of stakeholders:

- the MoE/MAF Secretariat;
- the selected staff in the Directorates of Mechanization, Research & Training, Horticulture, Forestry, Cooperative & Development and Agriculture;

The MoE/MAF Secretariat assisted as necessary by additional experts, will take responsibility for sensitization and awareness raising amongst MAF institutions and stakeholders.

Table 9 sets out the capacity building requirements for these different groups. An outline of the curriculum for the various training/capacity building activities is provided in Table 10.

Table 9: Training/capacity building requirements

Attribute level of training	County assistant commissioners	Other County and Payam, Boma officials, extension workers	State officials and institutional stakeholders	Stakeholder groups at county level and below
Training to a level that allows trainees to go on to deliver sensitization/ awareness raising to others, and to manage environmental and social mainstreaming within MAF processes	√	-	-	-
Sensitization, in which the participants become sufficiently familiar with the issues that they can take an active role in facilitating and shaping discussion on MAF	-	√	-	-
Awareness-raising, in which the participants appreciate the significance or relevance of the issues, and are able to take them into account when articulating their needs and expressing their views	-	-	-	√

Table 10: Proposed environmental training and sensitization program

Intended Audience	Training Content	Input (days)	Frequency
County assistant commissioners	(i) introduction to environmental and social issues in agriculture (ii) integrating environmental and social considerations into identification and design of projects/activities (iii) use of appropriate indicators and monitoring/evaluation techniques (iv) environmental and social advocacy (within a consultative process) (v) environmental regulations/safeguards (South Sudan and World Bank) (vi) open session on specific technical issues as requested (vii) train the trainers techniques	2 day workshop	Inception, and again at mid-term of Program
Other County and Payam, Boma officials, extension workers	(i) introduction to environmental and social issues in agriculture (ii) overview of integration of environmental and social considerations into identification and design of projects/activities (iii) policy and cross-sectoral issues (iv) environmental and social advocacy (within a consultative process)	1 day workshop	Inception, and again at mid-term of Phase
State officials and institutional stakeholders	(i) overview of environmental and social issues in agriculture (ii) policy and cross-sectoral issues (iii) environmental and social advocacy (within a consultative process)	0.5 -1day workshop	Inception phase
Stakeholder groups at county level and below	(i) overview of environmental and social issues in agriculture (ii) environmental and social advocacy (within a consultative process)	1 day workshop	Inception, and again at mid-term of Phase

8. ENVIRONMENTAL AND SOCIAL ROLES AND RESPONSIBILITIES FOR THE COUNTY OFFICIALS

Environmental and social focal points at the County level will help in mainstreaming environmental and socio issues in the MAF/MARF programs and activities at Payma and Boma levels. This has been found necessary due to limited human capacity at the national and State level. Environmental and social focal points should be identified in the following MAF/MARF institutions: the national MAF/MARF/MoE Secretariat; each of the two national fora (Extension and Research); and the County MAF/MARF assistant commissioners. The Roles and responsibilities for each are defined:

8.1 Environmental and Social Roles and Responsibilities of the national MAF/MARF/MoE Secretariat

There should be deliberate effort made towards considering and integrating issues of natural resources, environmental and social sustainability into MAF/MARF processes and outcomes, in order to maximize the positive contribution that MAF and MARF make to resource conservation, environmental sustainability, livelihoods security and social inclusion.

8.1.1 Responsibilities

- (i) Ensuring effective integration of environmental and social considerations (e.g. sustainable land management, resource conservation, integrated pest management, free access to land and resources, and culturally appropriate benefits-sharing for marginalized and indigenous groups) into all aspects of identification, consultation, planning and implementation of MAF and MARF activities;
- (ii) advising the Ministers, Under Secretaries, and Director Generals on the environmental and social implications of proposed policy reforms (where necessary by commissioning further activities [see below]);
- (iii) Coordinating, and liaising with, County officials to ensure effective mainstreaming of environmental and social issues into the implementation of MAF and MARF activities, and facilitating lesson-learning and experience-sharing among districts;
- (iv) ensuring that MAF and MARF-funded activities are consistent in their approaches to environmental and social issues, thereby supporting full blending at the operational level;
- (v) facilitating and informing discussions on environmental and social issues at ministerial level;
- (vi) managing the implementation of all training and awareness raising;
- (vii) consolidating documented discussions of the different implementation levels into periodic reports on environmental and social mainstreaming within MAF and MARF;
- (viii) defining and managing further activities to support environmental and social mainstreaming into MAF and MARF processes (e.g. further studies; capacity building) – these may include both support activities defined and budgeted within a

- donor funded program and components of broader technical support activities funded through MAF and MARF;
- (ix) identifying suitable consultants/institutions to be used on technical support activities in relation to any of the above tasks, and overseeing their procurement and performance;
- (x) liaison with the MoE on a regular basis, and other key environmental and social stakeholders;
- (xi) defining, and subsequently monitoring, suitable environmental and social indicators for MAF and MARF (including, in consultation with County officials, for individual micro projects);
- (xii) providing environmental and social inputs to periodic MAF and MARF monitoring, evaluation, and reporting activities; and
- (xiii) Supporting and contributing to subsequent formal analyses and reports on environmental and social aspects of MAF processes (e.g. strategic environmental assessment (SEA) of policy reforms).

8.2 Environmental and social roles and responsibilities of the State MoE/MAF/MARF secretariats

Within each of the State Secretariats in the MoE, MAF and MARF ministries, a member will be appointed as Environmental and Social Focal Point. The overall roles and responsibilities for this person will cover a broad range of issues; they should include the following points in relation to environmental and social issues within MAF and MARF.

8.2.1 Roles

To facilitate effective discussions on issues of natural resources, environmental and social sustainability within the State Secretariat, so that MAF and MARF outcomes (policy reform, State interventions) respond to the issues in order to maximise the positive contribution that MAF and MARF make to resource conservation, environmental sustainability, livelihoods security and social inclusion.

8.2.2 Responsibilities on environmental issues

- (i) Contributing to, and facilitating, the active involvement of environmental and social stakeholder representatives in the State Secretariat;
- (ii) ensuring the State Secretariat receives advice and information on the environmental and social implications of proposed national policies and micro projects in the counties;
- (iii) facilitating full participation of all environmental and social stakeholders in the consultative process to ensure that outcomes reflect the opinions and aspirations of all interest groups, paying special attention to support to engagement by the representatives of marginalized and/or disadvantaged groups (e.g. indigenous peoples, HIV orphans, etc);
- (iv) from discussions in the State Secretariat, identifying environmental and social needs and priorities (e.g. within the design and implementation of project activities; for training/awareness raising; or for technical support activities), and providing this

- information to the national MoE/MAF/MARF Secretariat environmental and social focal point in a timely and systematic fashion;
- (v) documenting the environmental and social dimensions of forum discussions, and reporting these to the national MoE/MAF/MARF Secretariat;
- (vi) Supporting and contributing to other MAF and MARF environmental and social mainstreaming activities as appropriate.

8.3 Environmental and social roles and responsibilities of the County Secretariats

The County assistant commissioners for Agriculture, forestry, fisheries and Animal resources will constitute a Secretariat which will have a Coordinator. The overall roles and responsibilities for this person will cover a broad range of issues; they should include the following points in relation to environmental and social issues within MAF and MARF

8.3.1 Roles

To ensure full involvement of environmental and social stakeholders in MAF and MARF activities at County, Payam and Boma levels in the consultative processes, and full integration of environmental and social considerations into the implementation micro projects that MAF and MARF outcomes maximize the positive contribution to resource conservation, environmental sustainability, livelihoods security and social inclusion.

8.3.2 Responsibilities

- (i) Ensuring that both donor funded micro projects and MAF/MARF initiatives are identified, planned and implemented in a strongly participatory manner and proceed in environmentally and socially sustainable manner;
- (ii) supporting and informing discussions of the Secretariat at State level and below;
- (iii) liaising with the national MoE/MAFMARF Secretariat to facilitate lesson-learning and experience sharing between States;
- (iv) ensuring that similar lesson-learning and experience-sharing takes place among micro projects activities within the State;
- (v) identifying and informing the national MoE/MAFMARF Secretariat of additional environmental and social requirements at State level (e.g. specific technical studies, capacity building);
- (vi) awareness-raising relating to the environmental and social objectives of MAF/MARF – amongst State officials, within the State Environment Office, and other stakeholders as required;
- (vii) contributing to national MoE/MAF/MARF monitoring and evaluation and reporting on environmental and social issues, as required;
- (viii) in consultation with the national MoE/MAF/MARF, and subsequently monitoring, suitable environmental and social indicators for MAF/MARF micro projects.

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10. Annex on Consultations: Summary of key issues and list of stakeholders

Consultations were held with a range of stakeholders as part of the report preparation process. The key issues raised by different stakeholder groups are summarized below.

S.No.	Stakeholder Group	Key issues raised
1.	Ministry of Agriculture, Directorate of Forestry	• Loss of trees, some of high value, due to poor coordination of activities between the forestry and agriculture departments • Risk of Quela Bird infestation on farmers field • No appropriate chemicals (Quela Tox, Diazinon) are available due to shortage of finance for protecting Quela Bird • Limited cross-sectoral coordination between the Forestry and Agriculture departments in the counties • Lack tree nurseries at community level due to lack of finances • Less consideration of forest conservation and environmental protection by implementing NGOs • Need for capacity building and trainings in ways of harnessing environmental conservation with farming practices
2.	Ministry of Agriculture, Directorate of Plant Protection	• RSS does not have a policy or guidelines on the use of pesticides and inorganic fertilizers. • Lack of appropriate legal framework, lack of mechanism to regulate the importation and use of pesticides, lack of manpower, lack of facilities including spraying equipment, and laboratory and vehicles to facilitate movement. • Lack of monitoring mechanisms for chemicals coming into the country and used by farmers. • Major pesticides being used in some parts of the country are Malathion, Pyrethrins, and anti-termite control pesticides. • Use of communities indigenous knowledge and botanical plants as a pesticide • Lack of adequate pesticides, this aggravate crop loss due to pest attack
3.	Forestry Department in Morobo County	• Need for greater emphasis on agroforestry and forestry related activities when NGOs and Agriculture Department work with farmer groups to improve agricultural productivity. • Having tree nurseries in every Payam would help to supply tree seedlings for interested farmers but currently there is no money to set-up nurseries. • Rampant deforestation mainly for charcoal burning, firewood and timber. • Limited cross-sectoral coordination of activities between the forestry and agriculture departments • Lack of knowledge and appreciation of the importance of

		keeping woody vegetation on-farm • No record of cultivation in central or state forest reserves by farmer groups in the project counties • No displacement of communities or exclude of farmers from project implementation benefit
4.	Forestry Department in Yambio County	• Rampant deforestation mainly for charcoal burning, firewood and timber. • Trees used for charcoal burning and firewood include the <i>Vitallaria paradoxa</i> (lulu). • Preferred trees for timber include <i>Milicia excelsa</i> and <i>Khaya senegalensis</i>. • All these are endangered species • No record of cultivation in central or state forest reserves by farmer groups in the project counties • No displacement of communities or exclude of farmers from project implementation benefit • Preference to extensive farming than intensive one
5.	Agriculture Department staff, Morobo County	• County level staff can monitor the activities of the farmer groups advise them on environmentally acceptable farming practices • Lack of transport facilities is hindering staff movement and their ability to help farmers address environmental impacts. • Quelea tox and Diazinon to be made available for dealing with Quelea birds, also provide mist Nets to small farmers • No record of cultivation in central or state forest reserves by farmer groups in the project counties • Preference for extensive farming rather than intensive one
6.	Agriculture Department staff, Yambio County	• Preferring expansion of area under cultivation leads to increased productivity than adopting intensive farming • Lack of knowledge and appreciation of the importance of keeping woody vegetation on-farm • Households are encouraged to participate in activities such as road rehabilitation and are paid money so as to be able to buy food
7.	Farmers Groups, Morobo County	• Negligible use of pesticides and inorganic fertilizers • Use locally prepared infusions of red chilli (<i>Capsicum frutescens</i>), Paw paw leaves (<i>Carica papaya</i>) and Vernonia leaves (<i>Vernonia amygalina</i>) to control pests that attack their crops especially vegetables. • Also use Tobacco (<i>Nicotiana tabacum</i>) or Neem tree (<i>Azadirachta indica</i>) leaves infusion to control pests. • Physically remove infected crops and either burn or bury them. • An increase in pest prevalence is being noticed and this is affecting yields. • No communities have been displaced or excluded from project implementation.
8.	Bangusa Payam, Yambio	• Yatta forest reserve has not been encroached, though there are refugees and an army barracks in the area. • preferring extensive farming than intensive farming
9.	Farmers Groups,	• Shifting cultivation practiced.

	Lainya County	• A piece of land cultivated for 3-5 years before shifting to another place, when soil fertility declines. • Burning is a common practice as a starting activity in the clearing of land for cultivation. • Poor benefiting from payments from road rehabilitation, able to buy food • No encroachment into Reserve Forest areas
10.	Raga County	• Risk of Quela Bird on farmers field • No appropriate chemical (Quela Tox, Diazinon) are available due to shortage of finance • Lack of knowledge and appreciation of the importance of keeping woody vegetation on-farm • Very poor households are encouraged to participate in activities such as road rehabilitation and are paid money so as to be able to buy food

Details of stakeholders consulted are presented below.

Name/Contact	Designation
Baiga Ayume Anda	Kaya Boma Chief, Kimba Payam, Morobo County, Central Equatoria State
(a) Cheka Henry Stephen (b) George Ruese Yairo	Ag. Assistant Commissioner of Forestry, Morobo County Forestry Overseer, Morobo County
Christine Rojjo Samson	Assistant Commissioner for Agriculture Morobo County
Lukasara & Loro Farmers groups supported by AAH-I Rose Ayozu Darious Richard Sebit Ephraim	Kendila Boma Gulumbi Payam Morobo County Payam Extension Officer for Gulumbi Payam AAH-I Agriculturalist
Logu-Dapa Farmers Group Supported by NPA	Kenyi Village, Kenyi Boma, Kenyi Payam Lainya County
Mr. Timothy Thwol Onak	Director General, Forestry, MAF
Alexander Ali Natana	Ag. Director for Plant Protection, MAF/RSS
Abdelrahman Tamim Sartak	Pesticide Chemist MAF/RSS
Miuro Mivule	Project Director AAH-I
Faustino Mukhundu Payam Yambio Boma Ngido	Chairman of farmers' group

Name/Contact	Designation
Yambio County Western Equatoria State,	
Joseph Eriminio Abiambu Yambio	Senior Conservator of forests, Yambio County
Anthony Tungo Peter Yambio County Rimenze Boma Bangusu Payam Western Equatoria State	Agricultural Payam Extension worker for Bangusu Payam, Yambio County Western Equatoria State
Rev. Elinama Phillimon	ECS Deanary Makpandu Rimenze Boma Bangasu Payam Yambio County
Director General/State MAF, Western Equatoria State	Western Equatoria State, Yambio
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