Equatorial Lakes Subsidiary Action Program

FEASIBILITY STUDY AND PREPARATION OF AN INTEGRATED WATERSHED MANAGEMENT PROGRAM AND INVESTMENT PROPOSAL FOR SIO-MALABA-MALAKISI SUB BASIN

Final Report

Investment Project Proposal

Annex 4. Environmental and Social Management Framework

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CHAPTER 1.Introduction

The Sio-Malaba-Malakisi Integrated Watershed Management seeks to champion development that ensures conservation, regeneration and the judicious use of all the natural resources such as land, water, plants, animals etc. within the watershed. The proposed watershed investment options tries to bring about the best possible balance in the environment between natural resources on the one side, and human on the other.

In order to ensure, that the proposed financing under the new project design does not result in adverse environmental impacts, as well as lead to enhancement of positive environmental impacts, the PMU is proposing an Environmental and Social Management Framework (ESMF) for the watershed.

The proposed Sio- Malaba – Malakisi Watershed project will finance investments that are intended to assure sustainable watershed development and management in the project districts in both Uganda and Kenya. The project interventions are, therefore, expected to result in benefits to the rural communities, through improved water quality, reduced soil erosion and nutrient loss, improved vegetation, increased fodder availability, increased agricultural production, increased incomes, enhanced food security, etc.

While the proposed project interventions are expected to result in overall environmental improvements in the project districts, potential adverse environmental impacts can occur if the schemes are not properly designed, sited, implemented, and maintained.

OBJECTIVES OF ESMF

The broad objective is to ensure that the social and environmental issues associated with projects are systematically identified and addressed in the various stages of the implementation of subprojects.

Specific objectives are:

- To provide a systematic approach for identifying the various possible environmental and social impacts at the different stages of the project cycle.
- To identify appropriate mitigation measures for addressing the identified environmental and social impacts.
- To devise a responsive monitoring framework as part of the broader Environmental and Social Performance Assessment for the entire watershed.

CHAPTER 2.Existing policy, legal and institutional framework

2.1 Constitutional Provisions

UGANDA CONSTITUTION

In Uganda natural resource management (including water) is specified in the Constitution (1995), which is the supreme law of the land. The Constitution provides that the state shall promote sustainable development and public awareness of the need to manage land, air and water resources in a balanced and sustainable manner for present and future generations. The Constitution further provides that natural resources be managed to meet the development and environmental needs of present and future generations. In particular, the state is required to take all possible measures to prevent or minimize damage and destruction to land, air, and water resources due to pollution or other causes.

KENYAN CONSTITUTION

In the new Kenyan Constitution (1992), Article 42 (a) says that every person has the right to clean and healthy environment, which includes the right to have the environment protected for the benefit of the present and future generations through legislative and other measures. Article 60 (1) states that land in Kenya shall be held, used and managed in a manner that is equitable, efficient, productive, and in accordance to the principles of sustainable and productive of land resources, and sound conservation and protection of ecologically sensitive areas.

The Constitution also imposes a duty on the state to protect important natural resources, including water, on behalf of the people of Kenya.

2.2 Legal Framework

LEGAL FRAMEWORK FOR EXPROPRIATION (KENYA)

In Kenya expropriation is provided for in the constitution under section 75 for private land and sections 117 and 118 for unregistered Trust Land. But the Constitution only gives general guidelines. The detailed procedures for acquisition are elaborated under the “Land acquisition Act” in Chapter 295 for private land and chapter 288 for unregistered Trust Lands. “Trust Land” refers to that land that is still held under African customary tenure. The title to this land is said to vest in the County Council in trust for its inhabitants, hence the term “Trust”

LEGAL FRAMEWORK FOR EXPROPRIATION (UGANDA)

In Uganda, the Constitution, 1995 and the Land Act, 1998 give the government and local authorities, power to compulsorily acquire land. The Constitution requires that if a person's property is compulsorily acquired, that person must receive prompt payment "of fair and adequate compensation prior to taking possession" of the property.

The Land Acquisition Act, 1965 makes provision for the procedures and method of compulsory acquisition of land for public purposes. Ugandan law does not make any specific accommodation for squatters or illegal settlers, and compensation is based on legal occupancy. (lawful or bonafide occupancy).

THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT (EMCA), 1999 - KENYA

The main objective of the Act is to provide for the establishment of an appropriate legal and institutional framework of the management of the environment in Kenya. The Act further aims to improve the legal and administrative co-ordination of the diverse sectoral initiatives in the field of environment so as to enhance the national capacity for its effective management. Two major institutions have been established for the purpose of the administration of the above act. They are the National Environmental Council (NEC) and the National Environmental Management Authority (NEMA).

THE NATIONAL ENVIRONMENTAL COUNCIL (NEC) - KENYA

The Council functions to formulate national policies, goals, and objectives and the determination of policies and priorities for environmental protection. The Council also promotes co-operation among all the players engaged in environmental protection programmes.

THE NATIONAL ENVIRONMENTAL MANAGEMENT AUTHORITY (NEMA) – KENYA AND UGANDA

National Environmental Management Authority, NEMA, is established both in Kenya and Uganda as the corporate body responsible for the administration of the environmental legislations. It is responsible for the management of environment in accordance with the law.

In Kenya, NEMA functions include the co-ordination and regulation of various environmental management activities, initiation of legislative proposals and submission of such proposals to the Attorney General, research, investigations and surveys in the field of environment.

NEMA is charged with the responsibility of the execution of the Environmental Impact Assessment (EIA). Section 58 (1) of the EMCA requires that all activities related to the projects listed in the Second Schedule of the Act should be subjected to an EIA.

UGANDAN NATIONAL ENVIRONMENT ACT CAP 153

This is a powerful act that ensures overall environmental sustainability in Uganda. More importantly the Act has created The National Environment Management Authority-NEMA, Uganda, which is a semi-autonomous institution, established in May, 1995, under the Act. It is

charged with the responsibility of coordinating, monitoring, regulating and supervising environmental management in the country. NEMA spearheads the development of environmental policies, laws, regulations, standards and guidelines; and guides Government on sound environmental management in Uganda. In this regard NEMA has developed many environmental standards including water quality, air and waste management.

UGANDA THE WATER ACT, CHAPTER 152

The Act establishes the Water Policy Committee, an inter-sectoral body, whose function among others is to coordinate the preparation, revision, and updates of the comprehensive water action plan for the investigation, control, protection, management and administration of water for the nation. Such planning may specify activities and work, which require the prior approval of the Policy Committee.

KENYA WATER ACT

The Water Act creates the Water Resources Management Authority (WRMA) as the agency responsible for the regulation of water resources. Section 14 of the Act provides that WRMA may designate catchment areas, defined as areas from which rainwater flows into a watercourse. Section 10 states that WRMA shall establish regional offices in or near each catchment area. Section 16 provides that WRMA shall appoint a committee of up to fifteen persons for each catchment area to advise its regional officers on matters concerning water resources management, including the issuance and revocation of permits. The Act provides a role for user groups, organized as water resources users associations, in water resources management.

THE LAKES AND RIVERS ACT CHAPTER 409 - KENYA

The Act provides for protection of river, lakes and, associated flora and fauna.

NATIONAL FORESTRY AND TREE PLANTING ACT, 2003 - UGANDA

This Act provides for conservation, sustainable management and development, and beneficial use of forest resources. The law also recognizes other players including private and community forest practitioners.

KENYA THE FOREST ACT NO.7 OF 2005

The Act provides for sustainable forest management including Joint Forest management Agreements. The Act brings all forests be it private, local authority or state- under the act, and prescribes very heavy penalties for damage to forests and trees.

THE UGANDA WILDLIFE STATUTE

The statute was enacted in 1996 to provide for sustainable wildlife management; consolidate the law relating to wildlife management; and establish a coordinating, monitoring and supervisory body for that purpose. The Statute created the Uganda Wildlife Authority.

THE KENYA WILDLIFE (CONSERVATION AND MANAGEMENT) ACT

The Act provides for the establishment of game parks and reserves and prohibits activities that might hamper the proper management of wild animals.

THE LAND ACT, CHAP 227 - UGANDA

The Act provides that natural resources such as forest reserves are held in trust by the state government and local government to be reserved for ecological and tourist purposes for the common good of the people. This means that the government reserves the right to determine in what manner these resources are to be utilized.

AGRICULTURE ACT, CHAPTER 318 - KENYA

These provisions give power to the Minister, which is exercised through the Agriculture Officer at the district level. After concurrence with the Central Agricultural Board and consultation with the District Agriculture Committee, the Minister administering the Act can impose land conservation orders to control cultivation, grazing and clearing. These controls may be necessary to protect the land against soil erosion, to protect fertility and to maintain catchments.

FISH ACT OF 1964 - UGANDA

This Act governs the utilization and management of fisheries resources.

KENYA FISHERIES ACT, CHAPTER 378

The objective is: “providing for the development, management, exploitation, utilization and conservation of fisheries.”

2.3 Wetlands Policies

REGULATION POLICIES FOR WETLANDS MANAGEMENT – UGANDA:

Wetlands regulations in Uganda include the Wetlands Policy (1995), the Wetlands Regulations (1995) and the National Environment (Wetlands, River Banks and Lake Shores Management) Regulations, No. 3/2000.

The National Policy for the Conservation and Management of Wetland Resources was adopted in 1996 and highlights the importance and functions of wetlands as a vital resource, covering almost 10% of the country’s surface area. The policy sets out five goals: to ensure optimal use of wetlands; stop degradation of wetland productivity; maintain biological diversity of natural and semi-natural wetlands; maintain wetland functions and values; and integrate wetland concerns into the planning and decision making of other sectors.

THE NATIONAL WETLAND REGULATION - KENYA

The Kenyan National Wetlands Policy sets five goals, key among them:

- to end practices which reduce wetland productivity;
- to maintain the biological diversity of natural and semi-natural wetlands;
- to integrate wetland concerns into planning and decision-making of other sectors.

Consequently the policy recommends that, inter alia, there should be no net drainage of wetlands unless more important environmental management requirements exist and that only activities which are compatible with the sustainable utilization of wetlands should be permitted. Transboundary issues may arise from this kind of action.

2.4 International conventions and treaties

CONVENTION ON WETLANDS OR THE RAMSAR CONVENTION

The Ramsar Convention on Wetlands is primarily concerned with the conservation and management of wetlands. 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. Kenya ratified the Ramsar Convention in June 1990 and 5 sites have been inscribed as RAMSAR sites[1] representing a total of 101 849 ha, but none of them included in the SMM watershed. The proposed project is expected to adhere to the Ramsar Convention's principles of wise use of wetlands in the project area.

CONVENTION ON BIOLOGICAL DIVERSITY (UN CBD)

The Convention on Biological Diversity adopts a broad approach to conservation. It requires Parties to the Convention to adopt national strategies, plans and programmes for the conservation of biological diversity, and to integrate the conservation and sustainable use of biological diversity into relevant sectoral and cross-sectoral plans, programmes and policies. The proposed project is expected to conserve biodiversity, especially the rare and endangered species in the project area and its environs. Uganda and Kenya are both CBD's parties by ratification since respectively 1993 and 1994.

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

[1] Lake Baringo (31 469 ha), Lake Bogoria (10 700 ha), Lake Elmenteita (10 880 ha), Lake Naivasha (30 000 ha) and Lake Nakuru (18 800 ha)

be terrestrial or marine. The State Members of the Convention endeavour 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. Kenya only is party of this Convention since 1999.

UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE (UNFCC)

The United Nations Framework Convention on Climate Change (UNFCC) 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. The proposed project will assist in the implementation of the specific requirements of the Convention. Kenya and Uganda are inscribed on the list of non-Annex I Parties[2]

UNITED NATIONS CONVENTION TO COMBAT DESERTIFICATION (UNCCD)

The objective of the United Nations Convention to Combat Desertification (UNCCD) is to combat desertification and to mitigate the effects of drought in seriously affected countries, especially those in Africa. 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. Both Uganda and Kenya are parties of the convention from 1997.

IMPORTANT BIRD AREAS (IBAS)

The function of the BirdLife Important Bird Area (IBA) Programme is to identify, protect and manage a network of sites that are significant for the long-term viability of naturally occurring bird populations, across the geographical range of those bird species for which a site-based approach is appropriate. The project is expected to recognize these IBAs and to protect them where they occur in the project area or in the environs. Lake Victoria basin has five of sixty sites that have been identified as Important Bird Areas (IBAs) of Kenya, particularly Sio Port Swamp (KE 060) included in the Project Area. Other sites are important to consider like: Busia grasslands (KE 057), Mont Elgon (KE 059).

[2] UNFCC Non-Annex I Parties are mostly developing countries recognized by the Convention as being especially vulnerable to the adverse impacts of climate change, including countries with low-lying coastal areas and those prone to desertification and drought. The Convention emphasizes activities that promise to answer the special needs and concerns of these vulnerable countries, such as investment, insurance and technology transfer.

2.5 Regional Environmental Policies

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 utilisation 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 utilisation of, and benefits from, the common Nile Basin water resources" or in short "Sustainable development of the River Nile for the benefit of all".

THE EAST AFRICAN COMMUNITY PROTOCOL ON ENVIRONMENT AND NATURAL RESOURCES MANAGEMENT

This Protocol shall govern the Partner States of the EAC in their cooperation in the management of environment and natural resources over areas within their jurisdiction including transboundary environment and natural resources.

The objectives of this Protocol shall be to:

- promote sustainable growth and development of the Partner States through sustainable use and management of the environment and natural resources through prevention of activities that are detrimental to the environment and natural resources;
- foster closer cooperation for judicious, sustainable and coordinated management, conservation, protection and utilization of the environment and natural resources and deepen integration and poverty alleviation;
- promote capacity building and environmental awareness in environment and natural resources management;
- promote shared responsibility and cooperation in the management of environment and natural resources including those that are transboundary in nature among Partner States; and
- promote development and harmonization of policies, laws and strategies for environment and natural resources management to support sustainable development.

Each Partner State shall take appropriate measures within its competence, including the adoption of laws and regulations, administrative actions and enforcement measures, to ensure compliance with this Protocol. However, this is still work in progress.

TRANS-BOUNDARY ENVIRONMENTAL ASSESSMENT FOR SHARED ECOSYSTEMS IN EAST AFRICA

These guidelines apply across all the EAC countries and spells out activities to be considered for Trans-boundary Environment Impact Assessments, and these include those that are implemented in the geographical area of the trans-boundary ecosystem. These shall include; policies, plans, programs or projects in one Partner State or activities out of character with their surroundings involving major changes in land use and which are likely to cause trans-boundary impacts in neighbouring countries. Such policies, plans, programs or activities could involve transportation and communication, mining, exploration for petroleum, hydropower stations, tourism, large scale agricultural projects, irrigation and diversion of water courses as well as large weed and pest control programs.

The following criteria for determining Trans-boundary Environmental Impacts are proposed in the guidelines:

- The activity falling within a core area or area of immediate impact,
- The activity falling outside the core and the immediate impact area but has trans-boundary effects,
- A policy, plan, program or an activity whose objective is to promote regional Integration,
- An activity whose impact may promote regional integration or
- An activity with potential risks of any trans-boundary impacts.
- A policy, plan or program which will affect valuable or vulnerable areas including landscapes with a recognized national or international status.

2.6 World Bank safeguard policies relevant to the SMM-IWMP

The Sio Malaba Malakisi is a project specifically tailored to improve the environment and population livelihoods and champion sustainability within the watershed. Whereas most intervention proposals are decidedly to improve the environment, some of them involve engineering works, while others have societal implications.

Some of actions may trigger national, regional and international environmental and natural resources policies and laws. National laws and regulations are triggered differently in each country and are dependent on the regulations and standards that have been developed in each country.

It is then anticipated that some people and areas will be affected by the activities of the subprojects. When this occurs, the relevant provisions of the laws of each country and those of the OP 4.12 of the World Bank will apply.

The regional policies, guidelines and protocols still remain non-binding to the two countries and can only be used for guidance.

The World Bank Safeguard Policies are useful because they can inform financing of the investment proposals developed for the water shed. The relevant and applicable safeguards policies of the World Bank are described below as they relate to the proposed investments:

Table 1: Relevant WB policies

POLICY	KEY FEATURES	APPLICABILITY
OP / BP 4.01 Environmental Assessment	Potential environmental consequences of Projects identified early in project cycle. EAs and mitigation plans required for projects with significant environmental impacts or involuntary resettlement. EAs should include analysis of alternative designs and sites, or consideration of 'no option'. Requires public participation and information disclosure before board approval.	Applicable. Could be triggered by works associated with storm water infrastructure for Lwakakha and Bungoma.
OP / BP 4.04 Natural Habitats	Prohibits financing of projects involving "significant conversion of natural habitats unless there are no feasible alternatives". Requires environmental cost benefit analysis. Requires EA with mitigation measures.	The schemes to be taken up under the project would not convert or degrade existing natural habitats. However the Environmental Monitoring framework proposed is to identify early in the project cycle any adverse impacts.
OP / BP 4.36 Forestry	Prohibits financing for commercial logging operations and acquisition of equipment for use in primary moist tropical forests	Not Applicable. Proposed interventions are to enhance afforestation and promote agroforestry.
OB / BP 4.09 Pest Management	Supports environmentally sound pest management, including integrated pest management, but does not prohibit the use of highly hazardous pesticides. Pest management is the borrower's responsibility in the context of a project's EA	The project will concern activities aiming at increasing agricultural productivity.
OB / BP 4.12 Involuntary Resettlement	Implemented in projects which displace people. Requires public participation in resettlement planning as part of EA for project. Intended to restore or improve income earning capacity of displaced populations.	Potentially applicable if some activity like reforestation, wetland rehabilitation or riverbank restoration leads to action on permanently inhabited land or used for crops. Mitigation measures may be needed for some specific local cases

POLICY	KEY FEATURES	APPLICABILITY
OP / BP 4.20 Indigenous peoples	Purpose is to ensure indigenous peoples benefit from Bank financed development and to avoid or mitigate adverse effects on indigenous peoples. Applies to projects that might adversely affect indigenous peoples or when they are targeted as beneficiaries. Requires participation of "indigenous peoples in creation of indigenous people's development plans".	As per the initial social assessment, no populations of indigenous people have been identified in the area
OP / BP 4.11 Physical cultural resources	Purpose is to assist in the preservation of cultural property, such as sites having archeological, paleontological, historical, religious and unique cultural values. Generally seeks to assist in their preservation and avoid their elimination. Discourages financing of projects that will damage cultural property.	Not applicable
OP/BP 4.37 Safety of Dam	Applies to large dams (15 meters or more in height). Requires review by independent experts throughout project cycle. Requires preparation of EA and detailed plans for construction and operation, and periodic inspection by the Bank.	Not applicable
OP/BP 7.50 Projects on International Waterways	Covers riparian waterways that form boundary between two or more states, as well as any bay, gulf, strait or channel bordered by two or more states. Applies to dams, irrigation, flood control, navigation, water, sewage and industrial projects. Requires notification, agreement between states, detailed maps, feasibility surveys.	Applicable in the context of transboundary watershed management project.
OP/BP 7.60 Projects in Disputed Areas	Applies to projects where there are territorial disputes present. Allows Bank to proceed if governments agree to go forward without prejudice to claims. Requires early identification of territorial disputes and descriptions in all Bank documentation	Not applicable

CHAPTER 3.Overview of Environmental and Social Impacts and Mitigation Measures of proposed Investments

The proposed projects and sub-projects within the watershed are to promote environmental sustainability within the watershed. However, there are some projects whose implementation may have some adverse unintended impacts. Most of these potential impacts are however subtle and easy to mitigate once taken on-board at the detailed conceptualization stage. Moreover they may only be applicable at a very local level and without cumulative impacts at the watershed scale. The table below presents potential impacts, possible mitigation and enhancement measures.

3.1 Environmental and Social Main Issues

The table below summarized the main environmental and social issues to be addressed by the IWMP.

Table 2: Main environmental and social issues to be addressed by IWMP

MAIN ISSUES	SPECIFIC ISSUES	IMPACTS	SUMMARY
High population pressure	Land fragmentation	Soil erosion and nutrient loss, landslides	Endangered watershed functions and ecosystems degradation leading to an increasing deterioration of environment and allowing only low-income for population
	Farming activities expanding into marginal areas	Soil erosion and nutrient loss, landslides; Destruction of ecological functions and loss of biodiversity	
	Poor land use management	Soil erosion and nutrient loss, landslides; Extreme hydrological regimes, seasonal flash floods	
	Deforestation	Soil erosion and nutrient loss, landslides; Drying up of streams and reduction of base flow	
Low technology levels	Encroachment on river riparian lands and wetlands	Degradation of riverbanks, erosion and landslides; Highly turbid waters and increased sediment loads in water courses and water storage facilities; Loss of ecosystem functions like water purification by wetlands; Degradation of aquatic fauna and river fish stock	
	Over-extraction of surface water	Divergence between water demand and water availability; Penalization of downstream users	
	Low sanitation coverage	Negatively impacted surface water and ground water quality Degradation of air quality Risks for public health	
	Inadequate solid waste management		
Limited capacities for resources management and environment control	Poorly controlled effluent discharges (industry, sewage outfalls…)	Negatively impacted surface water and ground water quality Risks for public health	
	Nutrient and agrochemical pollution	Pollution of soils Negatively impacted surface water and ground water quality	

3.2 Environmental and Social Impacts

The biophysical and social impacts of the SMM-IWMP can occur at various stages of project development and can be positive or negative.

At the local level SMM-IWMP is expected to generate many positive impacts that could lead to improvements in alleviation of poverty, improved food security through better crop yields, diversified agricultural resource base, and improved household income. The project will also result in a multiplier effect on the local economy through development of entrepreneurial activities.

At the national, regional and district/county levels, the project will promote rural development strategies that integrate ecosystem concerns and will also strengthen local social organizational structures to evaluate ecosystem concerns that cover more than one village.

At the global level, the project will contribute to the reduction of soil degradation, improvement of biomass production and sequestration of above and below ground carbon. The project will also contribute to reduced siltation, and nutrient runoff to rivers systems draining into Lake Victoria in Kenya and Lake Kyoga in Uganda.

Potential negative impacts at local, national and global levels may include pollution and eutrophication of water bodies resulting of intensification of agriculture and increased inputs use (fertilizers, pesticides), interference with wetland and animal ecology (particularly birds and fish), erosion and sedimentation and social disruption through lack of adequate capacity for environmental and social screening.

Alternative livelihoods 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 will be provided with an opportunity to learn how to avoid or mitigate localized impacts from initial subprojects so that measures can be integrated in subsequent activities.

Based on the nature of project and sub-projects (i.e. afforestation, riverbank protection, activities for wetland management) proposed under IWMP, it is possible that some activities would lead to a land loss or prevention or restriction of access and exceptionally lead to compensation or a possible resettlement. It is then anticipated that some people and areas will be affected by the activities of the subprojects.

The table below describes main proposed investment activities that are likely to be undertaken by the SMM-IWMP and predicts both positive and negative impacts. Related measures for mitigation or enhancement of impacts are also proposed.

Table 3: Potential impacts and proposed measures for sector project Afforestation

PROJECT OR SUBPROJECT ACTIVITIES	• Afforestation/ Reforestation of degraded gazetted forest • Promotion of community plantation forestry • Community support for sustainable forest management • Support development of private tree nurseries and service providers
POSITIVE IMPACT	• Stabilize or decrease forest degradation process • Rehabilitation of forests and woodlands, and re-establishment of forest tree species • Improvement of forest status and coverage • Increase capability and willingness of communities for the management of forests and woodlands • Increase availability of fire-wood and surplus wood for other uses for communities, including trade • Improvement of wildlife habitats and corridors
PROPOSED ENHANCEMENT MEASURES	• Planting multipurpose trees and species with different life cycles to ensure permanent forest cover. • Training communities in management of forest resources, in technical, economical and social aspects • Local communities like CBOs to ensure participation of women and youth in activities corresponding to their capabilities: forest protection, raising nurseries, seed treatment and sapling growing activities • Promote sustainable practices of fuel wood gathering and wood-saving techniques like improved wood stoves or other energy sources • Investigate PES and carbon market access potential for forestry activities • Dedicate special attention to wildlife habitats and corridors in afforestation area selection
POTENTIAL ADVERSE IMPACTS	• Change in diversity of flora and fauna • Introduction of few exotic species (mostly *Eucalyptus* and *Grevillea*) decreasing biodiversity and more sensitive to disease, insects, fires, etc. • Loss of land currently under agriculture
PROPOSED MITIGATION MEASURES	• Favour native species as far as possible • Consider mixture of high value trees and other plants, including those that provide non-timber forest products (NTFP). • Tree planting practice to minimise soil erosion (contours lines, continuous or discontinuous trenches…). • Development of compatible food and cash crops with trees on farms, in a non-competitive association, to save forested areas as productive. Silvipasture practices should be encouraged in areas where there is a demand for a mixture of fodder and fuel wood.

Table 4: Potential impacts and proposed measures for sector project Soil and water Conservation - Agroforestry

PROJECT OR SUBPROJECT ACTIVITIES	• Promotion of physical and biological soil erosion control measures like integration of contour strips of perennial fodder crops, cut-off drains / earth bunds, retention dishes… • Agroforestry promotion • Support development of private nurseries and service providers • Support restoration of existing small multipurpose dams or other structure for water harvesting
POSITIVE IMPACT	• Reduce surface run-off and soil and nutrient loss • Increase land tenure/use conditions • Decrease of erosion occurrence in the watershed • Soil fertility conservation • Improvement of vegetation cover • Improvement of water retention and harvesting • Secure land tenure/use conditions • Increase empowerment process of communities
PROPOSED ENHANCEMENT MEASURES	• Directly finance major soil erosion control structures at the scale of SC units • Support farmers initiatives for water harvesting, in surface or in underground tanks • Facilitate access to revolving funds or micro-credit to farmers to allow investments in the new technology promoted • Support community groups through Capacity Building by FFS
POTENTIAL ADVERSE IMPACTS	• Increase in production costs because of new labour costs for levelling of crop field and maintenance of terraces/ bund to check water runoff and soil loss • Possible increase of agro-chemicals (inorganic fertilizers, pesticides, herbicides) use leading to soil and water pollution
PROPOSED MITIGATION MEASURES	• Compensate increased costs by higher crop values such as oil palm, mulberry (silk worms), fruit trees/orchards into farms • To ensure higher income, investigate the mean to facilitate access to markets by producers • Promote use of organic inputs (fertilizers, pesticides)

Table 5: Potential impacts and proposed measures for sector project Conservation agriculture

PROJECT OR SUBPROJECT ACTIVITIES	• Zero tillage/minimum soil disturbance and seed drilling • Soil cover (mulch, cover crop-legumes like lab-lab, mucuna) • Selection of perennial crops instead of annual, good cover crops instead of open cover • Crop rotation/inter cropping • On site composting, crop residue trash lines • Support service providers local hire services and manufactures of machinery (sub-soiler, ripper, direct seeder-jab planter) • Multipurpose and nitrogen fixing tree planting • Furrow contour cultivation • Improved crop production measures • Woodlots, fodder development
POSITIVE IMPACT	• Soil fertility conservation and improvement • Enhanced soil moisture and reduction of surface run-off and soil and nutrient loss • Improvement of crop cultivation practices • Diversification of crop types, livelihoods and source of incomes • Improvement of food security • Increase capability and willingness of communities • Strengthen social ties and exchanges between farmers by creating new CBOs, FFS, committees, and stakeholder forums • Strengthen capacities and actions of technical officers • Support development and capacities of service providers and operators
PROPOSED ENHANCEMENT MEASURES	• Promote mixed cropping and flexibility in planting, rotation of crops and bringing the cultivated land under leguminous crop (beans, ground nuts etc.) to maintain soil nutrient content for fertility • Promote agro–forestry to maintain biological fertility of soil • Plantation of fodder species in the uncultivable waste land to supplement fodder • Facilitate access to revolving funds or micro-credit to farmers to allow investments in the new technology promoted
POTENTIAL ADVERSE IMPACTS	• Possible increase of agro-chemicals (inorganic fertilizers, pesticides, herbicides) use leading to soil and water pollution • Risks linked to introduction of exotic species for crops • Increased use of water • Vulnerable groups may lose access to water or land • Interests/rights of the vulnerable groups may not be integrated into the activities and social aspects considered (women and youth)

PROPOSED MITIGATION MEASURES	• Selection of low water demanding crops and rain water harvesting, storage of surface water (of streams, etc.) through water storage ponds • High water consumption crops like bananas, should be discouraged • Promote the use of bio-compost, organic mulch/ green manure and suitable organic / biotic control of insects and pests could result in lesser use of permissible chemical fertilizers and pesticides • Educate population in the proper use, storage and disposal of potentially polluting chemicals • Selection of crops should be based on local water budget and traditional practices • High nutritional value traditional crops should not be totally replaced by high yielding varieties. • Genetically manipulated varieties should be avoided • Introduce high value tree such as oil palm, mulberry (silk worms), fruit trees/orchards onto farms • Investigate the mean to facilitate access to markets by producers • Construction or rehabilitation of rural markets and storage facilities • Develop access to micro-credit for communities and farmers • Develop specific activities to be entrusted to women and youth, taking into account their capacities and constraints

Table 6: Potential impacts and proposed measures for sector project Riverbank protection

PROJECT OR SUBPROJECT ACTIVITIES	• Sensitization on utility of riverbank protection, capacity building (guidelines for riverbank protection and restoration) • Implementation of promoted techniques on pilot areas as example purpose • Vulgarization of laws and regulations related to riverbank protection • Awareness on the risks related to deforestation and riverbank erosion (flood events, loss of land…) • Promotion of afforestation and agroforestry on riverbanks
POSITIVE IMPACT	• Improvement of riverbank protection • Improvement of biodiversity along the rivers • Improvement of water quality and decrease of river silting
PROPOSED ENHANCEMENT MEASURES	• Propose sensitization/capacity building programme on safe sand extraction practices and on recommended practice on river bank protection (use of strips along the water courses, access of cattle to the river banks)
POTENTIAL ADVERSE IMPACTS	• Loss of land currently under agriculture
PROPOSED MITIGATION MEASURES	• Include local people and particularly land owners in the design and site selection of pilot activities • Involve local communities in implementation of works, to compensate land loss with employment

Table 7: Potential impacts and proposed measures for sector project Promotion of sustainable practices for river sand abstraction

PROJECT OR SUBPROJECT ACTIVITIES	• Sensitization, on the risks related to deforestation and riverbank erosion (flood events, loss of land…) • Improvement of knowledge on occurrence, practices and legal/regulatory framework in both countries • Proposition of harmonized regulation for river sand mining for both countries • Promotion of more improved practices for sand abstraction
POSITIVE IMPACT	• Community awareness on utility of riverbank protection • Awareness on the risks related to deforestation and riverbank erosion (flood events, loss of land…) • Improvement of riverbank protection • Improvement of biodiversity along the rivers
PROPOSED ENHANCEMENT MEASURES	• Sensitization of local building companies to checking the origin of the materials they use
POTENTIAL ADVERSE IMPACTS	• Loss of income for current operators
PROPOSED MITIGATION MEASURES	• Consider small scale operators and alternative livelihoods

Table 8: Potential impacts and proposed measures for sector project Permanent wetlands management project

PROJECT OR SUBPROJECT ACTIVITIES	• Promotion of wetlands conservation (ecological functions) • Promotion of diversified livelihoods/income generating activities • Improvement of fish capture techniques • Ridge and furrow agriculture methods • Promote aquaculture, extend fish culture system • Promote fish farms integrated units • Establishment of papyrus coup areas • Promote eco-tourism and handicraft development • Promote small scale irrigation schemes out of the wetland areas
POSITIVE IMPACT	• Stabilize or improve wetlands protection and conservation of ecosystem functions and services • Introduction of diversified sustainable practices • Diversification of livelihoods and source of income • Wildlife conservation with a view to ecotourism
PROPOSED ENHANCEMENT MEASURES	• Promotion and initiation of Payment for Environmental Services PES to give a sustainable framework to new initiatives • Construction or rehabilitation of rural market places and storage facilities, linked to improved access to market for the products, and firstly the new ones • Develop access to micro-credit for communities and farmers to facilitate initiatives
POTENTIAL ADVERSE IMPACTS	• Over-exploitation of fish stock • Destruction of papyrus areas • Social unbalance in community development • Increased trend to wetland drainage • Water deficit in the wetland areas • Degradation of water quality by discharge of polluted water from fishponds • Wildlife disturbance due to tourism development
PROPOSED MITIGATION MEASURES	• Sensitization of communities regarding ecological services and functions of wetlands • Ensure that the interests/rights of the vulnerable groups are integrated into the activities and that gender aspects are considered (women and young people • Ensure a suitable balance between water intake and water level needs for wetlands conservation • Promotion of best practice to avoid pollution of water bodies by fish-farming • Sensitization on wildlife care in ecotourism context

Table 9: Potential impacts and proposed measures for sector project Seasonal wetlands (floodplain) management project

PROJECT OR SUBPROJECT ACTIVITIES	• Promotion of diversified livelihoods/income generating activities • Promotion of improved and diversified practices • Ditches dug for water retention • Optimum use of seasonal grazing • Type and extent of fuel wood and fodder production • Eco toilet promotion • Fruit orchard cultivation • Bee keeping
POSITIVE IMPACT	• Increased income levels • Better usage of natural resources and skills • Diversity of income sources • Enhanced environmental functions of wetlands
PROPOSED ENHANCEMENT MEASURES	• Construction or rehabilitation of rural market places and storage facilities, and improvement of access to market for new products • Support establishment of community organization for integration of all skills and capacity, including women and youth • Develop access to micro-credit for communities and farmers
POTENTIAL ADVERSE IMPACTS	• Potential arising of conflict among the users over common resources • Potential privatisation of wetland areas previously used by all • Excessive harvesting of a particular species/plant parts • Generation of waste from livelihood activities potentially cause of nuisance, sanitation problems and diseases • Possible occupational health hazards during harvesting of wetland resources such as exposure to bilharzia.
PROPOSED MITIGATION MEASURES	• Strengthening of community resource management institutions to reduce conflicts among the users over common resources • Investigate the mean to facilitate access to markets by producers • Sensitization on proper disposal of waste not to affect wetlands

Table 10: Potential impacts and proposed measures for sector project Storm water management for Lwakhakha and Bungoma

PROJECT OR SUBPROJECT ACTIVITIES	• Storm water management in urban areas
POSITIVE IMPACT	• Improved water quality • Possible improvement in groundwater quality • Increased perennial behaviour of streams • Reduction in flood occurrence
PROPOSED ENHANCEMENT MEASURES	• Improved solid waste management in parallel to support avoidance of structures clogging. • Sensitization and capacity building to local organizations on the importance of maintaining storm water drainage structures, including procedures such as silt removal, unclogging culverts, ditch cleaning...
POTENTIAL ADVERSE IMPACTS	• Modification in water availability pattern downstream • Siltation in drainage structures and check dams • Increased soil erosion & siltation rates due to construction activities • Water borne diseases due to water contamination during construction
PROPOSED MITIGATION MEASURES	• The site for check dams shall be site specific, gully checks for low slope whereas silting basins shall be used for steep slopes • Stone rip–rap or pitching, wooden piles should be provided under conditions of high soil erosion. • Provision should be made to trap transported debris and bed load, with sediment traps located at the inlet for easy access and cleaning • Scour protection to be provided at the base of the culvert outfalls and a stone pitched channel to lead the excess water away from the structure • Sediment traps with stone pitching and turfing to be constructed • Soil conservation measures around the structures (bio-engineering measures).

Table 11: Potential impacts and proposed measures for sector project Solid Waste Management Master Plan for Bungoma and Lwakhakha

PROJECT OR SUBPROJECT ACTIVITIES	• Solid Waste Management Master Plan in urban areas
POSITIVE IMPACT	• Reduced flood risks • Better management of surface water run-off • Improvement of public health conditions, welfare and aesthetic within the towns • Improved air quality • Improved water quality downstream • Availability of compost for use in organic farming • Creation of new job opportunities
PROPOSED ENHANCEMENT MEASURES	• Maintain waste collection schedules to avoid accumulation at skips or collection points • Initiate and promote waste sorting at source • Consider Private–Public Partnership to reduce costs that could be diverted from other important social programmes • Prioritize employment of local people in waste management
POTENTIAL ADVERSE IMPACTS	• New levies on residents for solid waste management may be resented by poor residents • Infrastructure created on land under other current use • Air/water pollution during waste collection and removal • New expenditure on Infrastructure may divert resources away from other relevant projects
PROPOSED MITIGATION MEASURES	• Conduct campaigns for the need for new levies to gain acceptability by the residents, and to create awareness amongst the residents on the importance of improved waste management. • Land not suitable for other productive purposes to be brought under infrastructure activities. • Regulatory safety provisions (Building works for Kenya and Uganda) to be strictly followed in waste handling, and in construction of related structures.

LOCALIZED IMPACTS

Most of the developments or subprojects planned under the SMM-IWMP will be small in scale. Consequently the significance of the direct negative environmental and social impacts is likely to be small. All the activities planned under the project would potentially have positive environmental and social impacts especially when considering the integrated watershed management of SMM basin linking upstream and downstream activities.

CUMULATIVE IMPACTS

Many of the subprojects may result in cumulative impacts on natural resources. Cumulative impacts are those that may result from individually small-scale activities with minimal impacts but which over time can combine to have a significant impact. Cumulative impacts can also be defined as impacts that potentially develop from the combined impacts of more than one subproject.

For example improvement of water quality and decrease of the sediment load in the lower reaches of the rivers will be the cumulative effect resulting of the small scale measures implemented to reduce soil erosion in the related watershed. Another example is the addition of soil conservation on small plots in different parts of a river basin, obtained through improved farming practices; this will lead, at local level, to a more sustainable soil fertility because nutrients will not be lost to runoff. But at the other end of the process, in the downstream areas, a lower sediment load in the river will permit an easier protection of wetlands (either seasonal or permanent) because of slower sedimentation process, thence a better possibility to improve fish reproduction and later fish capture.

CHAPTER 4.Environmental and Social Monitoring Framework

4.1 The Environmental and Social Performance Assessment Approach (ESPA)

The most appropriate approach for monitoring at the watershed scale is Environmental and Social Performance Assessment (ESPA). This is a broad monitoring framework for the entire watershed, given that the detailed investment models are not yet developed. It is expected that each individual investment project be screened for their merits in detailed Environmental Management Plans and in successive social status reports.

The monitoring framework proposed at this stage will enable the IWMP-PMU to monitor the cumulative environmental and social performance of all sub-projects/activities within the watershed and at a coarse level for the specific projects that have been selected by this study. The monitoring system at such a scale should be robust and simple yet accurate enough to provide trends in environmental performance and sustainability as well as social soundness across the watershed.

We are therefore proposing a process with the following steps:

- Appointment of qualified officers to implement the Environmental and Social Performance Assessment (ESPA);
- Preliminary environmental and social screening exercise before starting activities / Sub-projects
- Recommendation for mitigation measures or alternatives to address the potential negative effects highlighted by the screening;
- Preparation and implementation of an Environmental Monitoring Plan for each investment project/sub-project
- Monitoring of environmental and social progress based on Environmental and Social Performance Indicators (ESPI);
- Establishment of an environmental and social baseline (example Preliminary Forest survey, preliminary Wetlands Characterization; Water Quality Analysis at end points of the SWU…) to gather ESPI initial level;
- Annual Reporting of the Environmental and Social Performance Assessment (ESPA);
- Mid-term IWMP Environmental and Social Audit.

4.2 Responsibility and Reporting

4.2.1 Institutional Arrangement

To ensure a sustainable implementation of the projects/sub-projects and compliance with requirements regarding environmental and social protection, the following institutional arrangement is proposed and is involving:

1. Monitoring and Evaluation Officer (IWMP-PMU): responsible for the overall process of environmental and social monitoring; this officer will be in charge of monitoring the IWMP implementation and its compliance with all relevant national and transboundary policies and legislation regarding environmental and social issues as well as the EMPF prescriptions; he will supervise the environmental screenings before starting activities and according to the result, he'll recommend alternatives or mitigations measures
2. Coordination and liaison officers in each country: responsible of data collecting for ESM system and appropriate implementation of recommended mirigation measures
3. Technical district/sub-county officers in charge of sub-project-activities implementation and preliminary environmental and social screening.
4. External auditors: chosen among NEMA staff, they will conduct the monitoring plans audits;
5. Independent consultant: this environmental and social expert will conduct a midterm environmental and social performance audit. The audit report will be shared with officers involved in the ESM Process and other relevant governmental agencies. A disclosure phase will allow sharing results with the local stakeholders.

4.2.2 Reporting

The M&E Officer (staff of the IWMP PMU) will produce an annual environmental and social report.

A mid-term audit environmental and social performance audit will be produced by an external specialized consultant.

4.3 Environmental and Social Screening Exercise

The ESMF includes a preliminary Environmental and Social Screening Exercise (ESSE) to assess the potential environmental and social impacts associated with sub-projects and activities.

This screening exercise intends to help determine what measures will need to be undertaken to address the potential negative impacts of a sub-project of a set of proposed activities. It will also ensure that sub-projects/activities that may have potentially significant impacts will be studied in greater details or eventually will be submitted to EIAs if needed.

In order to help perform these ESSE with the most efficient results, a safeguard specialist will give appropriate training to technical officers to screen sub-project proposals for potential environmental or social issues.

The main aim of the screening exercise, as defined by the European Union, is to define whether a project needs:

- a full environmental and social assessment
- a partial environmental and social analysis
- no environmental and social assessment

or whether the analysis requires:

- an environmental and social audit
- no environmental and social audit.

The three main objectives of screening are to:

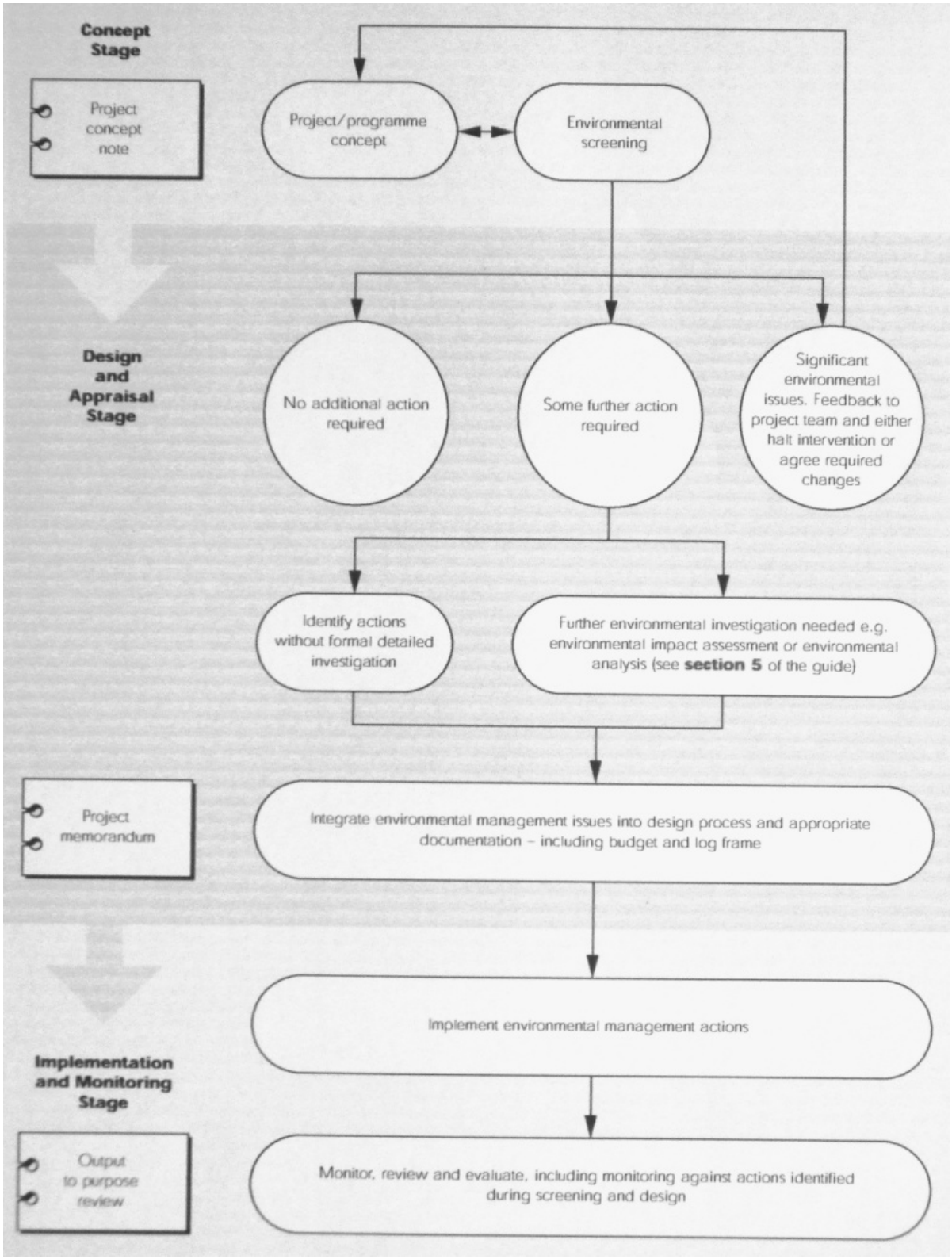
- **identify and exploit environmental and social opportunities** and benefits of a proposed intervention. For example, a screening note might identify the need to include social services (health, hygiene, mother and baby care...) in a local government development programme.
- **identify and manage environmental and social risks** associated with the intervention and ensure that appropriate action is taken. For example, improving solid waste collection can have many social, economic and environmental benefits, but the risks (e.g. damage caused during implementation) need to be managed.
- **ensure that planned activities are consistent with policy** at the national and international level. For example, screening should identify if there is national legislation with which the intervention needs to comply. Ideally a screening note should also highlight any links to multilateral socio-environmental agreements and international best practice.

Key points on environmental screening process are indicated below:

• Consider environmental and social issues early – ideally as soon as an intervention is identified.
• Screening is a crucial first step – it identifies environmental and social opportunities and risks, and determines the level of detail of any further studies.
• Integrate key issues and actions – the issues identified through screening need to be reflected in relevant project/programme documentation (e.g. the log frame).
• Socio-environmental appraisal is iterative – if new environmental or social issues come to light during design and implementation, appropriate action should be taken.

• Monitoring is important – to ensure opportunities and risks raised during screening and design are being managed effectively.

The main steps of the socio-environmental screening process are represented in the scheme below:



Source: **DFID** Environment Guide, a Guide to Environmental Screening, 2005

4.4 ESPA Framework, Priority Concerns and Indicators

Being essentially an environmental program it is desirable to develop an environmental performance review as a means to understanding environmental status in the context of sustainable social-economic development within the watershed. To this end, the development of a set of interconnected performance indicators should help the IWMP-PMU rate their environmental performance against project specific set targets and those at the watershed level.

A feedback mechanism allows adjustments to be made to the corrective actions that have been set, and also actions that are proposed to enhance positive environmental impacts.

4.4.1 Identification of priority issues

For ESPA to be useful, the number of priority concerns cannot be overly large. This is for both practical and statistical reasons. Worldwide experience suggests that a total of around fifteen priorities may be the maximum that can be realistically considered where the process of ESPA is starting. An important statistical consideration is that as the number of indicators increases so does the possibility that they are interrelated, rendering one or more unnecessary. For example, a strong correlation typically exists between incidence of diarrhea among children and microbiological contamination of drinking water. In such cases it may be unnecessary to compile data on both indicators. Simply monitoring water quality will indicate whether drinking water quality standards intended to safeguard human health are being achieved. Although both sets of data are functional, especially with respect to the actual provision of public health services, only one may be strictly necessary for ESPA purposes.

Caution is advised in adopting aggregate measures of environmental performance. Stressing that ESPA is intended as a communication tool, it is essential that indicators chosen communicate results to intended audiences. In the foregoing drinking water quality example, incidence of infant diarrhea is immediately relevant and understandable to affected families and government health care officials. A balance must therefore be achieved between simplifying ESPA through adoption of a small number of common indicators and accepting a larger number of indicators more directly linked to particular concerns.

4.4.2 Selection of pertinent Environmental and Social Performance Indicator

Environmental and Social Performance Indicators (ESPI) are tools for assessing environmental performance.

Comparison of the value achieved for a well-chosen indicator against a quantifiable and specified target provides a useful indication of the degree of success in reaching said targets. Selecting the most suitable indicators of performance corresponding to priority concern is therefore of prime importance. Key considerations in selecting indicators are their policy relevance, analytical soundness and measurability. Additional considerations relating to the credibility of indicators are data availability and quality.

Emphasis should be given to quality rather than quantity in selecting indicators. Factors that will determine indicator quality are policy relevance (or correlation with policy targets) and measurability (availability of data and cost of filling data gaps).

With respect to policy *relevance* an environmental indicator should:

(i) provide a representative picture of environmental conditions, pressures on the environment or management responses;

(ii) be simple, easy to interpret and able to reveal trends over time;

(iii) be responsive to changes in the environment and related human activities;

(iv) provide a basis for international comparisons;

(v) be applicable to Sio-Malaba-Malakisi watershed environmental issues and

(vi) have a threshold or reference value against which to compare it, to allow the significance of the values associated with it to be assessed.

With respect to *measurability*, the data required to support the indicator should be:

(i) readily available or made available at a reasonable cost;

(ii) adequately documented and of known quality; and

(iii) updated at regular intervals in accordance with reliable procedures.

4.4.3 Baseline surveys – Data requirements

A challenge in adopting ESPA as an effective environmental management tool relates to data quality and availability. Missing or poor quality data represent a major limitation in the selection of indicators, with the consequence that theoretically superior indicators are often overlooked in favour of indicators that are more readily quantifiable. Broader partnerships involving relevant national organizations especially the Lake Victoria Environmental Management Programme (LVEMP), research bodies and non-government organizations, are considered necessary for data gathering and overall success of ESPA. It will be important to integrate all relevant know-how and databases in order to improve data availability and quality.

Possible ESPI are suggested in the table below.

Table 12: Suggested indicators for SMM-IWMP

MAIN ENVIRONMENTAL AND SOCIAL ISSUE	EXAMPLE OF ENVIRONMENTAL AND SOCIAL PERFORMANCE INDICATORS (ESPI)
Deforestation	• Areas covered by forest or woodland • Areas of afforestation against areas of deforestation evidence
Water quality degradation	• Water chemical and physical quality: results of water analysis (including organic matter, pollutants and salts)
Extreme hydrological regimes	• Flow regime (point end of SWU) • Statistics of events flood events and affected areas; landslides on riverbanks
Water availability - Water scarcity	• Availability of water for users (wells, boreholes / SWU) • Ratio of water diversion for irrigation or other purpose / water coarse and SWU • Flow regimes at point end of SWU
Loss of soil fertility (nutrient loss)	• Soil quality (texture, structure, grain size, organic matter, nitrogen, phosphorus, calcium, sodium; …) • Average yields (by FFS)
Soil erosion	• Erosion figures (major lavakas) and landslides in areas covered by the project (FFS participants, CBO's plots etc…)
Waste management	• Occurrence of waste management system in the SWU • Result of water analysis (pollutants, organic matters…)
Storm water management	• Occurrence of storm water management system in the SWU • Result of water analysis (pollutants, organic matter, hydrocarbons…)
Wetlands degradation	• Areas covered by non degraded wetlands • Areas encroached on wetlands • Volume of papyrus coup products
Fish stock in the rivers	• Fish captures (by CBO's) • Fish production (from fish pounds) • Volume of fish traded on market and market price for fish
Decreasing Farmer's income	• Average yields (by FFS for example/SWU) • Average Income (by FFS for example/SWU)
Food security	• Diversification of livelihoods (by FFS/SWU)
Conflicts between land users	• Number of conflicts between users (wetlands, farmers /cattle owners etc.)
Access to Market	• Number of local markets (accessible for Farmers) • Level of trade on local markets
Gender disparity	• Number of women and young in the FFS or other CBO's and representatives in stakeholder forums • Number of women and young attending training courses, meetings etc.
Health and hygiene	• Incidence of water borne or water related diseases in infants, children and adults

CHAPTER 5.Environmental Monitoring Plan

As part of project implementation, the PMU should insist on the preparation and implementation of an Environmental Monitoring Plan (EMP) for each investment proposal at the implementation stage. The objective of the Monitoring Plan is to document the monitoring and reporting procedures for potential environmental and social impacts of the projects across the watershed.

5.1 Content of the Environmental Monitoring Plan

The Environmental Monitoring Plan provides guidance on the minimum details, methods and procedures for each investment proposal. The EMP shall contain the following information for each activity proposed by the project:

- Monitoring parameters;
- Methods for sampling, laboratory analysis (if necessary) and statistical analysis of data; other participatory activity (see below)
- Sampling locations;
- Sampling frequency;
- Monitoring responsibility/arrangements,
- Reporting requirements;
- Timetable;
- Budgets

The process of building EMP will include the production of an EMP matrix allowing crossing within a table the following information:

Performance questions and related targets / information needs and indicators / Baseline information: requirement and status / data gathering: methods, frequency, responsibilities / planning resources: forms, planning, training, data management, expertise, responsibilities / information use: analysis, reporting, feedback, change processes responsibilities.

Amongst major activities proposed in the EMP, participation of the communities is crucial and can been included through: Participatory rural appraisal (PAR); household and farm surveys; participatory impact monitoring (PIM), Stakeholder discussion groups.

Table 5 is proposing a format for Environmental Monitoring Plan. The key elements that should be included are the expected project actions; anticipated environmental impacts; proposed mitigation measures, with the parties responsible for carrying these out and the associated costs. Are also included the mechanisms for monitoring also indicating the responsible parties and costs.

5.2 Annual Audit for Completed Sub-Projects

For objectivity, it is proposed that all investment projects and sub-projects are subjected to external audits. Objectives of external audit are to verify/check the following:

- To check the adequacy/correctness of EMPs, screening and environmental evaluation of all schemes notably irrigation, storm water management and solid waste management;
- To check in the field the quality of implementation and effectiveness of the environmental mitigation measures with reference to the identified performance indicators.
- To assess the effectiveness of supervision and capacity building initiatives undertaken as part of the overall project.

External audit should be carried **once in a year** for the selected investment proposals or representatives of each category of projects in each of the two countries, i.e. Uganda and Kenya. The audit will also conduct a desk review to verify whether the environmental assessments procedures are followed correctly. The external audit will be done by an external agency appointed by the PMU in conjunction with relevant country agency, preferably NEMA of both countries.

The EMP can be presented in a tabular form and should contain at least the following points:

ACTIONS

Project & sub-projects components activities

IMPACT MITIGATION

Environmental impact

Mitigation measures

Mitigation responsibility

Mitigation Cost

IMPACT MONITORING

Parameter to be monitored

Monitoring responsibility

Frequency and means of verification

Monitoring Cost