THE GOVERNMENT OF RWANDA

MINISTRY OF AGRICULTURE AND ANIMAL RESOURCES (MINAGRI)

LAND HUSBANDRY, WATER HARVESTING AND HILLSIDE IRRIGATION (LWH) PROJECT

FINAL DRAFT

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK (ESMF)

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GLOSSARY OF TERMS

**Cumulative impacts/effects:** The total effects on the same aspect of the environment resulting from a number of activities or projects.

**Developer/Proponent/Sponsor:** the entity – person/company/agency – proposing to develop/implement/install a new project/sub-project or expand an existing project under the LWH.

**Direct impacts:** An effect on the environment brought about directly by the LWH projects.

**Disclosure:** Information availability to all stakeholders at all stages of the development of projects.

**Environment:** physical, biological and social components and processes that define our surroundings.

**Environmental Impact Assessment (EIA):** A comprehensive analysis of the project and its effects (positive and negative) on the environment and a description of the mitigative actions that will be carried out in order to avoid or minimize these effects.

**Environmental Monitoring:** The process of examining a project on a regular basis to ensure that it is in compliance with an Environmental Management Plan (EMP), or the Government of Rwanda (GoR) Environmental Impact Assessment (EIA) certification of approval conditions and/or environmental prescriptions.

**Impact:** A positive or negative effect that a project has on an aspect of the environment.

**Indirect impact:** A positive or negative effect that a project indirectly has on an aspect of the environment.

**Involuntary resettlement:** The forceful loss of land resources that requires individuals, families and/or groups to move and resettle elsewhere.

**Lead Agency:** The agency with primary responsibility for the protection of the environment. For instance, the lead agency for environment matters in Rwanda is the Rwanda Environment Management Authority (REMA).

**Mitigation measures:** The actions identified in an EIA to negate or minimize the negative environmental impact that a project may have on the environment.

**Project and sub-project:** a set of planned activities designed to achieve specific objectives within a given area and time frame.

**Project Brief:** The initial submitted document to REMA to initiate the process that will lead to the issuance of the EIS certificate of approval.
**Scoping:** The initial stage in an environmental assessment that determines the likely major environmental parameters that will be affected and the aspects of the project that will bring upon these effects.

**Screening:** An initial step when a project is being considered for environmental assessment. The screening is the determination of the level of assessment that will be conducted. In the case of GoR, screening will place project into one of three environmental categories (I, II or III).

**Significance:** Importance.

**Significant effect:** An important impact on an aspect of the environment.

**Stakeholder:** Any person or group that has an interest in the project, and the environmental effects that the project may bring about.
### ACRONYMS AND ABBREVIATIONS

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
<th>Note</th>
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<tbody>
<tr>
<td>CCPIGs</td>
<td>Common Commodity Production Interest Groups</td>
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<tr>
<td>DRC</td>
<td>Democratic Republic of Congo</td>
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<tr>
<td>DfID</td>
<td>Department for International Development</td>
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<tr>
<td>DDO</td>
<td>District Development Officer</td>
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<td>DEO</td>
<td>District Environment Officer</td>
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<td>EDPRS.</td>
<td>Economic Development and Poverty Reduction Strategy, Rwanda’s PRSP.</td>
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<tr>
<td>ESMF</td>
<td>Environment and Social Management Framework</td>
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<td>EA</td>
<td>Environmental Assessment</td>
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<td>EIA</td>
<td>Environmental Impact Assessment</td>
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<td>EMPS</td>
<td>Environmental Management Plans</td>
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<td>ESIA</td>
<td>Environmental and Social Impact Assessment</td>
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<td>FAO</td>
<td>Food and Agricultural Organisation</td>
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<tr>
<td>GOR</td>
<td>Government of Rwanda</td>
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<td>GDP</td>
<td>Gross Domestic Product</td>
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<td>HIV/AIDS</td>
<td>Human Immuno Deficiency Syndrome</td>
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<td>IPM</td>
<td>Integrated Pest Management</td>
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<tr>
<td>LWH</td>
<td>Land Husbandry, Water Harvesting and Hillside Irrigation</td>
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<tr>
<td>M&amp;E</td>
<td>Monitoring and Evaluation</td>
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<td>MFIs</td>
<td>Micro Finance Institutions</td>
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<td>MINALOC</td>
<td>Ministry of Local Government</td>
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<td>MINAGRI</td>
<td>Ministry of Agriculture and Animal Resources</td>
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<td>MINIRENA</td>
<td>Ministry of Land, Environment and Natural Resources</td>
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<td>NPE</td>
<td>National Policy on Environment</td>
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<td>NPK²</td>
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<td>OP</td>
<td>Operational Policy</td>
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<td>PFI</td>
<td>Participating Financial Institutions</td>
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<td>PMP</td>
<td>Pest Management Plan</td>
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<td>PCT</td>
<td>Project Coordinating Team</td>
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<td>PDO</td>
<td>Project Development Objective</td>
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<td>RAP</td>
<td>Resettlement Action Plan</td>
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<td>REMA</td>
<td>Rwanda Environmental Management Authority</td>
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<td>RHESI</td>
<td>Rwanda Horticulture Exports Standards Initiative</td>
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<td>LSG</td>
<td>Self-Help Groups</td>
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<td>SPAT</td>
<td>Strategic Plan for Agricultural Transformation</td>
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<tr>
<td>SLM</td>
<td>Sustainable Land management (SLM)</td>
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<tr>
<td>SWAp</td>
<td>Sector Wide Approach</td>
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<tr>
<td>WUA</td>
<td>Water User Associations</td>
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1 Economic Development and Poverty Reduction Strategy, Rwanda’s PRSP.
2 NPK means nitrogen, phosphorous and potassium.
EXECUTIVE SUMMARY
This Environment and Social Management Framework (ESMF) relates to the Rwandan Land Husbandry, Water Harvesting and Hillside Irrigation (LWH) Project which is being financed by the World Bank. The Ministry of Agriculture and Animal Resources (MINAGRI) is the agency responsible for implementing the LWH, including the provisions of this RPF.

This ESMF is to be used by the MINAGRI in order to ensure that the World Bank safeguard OP 4.01 for environmental assessment are adequately addressed. MINAGRI should in addition ensure that the relevant capacity and training needs are established in order for the recommended measures to be implemented effectively.

Project Background
Both the economic growth and the poverty-reduction objectives for Rwanda rely critically on agricultural growth. Agriculture is identified by the Government as one of the key sectors in both its poverty reduction strategy, the EDPRS, 3 and in its longer-term Vision 2020 document.

Agriculture is the backbone of Rwanda’s economy, accounting for about 39 percent of GDP, 80 percent of employment, and 63 percent of foreign exchange earnings. It also provides 90 percent of the country’s food needs. Total arable land in Rwanda is slightly above 1.5 million ha, 90% of which is found on hillsides. The sector faces several challenges: (i) a binding land constraint that rules out extensification (bringing more and more land under cultivation); (ii) small average land holdings (0.3 ha); (iii) poor water management (uneven rainfall and ensuing variability in production) resulting from very low levels of irrigation (15,000 ha in the whole country); (iv) the need for greater (public and private) capacity from the district to the national levels and the lack of extension services for farmers; and (v) limited commercial orientation constrained by poor access to output and financial markets. Without the option of extensification, agricultural intensification must take place in the context of a potentially fertile, but challenging, physical environment. Steep terrains and the highest population density in sub-Saharan Africa (355 inhabitants per km²) make good land husbandry a strict necessity (to curtail erosion and otherwise maintain the quality of the soil), as well as an environmental prerogative. Arable land on hillsides constitutes the vast majority of the total agricultural land in the country, but erosion costs the country 1.4 million tons of fertile soils per year. Given its high dependence on rain fed agriculture, irrigation is critical to reducing the sector’s vulnerability to climatic variation and to aligning the right incentives for intensification.

3 Economic Development and Poverty Reduction Strategy, Rwanda’s PRSP.
Project Description
To address the critical agenda of hillside intensification, the Government designed and developed a Land Husbandry, Water Harvesting and Hillside Irrigation Program under Program 1 of its SPAT. The LWH Program, as conceived by Government, is a two-phased program to implement improved land-husbandry and increased productivity in 101 pilot watersheds covering 30,250 ha of land. The first phase was to cover the development of 32 sites, permitting a learning process before the second phase, which would see the completion of the program through the remaining 69 sites. It envisions some 12,000 ha of the 30,250 ha total to be irrigated. It is expected that a number of development partners will each finance a slice of the overall program, which therefore calls for strong programmatic guidance by the Government to ensure coherence, complementarities and adherence to a common approach, including safeguards.

The Land Husbandry, Water Harvesting and Hillside Irrigation (LWH) project which is a comprehensive project that deals with a comprehensive watershed management, water-harvesting in valley dams for hillside-irrigation and horticultural development that uses commercial-value fruit species. The project rational stems from EDPRS that aims at robust growth of commercialized agriculture such as in export in coffee, tea and horticultural fruits such as avocado, mangoes, pineapple, cooking banana, etc. It also originates from the country’s Strategic Plan for Agricultural Transformation (SPAT 2004) which is designed to contribute to poverty reduction and to support economic growth through increased productivity and diversification of revenue opportunities and protection of the rural environment in effectively decentralized and transparent governance.

Apart from 8 project sites already identified (Karongi 1 and 2, Kayonza, Bugesera 1 and 2, Gatsibo 1 and 2, Nyanza) by the LWH and for which detailed feasibility studies have already been undertaken, the activities that the Rwanda’s Land Husbandry, Water Harvesting and Hillside Irrigation (LWH) project will be financing that would give rise to environmental risks and concern were not confirmed during the preparation of the project and the exact location of facilities to be constructed was also not finalized during this period.

Therefore, in compliance with the Rwanda Environmental Management Authority (REMA) and the World Bank’s Safeguards Policies, the government of Rwanda represented by the Ministry of Agricultural and Animal Resources, has prepared this Environmental and Social Management Framework (ESMF). The ESMF is an instrument, through which the sub-project’s environmental and social impacts are identified, assessed, evaluated and have appropriate mitigation, management and monitoring measures, designed and incorporated within the sub-project itself.

This ESMF is prepared for small scale infrastructures and it is complemented by three other safeguards instruments. Environmental Assessment (EA) accompanied with Environmental Management Plans (EMPs) for each subproject being developed in LWH. A Resettlement Policy Framework (RPF) that provides standards and procedures for compensation for any land acquisition or restriction of access to resources that LWH
investment may require. And a Pest Management Plan (PMP) to ensure that LWH supported investments in strengthening agricultural productivity pay adequate attention to the need to promote integrated pest management, and to ensure that pesticides are used appropriately.

Environmental and Social Requirements
The GoR by its national laws and the World Bank’s Operational and Procedural Policies, specifically OP 4.01 requires the government to prepare an Environment and Social Management Framework (ESMF), which establishes a mechanism to determine and assess future potential environmental and social impacts of the Ministry of Agriculture and Animal Resources (MINAGRI) planned investments/activities under the proposed LWH.

An ESMF is required for this project because the precise details of the majority of investments are yet to be defined in terms of their exact location etc. Therefore it is not possible to ascertain the precise location and nature of impacts at this stage.

The ESMF then sets out screening, mitigation, monitoring and institutional measures to be taken during design, implementation and operation of these activities to eliminate adverse environmental and social impacts, offset them, or reduce them to acceptable levels.

In keeping with this requirement and the further detail set out the draft report will firstly be made publicly available to project-affected groups and local NGOs in Rwanda by placing a public notice in a national newspaper and making the report available at the offices of relevant government ministries and REMA. This measure will also satisfy the Organic Law requirement that EIA reports are disclosed and be subjected to review by the public. Following revisions, the ESMF will be officially submitted to the World Bank, and made public before appraisal by the World Bank.

OP 4.01 further requires that the ESMF report must be disclosed as a separate and stand alone document by the Government of Rwanda and the World Bank as a condition for Bank Appraisal of the LWH. The disclosure of these documents should be both in locations where it can be accessed by the general public and local communities using the media, and at the Infoshop of the World Bank. The date for disclosure must precede the date for appraisal of the project.

Safeguard Screening Procedures
The proposed project has been rated Category B under the World Bank Operational Policy on Environmental Assessment (OP4.01), requiring a partial Environmental Assessment (EA). The ESMF is expected to cover the unknowns, to help in the screening, and to recommend mitigation measures. The screening and review process will determine whether a particular subproject will trigger a safeguard policy, and what mitigation measures will need to be put in place. The screening and review process will also ensure that subprojects that may have potentially significant impacts will require more detailed study and the need for subproject specific EA and/or EMP.
Environmental and Social Impacts
The following adverse impacts have been identified as likely to arise from the implementation of the LWH especially when implementing major activities in component (a) (b) of the project and for which this ESMF report seeks to address:

Environmental impacts
- Water quality and quantity degradation (both surface & ground water)
- Soil erosion and quality deterioration
- Loss of biodiversity
- Ecological imbalances
- Ecosystems damage
- Surface water sedimentation
- Damage to aquatic habitats
- Soil salinity
- Sanitation and waste management problems
- Pathogen breeding ground
- Introduction of invasive flora species
- Loss of high value trees especially those with medicinal value
- Borrow pit impacts
- Downstream flooding or water reduction

Socio-cultural and Economic Impacts;
- Displacement of local inhabitants
- Damage to property e.g. crops, structures, houses
- Water use conflicts
- Land ownership conflicts
- Damage of aesthetics of the area/land
- Food insecurity attributed to by displacement of subsistence farming
- Dam safety related impacts e.g. Drowning of livestock and humans
- Traffic congestion
- Camp construction impacts

Health Impacts
- Spread of water borne diseases
- Spread of HIV/AIDS
- Dust impacts
- Noise impacts
- Construction Camps related impacts

The impacts are considered to be localised to the specific project areas, minimal and minor in scale and in terms of magnitude and should be easily mitigated through the preparation of adequate EMPs and RAPs whenever required.
Positive Impacts

- Catchment Rehabilitation and Management
- Soil Conservation
- Flood Control
- Water Resources Conservation
- Birdlife Habitat
- Improved soil conservation
- Improvement of previously water-logged areas
- Increased farm incomes from crop output
- Environmental Protection
- Food Security
- Poverty Alleviation
- Raise Rural Income
- Improved access to water for domestic purposes
- Improved nutrition
- Water for domestic use-washing clothes, bathing livestock
- Appreciation of the value of land
- Employment creation for community members
- Provision of fuelwood
- Empowerment of farmers

Reporting and Performance Review Requirements

Bi-Annual environmental and social progress reports will be prepared by the LWH Social and Environmental specialists who should be hired immediately or as soon as possible before the commencement of the project with the technical support of consultants. These reports will be submitted to LWH before the Bank’s supervision mission arrives. The annual reports will be shared with LWH’s Project Coordinating Team (PCT), MINAGRI, REMA, World Bank, other development partners financing LWH activities, and other relevant government agencies.

Capacity Building and Training

Effective implementation of the Environmental and Social Management Framework will require that adequate capacity enhancement within institutions and other stakeholders are undertaken. There will be training for the yet to be recruited LWH Environmental and Social Specialists and REMA. The training will cover implementation of the ESMF including project screening, impact identification and analysis, Environmental Assessment procedures and requirements (EA and EIA), Design and implementation of mitigation measures at sub project level, monitoring and review of environmental performance and reporting.

Report Structure

The key highlights in this ESMF report are presented as follows:

- **Introduction** about the objectives of the ESMF including description about the LWH. The description of the project is found in Chapter 1 and further details the
LWH project components and anticipated sub project activities within the components.

3 Chapter 2 of the ESMF outlines the methodology that was used in undertaking and developing this framework.

3 Detailed and comprehensive environmental and social baseline data which provide the environmental and social management process with key baseline information when identifying adverse impacts is found in chapter 3. The information contains data on Rwanda’s bio-physical environmental features such as its climate, hydrology in terms of ground and surface water resources, major and sensitive wetlands, flora and fauna. On social baselines the report discusses the main features of Rwanda in terms of demographics, public health features, education, water and sanitation and poverty.

3 Chapter 4 presents a description of the administrative, policy and regulatory framework related to environmental concerns in Rwanda.

3 A review of the World Banks Safeguards Policies is made in chapter 5. The triggered policies are:

a) Environmental Assessment (OP4.01, BP 4.01, GP 4.01)
b) Involuntary Resettlement (OP/BP 4.12)
c) Pest Management (OP 4.09)
d) Safety of Dams (OP 4.37, BP 4.37)
e) Natural Habitats (OP 4.04, BP 4.04, GP 4.04)
f) Forests (OP 4.36, GP 4.36)
g) Projects on International Waters (OP 7.50, BP 7.50, GP 7.50)
h) Physical Cultural Resources (OP/BP 4.11)

Potential adverse environmental and social concerns and impacts from anticipated project activities have been identified and presented in detail in chapter 6 in a generic format. A monitoring plan for the mitigation measure is in the same chapter. Chapters 7 and 8 highlight the project coordination and implementation agreements, approvals and reporting.

The ESMF report is organized as follows:

3 Acronyms and abbreviations
3 Executive summary
3 Chapter 1-Introduction Chapter and description of the proposed project
3 Chapter 2-Study Methodology and consultation
3 Chapter 3-Baseline information
3 Chapter 4-Description of National and International Regulatory Framework
3 Chapter 5-World Bank Environmental and Social Safeguards Policies
3 Chapter 6- Determination of Potential Environmental Impacts
3 Chapter 7- Project Coordination and Implementation Arrangements
3 Chapter 8 - Capacity building and training requirements
3 Chapter 9- References
3 Technical annexes
   ○ Annex A Stakeholders Consulted
- Annex B - Suggested format for EA studies.
- Annex B – Suggested format for a simple EMP.
1.0 INTRODUCTION

This chapter describes the proposed Land Husbandry, Water Harvesting and Hillside Irrigation (LWH) including the different components and activities and outcomes expected during the duration of the project.

1.1 Project Description
Land Husbandry, Water Harvesting and Hillside Irrigation (LWH)

1.1.1 Objectives of the Project
The Government of Rwanda (GoR) through the Ministry for Agriculture and Animal Resources (MINAGRI) has proposed the launch of the LWH project which is a comprehensive project that deals with a comprehensive watershed management, water-harvesting in valley dams for hillside-irrigation and horticultural development that uses commercial-value fruit species. The project rational stems from EDPRS that aims at robust growth of commercialized agriculture such as in export in coffee, tea and horticultural fruits such as avocado, mangoes, pineapple, cooking banana, etc. It also originates from the country’s Strategic Plan for Agricultural Transformation (SPAT 2004) which is designed to contribute to poverty reduction and to support economic growth through increased productivity and diversification of revenue opportunities and protection of the rural environment in effectively decentralized and transparent governance.

1.1.1 Objectives of the Project
The Project Development Objective (PDO) is to increase the productivity and commercialization of hillside agriculture in target areas. This PDO, and the key performance indicators below, were developed together with Government and development partners as part of the Common Framework of Engagement for the Government’s wider LWH Program.

Key Performance Indicators
- PDO Indicator 1: Increased Productivity (MT/ha) in project-affected areas; [TBC]
- PDO Indicator 2: Increased productivity ($/ha) in project affected areas;
- PDO Indicator 3: Increased share of commercialized products in agricultural output of project affected areas.

1.2 Project Components
The Land Husbandry, Water Harvesting and Hillside Irrigation (LWH) Project uses a modified watershed approach to introduce sustainable land husbandry measures for hillside agriculture on selected sites, as well as developing hillside irrigation for subsections of each site. The Project envisions the production of high-valued (organic) horticultural crops with the strongest marketing potential on irrigated portions of hillside, and the improved productivity and commercialization of rainfed crops on the rest (the majority) of the site catchment-area hillsides. The LWH represents a transformation of hillside intensification with a view to increasing productivity in an
environmentally sustainable manner. As with all transformation, it requires high levels of community participation and ownership. As such, throughout the project description below, the Project will use participatory land-use processes to promote high level stakeholder involvement, and to build awareness and empower the community members to enhance their buy-in for the comprehensive land management work. The LWH Project therefore has two components aimed at (A) developing the human and organizational capacity and (B) the required physical infrastructure for hillside intensification and transformation, as well as a third component (C) for SWAp project management. The section below describes in detail all the 3 components but the only component that will trigger O.P. 4.01 is component B and hence remains the significant focus of this ESMF.

**Component A: Capacity Development and Institutional Strengthening for Hillside Intensification**

The objective of Component A is to develop the capacity of individuals and institutions for improved hillside land husbandry, stronger agricultural value chains and expanded access to finance. Using a value chain approach to the Project’s PDO, Component A covers the capacity development and institutional strengthening for both production and marketing, including the access to finance issues that can constrain both. Component A includes four sub-components: A1 Strengthening Farmer Organizations; A2 Extension; A3 Marketing and Finance; and A4 Capacity Development and Institutional Strengthening: MINAGRI and its Agencies.

**Sub-component A1: Strengthening Farmer Organizations**

The Project will strengthen the organizational capacity of cooperatives and farmer organizations for sustainable hillside intensification. The success of the Government’s hillside intensification objectives largely hinges on strong ownership and engagement of farmers in production and marketing activities, particularly given the nature of decentralization in Rwanda. This requires solid farmer-based institutions both at the local, provincial and national levels. In general, the Project will (a) support the introduction of effective mechanisms to ensure accountable decision-making processes and member participation in the management of the affairs of the organization; (b) assist the Government in their organizational diagnosis, capacity building and institutional strengthening activities—required for increasing the productivity and commercialization of agriculture in the targeted areas; and (c) where creation of organizations is necessary for LWH (see below), particularly at the local level, support for such would be designed so as to foster much needed ownership by the grassroots members.

The Project will strengthen the technical and entrepreneurial capacity of organizations’ members for hillside intensification. During the Project planning process, farmers may need to be mobilized and assisted to form Land-husbandry Self-Help Groups (LSGs), Common Commodity Production Interest Groups (CCPIGs) and Water User Associations (WUAs). The Project will support the training needed to build members’ understanding, competence and appreciation for improved, sustainable land-husbandry and commercial agriculture. These activities will empower farmer organization members for hillside
intensification through group-based interventions to tackle common problems. The Project will therefore finance the development and dissemination of extension materials covering erosion control, soil fertility replenishment, irrigation, water management, commercial agriculture, horticultural management, value adding and marketing innovations. Training and demonstration activities that assist farmers and entrepreneurs to become modern agriculturalists and traders that are committed to export-crop production will also be supported under this sub-component.

Sub-Component A2: Extension
The demand for extension services under the LWH is considerable. The LWH project calls for a holistic approach to watershed management. It involves several technical and technological challenges, ranging from construction and management of terraces to the development of appropriate land husbandry practices for both rain-fed and irrigated agriculture, as well as for both annual and perennial crops. Several actors or institutions are involved in the delivery of extension services, including MINAGRI, specialized agencies of MINAGRI, the decentralized local administration, farmers’ organizations, NGOs, the private sector, agricultural education institutions, and agricultural research institutes.

The Project will finance activities to address the key extension issues most critical to the success of LWH objectives. In line with the results of the extension analysis mentioned above, this sub-component will finance the formulation and activities of a road map for action on each watershed, which might involve: (i) setting up a common framework for “participatory extension” that would cover problem diagnosis, solution identification, and experimentation of possible technologies or practices; (ii) defining a clear organizational mechanism by which periodic interactions (face to face and mass communication) are planned and held between farmers and extensionists; and (iii) defining approaches for evaluation and validation of results following adoption of new technologies and practices. Such a road map, in turn, has several implications on the institutional, organizational and human resource aspects of the affected communities (see Annex 4) and Project activities will address these.

Sub-component A3: Marketing and Finance
Marketing
The Project will finance investments in marketing infrastructure and build the capacity necessary to address the challenges surrounding successful horticultural development. Previous analytical work4 covering high value crops in Rwanda has amply demonstrated the country’s excellent agro climatic potential for the production of a wide variety of fruit and vegetables, as well as the challenges in doing so. The Project will help address these challenges through the following activities: (i) fostering linkages among entrepreneurs and smallholder organizations; (ii) building the required post harvest infrastructure to ensure proper handling of produce and exploiting any processing potential; and (iii) promoting the necessary enabling regulatory environment.

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The Project will foster linkages between entrepreneurs and small holder organizations. Building on the Project’s activities with strengthening farmer organizations (Sub-component A1), the Project will look at promoting the development of linkages between entrepreneurs with trading / exporting capabilities and strong producer organizations who can meet required product standards. The Project will further support the much needed formation of an association of private entrepreneurs in the horticultural sector that will become the natural counterpart to the Government’s horticultural promotion bodies.

The Project will facilitate investments for post harvest infrastructure, including packing and processing. The Project activities would finance infrastructure and facilitate infrastructure investments through the rural finance activities of this sub-component. To provide a demonstration effect, the Project could, for example, finance the construction of pilot pack houses in regions with recognized potential for commercial horticulture. This sub-component would also provide the technical assistance required to realize the full potential of these investments. For these activities, the Project will work in explicit coordination with the World Bank’s Rwanda Electricity Access Scale-Up project (P111567) for the necessary rural electrification and the pipeline Rural Roads operation to ensure a viable chain to markets.

The Project will support the regulatory environment for the proper handling of produce. The WTO-financed (and World Bank-supervised) Rwanda Horticulture Exports Standards Initiative (RHESI) has made substantial progress in the area of regulatory framework for horticultural exports and in raising awareness on SPS standards among stakeholders. Given RHESI’s projected closure in April 2009, it would be important for LWH to carry on this work. The RHESI project completion report would be a good point on which the Project bases its support of sanitary and phytosanitary standards, and the capacity to comply with these.

**Rural Finance**

The Project will finance investments in improving rural access to financial services (including savings, credit and insurance) on a sustainable basis. Project activities include (i) product development such as leasing, warehouse receipts and other supply chain specific financing products; (ii) index-based weather insurance; and (iii) capacity building and linkages for rural people (financial literacy), their organizations and rural financial service providers such as MFIs. All capacity building measures will be offered strictly on a demand basis. While costs of promotional activities will be fully funded under the Project, technical training will be offered on a cost-sharing basis, with commercial banks and MFIs making higher relative contributions than small rural-based producer groups. Those initiatives geared at higher levels of financial literacy will be fully funded under the Project. All of these activities aim at removing some of the current obstacles facing rural entrepreneurs in the financial sector. These obstacles include an inadequate range of products offered to rural clients; perceived high risks in primary agricultural production; and insufficient capacity and linkages by producer organizations with agribusinesses and financial institutions. The Project will therefore address these obstacles through these three clusters of activities.
The Project will develop appropriate pilot agricultural and rural financial products with participating financial institutions (PFIs). These products include savings, leasing, and value chain financing. At a time when new procurement methods for fertilizer and business opportunities for producer groups are emerging in Rwanda, the development of targeted savings products is indispensable to facilitate smallholder productivity gains. In order to achieve the proposed growth in primary agriculture, processing and marketing, significant investments in equipment are needed, but term finance is difficult for rural people to obtain. The Project will collaborate with the IFC in the development of rural leasing products that have the advantage of eliminating the collateral requirement and needing less down-payment. Finally, there is an enormous potential for closer coordination and expansion of value chains, which requires the application of value chain finance modalities in Rwanda. The Project will develop the use of forward contracts and warehouse receipts as collateral.

The Project will support the development of two to five index-based weather insurance products to reduce the associated risk in lending to rural investors. Financial institutions have often been reluctant to lend for agricultural production because of the perceived high risks. The Project will facilitate the development of two to five index-based weather insurance products by (i) financing a satellite study to fill the gaps in the existing ground data on rainfall, thus permitting insurance companies to calculate their risks and premiums; (ii) financing the rehabilitation of ground weather stations and introducing new reporting and monitoring system for accurate and up-to-date data capture; (ii) financing pilot surveys on the demand for insurance among producers and their organizations; (iii) financing technical surveys to determine appropriate triggers for index-based insurance; and (iv) providing technical assistance in the packaging and marketing of local insurance companies. Insurance underwriting will be done by national and international insurance companies.

The Project will invest in capacity building and linkages for rural people, for producer organizations and for rural financial service providers such as MFIs. Investments in financial literacy are indispensable in moving rural actors to the new practices and innovations needed to realize Rwanda’s agricultural growth agenda. Activities to be supported include: (i) the preparation and dissemination of adult education materials; (ii) technical guides for understanding the practice of credit unions and microfinance; (iii) training of trainers in MFIs and the cooperative sector for the dissemination of such. In addition, as most of the producer organizations are seriously under capitalized, substantial capacity building of producer organizations will be undertaken, including the development of new savings and capital formation processes and a review of the internal pricing policies. Finally, rural MFIs and credit unions also need capacity building to enable them to provide financial services in local value chains. Activities will include technical training an, on-site technical assistance, conducted in close collaboration with the national MFI umbrella organization, AMIR, with other donor initiatives, such as UNCDF and those of international NGOs.
Sub-Component A4: Institutional strengthening and Capacity Building: MINAGRI and its Agencies

Sub-component A4 is designed to help MINAGRI and its agencies to improve their long term capacity for hillside intensification and sustainable land management (SLM). Activities to be supported by the Project therefore cover both the technical and community engagement aspects so critical to intensification and to SLM. Activities to be supported under the project include (i) building capacity among MINAGRI staff for community mobilization, participation, and integrated watershed management approaches (see B1 for description); (ii) strengthening extension and technical backstopping capacity of Government staff at all levels, including filling the identified human resource gaps by financing higher technical qualifications of appropriate MINAGRI staff; and (iii) establishing an ‘experts forum’ for the long term sustainability of the Government’s horticultural and hillside intensification activities.

The Project will invest in capacity building of MINAGRI staff for community mobilization, including how to (a) formulate and implement communication strategies, comprehensive community consultations and participatory planning processes; and (b) sensitize and mobilize communities to incorporate a participatory and integrated watershed approach into hillside intensification.

The Project will strengthen the extension and technical backstopping capacity of government staff at all levels. Establishment of a technical advisory group at central, district and sector levels with key focal people will be crucial for facilitating the rapid introduction of intensive and comprehensive land husbandry, water resource management, and commercialized horticulture farming. Intensive training, workshops and cross-country study tours will be designed and funded by the Project to target the key staff at RADA, district officers, and ‘lead’ hillside farmers in order to build functional capacity. In connection with the extension materials of sub-component A2, technical field guides for staff will be developed in comprehensive land husbandry, irrigation, horticultural management, value adding and marketing, and agroforestry. The Project will help fill the recently identified gaps in technical qualifications at MINAGRI for hillside intensification and sustainable land management, including Bachelors and Masters level qualification in identified ‘gap’ subject matter areas.

The Project will support the setting up of an ‘Experts Forum’ to ensure the long-term effectiveness and sustainability of LWH activities. The “Expert Forum” would comprise of key stakeholders in the system. It would also include inventories of knowledge providers, and be the focal point for priority setting exercises and database development to address technology evaluation, generation and up-scaling of best practices. The Project can support activities of the Experts Forum with respect to the articulation of a well designed series of research topics related to sustainable land management and horticultural production and marketing.
**Component B:**  
*Infrastructure for Hillside Intensification*

The objective of this component is to provide the essential ‘hardware’ for hillside intensification to accompany the capacity development and institutional strengthening activities of Component A. Its three sub-components are organized around the L, the W and the H of LWH: (i) Land husbandry infrastructure supports the development of participatory and comprehensive land husbandry practices in sub-watersheds; (ii) Water harvesting infrastructure, including valley dams and reservoirs; and (iii) Hillside irrigation infrastructure, including the development of the conveyance structures for hillside irrigation. In total, five to six sites will be developed with a total area of 2,000 to 2,400 hectares. Roughly one quarter of each site will be irrigated (the ‘command area’), the water harvesting infrastructure of dam and reservoir accounting for roughly 5% of site surface, with the remaining area under comprehensive land husbandry development and downstream reservoir protection.

In determining the precise package of interventions per site, options assessment will be conducted, both with respect to the exact location of the hillside infrastructure and the technologies that will be developed (i.e. extent of land husbandry as compared to the extent of water harvesting and irrigation infrastructure). Direct beneficiaries from this component include smallholder farmers producing both irrigated and rainfed crops in the project sites, in total about 6,700 to 8,000 households.

**Sub-Component B1: Land husbandry Infrastructure**

The Project will develop participatory and comprehensive land husbandry practices in a sub-watershed setting. Activities will include soil conservation measures and infrastructure appropriate to differing slope categories (e.g. bunding, green manuring, progressive and radical terracing, etc. Given the acidity of Rwandan soils, additional activities such as liming may be necessary. The sub-component is designed to improve hillside agricultural management to protect against water erosion and enhance sustained crop productivity and ecosystem conservation. The activities described will benefit all farming households in the project-affected area, whether irrigated or rainfed.

The project will invest in infrastructure for downstream reservoir protection. The aim of downstream reservoir protection is to guarantee the environmentally friendly and long-term use of valley-dam reservoirs. Project activities would develop a silt trap zone for sediment reduction into the reservoir; including fencing the reservoirs; planting perennial forage legumes in all immediate upstream sides of the reservoirs; and planting perennial commercial trees in all immediate upstream sides of the forage legume area. These activities would also include the survey and design of catchments that contribute water in the form of run-off to the reservoirs, including land area to be inundated; actions for change of land use (from annual crop production to perennial crop production) among farmers who own the land, including facilitation of land substitution.
Sub-Component B2: Water harvesting infrastructure

The Project will invest in water harvesting infrastructure, including valley dams and reservoirs on the selected sites. Feasibility and detailed design studies have been conducted. Dams will be lower than 20m in height and will inundate on average about 6 hectares each. The water storage allows for irrigated crop production for 100 days on average, which allows a second crop during the dry season. Water harvesting infrastructure will be developed jointly with the irrigation infrastructure (sub-component B3) and after completion of the beneficiary consultation process referred to under that sub-component.

Sub-Component B3: Irrigation infrastructure

The Project will develop conveyance structures for hillside irrigation. This includes primary and secondary water distributions and field level application for basin or furrow irrigation. The component also includes command area development of irrigated hillsides, such as land preparation and land leveling, terracing and bunding. Project activities include (i) feasibility and design studies completed on five to six sites; (ii) beneficiary consultation and design options selection; (iii) hillside irrigation on 5-6 sites developed; and (iv) asset management plans developed for each site.

The Project will follow a consultative process for hillside irrigation development. As with other sub-components, activities will include stakeholder consultations after completion of feasibility studies and preliminary design. A number of design options will be developed and presented to beneficiaries, who will choose from among these options. Following the selection of the preferred design option by the beneficiaries, a detailed design study will be commissioned by the project. Separately, an Environmental Impact Assessment (EIA) and Resettlement Action Plan (RAP) will be prepared prior to the completion of the detailed design so that their results can be included in the design. For each site, an asset management plan will be developed that will outline activities, responsibilities and timeline for operation and maintenance of the infrastructure, including WUAs.

Component C
Implementation through the Ministerial SWAp Structure

The objective of Component C is to ensure that Project activities are effectively managed within the new SWAp structure for Ministerial implementation of programs and projects at MINAGRI. With the very recent restructuring of MINAGRI—both as part of a Government-wide rationalization and to facilitate the implementation of the agricultural sector’s nascent SWAp—the World Bank is committed to helping MINAGRI effectively manage and implement its programs and projects without the creation of new project implementation units PIUs. The activities of this component are therefore structured around implementation of the Government’s LWH program in line with the SWAp. The PAPSTTA project has undertaken extensive diagnostic of MINAGRI with respect to its SWAp implementation capacity and will inform the Project’s support.
The project will finance activities that support SWAp implementation of LWH, including: (i) financing, in the immediate term, (and in coordination with DFiD and IFAD) the central and decentralized MINAGRI staff required to implement LWH under the new structure; and (ii) assisting MINAGRI with the implementation of the new SWAp structure, including rigorous M&E and MIS systems and in their coordination with other essential line ministries (e.g. MINALOC and MINRENA).

Table 1: LWH Project Components and Cost (in US$ million)

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<td>Sub-component A1: Strengthening farmer organizations</td>
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<td>Sub-Component A4: Institutional strengthening and capacity building of MINAGRI and its agencies</td>
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<tr>
<td><strong>Component Totals</strong></td>
<td><strong>USD20.757</strong></td>
<td><strong>USD10.469</strong></td>
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<td><strong>Grand Total</strong></td>
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<td><strong>USD45.076</strong></td>
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2.0 METHODOLOGY AND CONSULTATION

The study was conducted by the consultant using the following approach and methodology:

2.1 Detailed and in-depth literature review
Review on the existing baseline information and literature material was undertaken and helped in gaining a further and deeper understanding of the project. Among the documents that were reviewed in order to familiarise and deeply understand the project included:

- NERP ESMF Report
- RSSP II Resettlement Policy Framework.
- Rwanda Energy Access Scale up Program (EASP) Resettlement Policy Framework.
- UERP Resettlement Policy Framework,
- NERP Resettlement Policy Framework,
- UERP Abbreviated Resettlement Action Plans (ARAPs) for Birembo substation, diesel power plant and transmission network.
- Rwanda’s Organic Law
- Agricultural Law and regulations of Rwanda
- World Bank Project Concept Note and Integrated Data Sheet
- LWH Project preparation brief-Status and Next steps
- LWH Preparation Country document
- Project Concept Note
- Project Information Documents (Concept Stage)
- Integrated Safeguard Data Sheets (Concept Stage)
- Minutes of the Project Concept Note Review Meeting
- Technical Mission Aide Memoire
- Project Appraisal Document (Draft)
- Safeguard Mission Aide Memoire
- Project Preparation Facility Agreement (Draft)

The consultant also undertook detailed review and analysis of the national relevant legislations, policies and guidelines including the World Bank Safeguards Policies, international conventions related to this project and other relevant documents.

2.2 Field Visits
The consultant made visits to the already identified 8 project sites (Karongi, Gatsibo, Bugesera, Nyanza and Kayonza) in order to familiarise with the issues on the ground and appreciate the concerns.
2.3 Interactive Discussions
Various discussions were held with the LWH and MINAGRI staff, World Bank Country office staff, RSSP staff and REMA as well as other relevant staff of key implementing partners of the project. These discussions were very insightful in understanding the issues and are the basis for most of the measures contained in this ESMF.

2.4 Preparation of ESMF
This involved

- Collation of baseline data on the environmental conditions of the project area;
- Identification of positive and negative environmental and social impacts;
- Identification of environmental and social mitigation measures;
- Preparation of screening procedures to be used while screening subproject proposals; and
- Formulation of environmental and social monitoring plans.
3.0 BASELINE DATA

This section describes the overall baseline condition of Rwanda in terms of bio-physical environment, as well as the socio-economic and cultural attributes.

3.1 Location and Size
Rwanda is a small mountainous landlocked country, located in Central Africa, at latitude 20°00 S and longitude 30°00 E, bordered to its south by Burundi for about 290km, Tanzania to its east for 217 km, Uganda to its north for 169km and the Democratic Republic of Congo (DRC, formerly Zaire) to its west for 217 km. Rwanda has a total surface area of 26,338 sq. km of which the total land area is 24,948 sq. km and 1,390 sq. km is water.

Rwanda is often referred to as the country of a “thousand hills” (mille collines), because of its numerous highly dissected hills, often with flat peaks and convex slopes, separated by relatively narrow valleys, with the lowest altitude of 950m at Rusizi River and the highest altitude at Mount Karisimbi 4,519 m. The average altitude is 1,250 m above sea level.

Rwanda can be divided into six topographical regions which are;

③ From west to east are the narrow Great Rift Valley, which slopes sharply to Lake Kivu
③ The Volcanic Virunga Mountains, whose highest peak, the snow capped Mount Karisimbi, towers over the high north western lava plains.
③ The steep north-south rise of the Congo – Nile Basins divide, whose width averages 25 km.
③ The ridge of the Congo – Nile Basins divide, with an average elevation of 2750m above sea level.
③ The central plateaus east of the mountains, which are covered by rolling hills.
③ The savannas and swamps of the eastern and south eastern border areas which cover one-tenth of the nations land area and include the vast Kagera National Park.
③ Most of Rwanda is at least 900m above sea level; the central plains have an average elevation of 1932m, while southeastern Rwanda has a desert like terrain.

3.2 Physical Environment

3.2.1 Climate
Rwanda enjoys a tropical temperate climate due to its high altitude. The average annual temperature ranges between 16°C and 20°C, without significant variations. Rainfall is abundant although it has some irregularities. Winds are generally around 1-3 m/s. In the high regions of the Congo-Nile ridge, average temperatures ranges between 15 and 17°C.
and the rainfall is abundant. The volcanic region has much lower temperatures that can go below 0°C in some places.

In areas with intermediary altitude, average temperatures vary between 19 and 21°C and the average rainfall is around 1000 mm/year. Rainfall is less irregular, and sometimes causes periods of drought.

In the lowlands (East and Southeast), temperatures are higher and the extreme can go beyond 30°C in February and July-August. The absolute temperature of 32.8°C was recorded in the Southeast by Karama-Plateaustation on the 4th of September 1980.

Thermic constraints are more considerable there than in the remaining part of the country. Rainfall is less abundant in that region (700 to 970 mm/year). Weather in Rwandan is determined by the rainfall patterns. Thus, the climate of the country is characterized by an alternation of four seasons of which two are wet and the other two are dry.

However, one can notice that rainfall is generally well distributed throughout the year, despite some irregularities. Eastern and South-Eastern regions (Umutara, Kibungo, Bugesera, Mayaga) are more affected by prolonged droughts while the northern and western regions (Ruhengeri, Gisenyi, Gikongoro and Byumba) experience abundant rainfall that usually causes erosion, flooding, and landslides.

The quantity of total annual rainfall varies between 800mm in the Northeast of Rwanda (Eastern Umutara) and 1600 mm in the natural forest of Nyungwe (Wisumo) and in the high lands of the Northwest (Kinigi). The decrease in rainfall is observed in the region of Bugesera (900 mm) and in the Western part of Gisenyi Province (1200 mm). The increase of rainfall is observed in some regions like Kibungo (Gahororo, 1200 mm); in the Southwest (Mibirizi, 1450 mm) and in the natural forest of Gishwati (1350 mm). The region that is characterized by the highest rainfalls (over the average isohyets of 1200 mm) is located in the western half of the country, from Byumba to Kibeho and from Kinigi to Mibirizi including the region bordering Lake Kivu.

3.2.2 Relief
The Rwandan relief is hilly and mountainous with an altitude varying between 900 m and 4.507 m. The components of that relief are:

* **Congo-Nil Ridge** over laying Lake Kivu with an altitude between 2500 m and 3000 m. It is dominated in the Northwest by the volcanic ranges consisting of five volcanic massifs of which the highest is Karisimbi with 4507 m. *The central plateau* presents a relief of hills with an altitude ranging between 1500 m and 2000 m. *The lowlands of the East* are dominated by a depression characterized by hills with more or less round top and 1000 to 1500 m in altitude. *The lowlands of the South-West in Bugarama plain* with an altitude of 900 m are part of the tectonic depression of the African Rift Valley.
3.2.3 Catchment and Hydrology

Rwanda has a relatively big quantity of water: rivers, lakes and marshes and occupy a surface area of 211000 ha or about 8% of the national territory (lakes: 128000 ha, rivers: 7260 ha and marshes: 77000 ha).

**Surface water**

Rwanda has a dense hydrographical network of ± 2 km/km² (length of the superficial flow network by km² of surface). The country is divided into two hydrographical basins with a separating line called Congo-Nile Ridge, moving from the North to the South and ± perpendicular to the volcanic chain, making natural obstacles exchange between the catchments basins of the Northern Kivu and the Southwest of Uganda and those of Rwanda.

In the West of that line there is the Congolese basin (33% of the surface of the national territory) that drains 10% of water resources of the country. It comprises rivers Sebeya, Koko, Rusizi, Rubyiro, as affluents of Lake Kivu (102800 ha on the Rwandan side, 473 m of maximum depth), Ruhwa and many other small rivers.

In the East of the Congo Nile Ridge there is the Nile basin which covers 67% of the National territory and drains 90% of Rwandan waters by two main rivers namely Nyabarongo and Akagera. The latter is the main affluent of Lake Victoria with an average outflow of 256 m³/s at Rusumo station and thus considered as the source of the Nile. The basin of the Nile in Rwanda comprises a lot of small lakes (Bulera, Ruhondo, Cyohoha South, Mugesera, Muhazi, Rwampanga, Mihindi, Mirayi and many others). Those lakes are not very deep (5 to 7 m of depth) except for Lake Bulera and Ruhondo which are 50 to 60 m deep.

**Underground water**

The outflow of the underground renewable water resource is estimated at 66 m³/s. Out of this, the 22000 known sources contribute an output of 9 m³/s. In general, little information is available on underground resources.

Rwanda's water resources cover a surface area estimated at about 212 000 ha, made of rivers and wetlands; the water of wetlands cover some 77 000 ha, that is 37% of the total surface. Rwanda is divided into two major drainage basins, the Nile to the east and the Congo to the west. The Congo River Basin covers 25 percent of Rwanda and receives 10 percent of the total national rainfall. The rainfall regime has a strong influence on the hydrological regime. The country experiences floods during the long rainy season (March – May) and floods subside during the long dry season (June – September). Low water levels are very marked.

The catchment/watershed of these marshlands are the many hills that catch rain water and drains slowly to the lower areas where the marshlands modify the movement of water in the channel network by lowering the peak flow and volume of flood discharges. Ground water in most of these marshlands areas is struck at a depth of 8m. The marshlands
provide recharge of the ground water through percolation during water retention time in the area.

According to a study by FAO, the total area of marshlands of Rwanda is estimated at about 165,000 ha which are partially exploited depending on their degree of flooding. However, only 4,000 ha of wetland are fully equipped with irrigation and drainage systems and 1,200 ha are partially equipped.

Rwanda has a dense hydrographic network divided in two unequal watersheds which are situated on either side of the Congo-Nile ridge: the Congo basin and the Nile basin. The Congo basin consists only of insignificant and short rivers, which flow into Lake Kivu. River Rusizi in the south is its outflow towards Lake Tanganyika. The Nile basin covers the greatest part of the territory.

Most rivers originate from the slopes of the Congo-Nile ridge. The two main rivers, namely Nyabarongo and Akanyaru, together with their numerous tributaries form, downstream from Lake Rweru, the river Akagera which drains the best part of Rwanda’s waters towards the Nile, forming the border with Burundi in the south and Tanzania in the east. Rivers Nyabarongo and Akagera are closely associated with vast marshes and numerous shallow lakes found along these rivers. The ecology of these ecosystems is very dynamic and complex; the vegetation of marshes and the size of the lakes change continuously with the rainfall and the flow rate of the rivers.

**Lakes**

Rwanda has some 28 lakes of significant size. Six among the largest are entirely within the national territory: Runhondo, Muhazi, Mugasera, Ihema, Rwanye and Burera. Three others, Rugwero, Cyahoha and Kivu, are shared with neighboring countries. The largest and most spectacular is Lake Kivu, so large as to seem almost like a sea to the landlocked inhabitants.

Lake Kivu lies at 1,460m above sea level and is 90 km long (north-south) and 49 km wide (east-west). From an average depth of 220m, it plunges to a maximum depth of 475m. Lake Kivu has a rough, jagged coast and contains numerous islands, the largest of which is Idjwi. Lake Kivu lies on the border with Congo in Western Rwanda at the foot of the Virunga Volcanoes. Kivu’s shores are densely populated and the principal town on the Rwandan side is Gisenyi. Although it is supplied with fish, the lake is poor in fauna but rich in volcanic substance. Great volumes of dissolved methane gases that may be developed as energy sources exist in its deep waters. Lake Kivu drains to the south into Lake Tanganyika by the swiftly descending Ruzizi River.

The Central Plains are drained by the Nyabugogo, and Akanyaru rivers. Rwanda’s eastern border is formed by the Akagera River on its way to Lake Victoria. The rivers and lake cover some 135,000 ha, or 5% of national territory.
Quality of water
In Rwanda the quality of water is generally good with a pH ranging between 6 and 7.5. Surface water often carries sediments and in mining and volcanic regions, the water can contain arsenic, lead, mercury, fluoride, iodide and other toxic metalloids and heavy metals. The physio chemical pollution of water is not frequent due to the small level of industrialization and use of agricultural chemical inputs. The microbiological pollution is often observed and it comes from various domestic wastes and debris carried by rain water towards the natural environment. The pollution of water courses and lakes by the water hyacinth and other harmful aquatic plants is a phenomenon that is very recent and alarming in Rwanda.

3.2.4 Wetlands
Wetlands cover a total area of 164,000 ha or about 6% of the territory. The wetlands (marais in French) include a variety of ecosystems, ranging from large, permanently flooded swampy peat-lands to smaller, seasonally flooded wetlands with a more mineral soil. The main swamps are Akanyaru (30,000 ha) on the border with Burundi, Mugesera-Rugwero in the southeast, Kagera swamps along the Tanzania border in the east, Nyabarongo (10,000 ha) and the Rugezi wetlands (5,000 ha) in the north.

The wetlands serve as troughs for sediment particles and play an important role in the national water balances by acting as a buffer, thus reducing the maximal flow rates during the rainy season and maintaining a relatively high flow rate during the dry season.

Currently, an estimated 94,000 ha have been brought under agriculture, the large majority of this being spontaneous agriculture with maize, sweet potatoes and beans. In addition, the wetlands are used for a variety of traditional activities including the collection of leaves to make handicrafts, extensive grazing and making of bricks. Wetlands also provide a spawning habitat for fish, and are of great significance for biodiversity conservation.

The wetlands are composed of marshes, lakes, rivers and brooks representing around 14.9% of the national territory of which 6.3% consist of marshes and 8.6% of lakes, water courses and pools of permanent or seasonal fresh water. In the highlands of the Northwest, there are: lakes Bulera and Ruhondo as well as the marshes of Rugezi. In the Central and the East of the country, wide marshes are those of Nyabarongo, Akanyaru and Akagera rivers. Many cuvette lakes connect with rivers and most of them are located in the Akagera National Park. From the Southeast to the Northwest, there are lakes like Cyohoha in the South, Mugesera, Rweru, Sake, Cyambwe, Ihema, Milindi, Rwanyakizinga, Kivumba, etc.

Given the importance that the Government of Rwanda attaches to wetlands, in 2003 Rwanda ratified the Ramsar Convention or convention on wetlands and has already registered on the Ramsar list the site of Rugezi and identified other potential sites that will be registered in the future, like the complex of Mugesera-Rweru, Kamiranzuvu marshes and the wet zones of the Akagera National Park. In addition, a plan of action for the implementation of the Ramsar Convention was developed in June 2004.
The wetlands ensure several functions and provide numerous services to people. For instance they ensure control of floods and the recharge of underground waters. They play the role of alleviating the erosive force of water and thus facilitate the deposit of sediments in suspension that could block water courses downstream.

**Degradation of water resources**

The degradation of water resources is characterized by:
- Frequent flooding and their effects on health, infrastructures, economy, land and aquatic ecosystems.
- The problems linked to water pollution (toxic products, water hyacinth ...);
- Erosion of drainage basins, sedimentation of water courses and silting up of lakes;
- Over exploitation of lakes and water reserves;

### 3.2.5 Soils

**Pedology**

The Rwandan pedology is characterized by six types of soils namely:
- Soils derived from schistose, sandstones and quartzite formations (50%);  
- Soils derived from granite and gneissic formations (20%);  
- Soils derived from basic intrusive rocks (10%);  
- Soils derived from recent volcanic materials (10%);  
- Soils derived from old volcanic materials (4%);  
- Alluvial and colluvial soils (6%).

The underground earth contains deposits of minerals such as tin, wolfram, Colombo tentalite and gold. There are also big numbers of quarries (clay, sand, building stones, limestone, peat, etc). From 1999 to 2001, the mining sector played an important role in the national economy. It contributed to export revenues in the following proportions: 5.9% in 1999; 12.58% in 2000; 42.64% in 2001.

**Figure 1: Distribution of arable lands**

![Figure 1: Distribution of arable lands](image1)

**Figure 2: Distribution of the surface of arable lands**

![Figure 2: Distribution of the surface of arable lands](image2)
Rwanda’s soils contain many of the metal compounds found in laterite soils, but are generally lighter, more fertile, more workable, and less problematic to farmers than true laterite soils. There are two sub zones, with vastly different soils. To the northwest and the lower portions of the larger river valleys are very fertile volcanic soils covering approx. 10% of the country. Elsewhere, the largely metamorphic bedrock has produced generally poor quality with fertility varying and depending on extent of erosion and leaching.

About 30% of Rwanda’s land is suitable for farming, and another 30% for grazing. Except where the land is seriously eroded or leached by heavy farming, the soils have good humus content and fertility. Intensive food crop production, often on steep slopes, has led to serious soil erosion. Pastureland has also been overgrazed in many areas. Population pressure on the richer lands is sufficiently intense that soil damage, which is due to leaching, erosion, and intensive farming without adequate fertilizer, is an increasingly serious problem.

Many members of local communities complained of problems associated with low soil fertility on levels of food production and household incomes.

Rwanda being one of the most densely populated countries in Africa, and with the mountainous terrain and steep slopes coupled with the expanding growth rate which has been exacerbated by the added pressure for land to support the returnees, agricultural land is becoming increasingly degraded. Farmers are intensifying land use to meet food needs without proper management practices and external inputs. The resulting depletion of nutrients from the soils has caused crop production to stagnate or decline, with a significant adverse impact on Rwanda’s food security situation.

Rates of nutrient depletion range from moderate, 30 to 60 kilograms of NPK\(^5\) per hectare per year in the humid forest areas and wetlands to high, above 60 kilograms in the highland areas. It is estimated that in bad years, the difference between nutrient inputs and nutrient losses in Rwanda can be a bad as –136 kilograms of NPK per hectare. Nutrient imbalances are highest where fertilizer use is particularly low and nutrient loss, mainly from soil erosion, is high.

More nitrogen and potassium than phosphorous get depleted because nitrogen and potassium losses primarily arise from leaching and soil erosion. These soil problems result mainly from continuous cropping of cereals without rotation with legumes, inappropriate soil conservation practices, and inadequate amounts of fertilizer use.

Fertilizer tends to be used mostly on cash and plantation crops because of the high profitability of fertilizers in the production of export crops. Food/subsistence crops get

\(^5\) NPK means nitrogen, phosphorous and potassium.
less fertilizer because of unfavourable crop/fertilizer price ratios and financial constraints faced by farmers.

Although increasing the use of mineral fertilizer may be the centrepiece of the strategy to balance nutrient depletion and improve soil fertility and productivity, it should not be taken to mean that fertilizer levels should be increased beyond basic requirements. Indeed, surpassing recommended levels for less-responsive varieties and in poorly managed cropping systems can lead to high nutrient losses and low yields. Moreover, to achieve intended goals which are to increase rural incomes through increased agricultural productivity, inter alia, fertilizer use must be combined with a broad spectrum of complimentary practices, such as soil conservation, recycling of crop residues, livestock management, and use of organic fertilizers.

**Use of soils**
The exploitation of land employs 88% of the active population. The number of agricultural households is about 1.4 million with an average surface area of 0.60 ha. Land resources are thus limited and coveted resulting in overexploitation and inappropriate use of lands with disastrous consequences on land resources and on environment in general. Rwanda has also about 165,000 ha of marshes of which 66,000 ha can be developed into rice fields. However, there are big differences where the surface of arable land varies from 0.25 ha to more than 3 ha per family according to regions.

**Soil degradation**
Rwandan soils are naturally fragile. They are derived from physio-chemical alteration of schistose, quartzite, gneissic, granite and volcanic rocks that form, the superficial geology of the country.

The degradation of the natural environment is particularly linked to hydrous erosion that affects a big portion of cultivated lands. It is assumed that the hydrous erosion reduce the capacity to feed 40,000 people per year and causes annual losses of about 15,000,000 tones of soil, due to poor conservation of soils, estimated at 945,200 tones of organic materials, 41,210 tones of nitrogen, 280 tones of phosphorus and 3,055 tones of potassium for the whole country.

The generic impacts of erosion are numerous:
- Loss of soils fertility due to leaching of arable land with its consequences on agricultural production;
- Increase of sedimentation downhill cultivated lands from eroded plots.
- Risk of crops destruction and silting-up in marshes and plains (areas that are more favourable to agriculture);
- Risk of local landslides and mudslides;
- Risk of irreversible leaching of soils.
The hilly nature of Rwandan topography is one of the main factors of soil vulnerability.

**Highland soils**
The highland soils are particularly prone to erosion and landslides especially regions of the Congo-Nile ridge, valleys and lowlands (peat lands) as well as highland meadows. Soils of foothills of the Congo-Nile Ridge and of other transition regions between the central plateau and highlands are fertile but, due to deforestation and inappropriate agricultural practices, they are vulnerable to erosion.

**Soils of the central plateau**
The central plateau covers the regions of South and Southeast (former provinces of Gitarama, Butare, a part of Kigali-Ngali and Kibungo). The soil types are hill Ferro soils and valley histosoils. The slopes of hills are exposed to erosion notably in the case of clay-sandy or gravelly soils.

**Soils of the lowlands**
They cover the Eastern and South-eastern regions and are Ferro soils with savannah vegetation. Like the region of Bugesera, the river-lake complex along Nyabarongo and Akanyaru rivers underwent serious leaching. In addition, the geological structure of soils in those regions allows rain waters to infiltrate deeply into soils, and that can partly explain the lack of runoff waters and shallow brooks.

**Soils of valleys**
These are soils of histosoil and peat soil types that constitute potential agricultural and energy wealth (case of intermountain basins of Kamiranzovu and Rugezi). In the wide water surfaces of eastern regions like Umutara and Bugesera, as well as the Rusizi region (Bugarama), the valleys are of vertisoil and alluvial types are fertile. The slope slight as they may be, are threatened by erosion due to the weak permeability of soils.

The exploitation of peat for fuel production purposes would require a preliminary development plan for swampy areas. In fact, any extraction of peat is associated with drainage and exudation, two factors likely to impact negatively on the crucial role of wet ecosystems and swamps in regulating the hydrology. Moreover, the exploitation of mines and quarries spoils the landscape and more often constitutes a source of soil erosion, water pollution and pose a danger to human health. A good number of queries are not rehabilitated and always left open.
3.3 Biological Environment
Rwanda is covered with diverse ecosystems that include mountains, ombrophile forests, gallery forests, savannahs, wet and aquatic zones, wood and agro ecosystems. All these ecosystems have a rich flora and fauna.

3.3.1 Protected areas
The fauna and the flora can be better preserved and protected thanks to the establishment of a system made of protected areas like national parks and forest reserves to which the best management is applied. However, through time and due to human activities, these conservation areas have been reduced considerably.

3.3.2 Forests
Rwanda’s remaining natural forests, the Nyungwe Forest, the Gishwati Forest and the Mukara Forest, are highland forests around the volcanoes, have a high degree of biological diversity and rare animal species, such as mountain gorillas, Ruwenzori colobus monkeys and golden chimpanzees.

It is estimated that there are 2150 plant species to be found in Rwanda, with around 700 species of these acknowledged to have medicinal value. Towards the east of the country lies the Akagera National Park, the Mutara game reserve forests galleries and wooded savannahs.

Population pressures have already drastically reduced the land area of the natural forests of Rwanda from about 30% to presently fewer than 10% in less than a century. The deforestation of Rwanda’s remaining forests is also the result of high fuel wood consumption. Heavily populated and cultivated areas adjacent to the natural forest, as well as the recent wars, have resulted in massive deforestation and loss of genetic diversity within Rwanda’s natural forest.

Clearance for farming and pasture land has also contributed to the reduction in forest cover, as well as harvesting for fuel wood and timber for housing and small scale mining. Production of export crops is also a factor in forest destruction: half the forests around the volcanoes in the north were cleared for pyrethrum plantations in the 1960’s, and areas around the Nyungwe were cleared for tea plantations.

Preliminary estimates indicate that the protected areas and forest reserves were seriously damaged as a result of recent wars. From an estimated pre-1994 total surface area of 417,000 ha, it is thought that they have been reduced to approximately 226,000 ha. Specifically, the Akagera National Park was reduced to less than one-third of its original size when the Umutara prefecture was created in 1996 for the resettlement of returning refugees. The Gishwati Forest has all but disappeared (from a pre-war estimate of 37,000 ha, only about 2,000 ha now remain.

3.3.3 National Parks/Forest Reserves at a Glance
The national parks in Rwanda are:
Volcanoes National Park
Akagera National Park
Nyungwe National Park
Gishwati Forest Reserves

These areas are exclusively reserved for the protection of flora and fauna, eco-tourism, biodiversity conservation, and for geological formations of scientific and aesthetic value. The geographical distribution of those parks on the national territory is a guarantee of the conservation of biological diversity representative of the fauna and flora of the country.

**The Volcanoes National Park (VNP)** is famous worldwide due to the presence of the mountain gorilla (*Gorilla gorilla beringei*). In addition to the mountain gorilla, the mountain ecosystem (high altitude, plenty of rainfall, humid temperature) induces a variety of biodiversity. The VNP hosts 245 species of plants of which 17 are predominant, including 13 orchid internationally protected, 115 species of mammals, 187 species of birds, 27 species of reptiles and amphibians and 33 species of arthropods. Some of these species are endemic while others are internationally protected.

**The Nyungwe National Park (NNP)** is the largest mountain rain forest of Africa with a surface of 101,500 ha. It contains more than 1200 species of flora of which 140 species of orchids, 260 species of ligneous and herbaceous plants, 24 species of trees, 275 species of birds of which 26 are endemic in the Albertin Rift and 3 are on the red list of the IUCN, (Bradypertus graueri, Crypto spiza shelleyi and Apdis argentea), 13 species of primates representing 1/5 of primate species discovered in Africa and the *Colobus angolensis ruwenzori* that appear in group of 300 to 400 individuals.

**The Akagera National Park (ANP)** covers a surface of about 108,500 ha and hosts more than 900 species of plants, 90 mammals, of which 47 species of big mammals, 530 species of birds, 9 species of amphibians and 23 species of reptiles. Four animal species are protected by the CITES (Convention on International Trade of Endangered Species) namely *Loxodonta Africana*, *Sincerus caffer*, *Panthera leo* and *Tragelaphus oryx*.

<table>
<thead>
<tr>
<th>Names of Parks</th>
<th>Surface in Ha (at the time of its creation)</th>
<th>Surface today</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Akagera National Park</td>
<td>250 000</td>
<td>108 500</td>
<td>Created in 1934, it is the guarantee of the conservation of fauna and flora of the eastern savannahs ecosystem</td>
</tr>
<tr>
<td>Volcanoes National Park</td>
<td>34 000</td>
<td>16 000</td>
<td>Created in 1925, it represents the last refuge of the natural flora of volcanic landand the fauna which is specific to the volcanic ecosystems of the north</td>
</tr>
<tr>
<td>Nyungwe National Park</td>
<td>103 000</td>
<td></td>
<td>Created in 2005, it comprises also a small forest of cyamudongo at 10Km southwest of Nyungwe. It ensures the survival of the mountain fauna and</td>
</tr>
</tbody>
</table>

Table 2: Reduction of the sizes of protected areas in Rwanda
3.3.4 Relic forests and gallery forests

The *Gishwati forest* that covered 21,000 ha before 1981, consisted of only 600 ha in 2002. The natural forest of *Mukura* that stretches on 3,000 ha in 1960 covered only 800 ha in 2002. Regarding tree species and altitude, it is similar to that of *Gishwati* (2000~3000 m).

Relict forests and savannahs in the East are located around the Akagera Park and have a variety of endemic and rare species whose majority is used in traditional medicine. *Gallery forests* accommodate an important biodiversity with endemic and rare species. That is for instance the case of the *Blighia unijugata*, *Grewia forbese*, *Rhus vulgaris*, *Pterygota mildbraedii* and *Ficus sp*.

In general, for a period of about 40 years, the surface area of the natural forests of Rwanda underwent a decrease of about 65% between 1960 and 2002. The search for arable lands, extensive farming, illegal felling of forests for firewood, production of wood for charcoal and poles for building in urban areas, as well as a land mismanagement have drastically contributed to the reduction of the surface area of forests.

3.4 Biodiversity of wetlands

The ecosystems of the Rwandan wetlands inhabits a rich biological diversity in terms of vegetation and animal species (more than 104 plant species have been identified), except for Lake Kivu, Bulera and Ruhondo that have some liminologic problems.

The Lake Kivu contains a very poor aquatic flora and the density of the phytoplankton is relatively low due to the lack of mixture of layers (the nutrients are found at the bottom of the lake). The aquatic fauna is also poor due to the physical isolation of the lake.

Most lakes of the Akagera National Park are very rich in biodiversity with phytoplankton, fish species and ornithological fauna. The flora is dominated by the *Cyperus*, *Phragmites*, *Phinix*, etc. The Water Hyacinth (*Eichornia crassipes*) is present and has started spreading covering more important surfaces of the lakes, thus posing a threat to their biological diversity. Some lakes like *Cyambwe*, *Rwampanga* and *Rweru* are particularly rich in hippopotamuses and crocodiles. One can also find many other lakes such as Nasho, lakes of *Gisaka* and *Bugesera* that contains phytoplankton that is very rich in biodiversity and flora that is mainly dominated by papyrus with *Cyperus papyrus* mixed with *Miscandium violaceum* and *Nymphaea nouchallii*. All these lakes are associated with gallery forests onshore or on small islands.

Concerning the Northern lakes (Bulera and Ruhondo), the aquatic flora and fauna are poor due to the physico-chemical situation unfavourable to their development and the isolation of the two lakes. The concentration of the plankton is less important in Lake *
Bulera than in Ruhondo. They have 48 species grouped in 4 families (*chlorophyceous*, *Cyanophyceous*, *pyraphytes* and *bacillariophyceous*).

Lake Muhazi is land locked, isolated, and its ichthyologic fauna is very limited. One can find three endemic species and other nine introduced from outside. The lake is very rich in phytoplankton.

The macroflora of the marshes is mostly composed of wide spaces of papyrus with some zones of Miscanthidium. The low layer is covered with Cyclosorus stratus. The fauna of big rivers and associated marshes comprises ungulates, carnivores, primates, rodents, lagomorphous, insectivorous and birds.

3.5 Biodiversity in agricultural systems

The natural ecosystems that covered the country before the colonial period have been modified by the demographic pressure on more than 90% of the national territory. Human settlement, diversified agro-pastoral practices, consumption of forest products, bush fires and urbanization has caused the disappearance of that climatic formation. Those changes caused secondary formations consisting essentially of graminaceous plants, numerous seasonal or perennial species alternating with crops.

Agricultural land presently covers around 52% of the total surface area of the country and is permanently cultivated. The time between two growing seasons is the only period of respite. These areas have various crops that play an essential role in the national economy. These crops are usually grouped in two categories: subsistence and cash crops.

Some of the food crops include; sorghum, beans (*Phaseolus vulgaris*), eleusine (*Eleusine corocana*), Colocases (*Colocasia antignorum*), maize (*Zea mays*), rice (*Oryza sativa*), wheat (*Triticum sp*), barley (*Hordeum vulgare*), peas (*Pisumsativum*), soja bean (*Soja hispada*), peanut (*Arachis hypogea*), sweet potato (*Ipomea durcis*), potato, cassava (*manihot esculanta*) and banana (*Musa*).

The importance of each crop varies according to regions. Some crops, like bananas, potatoes, different varieties of wheat, sorghums and beans are subject to high commercial trade. Potatoes, beans, cassava and bananas are present everywhere for the daily diet of the people. The cash crops are very few. They are limited to coffee, tea and pyrethrum.

3.5.1 Pastoral zones

In Rwanda, the essential part of animal husbandry is limited to the family and a small number of animals per household. As agriculture occupies the biggest portion of land, the cows graze in paddocks, on road sides, and in some parts of marginal lands. This obliges farmers to adopt the semi-permanent farming and grow fodder crops such as Tripsacum laxum, *Setaria* spp, *Desmodeum* spp, *Pennisetum purpureum*, *Mucuna pruriensis*, *Cajanus cajan*, *Calliandra calothyrsis*, *Leucaena diverifolia*, *Sesbania sesban*, etc. However, we can notice the development of ranching in Umutara and Gishwati. Other pastoral land is very limited and distributed all over the country.
These areas are prone to bush fires, trampling and sometimes overgrazing. The latter is the main cause of reduction of the biological diversity as it exterminates the most precious species along with pyrophyle species with small bromatologic value such as Eragrostis spp, Sporobalus spp and Digitaria spp.

### 3.5.2 Forestry and tree cultivation

Tree planting in Rwanda was limited to some plants around households such as *Ficus thoningii, Euphorbia tirucalli, Erythrina abyssinica, Vernonia amygdalena, Dracaena afromontana*, etc., but the cultivation of woody perennials for timber, energy generation or other services was not part of the customs. That resulted in a massive exploitation that quickly proved its limits.

The first forest plantations were created in 1920 and 1948 and only consisted of Eucalyptus. Later on, other species were introduced. These were namely Pinus spp, Callistris spp, Grevillea robusta, Cedrela spp, Cupressus. The Arboretum of Ruhande (ISAR Station) has 206 species among which 146 feuillus, 56 resinous and a species of bamboo. Those species proved to be dangerous for the biological patrimony because they used to drain and acidify places that are already acid, what caused the reduction or even the extermination of the undergrowth. Thus planting those species would lead to erosion. The covered surface area was estimated at 256,300 hectares in 1998. Despite efforts of diversifying tree species, we estimate that 99% of trees consisted of Eucalyptus spp.

A replacement of those trees by agro forestry species such as Grevillea, Cedrela, Maesopsis, Calliandra, Leucena proves to be of urgent need. That is why agro forestry practices have to be developed even in agricultural zones.

### Deforestation

The deforestation phenomenon is mostly intensified by the production of fire wood, charcoal, and it constitutes a high threat to vulnerable groups and to the entire population since the main source of energy in Rwanda is timber.

Demographic pressure associated with high demand for wood products and other human activities thus constitutes the main cause of intensive deforestation, and it immediately results in reduction of the vegetation and forest cover. Then soil erosion and land degradation deteriorate during rain season.

### 3.6 Volcanoes

The Virunga Volcanic range, north of Lake Kivu extends some 80 km along the borders of Congo, Rwanda and Uganda. The range runs east-west, perpendicular to the Rift Valley in which Lake Kivu lies. Of its eight major volcanic peaks, the highest is Karisimbi at 4,507m above sea level. This strotovolcano is part of a group of volcanoes in the Bufumbira field which is an eastern region of the Virunga. Visoke volcanoe is also located in the Bufumbira field, with a peak elevation of 3,660 m above sea level.
Individual volcanoes bear Rwanda descriptive names, such as Sabinio (Sabinyo; “Old Man with Large Teeth”) and Muhavura (“Landmark”, or “Guide”).

The six volcanoes of the center and east are extinct. Mikeno and Sabinio are the oldest of these, dating from the early part of the Pleistocene Epoch (the Pleistocene began about 1,800,000 years ago and lasted until about 10,000 years ago); their craters have disappeared, and erosion has imposed a jagged relief. In the middle Pleistocene (900,000 to 130,000 years ago), Karisimbi, Visoke, Mgainga, and Muhavura appeared, all but Karisimbi possessing a crater summit. The crater of Muhavura contains a small lake.

Not more than 20,000 years ago Nyiragongo and Nyamulagira emerged at the western end of the chain, both with extensive craters. The main crater of Nyiragongo is about 1.2 km across and contains a liquid lava pool. The lava field of these two volcanoes has remained active, and some of the flows have reached as far as Lake Kivu, notable eruptions occurring in 1912, 1938, and 1948. In 2002 lava from Nyiragongo destroyed much of the nearby city of Goma, in Congo, leaving thousands homeless. Many lesser cones flank the major volcanoes.

The Virunga Mountains rise out of densely populated plateaus that are inhabited mostly by Rwandan cultivators and, certain areas, by cattle herders. A wide variety of vegetation grows on the slope of Karisimbi. One type that grows in the lower afro-alpine zones of Karisimbi is the Lobelia or Scenecio plant. In Mudende, a commune in Gisenyi, wheat, potatoes and other crops are grown in the rich volcanic soils at the foot hills of Karisimbi. Mudende is also the name of the largest cinder cone in this area, and agriculture completely covers this extinct cinder cone, and crops are even grown inside that crater itself.

The Southern flanks of the central and eastern mountains comprise Volcanoes National Park in Northwest Rwanda, protecting the mountains alpine vegetation, as well as wildlife that includes the golden monkey and the mountain gorilla. Human activity and settlement is dangerously close to these volcanoes.

3.7 Wildlife
The dense high altitude forests of Volcanoes National Park is home to about half (320) of the Worlds remaining population (650) of Mountain Gorillas. Mountain gorillas eat large amounts of vegetation from more than 70 different plant species and spend about 30% of each day foraging for food. They consume roots, leaves, stems of herbs, vines from trees, shrub-sized plants, wild celery, gallium, vines, berries, barks and bamboo shoots.

Among the 12 species of primates in the Nyungwe National Park, are the black and white Colobus monkeys that wonder around in huge troupes, some of which are made up of over 300 agile individuals. There are also known to be 275 species of birds in the Nyungwe.

In the Akagera National Park is the largest variety of wildlife species that include Buffalo, zebras, antelope, warthogs, chimpanzees, lions, elephants, rhinoceros,
hippopotamus, as well as the rare species – such as the giant pangolin, or anteater. The main threat they face is the destruction of their habitats and poaching.

Rwanda as a whole is known for its rich variety of flora is accompanied by an equal variety of fauna, including several species of birds and primates. The country has more than 275 species of birds, 24 of which are endemic to Albert Rift. Thirteen types of primates have been identified, representing fifth of Africa’s primate species among which is the most threatened. Most of these species are concentrated in large wetlands of (Kagera, Kamiranzovu Rugezi, and Rweru-Mugesera) and protected areas of Nyugwe and Akagera.

3.7.1 Critical Habitats
As the pressure for access to land increases, human activity and settlement threatens to enter these protected forests and parks and to destroy these natural habitats. In the past, the demand to convert more land to agricultural use for instance, led to the destruction of some of Rwanda’s wetlands (marias), which has resulted in flooding, loss of wildlife habitats and sedimentation.

Currently, none of the country’s wetlands has a protected status (except the wetlands in Akagera National Park). Nevertheless, five wetlands have been described as crucial for the protection of birdlife. These are Mugesera, Kagera, Nyabarongo, Rugezi Swamp, and the Akanyaru wetlands. These wetlands also support a number of globally threatened species and restricted range species, such as water turtles, crocodiles, snakes, otters and a large variety of water birds including herons, egrets, ducks, warblers and weavers. Some 180 bird species have been identified in the wetland habitats of Rwanda, including 6 European migrant birds.

3.8 Socio-economic Environment

3.8.1 Population and Demographic Characteristics
In August 2002, Rwanda counted 8,128,553 inhabitants with a surface area of 26.338 km2, i.e. a physical density of 321inhabitants/km2. Given that the effectively useful land is only of 18,740 km2, the physiologic density in 2002 was 378 inhabitants by km2. Rwanda is classified among the poorest countries of the world. About 50% of the population is below 16 years of age and 90% live in rural areas.

In 2002, the Gross Domestic Product (GDP) per inhabitant was estimated to be 77,870 FRW. The real growth of the GDP for the year 2002 was 9.4% compared to the year 2001, mostly due to a good food harvest.

The Gross Domestic Product of Rwanda is dominated by the agriculture sector. In 2002, the portion of agriculture in the GDP was more than 43%, that of industry was 19% and that of services was 37%.

Agriculture is the primary economic activity for the 90% of the population living in the rural areas but Rwanda ran out of new arable land almost 20 years ago and agricultural
productivity has been on the decline. The severe degradation of scarce land, forests and water resources that support agriculture has become an obstacle to the revival of the rural economy.

Table 3, Rwanda: Demographic and Social Indicators

<table>
<thead>
<tr>
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<th>1980</th>
<th>1990</th>
<th>2000</th>
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</thead>
<tbody>
<tr>
<td>Population (millions)</td>
<td>5.163</td>
<td>6.879</td>
<td>8.5</td>
</tr>
<tr>
<td>% Female</td>
<td>-</td>
<td>51.3</td>
<td>53.5</td>
</tr>
<tr>
<td>Fertility Rate</td>
<td>8.3</td>
<td>6.9</td>
<td>5.8</td>
</tr>
<tr>
<td>Poverty (Headcount index (%))</td>
<td>40</td>
<td>53</td>
<td>60</td>
</tr>
<tr>
<td>Life Expectancy</td>
<td>46</td>
<td>49.5</td>
<td>49</td>
</tr>
<tr>
<td>Infant Mortality (per 1000 births)</td>
<td>128</td>
<td>85</td>
<td>107</td>
</tr>
<tr>
<td>Under 5 Mortality (per 1000 births)</td>
<td>224</td>
<td>150</td>
<td>198</td>
</tr>
<tr>
<td>Maternal Mortality Rate (per 100,000 births)</td>
<td>-</td>
<td></td>
<td>810</td>
</tr>
<tr>
<td>HIV/AIDS Prevalence (ages 15-49)</td>
<td>-</td>
<td>-</td>
<td>13.7</td>
</tr>
<tr>
<td>HIV/AIDS Prevalence (over 12yrs): rural</td>
<td>-</td>
<td>-</td>
<td>10.8</td>
</tr>
<tr>
<td>HIV/AIDS Prevalence (over 12yrs): urban</td>
<td>-</td>
<td>-</td>
<td>11.6</td>
</tr>
<tr>
<td>Literacy</td>
<td>45</td>
<td>50</td>
<td>52</td>
</tr>
<tr>
<td>Males</td>
<td></td>
<td>63</td>
<td>58</td>
</tr>
<tr>
<td>Females</td>
<td>-</td>
<td>44</td>
<td>47.8</td>
</tr>
<tr>
<td>Gross Primary School Enrolment</td>
<td>63</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td>% Girls in total enrolment</td>
<td>48.0</td>
<td>49.6</td>
<td>49.6</td>
</tr>
<tr>
<td>Net Primary Enrolment</td>
<td>-</td>
<td>-</td>
<td>73.3</td>
</tr>
<tr>
<td>Gross Secondary School Enrolment</td>
<td>3.0</td>
<td>8.0</td>
<td>10.2</td>
</tr>
<tr>
<td>% Girls in total enrolment</td>
<td>33.3</td>
<td>39.9</td>
<td>50.67</td>
</tr>
<tr>
<td>Higher Education: % girls in total enrolment</td>
<td>8.2</td>
<td>16.6</td>
<td>26.9</td>
</tr>
</tbody>
</table>

Figure 3: Composition of the GDP in 2002

Source: MINECOFIN, Edition n°5 August 2002: Indicators of economic development
The health status in Rwanda is poor. The social indicators related to health and survival have more or less stagnated in the last twenty years, with life expectancy of 49 years in 2000 compared to 46 in 1980, and infant mortality of 107 per 1000 live births compared to 128 in 1980. The incidence of HIV/AIDS is high, with 10.8% of the rural and 11.6% of the urban populations over 12 years of age, seropositive. Water and sanitation services are deficient, with access to potable water by about 52% of households, a decline from 64% at the end of the 1980’s. HIV/AIDS, persistent malaria, violent conflicts and their aftermath, malnutrition and poor quality health care have been major factors in poor survival indicators.

In Rwanda, there are three official languages, Kinyarwanda, English and French. Kinyarwanda is the native language of all the Rwandese, irrespective of ethnicity. Swahili is also widely spoken.

3.8.2 Human settlements

The Rwandan settlement pattern has been scattered since time immemorial. It has for long been characterized by the traditional use of land associated with the ancestral lifestyle but which does not correspond any more to the present environmental and economic constraints. It is in that perspective that the present policy of the Government of Rwanda regarding settlement consists of encouraging a clustered habitat commonly known as «UMDUGUDU».

In urban areas, Rwanda has not yet developed city master plans. There are only plans of different towns of which some have expired and need updating. Urban centres developed spontaneously without taking environmental aspects into consideration.

Sanitary facilities are insufficient and sometimes inadequate in city centres. In peri-urban zones qualified as spontaneous quarters, solid wastes are piled in disorder, drinking water is rare, and rain water draining gutters are insufficient. Thus diseases are frequent in those areas, the degradation of environment is more pronounced and living conditions are poor.

City development should normally be based on urban planning documents like the “Urban management master plan (SDAU)”. Presently, only two centres have got that kind of document and the SDAU of Kigali and Rwamagana are under development. The policy of city development which is under finalization is aimed at supporting districts in their efforts to quickly get urban planning documents integrating environmental aspects.

3.8.3 Energy and transport

In Rwanda, the biomass constitutes the main source of energy as it covers 94% of national needs. Woody fuels and biomass wastes are the sources of energy used in households, industries and handicrafts.

However, the country has also other sources of alternative sources of energy which are not yet exploited namely peat estimated at 155 millions of tones, methane gas of Lake Kivu representing 57 billions m3 and solar energy.
Combined with anthropic factors (agriculture, drainage of marshes, deforestation and overexploitation of river basins), the hydrous deficit is considered to be the main factor of vulnerability of the hydroelectricity subsector of the energy sector. It is evident that the pluviometric deficit leads to the reduction of offer in water resource and, consequently, in hydroelectricity. That was the case for the power plants of Ntaruka and Mukungwa on lakes Bulera and Ruhondo, two main interior sources of electric energy of Rwanda.

Generally, the energy sector is essentially of the traditional type as only wood (15% charcoal, 71% fire wood and 8% harvest wastes) covers about 94% of the total energy needs of the country, against only 5% for the contribution of petrol products and 1% for electric energy.

Moreover, the hydroelectricity infrastructure is still weak and the present production does not exceed 27 MW while the demand is more than 40 MW; However, the electricity from diesel thermic sources was recently produced at Jabana and Gatsata, and the mobilization of funds and investors is underway for other hydro-electric projects:

- 28 MW on Nyabarongo River in Bulinga;
- 60 MW (three countries) on Akagera at Rusumo;
- Rusizi II; Mukungwa III; Rukarara and various other micro hydro electric plants.

The transport sector is generally dominated by road transport that totals 14000 Km of roads and tracks. In the sub sector of air transport, the country has two international airports (Kigali and Kamembe) and aerodromes (Huye, Rubavu and Ruhengeri, etc) used in internal transport. Lake transport is used mainly on Lake Kivu for connecting districts of the Western Province. But the construction of certain roads was done without studying the environmental impact, which caused landslides, floods, gullies and sandbanks in depressions (example: Gitarama-Ngororero-Mukamira road.)

### 3.8.4 Industry and Mining

The industrial sector of Rwanda is modest and recent: 78% of industrial companies were created between 1964 and 1987. In 2002, the contribution of the industry sector to the GDP was of 19% of which the major part was from the agro industry and the rest from small and medium size of companies which produce consumption goods in replacement of importation by using simple technologies.

One of the major problems is related to the location of industrial units as some of them are installed near residence houses, others in valleys (wet lands). These installations are sometimes sources of pollution because of their wastes, liquid (waste waters) or gaseous (dust, smoke, smell), and noise. In the mining sector, the rehabilitation of quarries was never a preoccupation of those concerned. Many abandoned quarries are not rehabilitated. The exploitation of mines and quarries is often a source of water pollution due to contamination linked with the absence of waste water purification, modern practices of exploitation and soil erosion.
3.8.5 Agriculture
Agriculture is the most important sector of the Rwandan economy with a contribution of 47% to the GDP (12% for livestock) and contributes 71% of export revenue. Coffee and tea are the main export crops, with about 62 millions US$ of export revenue in 2005, of which 38 millions US$ were from coffee and 24 millions US$ from tea.

The agriculture production system is based on small family exploitations whose production is consumed by the owners at more than 80%. The systems of crops are complex, based on the diversification of productions and the association of crops. Seven main crops, namely banana, bean, sweet potato, cassava, sorghum and potatoes, of which the first five are present in 90% of production units and constitute the common basis for all the regions of Rwanda. The little use of chemical fertilizers and pesticides, the low level of equipment and the very limited use of research based technologies result in small yields which are also very vulnerable to climatic changes.

Research and popularisation should normally contribute to growth by the promotion of modern inputs and appropriate technologies, but it was noticed that during the PRSP1, there was no clear strategy concerning research and popularization. That is the reason why MINAGRI has put in place RADA, RARDA and restructured ISAR.

The extensive agriculture practiced by the Rwandan population contributes to the degradation of environment. The agricultural intensification at the level of projects was often realized without taking into account environmental drawbacks accrued from inputs like (mineral fertilizers, pesticides, herbicides and used techniques).

3.8.6 Animal husbandry
Animal husbandry, essentially made of cattle, is extensive. Average milk production is 1 litre/cow/day for 180 days of lactation (MINAGRI, 2001). The pastures consist mainly of family fallows and marginal lands considered as inappropriate to agriculture such as the undergrowth. The demographic pressure progressively leads to the semi-intensification or intensification of fodder resources used to feed animals.

Data from MINAGRI (2006) show that the number of cows increased by 60% between 2000 and 2005 (see appendix 1.13): the number of cows increased by 43%, goats 67%, sheep 195%, porc 93%, poultry 44% and rabbits 67%. The limited subsisting pastoral areas are badly used because farmers do not master the rotative management of pastures. That is showed by the overgrazing and overexploitation caused by trampling, degradation and disappearance of vegetation cover. The permanent stabulation, the semi stabulation and extensive farming constitute the three main types of animal husbandry.

It should be noted that there is a program in MINAGRI through RARDA, called « One Cow to Every Poor Family in Rwanda » that will cover all the districts of the country in order to contribute to poverty reduction and food security.
3.9 Summary of Key environmental and Social Issues in proposed project sites

The proposed project sites are currently in Kayonza, Bugesera, Gatsibo, Karongi and Nyanza districts. The key issues in terms of environment and social perspectives of concern in all the proposed project sites and which are of significance to the planning and implementing agencies are summarised below and include:-

1. Land degradation from soil erosion, soil exhaustion and overgrazing. A problem throughout Rwanda
2. Massive and continued loss of vegetative cover due to deforestation and loss of other land cover, deterioration of catchment buffer zones
3. Population pressure and poverty leading to unsustainable land use practices. Small average land holdings (0.3 ha) in the project sites is causing pressure on land use
4. Loss of top soil and reduction of soil fertility leading to decrease in agricultural. increased erosion leading to loss of fertile soils and sedimentation and siltation
5. Inappropriate agricultural practices leading to decreased soil quality and erosion, such as use of marginal lands, overgrazing and free grazing
6. Lack of soil and water conservation measures and/or abandonment of anti-erosion works.
7. Land use conversion due to increasing need for arable land and grazing areas; burning practices for land clearing and shifting cultivation
8. Uncontrolled logging for fuel wood and charcoal production for domestic/household energy consumption, construction material and local industry fuel needs.

9. Lack of water supply systems and/or other reliable drinking water source
4.0 DESCRIPTION OF THE ADMINISTRATIVE, POLICY AND REGULATORY FRAMEWORK

4.1 National Environmental and Social Management Requirements
This chapter of the report describes the institutional, legal and policy framework for environmental and social requirements in Rwanda, the relevant World Bank safeguard operational policies applicable to the project as well as the international laws and conventions that bear relevance to the implementation of this project.

4.2 The Legal, Regulatory and Policy Framework

4.2.1 The 2003 Constitution
The referendum of 26 May 2003 confirmed the new Constitution of the Republic of Rwanda, which states in its preamble, inter alia, that in the wake of the genocide that was organized and supervised by “unworthy leaders” and other perpetrators and that decimated more than a million sons and daughters of Rwanda.

Article 45 of the constitution states that all citizens have the right to participate in government of the country, whether directly or through freely chosen representatives in accordance with the law. All citizens have the right of equal access to public service in accordance with their competence and abilities.

Article 49 states that every citizen is entitled to a healthy and satisfying environment. Every person has the duty to protect, safeguard and promote the environment. The state shall protect the environment. The law determines the modalities for protecting, safeguarding and promoting the environment.

4.2.2 Law on Environment Protection and Management
The most relevant legislation for this study is the Organic Law on Environmental Protection, Conservation and Management. The legislation sets out the general legal framework for Environment protection and management in Rwanda. The law centres on avoiding and reducing disastrous consequences on Environment.

Ministry of Land, Environment and Natural Resources (MINIRENA) the ministry responsible for the Environment puts in place the organic law regarding environment conservation. Initially until very recently, REMA was responsible for the approval of EIA reports a responsibility that has now been transferred to Rwanda Development Board where there is a department for EIA headed by a Director and responsible for review and approval of all EIA reports.
4.2.3 Law in the Use and Management of Land in Rwanda

The law in the land use and management determines how land should be used in Rwanda. It also institutes the principles that are respected on land legal rights accepted on any land in the country as well as all other appendages whether natural or artificial. Chapter II of the law categorizes land according to its uses. Article 12 of the law gives the state ownership over land which makes up the public domain including lakes and rivers as listed by an order of the Minister having water in his or her attributions, shores of lakes and rivers up to the length determined land occupied by springs and wells determined in accordance with an order of the Minister having water in land reserved for Environmental conservation composed of natural forests, national parks, reserved swamps, public gardens and tourist sites among others Article 29 gives the state control over swamp. The state is the only authority over the use.

The law calls for inventory of the all swamps and their boundaries the structure of the swamps, their use, how they can be organized. According to article 29 of the Land Organic Law, swamp land belongs to the state and no person can use the reason that he or she has spent a long time with it to justify the definitive take over of the land. In order for the swamp land to be efficiently managed and exploited, a Minister must give an order having Environment in his or her attributions that shall determine a list of swamps and their boundaries. The law further requires that such a list shall clearly indicate the structure of the swamps, their use, how they can be organized so that they can be beneficial to Rwandan nationals on a sustainable basis. The ministerial order must also certify the modalities of how swampland shall be managed, organized and exploited. LWH will follow the recommendation stipulated in articles of this law.

4.3 POLICIES

4.3.1 Vision 2020

Environment protection and management rank among the main pillars of vision 2020. By 2020, the Government intends to have built a nation where pressure on natural resources mainly lands, water, biomass; biodiversity will have reasonably been decreased and the pollution process and environmental degradation reversed. The management and protection of these resources and environment are more rational and strictly under control in order to preserve and conserve for the future generations a basic heritage which is likely to ensure sustainable development.

Therefore, with regard to natural resources and environment protection and management, the Government of the Republic of Rwanda has set on a mission of decreasing the percentage of households involved in direct exploitation of primary agriculture from 90% to 50%; setting up efficient and updated regulations which are appropriate for sustainable protection and management of natural resources and environment; decreasing within the national energy assessment rates of diseases related to environmental degradation and firewood from 60% and 94% to 50% respectively.
To achieve these objectives, Rwanda will ensure: 1) that the environment issue is integrated into all education, sensitisation, and development policies and programmes as well as in all decision-making processes, 2) the promotion of grassroots’ communities participation with more involvement of women and the youth in environment protection and management; 3) that the precaution principle is set up to alleviate negative effects of socio-economic activities to our environment; 4) a diversification of energy sources that will be made available to the population to decrease pressure on biomass; 5) that the “polluter-pays” principle as well as preventive and penal measures are set up to safeguard the environment; 6) that a study on environmental impact be conducted for any development project and programme; 7) the planning of industrial sites establishment and control of their effects on environment and the population; 8) the promotion of more environment friendly transport, stocking and industrial products and waste elimination technologies; 9) regulations relating to mine exploitation and mine discharge treatment are applied; 10) rehabilitation of former quarry sites; 11) that the Bureau of Standards for local and imported products is strengthened; 12) a statistic database on natural resources and environment and a quick alert system to mitigate anticipate natural disasters are set up and that a scheme for victims of a natural calamity is created; 13) that Rwanda Environment Management Authority (REMA) is set up and supported, (14) the cooperation with other countries and international institutions in the area of environment protection and management.

Public institutions should sensitize and urge the private sector, civil society, donors and grassroots’ communities to efficiently contribute to natural resources management and environment protection. The implementation of laws and regulations, adoption and dissemination of environment friendly technologies will constitute a big priority for both central and local Governments.

Finally, regional and international cooperation will be promoted and strengthened to efficiently contribute to environment protection and management. Public institutions in charge of environment protection and management will be strengthened and the role of the private sector and civil society will be clearly defined and enhanced for a more coordinated and harmonised environmental action.

4.3.2 Rwanda Environmental Policy
The overall objective of the Environmental Policy is the improvement of man’s wellbeing, the judicious utilization of natural resources and the protection and rational management of ecosystems for a sustainable and fair development. The policy seeks to achieve this through improved health and quality of life for every citizen and promotion of sustainable socio-economic development through a rational management and utilization of resources and Environment, integrating Environmental aspects into all the development policies, planning and in all activities carried out at the national, provincial and local level, with the full participation of the population, conservation, preserve and restoration of ecosystems and maintenance of ecological and systems functions.
With reference to the National Policy on Environment (NPE) in Rwanda, as of November 2003, to ensure a sustainable environment protection and management, the following principles mention among others that:

1. It is every person’s right to live in a safe and stable environment, but on the other hand, they must keep it salubrious,
2. The national economic growth must be based on rational use of resources and take into account environmental dimensions,
3. Active and effective participation of the whole population for environment protection and management,
4. A special emphasis must be laid on environmental education and sensitisation programme at all levels with more involvement of women and the youth,
5. Environmental impact is to be analysed while conducting studies of development projects.

In addition, some political options and strategic actions have been envisaged. With regard to population and land development, the NPE proposes the elaboration or updating of master plans and special planning in urban areas.

As regards natural resources management (lands and water), the NPE proposes among others:
   ① Ensure the preservation and protection of soils against any form of degradation,
   ② Ensure that a prior study of environmental impact which underlines costs and benefits from slopes and underlying ecosystems protection is conducted for any development projects
   ③ Encourage programmes of rainwater collection, stocking and use.

Regarding wetlands management, forests and other reserves and biodiversity, the NPE proposes among others:
   ① Set up protection measures for slopes to avoid degradation of swamps,
   ② Promote the rehabilitation of ecosystems under degradation and restoring endangered species;

As regards environmental education, information and research, the NPE proposes among others to reinforce the human and institutional capacity building with regard to environment and to sensitize the population to protect environment.

With regard to health and sanitation, the NPE proposes among others:
   ① Set up a system of waste collection, transport, disposal and elimination,
   ② Establish norms of zone protection between dumps, human buildings and water sources,
   ③ Set up an appropriate canal and evacuation system for waste waters and rainwater in towns and resettlement sites “Umudugudu”.

As regards the environment decentralised management, the Central Government will be concerned with conservation and protection policies while tourism and environmental management will be transferred to government decentralised services at the District and Kigali City levels. At this level, the implementation capacity of this environmental policy is very low.

The strategy and the national action plan on biodiversity were approved in June 2000, and objectives and priorities for sustainable biodiversity conservation and management were defined. Biodiversity includes slopes and wetlands but also the government strategy on protected areas. According to strategies in the area of environment, environmental concerns rank as follows:

i) Political and legal frameworks relating to environment unknown by the population and/or decentralised entities; ii) low level of awareness among people with regard to environment; iii) inadequate exploitation of forests; iv) erosion; v) exploiting quarry sites without restoring exploited parts; vi) insufficient knowledge on environment status; vii) weakness of decentralised structures in environment management; viii) absence of appropriate environment-friendly technologies.

In general, the national environmental policy is in direct relation with other policies in the area, especially policy on agriculture, land, water and sanitation, forests, energy, industry, gender, etc.

**4.3.3 Health Sector Policy**

One of the objectives of Rwanda Heath Sector Policy is to improve the quality of life and demand for services in the control of disease. The policy identifies the most common illnesses in Rwanda and puts priority to addressing these diseases. Irrigation projects have a role to play in malaria incidences, the policy in these subproject areas should emphases on Environmental control of the disease vector especially in marshland areas.

**4.3.4 Agriculture Policy**

The main objective of Rwanda agricultural policy is to intensify and the transform subsistence agriculture into a market oriented agriculture, and which requires the modern inputs, notably improved seeds and fertilizers. The policy puts emphasis on marshland development for increased food production because the soil on hills is degraded by erosion and not sufficient.

The policy promotes small scale irrigation infrastructure development in the country’s selected marshlands while preventing Environmental degradation. To achieve sustainable agricultural development, the policy emphasizes the need to adopt Integrated Pest Management practices. LWH has planned to carry out a study on IPM to guide on the best use of pesticides.
4.3.5 Land Policy
The Rwanda land policy calls for rational use and sound management of national land resources and be based on master plans. The policy also provides development of land use plans based on suitability of the areas/lands thus distinguishing the different categories of land and their purpose.

The policy promotes irrigating areas that are more or less flat and semi-arid to support agricultural production while discouraging overgrazing and pasture burning. On the use and management of hillsides and marshlands, the policy stipulates that marshlands meant for agriculture should be cultivated after adequate planning and Environmental Impact Assessment.

4.3.6 Water and Sanitation Policy
The sectoral policy on water and sanitation is based on vision 2020, millennium development goals and poverty reduction strategy. The policy provides for decentralization in line with the national decentralization policy, institutional aspects, integrated watershed management, monitoring and assessment and participatory approach to water and sanitation among other sectoral reforms in Rwanda.

The policy identifies the sub sector constraints and proposes measures to achieve policy objectives of improving the living conditions of the population through optimal use of water resources and access of all to water and sanitation services. One of the programs of this policy is on water supply and sanitation program in rural area. In order to achieve the millennium goals and the 2020 Vision, the Government of Rwanda launched 15 years water and sanitation program in rural area. This program aims to improve the population rate with access to water, presently at 44%, and increase the sanitation rate, presently at 8%, to 66% in 2010, to 80% in 2015 and 100% in 2020.

4.3.7 National Water Resources Management Policy
The water policy aims at fair and sustainable access to water, improvement of the management of water resources, etc. through reforestation on hillsides and water catchments areas. This policy would seem in conflict with other sector policies including agriculture and marshland development.

The policy also needs to adopt a holistic approach to the management of water resources and integrate other polices related to it including the forest, wetlands, agriculture and land. This policy is relevant to LWH subprojects as some of the project activities will be undertaken in areas with water resources and one of the key project input is water which is governed by the policy.

4.3.8 National Biodiversity Strategy and Action Plan
This strategy defines the objectives and priorities for the conservation and sustainable management of biodiversity. The plan includes hillsides and wetlands and protected areas as some of the areas that need to be conservation.
The strategy focuses on five major areas i.e. improved conservation of protected areas and wetlands; sustainable use of biodiversity in natural ecosystems and agro-ecosystems; rational use of biotechnology; development and strengthening of policy, institutional, legal and human resources frameworks; and equitable sharing of benefits derived from the use of biological resources. The Action Plan consists of urgent and priority actions which are attainable in a period of five years.

The strategy focuses on five major aims: improved conservation of protected areas and wetlands; sustainable use of biodiversity in natural ecosystems and agro-ecosystems; rational use of biotechnology; development and strengthening of policy, institutional, legal and human resources frameworks; and equitable sharing of benefits derived from the use of biological resources. The Action Plan consists of urgent and priority actions which are attainable in a period of five years. However, the plan is not based on the actual status quality of wetlands which is one of the most important ecosystems in Rwanda. There is need to undertake inventory of wetlands in the country which will allow planning of these ecosystems.

### 4.3.9 National Poverty Reduction Strategy

The National Poverty Reduction Strategy identifies the transformation of the subsistence agriculture, into a modernized agriculture, which is market oriented as one of the priority sectors. Other priority areas include human development which covers the actions of improving living conditions of the poor, economic infrastructure, governance, development of the private sector and the institutional reinforcement.

### 4.4 Relevant Institutions

#### 4.4.1 The Ministry of Natural Resources.

MINITERE which is the ministry responsible for the environment under the article 65 puts in place Rwanda Environment Management Authority (REMA) which is the institution now charged with the responsibility of ensuring environmental protection. REMA was initially responsible for reviewing and approving EIA reports but this duty has now been transferred to the newly created Rwanda Development Board where a department of EIA has been created and tasked with review and approvals of all EIA studies.

**MINIRENA** is responsible for developing land utilization policies (including surveying, land classification, land laws and land tenure); the development of environmental policies and procedures (including impact assessments), protection of natural resources (water, land, flora, and fauna), environmental legislation, biodiversity, and other environmental aspects.

*Chapter IV of the Organic Law Article 65 clearly calls for the need to subject projects to mandatory Environmental Impact Assessment.*
Article 65: Further specifies that every project shall be subjected to environmental impact assessment prior to its commencement. It shall be the same for programs, plans and policies likely to affect the environment. Specific details of projects referred to in this Article shall be spelt out by the order of the Minister in charge of environment.

Article 66 states that Environmental Impact Assessment (EIA) shall include at least the following:

- A brief description of the project and its variants.
- Analysis of direct and indirect foreseeable consequences on the environment.
- Analysis of the initial state of the environment.
- Measures envisaged reducing, preventing or compensating for the consequences.
- Reasons for the choice.
- A summary of requisitions from clause 1 to 5 of this article;
- A definition of the evaluation and monitoring methods used regularly and environmental indicators before (initial state), during and after implementation of the project or, as the case may be, at the final evaluation stage of the project;
- A financial evaluation of measures recommended preventing, reducing or compensating for the negative effects of the project on the environment and measures for regular monitoring and control of relevant environmental indicators.

The law gives right to every natural or legal person in Rwanda to live in a healthy and balanced environment. They also have the obligation to contribute individually or collectively to safeguard country’s natural, historical and socio-cultural heritage.

The framework of the law on the protection and management of natural resources centers on avoiding and reducing the disastrous consequences on environment. It measures result from an environmental evaluation of policies, programs and projects, aimed at preventing the consequences of such activities.

The principle of sustainability of environment and equity among generation emphasizes human beings at the core of sustainable development. They therefore, have a right to a healthy and productive life in harmony with nature. They must so as to equitably meet the needs of the present and future generation

4.4.2 Rwanda Environment Management Authority

With regards to the management of the bio-physical environment throughout Rwanda, the overall responsibility now lies with the Rwanda Environment Management Authority. In November 2003, the Government of Rwanda approved the law establishing the Rwanda Environment Management Authority (REMA). The functions of REMA are;

- To implement Government environmental policy and decisions of the Board of Directors.
To advise the Government on legislative and other measures for the management of the environment or the implementation of relevant international conventions, treaties and agreements in the field of environment, as the case may deem necessary.

To take stock and conduct comprehensive environmental audits and investigations, to prepare and publish biannual reports on the state of natural resources in Rwanda.

To undertake research, investigations, surveys and such other relevant studies in the field of environment and disseminate the findings.

To ensure monitoring and evaluation of development programs in order to control observance of proper safeguards in the planning and execution of all development projects, including those already in existence, that have or are likely to have significant impact on the environment.

To participate in the set up of procedures and safeguards for the prevention of accidents and phenomena which may cause environmental degradation and propose remedial measures where accidents and those phenomena occur.

To render advice and technical support, where possible, to entities engaged in natural resource management and environmental protection.

To provide awards and grants aimed at facilitating research and capacity-building in matters of environmental protection.

To publish and disseminate manuals, codes or guidelines relating to environmental management and prevention or abatement of environmental degradation.

**4.4.3 Rwanda Development Board**

This is a one stop institution bringing together several government bodies in Rwanda focussed at promoting investment in Rwanda. RDB has created a department of EIA responsible for reviewing all projects EIA before approval a duty that was previously undertaken by REMA.

Rwanda also adheres to several international agreements, treaties and conventions, though management legal tools are not yet well developed. Among other conventions ratified by the Republic of Rwanda, the most important ones which have influenced or influence the national policy with regard to environment are:

- RAMSAR Convention on February 2, 1971 on wetlands
5.0 DESCRIPTION OF WORLD BANK ENVIRONMENTAL AND SOCIAL SAFEGUARDS POLICIES AND TRIGGERS

This ESMF has been designed so that all investments under the LWH will comply with the relevant laws of Rwanda and the Environmental and Social Safeguard Policies of the World Bank. In this chapter, the Bank’s safeguards policies and their applicability are discussed. The World Bank Safeguard Policies are:

1. Environmental Assessment (OP4.01, BP 4.01, GP 4.01)
2. Natural Habitats (OP 4.04, BP 4.04, GP 4.04)
3. Forests (OP 4.36, GP 4.36)
4. Pest Management (OP 4.09)
5. Physical Cultural Resources (OP/BP 4.11)
6. Indigenous Peoples (OD 4.10)
7. Involuntary Resettlement (OP/BP 4.12)
8. Safety of Dams (OP 4.37, BP 4.37)
9. Projects on International Waters (OP 7.50, BP 7.50, GP 7.50)
10. Projects in Disputed Areas (OP 7.60, BP 7.60, GP 7.60)

In preparing this ESMF, a consideration of the type of future investments planned vis-à-vis the baseline data presented in Chapter 4 and the requirements of the Bank Safeguard policies, has led to the determination that only the following Bank policies are triggered.

1. Environmental Assessment (OP4.01, BP 4.01, GP 4.01)
2. Involuntary Resettlement (OP/BP 4.12)
3. Pest Management (OP 4.09)
4. Safety of Dams (OP 4.37, BP 4.37)
5. Natural Habitats (OP 4.04, BP 4.04, GP 4.04)
6. Forestry (OP 4.36, GP 4.36)
7. Projects on International Waterways (OP 7.50, BP 7.50, GP 7.50)
8. Physical Cultural Resources (OP/BP 4.11)

This notwithstanding, since the exact location of the investments was not known at the time of preparation of the LWH, other bank policies may apply and not all policies selected above may apply simultaneously.

Therefore, a complete description of the Bank safeguards and their triggers for applicability can be found on the World Bank’s official web site www.worldbank.org and summarized in this chapter, to be used as part of the Environmental and Social Management process presented in chapter 6 of this ESMF.
5.1 Environmental Assessment (OP4.01, BP 4.01, GP 4.01)

This policy requires Environmental Assessment (EA) of projects proposed for Bank financing to help ensure that they are environmentally sound and sustainable, and thus to improve decision making. The EA is a process whose breadth, depth, and type of analysis depend on the nature, scale, and potential environmental impact of the proposed investments under the LWH. The EA process takes into account the natural environment (air, water, and land); human health and safety; social aspects (involuntary resettlement, indigenous peoples, and cultural property) and transboundary and global environmental aspects.

The environmental and social impacts of the LWH will come from the proposed investment activities under Components a) and b). However, since the exact location of these investments will not be identified before bank appraisal of the project, the EA process calls for the GOR to prepare an Environmental and Social Management Framework (ESMF).

This report which will establish a mechanism to determine and assess future potential environmental and social impacts during implementation of LWH activities, and then to set out mitigation, monitoring and institutional measures to be taken during operations of these activities, to eliminate adverse environmental and social impacts, offset them, or reduce them to acceptable levels.

Operational Policy 4.01 further requires that the ESMF report must be disclosed as a separate and stand alone document by the Government of Rwanda and the World Bank as a condition for bank appraisal. The disclosure should be both in Rwanda where it can be accessed by the general public and local communities and at the Infoshop of the World Bank and the date for disclosure must precede the date for appraisal of the program.

The policy further calls for the LWH as a whole to be environmentally screened to determine the extent and type of the EA process.

The World Bank system assigns a project to one of three project categories, as defined below:

**Category “A” Projects**

An EIA is always required for projects that are in this category. Impacts are expected to be ‘adverse, sensitive, irreversible and diverse with attributes such as pollutant discharges large enough to cause degradation of air, water, or soil; large-scale physical disturbance of the site or surroundings; extraction, consumption or conversion of substantial amounts of forests and other natural resources; measurable modification of hydrological cycles; use of hazardous materials in more than incidental quantities; and involuntary displacement of people and other significant social disturbances.”
**Category “B” Projects**
Although an EIA is not always required, some environmental analysis is necessary. Category B projects have impacts that are ‘less significant, not as sensitive, numerous, major or diverse. Few, if any, impacts are irreversible, and remedial measures can be more easily designed.’ Typical projects include rehabilitation, maintenance, or upgrades, rather than new construction.

**Category “C” Projects**
No EIA or other analysis is required. Category C projects result in negligible or minimal direct disturbance of the physical environment. Typical projects include education, family planning, health, and human resource development.

The LWH has thus been screened and assigned an EA Category B. This category of projects is defined as follows.

Category B projects are likely to have potential adverse environmental impacts on human populations or environmentally important areas – including wetlands, forests, grasslands, and other natural habitats – and are less adverse than those of category A projects. These impacts are site specific, few if any of them are irreversible, and in most cases mitigation measures can be designed more readily than for category A projects. The EA process for category B projects examines the potential negative and positive environmental impacts and recommends any measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance.

Therefore, this ESMF sets out to establish the EA process to be undertaken for implementation of project activities in the proposed LWH when they are being identified and implemented.

This process requires that LWH and its implementing partners screen their activities to identify their potential adverse impacts and thereby determine the corresponding mitigation measures to incorporate into their planned activities.

**5.2 Pest Management (OP 4.09)**
This policy aims at assisting borrowers to manage pests that affect either agriculture or public health. The Bank supports a strategy that promotes the use of biological or environmental control methods and reduces reliance on synthetic chemical pesticides. Rural development and health sector projects have to avoid using harmful pesticides. A preferred solution is to use Integrated Pest Management (IPM) techniques and encourage their use in the whole of the sectors concerned.

In appraising a project that will involve pest management, the Bank assesses the capacity of the country’s regulatory framework and institutions to promote and support safe,
effective, and Environmentally sound pest management. As necessary, the Bank and the borrower incorporate in the project components to strengthen such capacity.

The Bank uses various means to assess pest management in the country and support integrated pest management (IPM) and the safe use of agricultural pesticides: economic and sector work, sectoral or project-specific environmental assessments, participatory IPM assessments, and investment projects and components aimed specifically at supporting the adoption and use of IPM.

For World Bank funded agriculture projects, pest populations are normally controlled through IPM approaches, such as biological control, cultural practices, and the development and use of crop varieties that are resistant or tolerant to the pest. The Bank may finance the purchase of pesticides when their use is justified under an IPM approach. The policy supports use of environmental methods for public health projects in controlling pests. Where environmental methods alone are not effective, the Bank may finance the use of pesticides for control of disease vectors.

The Bank uses various means to assess pest management in the country and support integrated pest management (IPM) and the safe use of agricultural pesticides: economic and sector work, sectoral or project-specific environmental assessments, participatory IPM assessments, and investment projects and components aimed specifically at supporting the adoption and use of IPM.

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The policy supports use of environmental methods for public health projects in controlling pests. Where environmental methods alone are not effective, the Bank may finance the use of pesticides for control of disease vectors.

The policy calls for assessment of the nature and degree of associated risks, taking into account the proposed use and the intended users for procurement of any pesticide in Bank-financed projects. The policy sets criteria to apply for the selection and use of pesticides in Bank-financed projects including must have negligible adverse human health effects, must be shown to be effective against the target species, and must have minimal effect on non target species and the natural environment. The methods, timing, and frequency of pesticide application are aimed to minimize damage to natural enemies. Pesticides used in public health programs must be demonstrated to be safe for inhabitants and domestic animals in the treated areas, as well as for personnel applying them and the use must take into account the need to prevent the development of resistance in pests.
The policy requires that any pesticides it finances be manufactured, packaged, labeled, handled, stored, disposed of, and applied according to standards acceptable to the Bank. The Bank does not finance formulated products that fall in WHO classes IA and IB, or formulations of products in Class II\(^7\), if the country lacks restrictions on their distribution and use; are likely to be used by, or be accessible to, lay personnel, farmers, or others without training, equipment, and facilities to handle, store, and apply these products properly.

5.3 Natural Habitats (OP 4.04)

The conservation of natural habitats, like other measures that protect and enhance the environment, is essential for long term sustainable development. The Bank therefore supports the protection, maintenance, and rehabilitation of natural habitats. Natural habitats are land and water areas where (i) the ecosystems biological communities are formed largely by native plant and animal species, and (ii) human activity has not essentially modified the areas primary ecological functions. All natural habitats have important biological, social, economic, and existence value. Important habitats may occur in tropical humid, dry, and cloud forest; temperate and boreal forest; Mediterranean-type shrub lands; natural arid and semi-arid lands, mangrove swamps, coastal marshes, and other wetlands; estuaries, sea grass beds, coral reefs, freshwater lakes and rivers; alpine and sub alpine Environments, including herb fields, grasslands, and paramos; and tropical and temperate grasslands.

Therefore, the natural habitats policy may be triggered in certain cases because the investments proposed under this project may have potential adverse impacts on Rwanda’s many marshlands, water sources, rivers, and forests. The natural ecosystems of the rivers, wetlands and forests are known to support varying degrees of natural complexities of flora and fauna. Therefore, this policy requires that any activities funded under the LWH that adversely impacts these ecosystems are successfully mitigated so that the balance of the ecosystems are enhanced or maintained. This would require LWH to design appropriate conservation and mitigation measures to remove or reduce adverse impacts on these ecosystems or their functions, keeping such impacts within socially defined limits of acceptable change. Specific measures may depend on the ecological characteristics of the affected ecosystem. Such measures must include provision for monitoring and evaluation to provide feedback on conservation outcomes and to provide guidance for developing or refining appropriate corrective actions.

5.4 Involuntary Resettlement (OP 4.12)

The objective of this policy to avoid where feasible, or minimize, exploring all viable alternative project designs, to avoid resettlement. This policy is triggered in situations involving involuntary taking of land and involuntary restrictions of access to legally

\(^7\) Copies of the classification, which is updated annually, are available in the Sectoral Library. A draft Standard Bidding Document for Procurement of Pesticides is available from OPCPR.
designated parks and protected areas. The policy aims to avoid involuntary resettlement to the extent feasible, or to minimize and mitigate its adverse social and economic impacts.

This policy covers direct economic and social impacts that both result from Bank-assisted investment projects, and are caused by (a) the involuntary taking of land resulting in (i) relocation or loss of shelter; (ii) loss of assets or access to assets, or (iii) loss of income sources or means of livelihood, whether or not the affected persons must move to another location; or (b) the involuntary restriction of access to legally designated parks and protected areas resulting in adverse impacts on the livelihoods of the displaced persons. For project activities that impact people and livelihoods in this way, LWH will have to comply with the requirements of the disclosed RPF and RAPs to comply with this policy.

The policy prescribes compensation and other resettlement measures to achieve its objectives and requires that borrowers prepare adequate resettlement planning instruments prior to project appraisal of proposed projects. The objective of this policy to avoid where feasible, or minimize, exploring all viable alternative project designs, to avoid resettlement.

The policy requires the displaced persons and their communities, and any host communities receiving them, are provided timely and relevant information, consulted on resettlement options, and offered opportunities to participate in planning, implementing, and monitoring resettlement. Appropriate and accessible grievance mechanisms are established for these groups. In new resettlement sites or host communities, infrastructure and public services are provided as necessary to improve, restore, or maintain accessibility and levels of service for the displaced persons and host communities.

A separate Resettlement Policy Framework (RPF) was thus prepared that establishes standards and procedures for the preparation of Resettlement Action Plans (RAPs), as required. The RAPs would be prepared by LWH and its implementing partners. In this case, the World Bank reserves the right to also approve this RAP as a condition for that particular project investment to be financed. This policy would be triggered when a project activity, in the cases mentioned above, for example, causes the involuntary taking of land and other assets resulting in:

1. Relocation or loss of shelter,
2. Loss of assets or access to assets,
3. Loss of income sources or means of livelihood, whether or not the affected persons must move to another location,
4. Loss of land,
5.5 Forests (OP 4.36)

This operational policy aims to reduce deforestation, enhance the environmental contribution of forested areas, promote afforestation, reduce poverty, and encourage economic development.

The policy recognizes the role forests play in poverty alleviation, economic development, and for providing local as well as global environmental services. Success in establishing sustainable forest conservation and management practices depends not only on changing the behavior of all critical stakeholders, but also on a wide range of partnerships to accomplish what no country, government agency, donor, or interest group can do alone.

The forest strategy suggests three equally important and interdependent pillars to guide future Bank involvement with forests including harnessing the potential of forests to reduce poverty, integrating forests in sustainable economic development, and protecting vital local and global environmental services and forest values.

This policy applies to the following types of Bank-financed investment projects: (a) projects that have or may have impacts on the health and quality of forests; (b) projects that affect the rights and welfare of people and their level of dependence upon or interaction with forests; and (c) projects that aim to bring about changes in the management, protection, or utilization of natural forests or plantations, whether they are publicly, privately, or communally owned.

The Bank does not finance projects that, in its opinion, would involve significant conversion or degradation of critical forest areas or related critical habitats. If a project involves the significant conversion or degradation of natural forests or related natural habitats that the Bank determines are not critical, and the Bank determines that there are no feasible alternatives to the project and its siting, and comprehensive analysis demonstrates that overall benefits from the project substantially outweigh the environmental costs, the Bank may finance the project provided that it incorporates appropriate mitigation measures. The project activities that is likely to have negative impacts on forests will not be funded under LWH.
## Table 4: Summary of World Bank Safeguards Policies

<table>
<thead>
<tr>
<th>Safeguard policy</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>OP 4.01 Environmental Assessment</td>
<td>EA to be conducted for all projects that fall into either World Bank Category A or Category B. These categories are equivalent to Government of Rwanda’s Schedule 1 and 2 projects.</td>
</tr>
<tr>
<td>OP 4.36 Forests</td>
<td>The Bank’s lending operations in the forest sector are conditional on government commitment to undertake sustainable management and conservation-oriented forestry. In forestry areas of high ecological value, the Bank finances only preservation and light, non-extractive use of forest areas.</td>
</tr>
<tr>
<td>OP 4.04 Natural Habitats</td>
<td>The conservation of natural habitat is essential for long-term sustainable development. The Bank supports, and expects borrowers to apply, a precautionary approach to natural resources management to ensure opportunities for environmentally sustainable development. The Bank does not support projects that involve the significant conservation or degradation of critical natural habitats.</td>
</tr>
<tr>
<td>OP 4.09 Pest Management</td>
<td>In Bank-financing operations, pest populations are normally controlled through IPM approaches, such as biological control, cultural practices, and the development and use of crop varieties resistant or tolerant to the pest. The Bank may finance the purchase of pesticides when their use is justified under an IPM approach.</td>
</tr>
<tr>
<td>OP/BP/GP 4.12 Involuntary Resettlement</td>
<td>People who have to be removed or who lose their livelihood as a result of the project must be resettled, compensated for all of their losses and they must be provided with a situation that is at least as good as the one from which they came.</td>
</tr>
<tr>
<td>OD 4.10 Indigenous Peoples</td>
<td>This policy covers local indigenous people or distinct groups who are marginalized in society and who could be adversely affected by the project. The Bank does not support projects that negatively affect these peoples.</td>
</tr>
<tr>
<td>OP 4.11 Physical Cultural Resources</td>
<td>Bank supports the preservation of cultural properties which includes sites with archeological, paleontological, historical, religious or unique natural values. It seeks to avoid impacts on such sites.</td>
</tr>
<tr>
<td>OP 4.37 Safety of Dams</td>
<td>Bank financed new dams must be designed and built under the supervision of competent professionals to ensure dam safety. For dams over 15 metres in height, and dams 10 – 15 meters in height which are of concern, e.g. due to large flood handling requirement or location in a zone of high seismicity and/or where foundations and other design features are complex, specific dam safety plans are developed and implemented with a review by an independent panel of experts. For small dams (below 15 meters in height), generic dam safety measures designed by qualified engineers are used.</td>
</tr>
<tr>
<td>OP/ BP 7.50 Projects on International Waterways</td>
<td>If a project has the potential to negatively affect the quality or Quantity of water of a waterway shared with other nations the Bank will insist that a negotiated agreement be established between the two or more nations involved. Irrigation, drainage, water and sewage, industrial and similar projects that involve the use or potential pollution of international waterways (rivers, canals, lakes or similar bodies of water)</td>
</tr>
<tr>
<td>OP 7.60 Projects in Disputed areas</td>
<td>Projects in disputed areas could affect relations between the country within which the project is being developed and neighbouring countries. Disputes would be dealt with at the earliest opportunity.</td>
</tr>
</tbody>
</table>
### Table 5: Activities Triggering World Bank Safeguard Policies

<table>
<thead>
<tr>
<th>Policy</th>
<th>LWH Project</th>
<th>Discussions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Assessment</td>
<td>Yes</td>
<td>The project components 2 will trigger EA safeguards. Projects under component 3 including dam construction, irrigation systems installation and land husbandry will fall under category B.</td>
</tr>
<tr>
<td>Natural Habitats</td>
<td>Yes</td>
<td>The Land Husbandry and Water Harvesting as well as Hillside Irrigation projects will trigger OPs 4.04, BP 4.04 GP 4.04</td>
</tr>
<tr>
<td>Forests</td>
<td>Yes</td>
<td>Community-driven investments in management of natural resources sub-component including the land husbandry will trigger OP4.36 &amp; GP 4.36. These are sub projects including watershed rehabilitation interventions, such as integrated management of soil and water, reforestation and afforestation, catchment protection, and rehabilitation of degraded areas.</td>
</tr>
<tr>
<td>Pest Management</td>
<td>Yes</td>
<td>The project will trigger this policy through enhancement of public investments, which include financial support to farmers to access the required inputs (chemicals and high quality seed), intensified extension services. Subprojects that trigger this OP could be managed through adoption of Integrated Pest Management (IPM).</td>
</tr>
<tr>
<td>Involuntary Resettlement</td>
<td>Yes</td>
<td>Sub projects including irrigation, dam construction will trigger this OP.</td>
</tr>
<tr>
<td>OP 4.37 Safety of Dams</td>
<td>Yes</td>
<td>The construction of valley dams will trigger this OP.</td>
</tr>
<tr>
<td>OP BP 7.50 Projects on</td>
<td>Yes</td>
<td>Many of the rivers where the proposed projects are to be located feed into River Akanyaru and Akagera that drain into Lake Victoria and eventually the Nile hence any activity on these tributaries has implication on international water source shared by the Nile Basin Countries.</td>
</tr>
<tr>
<td>International Waterways</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OP 4.11 Physical Cultural</td>
<td>Yes</td>
<td>The proposed sites could be points where human remains of the genocide are buried and unknown. Such discoveries will require special removal.</td>
</tr>
<tr>
<td>Resources</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5.6 Safety of Dams (OP 4.37, BP 4.37)

Under LWH project implementation, the following will be respected in line with the Bank policy for dams’ safety:
(1) for large dams, dam safety plans will be prepared and implemented (see OP 4.37 for definition of large dams);
(2) for small dams, the Small Dam Safety Guidelines for Rwanda, adopted in November 2009, will be followed (please see the disclosed document on small dam safety guidelines for Rwanda - these guidelines are based on the September 2005 guidelines originally developed for small dams in Uganda, with support from the World Bank.

Small and Large Dams

For Small and Large Dams, the Project's adherence to the World Bank’s Operational Policy OP/BP 4.37 means that the Government of Rwanda (GoR) shall:

(a) furnish to the World Bank (“Bank”) for review, prior to the issuance of a request for proposals relating to a contract for the provision of technical services relating to the investigation, design, or construction or the commencement of operations of a dam, terms of reference satisfactory to the Bank for such contract, and appoint for the provision of such services professionals with qualifications and experience satisfactory to the Bank;

(b) furnish to the Bank for review, no later than 15 days after the completion or receipt of each such report, all reports relating to dam safety prepared by the GoR, any independent specialists assessing a dam under construction or targeted under the Project, or professionals appointed by the GoR to design, construct, fill, and start up a dam; and

(c) furnish to the Bank for review, as soon as available, all information relevant to dam safety, including cost estimates, construction schedules, procurement procedures, technical assistance arrangements, environmental and social assessments, along with the dam proposal, technical aspects, inspection reports, and any actions plans relating to dam safety prepared by the GoR.

1. The GoR shall furnish to the Bank for review, no later than three (3) months prior to the Project’s Closing Date, operational procedures with respect to dams constructed or targeted under the Project, including retention of written instructions for flood operations and emergency preparedness at such dams at all times, incorporation of necessary modifications to technical criteria for the evaluation of dam safety further to the advent of new technology or information, and application of such revised criteria to such dams and other dams under the Government’s jurisdiction as necessary.
For Large Dams, the Project’s adherence to the World Bank’s Operational Policy OP/BP 4.37 means that the Government of Rwanda (GoR) shall:

"With the selection of any Large Dams (i.e. dams 15 meters or more in height, or between 10 and 15 meters in height and presenting special design complexities, or under 10 meters in height and expected to reach 15 meters in height during operation), the Project will, prior to commencing implementation of a Large Dam:

(i) Appoint, contract the services of, and provide administrative support to an independent panel (the Panel) comprising at least three (3) experts acceptable to the Bank and with terms of reference acceptable to the Bank for review of the investigation, design, and construction and the commencement of operations of the subject Large Dam, such terms of reference including review of and advice relating to safety and other critical aspects of the subject Large Dam, its appurtenant structures, the catchment area, the area surrounding the reservoir, and downstream areas;

(ii) Convene, beginning as early in Large Dam Subproject preparation as possible, periodic Panel meetings and reviews, which shall continue through the investigation, design, construction, and initial filling and start-up phases of the subject Large Dam, inform the World Bank in advance of each such meeting such that the World Bank may participate in such meeting as an observer, and furnish to the World Bank for review, no later than 15 days after the receipt of such report, a copy of the Panel’s report of its conclusions and recommendations following such meeting; and

(iii) furnish to the World Bank for review, following the initial filling of the reservoir and the start-up of the subject Large Dam, a copy of the Panel’s report of its findings and recommendations in relation to such filling and start-up, and may disband the Panel in consultation with the World Bank following such review if no significant difficulties have been encountered in the filling and start-up.

(b) The Project will prepare and adopt Dam Safety Plans, satisfactory to the Bank, and which have been reviewed by the Panel and reflect the conclusions and recommendations of such review, as follows:

(i) (A) a Dam Construction Supervision and Quality Assurance Plan, (B) a broad framework Dam Emergency Preparedness Plan and an estimate of funds needed to prepare such Plan in detail, and (C) a preliminary Dam Operation and Maintenance Plan, all prior to the submission of the subject Large Dam sub-project to the World Bank;

(ii) a Dam Instrumentation Plan during the design phase of the subject Large Dam, prior to bid tendering under the Large Dam Subproject;

(iii) a Dam Emergency Preparedness Plan no later than one (1) year prior to the initial filling of the subject Large Dam; and

(iv) a Dam Operation and Maintenance Plan no later than six (6) months prior to the initial filling of the subject Large Dam.

(c) prequalify bidders prior to bid tendering under the Large Dam Subproject; and
(d) have periodic dam safety inspections performed by independent qualified professionals, with qualifications, experience, and terms of reference satisfactory to the Bank, and who have not been involved in the investigation, design, construction, or operation of the subject Large Dam following the initial filling and start-up of the subject Large Dam."

6.0 DETERMINATION OF POTENTIAL ENVIRONMENT AND SOCIAL IMPACTS

6.1 Positive Impacts
   a) Catchment Rehabilitation and Management
   b) Soil Conservation
   c) Flood Control
   d) Water Resources Conservation
   e) Birdlife Habitat
   f) Improved soil conservation
   g) Improvement of previously water-logged areas
   h) Increased farm incomes from crop output
   i) Environmental Protection
   j) Food Security
   k) Poverty Alleviation
   l) Raise Rural Income
   m) Improved access to water for domestic purposes
   n) Improved nutrition
   o) Water for domestic use-washing clothes, bathing livestock
   p) Appreciation of the value of land
   q) Employment creation for community members
   r) Provision of fuel wood
   s) Empowerment of farmers

Highlighted in summary below are the potential adverse impacts that could occur when the component B of the LWH project is implemented. An EMP has been prepared and details the potential adverse impacts for each of the proposed activities.

6.2 Critical Project Activities and Anticipated Adverse Impacts

The critical project activities that could potentially lead to adverse impacts mentioned below include;

1. Excavation works for the construction of dam and reservoir area will involve excavating the proposed sites for construction of the dam wall to block the water and create a reservoir
2. Retention of water in the reservoir area for irrigation will be undertaken once the wall is completed in order to store the water in the reservoir area for irrigation
3. Clearing of the proposed project sites for construction activities will be undertake and will involve clearing and cutting down of crops, vegetation and structures that could be in the dam or reservoir areas
4. Introduction or application of synthetic fertilisers and pesticides to boost overall productivity in the irrigation areas
5. Establishment of construction camps for the dam construction activities

**Potential Adverse Impacts**

a) Water quality and quantity degradation (both surface & ground water)
b) Soil erosion and quality deterioration
c) Loss of biodiversity
d) Ecological imbalances
e) Ecosystems damage
f) Surface water sedimentation
g) Damage to aquatic habitats
h) Soil salinity
i) Sanitation and waste management problems
j) Pathogen breeding ground
k) Introduction of invasive flora species
l) Loss of high value trees especially those with medicinal value
m) Borrow pit impacts
n) Down stream flooding and water use denial

6.3 Socio-cultural and Economic Impacts;

a) Displacement of local inhabitants
b) Damage to property
c) Water use conflicts
d) Land ownership conflicts
e) Damage of aesthetics of the area/land
f) Food insecurity attributed to by displacement of subsistence farming
g) Dam safety related impacts
h) Camp construction related impacts
i) Traffic congestion

6.4 Health Impacts

a) Spread of water borne diseases
b) Spread of HIV/AIDS
c) Dust impacts
d) Noise impacts

6.5 Localized Impacts

Most of the developments or subprojects planned under the LWH Project will vary from medium to small in scale. Consequently the significance of the direct negative environmental and social impacts is likely to be moderately significant except where they accumulate in single watersheds.
6.6 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. Examples include:

- Increased use of chemical fertilizer which may have downstream impacts; and
- Attraction of immigrant populations to communities that have improved production systems and social infrastructure.
- Reduced water to downstream users due to the dams
- Increased sedimentation of the natural water bodies and valley

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.

6.7 Strategic Impacts

The main objective of the LWH is to increase agricultural production and marketing in hillsides targeted for development under the Project in an environmentally sustainable manner. This will be achieved by assisting rural households to expand and intensify sustainable crop production systems and to increase their participation in agricultural markets.

6.8 Ecological Impacts and Land Degradation

A number of the proposed activities in the subprojects can lead to both localized and cumulative impacts on biodiversity, wetlands, soils and water quality. Land degradation may arise due to subprojects that involve intensification of agriculture. The environmental and social screening tools in Chapter 8 will be used to identify and mitigate the potential impacts as they relate to certain types of community investments.

6.9 Potential Sources of Pollution

The use of agro-chemicals such as inorganic fertilizers and pesticides, and organic manure can lead to pollution, especially due to surface runoff into adjacent watercourses, including infiltration into groundwater.

This will be carefully monitored through annual reporting tools described in Chapter 8. Training will be provided to communities in proper handling and application of these materials as part of local capacity building component.

6.10 Pest Management

Successful Integrated Pest Management/Integrated Crop Management (IPM) is based on sound farmer knowledge of the on-going agro-ecological processes of the farming environment. Such farmers are, therefore, technically empowered to make informed decisions on the most appropriate management strategies to apply a specific period of
crop development and production cycle. Furthermore, integrated crop/pest management is a farmer-centred management approach that addresses issues beyond pest management. It offers the entry point to improvement of the entire agricultural production system. It can be successfully adopted in the presence of a national Integrated Pest Management (IPM) policy framework and institutional support.

In all instances where high input-dependent crop/pest practices are adopted, pesticide misuse is known to be common and can result in the following impacts:

- Destruction of crop pollinators leading to poor crop yields;
- Elimination of the natural enemies of crop pests and consequent loss of natural pest control that keeps the populations of crop pests very low;
- Development of pest resistance to pesticides, encouraging further increases in the use of chemical pesticides;
- Contamination of the soil and water bodies;
- Toxicity to fish and birds;
- Proliferation of aquatic weeds;
- Pesticide poisoning of farmers and deleterious effects on human health;
- Unacceptable levels of pesticide residues in harvested produce and in the food chain; and
- Loss of biodiversity in the environment, particularly of the aquatic non-target species.

Considerable attention must, therefore, be paid to the environmental consequences of current pest management practices in Rwanda.

6.11 Environmental and Social Management Process

The Environmental Management Plan outlined here below consists of a set of measures for: a) screening (i.e. determination of potential adverse environmental and social impacts), b) mitigation, c) monitoring and d) institutional arrangements to be undertaken during planning, design, procurement, construction and post-construction stages of the activities to be financed in the LWH, to eliminate adverse environmental and social
impacts, offset them, or reduce them to acceptable levels. The EMP includes the actions needed to implement these measures. Refer Annex C for sample EMP to be used in the project.

For the purposes of this Environmental Management Plan (EMP), the activities in the LWH that are likely to have adverse impacts are mainly expected to arise from the installing component B infrastructure especially the Water Harvesting sub component which entails the construction of dams.
<table>
<thead>
<tr>
<th>Project components/ Activities</th>
<th>Negative Impacts</th>
<th>Mitigation Measures</th>
<th>Responsible Inst</th>
<th>Cost Estimates(USD)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Dam Construction, Irrigation system Installation and Land Husbandry</em></td>
<td>Localised vegetation and crop destruction</td>
<td>Provide compensation for crops and vegetation destroyed in accordance with the RPF</td>
<td>LWH PCT</td>
<td><strong>4.5 Million USD</strong> for mitigation and monitoring including compensation cost for land acquired, structures destroyed, crop loss, vegetation destroyed.</td>
<td>The LWH Environmental Specialist with input LWH Consultants must work with the design team to ensure mitigation measures are incorporated in the design.</td>
</tr>
<tr>
<td></td>
<td>Housing/structure and property destruction or land acquisition.</td>
<td>Provide compensation for any house, shelter or building destroyed as specified in the RPF</td>
<td>LWH PCT</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Localised soil disturbances and erosion</td>
<td>Undertake Soil control measures</td>
<td>LWH PCT</td>
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<td></td>
<td>Noise and dust related impacts during construction and operation</td>
<td>Use dust and noise mitigation measure to minimise impacts e.g PPEs, watering of construction sites to reduce dust, undertake construction in dry season etc</td>
<td>LWH PCT and Contractor</td>
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<td></td>
<td>Borrow pits related impacts including becoming breeding sites for malaria vector, hazard spots that could cause drowning, scarring of the environment.</td>
<td>Select borrow pits in areas not considered ecologically fragile or sensitive, rehabilitate borrow pits, and ensure that the borrow pits have drains to ensure that stagnant water which are breeding sites for disease vectors do not occur Prepare IPM for use in all</td>
<td>LWH PCT</td>
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<tr>
<td>Project components/ Activities</td>
<td>Negative Impacts</td>
<td>Mitigation Measures</td>
<td>Responsible Inst</td>
<td>Cost Estimates(USD)</td>
<td>Comments</td>
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<td></td>
<td>Water quality deterioration due to indiscriminate pesticide use</td>
<td>the projects where fertiliser is planned for use including training</td>
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<td></td>
<td><strong>Health and Safety</strong></td>
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<td></td>
<td>Construction related impacts including accidents experienced by the construction workers or residents likely to occur during the construction and installation phase.</td>
<td>Provision of suitable and safe clothing, shoes and head protection for site staff.</td>
<td>LWH PCT and Contractor</td>
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<td></td>
<td>.Adoption of best Health and Safety working practices/conditions during construction and operation activities.</td>
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<td>Work during approved and acceptable hours to minimize noise and effects of air pollution from their equipment.</td>
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<td>Effective and close supervision of construction activities.</td>
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<td></td>
<td>Legal Instruments to hold Contractors financially and in some cases criminally liable for adverse impacts that result from failure to implement contracted required mitigated measures.</td>
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<td></td>
<td>Noise related impacts during construction and operation phase</td>
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<td></td>
<td>Dust related impacts from construction machinery especially motorised vehicles</td>
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<tr>
<td>Project components/ Activities</td>
<td>Negative Impacts</td>
<td>Mitigation Measures</td>
<td>Responsible Inst</td>
<td>Cost Estimates(USD)</td>
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<td></td>
<td>Accidental drowning in the dams by livestock or children</td>
<td>Fence the dam area, erect warning signs and undertake sensitization of local communities</td>
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<td></td>
<td>Sanitation and waste management impacts</td>
<td>Develop a waste management plan in all the construction camps</td>
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<tr>
<td>Cultural Impacts</td>
<td>Establishment of dams, trenches and irrigation systems can lead to unearthing genocide sites hence cause cultural strife.</td>
<td>Consultation should be undertaken with local authorities and communities to ensure that potential genocide sites are avoided.</td>
<td>LWH PCT and Contractor</td>
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<td></td>
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<td>Accidental unearthing of such sites should be culturally handled in accordance with the cultural rites and requirements</td>
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<td>Funds for conducting necessary rituals and ceremonies related to beliefs must be set aside</td>
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<td></td>
<td></td>
<td>Avoid siting infrastructure where people will be disturbed and where resettlement could be an issue</td>
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</table>
6.12 Monitoring Plan

The objective of monitoring is two fold:

1) To alert project authorities (i.e. primarily) by providing timely information about the success or otherwise of the environmental management process outlined in this ESMF in such a manner that changes can be made as required to ensure continuous improvement to LWH environmental management process (even beyond the project’s life).

2) to make a final evaluation in order to determine whether the mitigation measures incorporated in the technical designs and the EMP have been successful in such a way that the pre-project environmental and social condition has been restored, improved upon or is worst than before and to determine what further mitigation measures may be required.

This section sets out requirements for the monitoring of the environmental and social impacts of the LWH projects. Monitoring of environmental and social indicators will be mainstreamed into the overall monitoring and evaluation system for the project. In addition, monitoring of the implementation of this ESMF will be carried out by REMA and the key implementing institutions of LWH.

6.12.1 Monitoring of Environmental and Social Indicators

Two opportunities will be taken to build a simple system for the monitoring and evaluation of environmental and social impacts:

The goals of monitoring are to measure the success rate of the project, determine whether interventions have resulted in dealing with negative impacts, whether further interventions are needed or monitoring is to be extended in some areas. Monitoring indicators will be very much dependent on specific project contexts.

Initial proposals

The key issues to be considered in the LWH subprojects include monitoring of water quality, agricultural production, income generation, and health and population influx. The goals of monitoring are to measure the success rate of the project, determine whether interventions have resulted in dealing with negative impacts, whether further interventions are needed or monitoring is to be extended in some areas. Monitoring indicators will be very much dependent on specific project contexts.

Monitoring and surveillance of subprojects will take place on a “spot check” basis at it would be impossible to monitor all the subprojects to be financed under the project. The spot checks consist of controlling the establishment of mitigation measures. It is not recommended to collect large amounts of data, but rather to base monitoring on observations by project technicians and stakeholders to determine the trends in indicators.
**Monitoring of participation process**

The following are indicators for monitoring of the participation process involved in the project activities.

Number and percentage of affected households consulted during the planning stage;

- Levels of decision-making of affected people;
- Level of understanding of project impacts and mitigation;
- Effectiveness of local authorities to make decisions;
- Frequency and quality of public meetings;
- Degree of involvement of women or disadvantaged groups in discussions.

Monitoring of implementation of mitigation plans lists the recommended indicators for monitoring the implementation of mitigation plans.

### 6.12.2 Evaluation of Results

The evaluation of results of environmental and social mitigation can be carried out by comparing baseline data collected in the planning phases with targets and post-project situations.

A number of indicators would be used in order to determine the status of affected people and their environment (land being used compared to before, how many clean water sources than before, etc). In order to assess whether these goals are met, the LWH Environmental Specialist with technical support of the Advisor will indicate in the EMP, parameters to be monitored, institute monitoring milestones and provide resources necessary to carry out the monitoring activities.

The following are some pertinent parameters and verifiable indicators/questions to be used to measure the ESMF process, mitigation plans and performance;

- Has the Environment consultants trained a local social and environmental specialist?
- Have the EMP’s and Final Designs been cleared by the REMA?
- Have the Civil Works Contractors got considerable legal muscle to enforce the EMP?
- At what rate are the civil works been monitored by LWH and by the REMA?
- How many violations of the contractors/transporters have been recorded and at what rate are they occurring.
- How many RAPS have been fully executed before PAPs are physically displaced?
- How many recorded grievance cases have been settled within one year?

### 6.12.3 Monitoring of ESMF Implementation

In addition to the Project Reports and ESIA studies required under the Organic Law, an Annual Audit on ESMF Implementation will be prepared by the PCT, and delivered to REMA. In addition, each large project that has been subject to an EA study (or RAP etc) will also be required to produce an annual audit report, for delivery to REMA.
### Table 7. Project Activities/Impacts

<table>
<thead>
<tr>
<th>Project Activities/Impacts</th>
<th>Impact Significance</th>
<th>Mitigation Measure(s)</th>
<th>Indicators</th>
<th>Responsibility</th>
<th>Frequency/Cost</th>
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</thead>
<tbody>
<tr>
<td><strong>Activity:</strong></td>
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<tr>
<td><strong>Land/Property Acquisition</strong></td>
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<tr>
<td><strong>Impacts</strong></td>
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<tr>
<td>Permanent loss of Land.</td>
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<td>Denial, Restrictive or</td>
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<td>loss of access to other</td>
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<td>economic resources.</td>
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<td><strong>Activity:</strong></td>
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<tr>
<td><strong>Promoting use and access</strong></td>
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<td>the required inputs (chemicals and high quality seed)</td>
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<tr>
<td><strong>Impacts</strong></td>
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<tr>
<td>Ground and surface water</td>
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<td>pollution by agro-chemicals</td>
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#### Activity: Land/Property Acquisition

**Impacts**
Permanent loss of Land, Denial, Restrictive or loss of access to other economic resources.

**Duration**
Impacts will be long term in nature for as long as the dams and reservoir continue to exist that land acquired will be permanently lost.

**Magnitude**
The scale and magnitude of the impacts will be fairly moderate because Rwanda is a tiny country with limited land hence acquisition of land leads contributes to displacement at any time hence negative impact which can be termed as mildly severe.

- **Or**
- Prepare resettlement and compensation plans (RAPs) consistent with the prepared RPF.
- Prepare and use cleared engineering design drawings and other contract documents, addressing specific mitigation measures.
- Conveyance Infrastructure i.e. Valley dams access roads etc located in areas with little or no impact on people and their economic resources
- RAPs prepared for each subproject and approved by World Bank and REMA
- Compensation agreements e.g., copies of agreed contracts by PAPs, copies of paid out cheques.

**Principal Responsibility - LWH staff**

**Others - Environment Advisor (EA) and LWH Environmental and Social Specialist, REMA**

**4.5 million USD** for compensation for land, crops loss, and vegetation destruction. This figure is derived and estimated in the LWH.

**Activity:**

**Promoting use and access the required inputs (chemicals and high quality seed)**

**Impacts**
Ground and surface water pollution by agro-chemicals

**Duration**
Impacts will be long term in nature for as long as the program is under implementation and using pesticides.

**Magnitude**
The scale and magnitude is fairly significant and severe especially cumulatively in terms of chemical run off thus

- Develop an Integrated Pest Management (IPM) for all the sub projects to guide in pesticide use.
- Train target groups in use and application of pesticides
- Water and soil quality
- Availability of an IPM strategy
- Availability of Training Manual in IPM
- MINAGRI, REMA, LWH

**Annually**
<table>
<thead>
<tr>
<th>Project Activities/Impacts</th>
<th>Impact Significance</th>
<th>Mitigation Measure(s)</th>
<th>Indicators</th>
<th>Responsibility</th>
<th>Frequency/Cost</th>
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<tbody>
<tr>
<td>Activity:</td>
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<tr>
<td>Construction of valley</td>
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<td>dams and Irrigation</td>
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<td>systems for irrigation</td>
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<td>works</td>
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<tr>
<td>Impacts</td>
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<tr>
<td>Soil degradation and</td>
<td>nutrient load into the drainage systems that could have far reaching impacts over time on the entire and major watersheds that drain in Akagera River and finally into Lake Victoria.</td>
<td>Dam design to include spillways, coffer dams etc. Undertake soil conservation measures to reduce sedimentation effect e.g. silt trap construction Undertake frequent dam instrumentation and monitoring, install spillways and coffer dams.</td>
<td>Soil salinity Water quantity Sediment load Water quality Water quality Change in exploitation levels of water/land Prevalence rates of water borne Diseases. Dam hazards e.g. leaks, seepages detected and corrected. Observe color of water from the seepage areas on the walls of the dam</td>
<td>REMA, LWH MINTERE, MINSANTE</td>
<td>Bi-Anually</td>
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<td>downstream flooding or</td>
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<td>water denial</td>
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<td>Dam hazards e.g.</td>
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<td>seepages, leaks, flooding.</td>
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<td>Habitat/ecosystem</td>
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<td>changes</td>
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<td>Erosion &amp; sedimentation</td>
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<td>Noise and dust impacts</td>
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<td>Borrow pit impacts</td>
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<td>Increase in spread of</td>
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<td>Project Activities/Impacts</td>
<td>Impact Significance</td>
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<td>Frequency/Cost</td>
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<tr>
<td>Water borne diseases, bilharzia, malaria, Soil salinization/alkanization from the irrigation canals</td>
<td>fertility and productivity aspects.</td>
<td>as specified above</td>
<td>through review of hospital records</td>
<td>LWH, Contractor, REMA</td>
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<td>Introduce fish in the reservoirs to feed on mosquito larvae etc</td>
<td>Soil sample results indicating PH</td>
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<td>Apply lime to the soils as well as other soil control measures to control PH</td>
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<tr>
<td>General Construction related impacts including camp construction</td>
<td>Duration Impacts will be short term in nature, reversible and of low significance in terms of scope, severity and magnitude.</td>
<td>Ensure that the contractor follows best practice in constriction management of impacts. Eg. Rehabilitation and restoration of borrow pits, berms to control erosion, sprinkling of water to reduce dust etc. Undertake awareness and sensitization on HIV/Aids, social harmony etc.</td>
<td>Availability of a contract document on the measure the contractor must adhere to in ensuring best practise in constriction</td>
<td>LWH, Contractor, REMA</td>
<td>During construction phase</td>
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</table>
6.12.4 Monitoring Roles and Responsibilities

**LWH Implementing Partner Institutions**
All the LWH implementing agencies identified under this project, will monitor the specific components of the LWH project that they are targeted to execute. They will be required to prepare periodic monitoring reports for submission to the LWH PCT and specifically to the Environment Officer and the M&E Officer.

**LWH Project Coordination Team (PCT)**
LWH’s PCT should within 6 months of commencement of the project recruit suitable local persons as Environmental Officer and Monitoring and Evaluation Officer. In order to provide these specialists with hands on experience they should be paired up with an international consultant for a period of 6 months in order to understand the practise of environmental assessment and management.

The LWH Monitoring and Evaluation Officer will be primarily responsible for ensuring compliance to the monitoring framework. Jointly with the Environmental Officer of LWH, they will undertake review of the monitoring reports emanating from the implementing agencies and will then upon approval submit these monitoring reports to REMA and the World Bank. The LWH PCT will also provide overall coordination in monitoring including training coordinating of training in collection and analysis of monitoring data for data collectors.

Critical role of the LWH PCT will include data analysis, as well as maintenance of management information systems and all baseline data. Lately other than preparation of periodic reports the PCT will implement all the necessary modifications in the monitoring framework.

**Rwanda Environment Management Authority**
REMA will play the leading oversight role of monitoring the activities of this project. The REMA will carry out this role by ensuring that the environmental management plans (EMPs) contained in the cleared design package is being implemented as specified therein. REMA will monitor the reports on a regular basis, perhaps quarterly. They will rely on a bottom up feedback system from the ground by going through the monitoring reports and making regular site visits to inspect and verify for themselves the nature and extent of the impacts and the success or lack off, of the mitigation measures.

**LWH Locally Based Environmental and Social Specialist**
LWH will recruit a locally based environmentally specialist who will be paired with an EA as specified above for a period of 6 months to learn and acquire on the job skills related to preparation of EMPs and monitoring. After this period the LWH local environmental specialist will take over all the duties of the EA. The EA advisor will be assessed at the end of the 6 months to determine the extent to which he ensured know how transfer to the local specialist and how well the specialist learned from the EA advisor.
Local Communities
Local communities will be useful agents in collection of data that will be vital in monitoring and as such they will play a role in the monitoring framework. Local communities in the project intervention areas will receive training and capacity building skills in data collection to be done by the implementing agencies so as to equip them with the ability to collect data.

Specific Community Groups

Water Users Association (WUA)
In each project site, there will be one Water Users Association (WUA) which will oversee the water usage. This will have its bye-laws and legal registration. Its membership will comprise of farmers who will be utilizing irrigation water in their farms i.e. those within the command area. The Water Users Association will have a coordination committee that will be responsible for the operation and maintenance of the irrigation scheme. In the initial project implementation stages, the operation and management will be jointly conducted by the project staff and the farmers (who will comprise of the coordination committee of the WUA) but eventually when the project exits, the farmers’ coordination committee members will manage the water use.

One of the areas to be addressed through the WUA coordination committee is how to manage the siltation of the reservoir and the irrigation canals, which would otherwise reduce the water reaching the entire command area thus affecting the yields. This will be done by having irrigation user fee per season depending on the area of land owned by an individual. The WUA coordination committee will be responsible for collection of these funds for its operation and de-silt the canals and the water reservoir when need arises. They should have a strict procedure for collecting user fees with set deadlines. Since the WUA will have its by-laws, they should include penalties for defaulters. However, the nature of the irrigation system may not provide a means of blocking supply of water to the individual defaulters; hence the penalty could include withdrawal of plots in the next season and rented out to willing farmers. It is the responsibility of the WUA coordination committee to ensure that the farmers are fully aware of the bye-laws and that they are strongly enforced.

Land-husbandry Self-help Groups (LSGs)
Land-husbandry Self-help Groups (LSGs) will be formed by farmers within the same sub-basin of a sub-watershed, and registered as a legal entity and as a Joint Venture Company with its own Memorandum of Association and Articles of Associations. These farmers will comprise those in the water catchment area and command area catchment area. Use of this group approach will ensure that all the farmers with land parcels in that category of land-use will implement the land-husbandry practices in a coordinated manner, thus curbing negligence, which may have a negative effect on the water reservoir and the command area by encouraging erosion.
6.12. 15 Community Participatory Monitoring and Evaluation

Capacity building for Participatory Monitoring and Evaluation will be done through training of trainers (ToT).

Each subgroup will select 2 representative members who will train the rest of their group members at the end of their training.

In close collaboration with MINAGRI and the project staff, community level Monitoring and Evaluation (PM&E) will be put in place. The community’s capacity will be built to enable them:

- Set targets: Each group will set targets based on what they hope to achieve as a group and individual level as a result of participating in the project
- Develop indicators: Each group will develop qualitative and quantitative indicators that they will use to monitor progress made towards the achievement of expected results (activities, outputs {short-term}, outcomes {medium term} and impacts {long term}) over time compared to the set targets. This will also incorporate participation and benefits by different gender categories.
- Reflective learning and corrective action: Twice every season (mid and end) each group will monitor their progress based on where they are, which way they are going, and how far they are from where they want to be. Through this monitoring, they will be able to identify factors that have influenced them positively to move in the right direction, or negatively and through reflective learning take corrective measures to put them back on track during the next season.
- Within each of the groups created (CCPIGs, WUA and LSGs) and implementing specific activities, there will be a monitoring and evaluation committee which will comprise of the ToTs and 3 more group members who will foresee the successful implementation of the activities by the members through ensuring cooperation of the members.
7.0 PROJECT COORDINATION AND IMPLEMENTATION ARRANGEMENTS

7.1 Projects and Sub-Project Preparation, Approval and Reporting
This section of the ESMF describes the process for ensuring that environmental and social concerns are adequately addressed through the institutional arrangements and procedures used by the project for managing the identification, preparation, approval and implementation of subprojects. This section sets out the reporting systems and responsibilities of the institutions in implementing the ESMF including the details to be addressed by the ESMF and the specific steps to be undertaken to ensure adherence to the ESMF.

7.2 Subproject Review
Subprojects and activities will each need to be reviewed for potential environmental and social impacts. The LWH is expected to produce net benefits. However certain project activities may have environmental and social impacts that will require mitigation. For this reason, this project has been rated as Category B under the World Bank Policy on Environmental Assessment (OP 4.01), requiring Environmental Assessment.

7.3 Subproject Screening and Screening Checklist
Subprojects and activities that fall under component B will each need to be reviewed for potential environmental and social impacts. Using the screening and review process for subproject 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 adverse impacts.

The screening will further ensure that subprojects that may have potential adverse impacts are studied in greater detail including need for subproject specific EIA. As part of the identification of sub-projects, the project proponent will prepare a simple screening checklist (Format 1.0).

7.4 Screening and sub project preparation
The screening will begin right at the time that the sub project has been identified including proposed location, scope and nature. The idea is to have the screening occur at the time of conducting feasibility studies so that any potential impacts identified through screening are immediately incorporated into the feasibility study hence ensuring that environmental sound design of the sub projects occurs right at the project design phase. This procedure will also apply when preparing the project report.

At the same time in cases where a full scale EIA is required, it will be paramount that the feasibility study occurs concurrent with the EIA study in order to ensure that the findings of the EIA are incorporated in the feasibility study at the design stage. This will ensure
that environmental sound design including proposed mitigation measures as well as
alternatives are incorporated in the feasibility reports at the design stage hence avoiding
design change at an advanced stage.

7.5 Who prepares a screening checklist?
The screening checklist will be prepared by LWH specifically they will be prepared by
the Environmental specialist to be hired by LWH. The screening checklist/form will be
submitted to the District Environment Officer (REMA) for review and approval. If the
DEO determines that the impacts will be significant a project report will be required.
District Environmental Committees will be required to sign off the screening
checklist review forms submitted by the DEO.

The reviewer of the screening checklist has an option to determine whether a more
detailed Project Report, based on a field appraisal, is required. A Project Report (will
require the DEO to briefly visit the proposed project site, interview the project
proponents, and assess the project’s impacts in view of their knowledge concerning
environmental and social risks and concerns in the area.

Project reports will be prepared by the environmental specialist of LWH with oversight in
put from the short term EA advisor. The project reports will be submitted to REMA for
final review and approval.

In the eventuality that a subproject cannot be approved by REMA on the
basis of a Project Report, the proponent will be advised to undertake a simple
environmental assessment and prepare an EMP. Project reports will be prepared
by independent consultants registered by REMA, who will be paid by the LWH.

7.6 Screening Checklist Review Form
Based on this application, the proposal will be reviewed and selection for the next stage
of evaluation undertaken. At this selection stage, a first level of environmental screening
takes place on the basis of the screening checklist completed by the proponent in this case
LWH and done by the environmental specialist recommended to be hired as explained
above.

The screening checklist will be reviewed using the Review Form, to be completed either
by the district environment officer. Where there are social impacts indicated, the form
will have to be reviewed in addition by LWH’s Social Specialist. The form prompts the
reviewer to verify the information provided by the proponent, and confirm the best course
of action. The reviewer must consider the nature and location of the project and the
anticipated impacts, and based on his/her judgment, confirm or propose the best course of
action.
**Format 1.0: SCREENING CHECKLIST**

**LWH Project: Select relevant project**

<table>
<thead>
<tr>
<th>Sub-project name</th>
<th>[type here]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>[type here]</td>
</tr>
<tr>
<td>Estimated cost (USD)</td>
<td>[type here]</td>
</tr>
</tbody>
</table>

**TYPE OF PROJECT OR ACTIVITY**

### Sub Project Type

- Construction of Valley Dams
- Construction of Irrigation Systems

Please give more details: [type here]

For all projects, an Environmental and Management Plan (EMP) will be required. In addition, the following studies may be required:

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Will this project affect Indigenous People? If yes, an Indigenous People’s Plan will be required</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Will the project require land for its development, and therefore displace individuals, families or businesses from land that is currently occupied, or restrict people’s access to crops, pasture, fisheries or forests, even, whether on a permanent or temporary basis. If yes, a Resettlement Action Plan will be required</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Will the Project:</strong></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Adversely affect natural habitats nearby, including forests, rivers or wetlands?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Require large volumes of construction materials (e.g. gravel, stone, water, timber, firewood)?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use water during or after construction, which will reduce the local availability of groundwater and surface water?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lead to soil degradation, soil erosion in the area?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Create waste that could adversely affect local soils, vegetation, rivers and streams or groundwater</td>
<td></td>
<td></td>
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<tr>
<td>Create pools of water that provide breeding grounds for disease vectors (for example malaria or bilharzia)?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Involve significant excavations, demolition, movement of earth, flooding, or other environmental changes?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Affect historically-important or culturally-important site nearby?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Require land for its development, and therefore displace individuals, families or businesses from land that is currently occupied, or restrict people’s access to crops, pasture, fisheries, forests or cultural resources, whether on a permanent or temporary basis?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Result in human health or safety risks during construction or later?

Involve inward migration of people from outside the area for employment or other purposes?

<table>
<thead>
<tr>
<th>Will the Project:</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Result in conflict or disputes among communities?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Affect indigenous people, or be located in an area occupied by indigenous people?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Result in a significant change/loss in livelihood of individuals?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adversely affect the livelihoods and/or the rights of women?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

If you have answered Yes to any of the above, please describe the measures that the project will take to avoid or mitigate environmental and social impacts

[type here]

What measures will the project take to ensure that it is technically and financially sustainable?

[type here]

CONCLUSION

Which course of action do you recommend?

ESMP       RAP
There are no environmental or social risks

[type here]

If a RAP is required, will the project Displace or restrict access for less than 200 individuals, or if over 200, are losses for all individuals less than 10% of their assets?

If Yes, Prepare an abbreviation RAP
If No, Prepare a full RAP

Full details of resettlement requirements are provided in the accompanying Resettlement policy Framework.

Completed by: [type here]
Name: [type here]
Position: [type here]
Date: [type here]
**Format 2.0: SCREENING CHECKLIST REVIEW FORM**

<table>
<thead>
<tr>
<th>Based on the location and the type of project, please explain whether the Proponent’s responses are satisfactory.</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Their description of the compliance of the project with relevant planning Documents</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>If ‘No’, please explain: [type here]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Their responses to the questions on environmental and social impacts</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>If ‘No’, please explain: [type here]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Their proposed mitigation measures</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>If ‘No’, please explain: [type here]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Their proposed measures to ensure sustainability</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>If ‘No’, please explain: [type here]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**REVIEWER’S CONCLUSION**

Which course of action do you recommend?

- ESMP: [Type here]
- RAP: [Type here]

There are no environmental or social risks

If a RAP is required, will the project displace or restrict access for less than 200 Individuals, or if over 200, are losses for all individuals less than 10% of their assets?

- If Yes, Prepare an abbreviated RAP
- If No, Prepare a full RAP

Full details of resettlement requirements are provided in the accompanying Resettlement Policy Framework.

If this differs from the Proponent’s recommended course of action, please explain:

[Type here]

Preparation of a project Report, based on field appraisal by REMA District Officer, is required to investigate further, specifically to investigate:

[Type here]

Reject

**Review form completed by:** [type here]

**Name:** [type here]

**Position / Community:** [type here]
Project Reports are normally prepared as a means of informing REMA of the proposed development such that after review of the report, REMA advises on the need or otherwise for a full EIA. The EIA regulations allow for approval of proposed projects at the Project Report Stage and have been effectively used by REMA to grant Environmental Licenses to small projects without requiring a full EIA.

### Table 8: The REMA Process for Approving Project Reports

<table>
<thead>
<tr>
<th>Steps</th>
<th>Action</th>
<th>Actor</th>
<th>Time requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>One</td>
<td>Submission of PR to REMA. REMA receives PR, issues a receipt and acknowledgement.</td>
<td>LWH</td>
<td>To be undertaken by LWH environmental and social specialists with input from the Safeguards Advisor</td>
</tr>
<tr>
<td>Two</td>
<td>REMA mails PR to Lead Agencies</td>
<td>REMA</td>
<td>7 days assuming all requirements are fulfilled</td>
</tr>
<tr>
<td>Three</td>
<td>Lead agencies review PR and issue comments</td>
<td>Lead Agencies</td>
<td>21 days (minimum) after receipt of PR from REMA.</td>
</tr>
<tr>
<td>Four</td>
<td>Review of PR by REMA</td>
<td>REMA</td>
<td>30 days after receipt of PR.</td>
</tr>
<tr>
<td>Five</td>
<td>Communication of findings from REMA review</td>
<td>REMA</td>
<td>45 days after receipt of PR.</td>
</tr>
</tbody>
</table>

Typical outcomes of review of Project Reports from REMA are likely to be as shown in Table 9 below. These are as follows:

**Project is approved.** Where REMA and Lead Agencies ascertain that a project report has disclosed adequate mitigation for identified impacts, the project is approved by REMA upon which, conditions attached to grant of an Environmental License are issued. Once these are fulfilled, an Environmental License is also issued subject to conditions which will be specific to the scheme in question. Among these is the requirement that the scheme design should not be altered without approval by REMA. As well, an audit report is required of each project after the first year of completion.

**Project Report discloses potential for major irreversible adverse impacts.** In this case, REMA may not approve the project.

### Table 9: Possible Outcomes of REMA Review of Project Reports

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Recommendation</th>
<th>Important precautions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project found to have no significant Social and Environmental Impacts or Project report discloses sufficient mitigation measures</td>
<td>An Environmental License will be issued by the Authority</td>
<td>Project report must disclose adequate mitigation measures and show proof of comprehensive consultations within the area of influence.</td>
</tr>
<tr>
<td>Significant adverse social and environmental impacts found or Project Report fails to disclose adequate mitigation measures.</td>
<td>A full cycle EIA will be required by REMA</td>
<td>As above</td>
</tr>
<tr>
<td>A proponent is dissatisfied with the outcome of the REMA review.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Format 3.0: PROJECT REPORT FORM**

<table>
<thead>
<tr>
<th>LWH</th>
<th>Select relevant project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sub-project name</td>
<td>[type here]</td>
</tr>
<tr>
<td>Estimated cost (USD)</td>
<td>[type here]</td>
</tr>
<tr>
<td>What are the project objectives and Activities</td>
<td>[type here]</td>
</tr>
<tr>
<td>Reason for field appraisal, based on Issues in screening checklist</td>
<td>[type here]</td>
</tr>
<tr>
<td>Approximate size of the project in land area</td>
<td>[type here]</td>
</tr>
<tr>
<td>Approximately size of the project in terms of affected individuals</td>
<td>[type here]</td>
</tr>
<tr>
<td>How was the site of the sub-project chosen?</td>
<td>[type here]</td>
</tr>
<tr>
<td>Does the project comply with the most Relevant planning document, for example the Development Plan?</td>
<td>[type here]</td>
</tr>
</tbody>
</table>

**Will the Project:**

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adversely affect natural habitats nearby, including forests, rivers or wetlands?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If ‘Yes,’ give details:</td>
<td>[type here]</td>
<td></td>
</tr>
</tbody>
</table>

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Is the project sited within a strict protected area, national park, nature reserve, natural/historical monument or area of cultural heritage?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If ‘Yes,’ give details:</td>
<td>[type here]</td>
<td></td>
</tr>
</tbody>
</table>

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Require large volumes of construction materials e.g. grave, stones, water, timber, firewood)?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If ‘Yes,’ give details:</td>
<td>[type here]</td>
<td></td>
</tr>
</tbody>
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<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Use water during construction, which will reduce the local availability of ground water and surface water?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If ‘Yes,’ give details:</td>
<td>[type here]</td>
<td></td>
</tr>
</tbody>
</table>

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead to soil degradation, soil erosion or soil salinity in the area?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If ‘Yes,’ give details:</td>
<td>[type here]</td>
<td></td>
</tr>
</tbody>
</table>

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Create waste that could adversely affect local soils, vegetation, rivers and streams or groundwater?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If ‘Yes,’ give details:</td>
<td>[type here]</td>
<td></td>
</tr>
<tr>
<td>Will the Project:</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>-----------------------------------------------------------------------------</td>
<td>-----</td>
<td>----</td>
</tr>
<tr>
<td>Create pools of water that provide breeding grounds for diseases vectors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(for example malaria or bilharzia)?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If ‘Yes,’ give details:</td>
<td>[type here]</td>
<td></td>
</tr>
<tr>
<td>Involve significant excavations, demolition, movement of earth, flooding,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>or other environmental changes?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If ‘Yes,’ give details:</td>
<td>[type here]</td>
<td></td>
</tr>
<tr>
<td>Affect historically-important or culturally-important site nearby?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If ‘Yes,’ give details:</td>
<td>[type here]</td>
<td></td>
</tr>
<tr>
<td>Require land for its development, and therefore displace individuals,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>families or businesses from land that is currently occupied, or restrict</td>
<td></td>
<td></td>
</tr>
<tr>
<td>people’s access to crops, pasture, fisheries, forests or cultural resources,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>whether on a permanent or temporary basis?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If ‘Yes,’ give details:</td>
<td>[type here]</td>
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<tr>
<td>Result in human health or safety risks during construction or later?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If ‘Yes,’ give details:</td>
<td>[type here]</td>
<td></td>
</tr>
<tr>
<td>Involve inward migration of people from outside the area for employment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>or other purposes?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If ‘Yes,’ give details:</td>
<td>[type here]</td>
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</tr>
<tr>
<td>Result in conflict or disputes among communities?</td>
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<td></td>
</tr>
<tr>
<td>If ‘Yes,’ give details:</td>
<td>[type here]</td>
<td></td>
</tr>
<tr>
<td>Affect indigenous people, or be located in an area occupied by indigenous</td>
<td></td>
<td></td>
</tr>
<tr>
<td>people?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If ‘Yes,’ give details:</td>
<td>[type here]</td>
<td></td>
</tr>
<tr>
<td>Result in a significant change/loss in livelihood of individuals?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If ‘Yes,’ give details:</td>
<td>[type here]</td>
<td></td>
</tr>
<tr>
<td>Adversely affect the livelihoods and/or the rights of women?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If ‘Yes,’ give details:</td>
<td>[type here]</td>
<td></td>
</tr>
</tbody>
</table>
Will the Project:  

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

**MITIGATION MEASURES**  
If you have answered Yes to any of the above, please propose adequate mitigation measures.

[Type here]

**ALTERNATIVES**  
Is it possible to achieve the objectives above in a different way, with fewer environmental and social impacts? If yes, describe these alternatives, and state why they have been rejected.

[Type here]

**OTHER OBSERVATIONS**  
Please describe any other observations, especially any related to the reason for the field appraisal.

[Type here]

**CONCLUSION**

Approval:
There are no environmental or social risks  
Independent preparation of a Detailed Plan is required:  
ESMP  
IPP  
RAP

If a RAP is required, will the project displace or restrict access for less than 200 individuals, or if over 200, are losses for all individuals less than 10% of their assets?

If Yes, prepare an abbreviated RAP  
If No, prepare a full RAP

Full details of resettlement requirements are provided in the accompanying Resettlement Policy Framework.

Reject

Review form completed by [type here names of all contributors to the appraisal]

Name:  [type here]  
Position/community: [type here]  
Date: [type here]
In the eventuality that a Project cannot be approved by REMA on the basis of a Project Report, the proponent will be advised to undertake full cycle ESIA leading to development of a fully fledged Environmental and Social Impact Assessment Study Report.

**Scoping Report**
Firstly, on advice from REMA, the proponent will prepare a Scoping Report specifying the project’s area of influence, the thematic scope and depth of assessments required, the composition of the required EIA team, and the probable budget required to mount the EIA Study.

**ESIA Study**
Upon review and approval of the Scoping Report, REMA will advise that an ESIA Study be undertaken. The ESIA Study will entail a systematic investigation of all impact areas as identified in the scoping report, taking care to document the current baseline environment, resource exploitation patterns and ecological pressure points. It is mandatory for the ESIA study to undertake public consultation with all stakeholders in the project’s area of influence. The ESIA Team should note and understand all stakeholder interests so as to cater for them in the ESMP. All accruing information will be written into a Draft ESIA Report prepared in the same format as the project Report and submitted to REMA for review. Upon review of this report, it will be subjected to public review.

**Public Review of the ESIA Report**
This will entail exposure of all the EIA documents at strategic points within the project’s area of influence so as to allow all stakeholders to read and understand how they stand to be affected by the project. The public review has to be advertised twice in local dailies that are widely read in Rwanda, and are often supplemented by public hearings organized by REMA where the project is explained to local stakeholders. Upon expiry of the public review period, the ESIA team will organize the written comments either into an additional chapter or a volume to the ESIA report. This chapter will clearly explain how each of the comments and concerns have been addressed and resolved. This will be issued under the same conditions as is the case of the project report.

**7.5 Overall Project Compliance and Reporting**
Owing to the significant nature of some of the project activities, a strict system of compliance monitoring and reporting will be adopted. *Figure 4 sets* out the key reporting lines and triggers.
Figure 4; The key reporting lines and triggers.

1a. DEO Annual Reports

1b. PCT Spot checks

1c. District-level Environmental and Social Trends

1d. Stakeholder/Public complaints

2. PSC Annual Report on Environmental and Social Compliance

3. Annual Environmental and Social Review

4. Independent Inquiries into problems project and Key Issues

CORRECTIVE MEASURES TO ADDRESS PROBLEMS AT DISTRICT LEVEL

AMENDMENT OF LWH PROJECT APPROACHES
**Annual Reports**

Forms proposed for completion on an annual basis are set out in Formats 4 and 5 below. These will comply with Rwandan EIA regulations, and will provide:

A means of communication between districts and PSC team at national level (i.e. through the Environmental Officer in the PCT), and between the PCT and the relevant government departments;

A paper trail of experience and issues running from year to year throughout the project;

Practical information from which the Environmental Officers Officer can assess strategic effectiveness of the proposed plans in achieving project objectives;

Practical information from which the Environmental Officers in the PCT and the consultant used to carry out the annual performance audit can draw on.

The District-level annual report will be completed with input in the appropriate sections by the District Environment Officer or the District Development Officer. The objective of the report is to feedback on activities and observations from sub-projects implemented over the review period in the district. The form will be submitted to the District Environment Committee and the PCT.

This national-level annual report is to be completed by the PCT principally by the Environmental Officer. The objective of the report is to consolidate and summarize the feedback from the districts, and assess the overall progress of the LWH projects against objectives.
Format 4.0: ANNUAL REPORT FORM FOR THE DISTRICT LEVEL

LWH project: select relevant project

District: [type here]
Reporting year: [type here]
Date of report: [type here]

PROJECT SUMMARY

Please enter numbers of sub-projects in the following table:

<table>
<thead>
<tr>
<th>Approved this year</th>
<th>Application included a screening checklist</th>
<th>Community carried out mitigation without advice</th>
<th>LWH provided advice on mitigation</th>
<th>Field Appraisal</th>
<th>ESMP</th>
<th>RAP</th>
<th>IPDP</th>
<th>PMP</th>
</tr>
</thead>
<tbody>
<tr>
<td>CATEGORY B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dam project</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Irrigation scheme</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction of roads and bridges</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aquaculture</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Terracing of farmland</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agricultural interventions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CATEGORY B – Results of ESMPs, RAPs etc

<table>
<thead>
<tr>
<th>Type of projects that have been subjected to ESMP, RAPs etc</th>
<th>Impacts identified included:</th>
<th>Are mitigation or monitoring measures being carried out adequately? If not, why not?</th>
</tr>
</thead>
<tbody>
<tr>
<td>[type here]</td>
<td>[type here]</td>
<td>[type here]</td>
</tr>
</tbody>
</table>

MANAGEMENT ISSUES

Have you or your predecessor been involved in the targeting or identification of sub-projects?

☐ Yes  ☐ No

If ‘Yes’, please describe:
[type here]

Have communities been involved in the targeting or identification of sub-projects?

☐ Yes  ☐ No

If ‘Yes’, please describe:
[type here]

Please explain any participatory issues that have impacted ability of communities to identify sub-projects:
[type here]
Please describe the activity of the following actors on environmental and social issues in your district this year:

| Activity | Government line agencies working with LWH on environmental and/or social issues | [type here] |
| Summary of key conclusions | NGOs in partnership with LWH to examine environmental and/or social issues | [type here] |
| Follow up activities recommended | DEC | [type here] |

Summarise any gaps/non-compliance in environmental and/or social activities:

<table>
<thead>
<tr>
<th>Key gaps/areas of non-compliance</th>
<th>Summary of key conclusions</th>
<th>Follow up activities recommended</th>
</tr>
</thead>
<tbody>
<tr>
<td>[type here]</td>
<td>[type here]</td>
<td>[type here]</td>
</tr>
</tbody>
</table>

**STRATEGIC IMPACT**

Is the project contributing to improved watershed sustainability in this district?

- [ ] Yes, is contributing to an overall improvement
- [ ] No, its worsening watershed degradation / it’s having a negative impact on the environment
- [ ] Too early to say

Please explain:

[type here]

Is the project contributing to increased welfare in this district?

- [ ] Yes, it’s contributing to an overall improvement
- [ ] No, its reducing income generating opportunities / having a negative impact on socio development
- [ ] Too early to say

Please explain:

[type here]

Has there been any analysis of cumulative environmental impacts in your district? If `yes` please describe. If No `tick here`

<table>
<thead>
<tr>
<th>Activity, review or study</th>
<th>Summary of key conclusions</th>
<th>Was the work successful? e.g. were its recommendations carried out? If not, why?</th>
</tr>
</thead>
<tbody>
<tr>
<td>[type here]</td>
<td>[type here]</td>
<td>[type here]</td>
</tr>
</tbody>
</table>
Have there been any other environmental or social analyses that have been carried out in the district?

<table>
<thead>
<tr>
<th>Examples of activities reviews or studies</th>
<th>Summary of key conclusions</th>
<th>Levels of success in achieving objectives. If not successful, why not?</th>
</tr>
</thead>
<tbody>
<tr>
<td>[type here]</td>
<td>[type here]</td>
<td>[type here]</td>
</tr>
</tbody>
</table>

Has there been any analysis of ‘catchment management plans in your district? If ‘Yes, please describe. If No’ tick here

<table>
<thead>
<tr>
<th>Activity, review or study</th>
<th>Summary of key conclusions (e.g. does the catchment management plan ‘fit’ with the River Basins Management plan?)</th>
<th>Was the work successful e.g. were its recommendations carried out? If not, why?</th>
</tr>
</thead>
<tbody>
<tr>
<td>[type here]</td>
<td>[type here]</td>
<td>[type here]</td>
</tr>
</tbody>
</table>

**POLICY AND INSTITUTIONAL**

Please describe the activity of the projects in addressing policy constraints that affect environmental and social sustainability

<table>
<thead>
<tr>
<th>Policy issue</th>
<th>Reforms required</th>
</tr>
</thead>
<tbody>
<tr>
<td>[type here]</td>
<td>[type here]</td>
</tr>
</tbody>
</table>

Are there any policy issues that limit environmental and /or social sustainability that require addressing at a national level?

<table>
<thead>
<tr>
<th>Policy issue</th>
<th>Reforms required</th>
</tr>
</thead>
<tbody>
<tr>
<td>[type here]</td>
<td>[type here]</td>
</tr>
</tbody>
</table>

**TRAINING**

Please list the training you have received under the LWH projects or otherwise

List TWO key areas of training you need in order to carry out your role in managing environmental and social issues in the LWH Projects

<table>
<thead>
<tr>
<th>[type here]</th>
</tr>
</thead>
</table>

Please list the training others have received under the LWH projects or otherwise

List TWO key areas of training that you suggest other agencies require, in order to improve environmental and social management:

<table>
<thead>
<tr>
<th>[type here]</th>
</tr>
</thead>
</table>

**Completed by:**
[type here the names of all those who have contributed to completion of the form e.g. DEO and DDOI]

**Position:**
[type here position of all contributors to the report]

**Date:** [type here]
Format 5.0: ANNUAL REPORT FORM TO BE COMPLETED BY PCT
ENVIRONMENT OFFICER

Project reference year: [type here]
Reporting year: [type here]
Date of report: [type here]

PROJECT SUMMARY
Please enter numbers of micro-project in the following table (i.e. insert totals from district reports):

Please enter numbers of sub-projects in the following table

<table>
<thead>
<tr>
<th>CATEGORY A</th>
<th>Approved this year</th>
<th>Application</th>
<th>Community carried out mitigation</th>
<th>MCA provided advice on mitigation</th>
<th>Field Appraisal</th>
<th>ESMP</th>
<th>RAP</th>
<th>IPDP</th>
<th>PMP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Policy, legal or strategy document</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dam project greater</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medium-scale irrigation scheme</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction of roads and bridges</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Riverbank stabilization</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Terracing of farmland</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agricultural interventions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CATEGORY A – Results of ESMPs, RAPs etc

<table>
<thead>
<tr>
<th>Type of projects that have been subjected to ESMP, RAPs etc</th>
<th>Summary of typical impacts identified:</th>
<th>Effectiveness of mitigation or monitoring measures carried out. Explain instances where not effective</th>
</tr>
</thead>
<tbody>
<tr>
<td>[type here]</td>
<td>[type here]</td>
<td>[type here]</td>
</tr>
</tbody>
</table>

Describe key unforeseen environmental and/or social problems associated with any sub-projects:

<table>
<thead>
<tr>
<th>Problem</th>
<th>Actions taken</th>
<th>Actions to be taken</th>
</tr>
</thead>
<tbody>
<tr>
<td>[type here]</td>
<td>[type here]</td>
<td>[type here]</td>
</tr>
</tbody>
</table>

MANAGEMENT ISSUES
Summarise, from the district reports, the ways in which District Environment and Development Officers have been involved in the targeting or identification of any sub-projects under the LWH projects.

[type here]

Summarise the extent to which communities have been involved in the targeting or identification of sub-projects.

[type here]

Please summarise any key participatory issues that have impacted communities’ ability to target or identify projects:

[type here]

Please summarise key points concerning the activities of the following actors on environmental and social issues in the districts

<table>
<thead>
<tr>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government line agencies working with LWH II on environmental and/or social issues</td>
</tr>
<tr>
<td>NGOs in partnership with LWH to examine environmental and/or social issues</td>
</tr>
<tr>
<td>DEC</td>
</tr>
</tbody>
</table>

Summarise any gaps/non-compliance in environmental and/or social activities:

<table>
<thead>
<tr>
<th>Key gaps/areas of non-compliance</th>
<th>Summary of key conclusions</th>
<th>Follow up activities recommended</th>
</tr>
</thead>
<tbody>
<tr>
<td>[type here]</td>
<td>[type here]</td>
<td>[type here]</td>
</tr>
</tbody>
</table>

**STRATEGIC IMPACT**

Is the project contributing to improved watershed sustainability in project area?

- Yes, it’s contributing to an overall improvement
- No, it’s worsening watershed degradation / it’s having a negative impact on the environment
- It’s contributing to improvements in some micro-catchment areas, and deterioration in others
- Too early to say

Please explain:

[type here]
Is the project contributing to increased social benefits (both financial and non-financial) in the project area?

- Yes, it’s contributing to an overall improvement
- No, its reducing income generating opportunities / it’s having a negative impact on socio development
- It’s contributing to improvements in social benefits in some areas, and deterioration in others
- Too early to say

Please explain:

[type here]

Summarise key activities to analyse cumulative environmental impacts:

<table>
<thead>
<tr>
<th>Examples of activities reviews or studies</th>
<th>Summary of key conclusions</th>
<th>Levels of success in achieving objectives. If not successful, why not?</th>
</tr>
</thead>
<tbody>
<tr>
<td>[type here]</td>
<td>[type here]</td>
<td>[type here]</td>
</tr>
</tbody>
</table>

Summarise any other environmental or social analyses that have been carried out in the districts?

<table>
<thead>
<tr>
<th>Examples of activities reviews or studies</th>
<th>Summary of key conclusions</th>
<th>Levels of success in achieving objectives. If not successful, why not?</th>
</tr>
</thead>
<tbody>
<tr>
<td>[type here]</td>
<td>[type here]</td>
<td>[type here]</td>
</tr>
</tbody>
</table>

Summarise any assessments that have been undertaken with respect to the catchment management plans.

<table>
<thead>
<tr>
<th>Examples of activities, reviews or studies</th>
<th>Summary of key conclusions</th>
<th>Level of success in achieving objectives. If not successful, why not?</th>
</tr>
</thead>
<tbody>
<tr>
<td>[type here]</td>
<td>[type here]</td>
<td>[type here]</td>
</tr>
</tbody>
</table>

Summarise your overall conclusions on the strategic fit and effectiveness of the catchment management plans in relation to the Catchment Management Plan including any revision that should be made to the Catchment Management Plan.

Please explain:

[type here]
POLICY AND INSTITUTIONAL
Please describe the activity of the projects in addressing policy constraints that affect environmental and social sustainability:

<table>
<thead>
<tr>
<th>Policy issue</th>
<th>Reforms required</th>
</tr>
</thead>
<tbody>
<tr>
<td>[type here]</td>
<td>[type here]</td>
</tr>
</tbody>
</table>

Are there further policy issues that limit environmental and/or social sustainability that require addressing at a national level? (Please describe, citing any relevant experiences from the districts)

<table>
<thead>
<tr>
<th>Policy issue</th>
<th>Reforms required</th>
</tr>
</thead>
<tbody>
<tr>
<td>[type here]</td>
<td>[type here]</td>
</tr>
</tbody>
</table>

TRAINING
Based on feedback from the districts, what are the 3 priority training requirements identified under the LWH projects

<table>
<thead>
<tr>
<th>Training requirement</th>
<th>Who for</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) [type here]</td>
<td>1) [type here]</td>
</tr>
<tr>
<td>2) [type here]</td>
<td>2) [type here]</td>
</tr>
<tr>
<td>3) [type here]</td>
<td>3) [type here]</td>
</tr>
</tbody>
</table>

Completed by:
[type here the names of all those who have contributed to completion of the form e.g. Environmental Officer and Monitoring and Evaluation Officer]

Position:
[type here position of all contributors to the report]

Date:
[type here]

Screening for Specific bank safeguards
There will be screening for the specific safeguards likely to be triggered by each project as described in the World Bank safeguards section. The checklist below will be used in determining if any of the safeguards will be triggered. This screening form will be prepared by LWH’s environmental specialist and thereafter submitted to the bank for review and approval.

Format 6.0
LWH Project: Select relevant project

<table>
<thead>
<tr>
<th>Sub-project name</th>
<th>[type here]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>[type here]</td>
</tr>
<tr>
<td>Estimated cost (USD)</td>
<td>[type here]</td>
</tr>
</tbody>
</table>

TYPE OF PROJECT OR ACTIVITY
**Sub Project Type**
- Construction of Valley Dams
- Construction of Irrigation Systems

Please give more details: [type here]

For all projects there will be screening for specific safeguards issues as described using the checklist below:

<table>
<thead>
<tr>
<th><strong>Pest Management</strong></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Will the project involve the extensive use of synthetic chemicals and pesticides in its implementation?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Indigenous People’s Rights</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Will this project affect Indigenous People? If yes, an Indigenous People’s Plan will be required</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Involuntary Resettlement</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Will the project require land for its development, and therefore displace individuals, families or businesses from land that is currently occupied, or restrict people’s access to crops, pasture, fisheries or forests, even, whether on a permanent or temporary basis. If yes, a Resettlement Action Plan will be required</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Will the Project:</strong></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Forests and Natural Habitats</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adversely affect natural habitats nearby, including forests, rivers or wetlands?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Will the Project:</strong></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dam Safety</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Will the project involve the construction of a dam?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Cultural Property</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Will the project affect historically-important or culturally-important site or will the project be implemented near sites with archeological, paleontological, historical, religious or unique natural values.</td>
</tr>
</tbody>
</table>

If you have answered Yes to any of the above, please describe how the safeguards triggered will be mitigated and submit to the bank for review and approval. [type here]
8.0 CAPACITY BUILDING, TRAINING AND TECHNICAL ASSISTANCE –LWH

Effective implementation of the Environmental and Social Management Framework will require technical capacity in the human resource base of implementing institutions as well as logistical facilitation. Implementers need to understand inherent social and environmental issues and values and be able to clearly identify indicators of these.

Even with existence of policies and laws such as the Organic Law on Environment Protection, evidence on the ground still indicates that there is significant shortcoming in the abilities of local and district level stakeholders to correctly monitor, mitigate and manage environmental performance of development projects. This is critical as the bulk of LWH projects are to be implemented at the community level.

While undertaking this study a capacity needs assessment was inbuilt to identify strengthening needs on social and environmental evaluation, screening, mitigation and monitoring. Capacity enhancement was consolidated into two key areas; human and institutional resources capacity. These are discussed in detail below.

8.1 Human Resource Capacity Requirements

Human capacity requirements for stakeholders of the ESMF were of two types i.e. low technical capacity and inadequate staffing. While adequacy in staffing requirements was varied between the various stakeholders, there was very limited presence of directly trained and dedicated staff for environmental management purposes within these institutions. Staffs from other departments are usually assigned duties related to environmental management. As a result, sufficient knowledge on environmental management principles, project screening, impact mitigation, monitoring and follow-up action was limited within most institutions.

In many institutions, staffs have been retained for core activities leaving little if any human resources to directly oversee environmental management activities. As a result, this portfolio which in many cases is given little attention is handled by staff members not adequately conversant with it.

In some cases, environment personnel are present but level of training and technical capacity on environmental principles and tools of management is not sufficient. Training and awareness creation will be undertaken at different levels of implementation. These levels will entail the central Government, local authorities, private sector, NGOs, and grassroots stakeholders. The exercise will be customised according to each level’s needs to ensure adequacy in implementation of the ESMF.

8.2 Technical Capacity Enhancement

Awareness creation, training and sensitization will be required for personnel of the following institutions.
8.3 Training will focus on:

3. Stakeholder engagement, consultation and partnerships;
3. EIA law, relevant environmental policies;
3. Development of mitigation measures and Environmental Management Plans
3. Thorough review of Country EIA procedures, Environmental Management policies & guidelines and WB safeguards as well as their implementation and enforcement.
3. The group will also be trained on use and application of ESMF tools (Screening checklists, EIA, EA), their review, implementation and enforcement.
3. Participants will be trained on environmental reporting, monitoring and follow-up of ESMF
3. Significant emphasis will be placed on understanding EIA procedures, Environmental Management policies & guidelines, WB safeguards, implementation and enforcement
3. Reporting, monitoring and follow-up of ESMF

In order to reduce costs, minimize duplication of efforts and integrate existing technical expertise, officers with relevant knowledge and experience in particular fields will be used to train the others. As an example the District Environment Officers can be used to train on requirements of Organic Law and associates guidelines and regulations.

### Table 10: Trainings and Target groups

<table>
<thead>
<tr>
<th>Training Aspect</th>
<th>Target group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrated Pest Management and Organic Agricultural Practices</td>
<td>Cooperatives, District Officers, LWH District Staff, Extension staff</td>
</tr>
<tr>
<td>EIA law, relevant Environment policies and World Bank Safeguard Policy and guidelines</td>
<td>PCT, Government agency representatives including district-level officials, NGOs, CBOs, Extension staff, Cooperative members.</td>
</tr>
<tr>
<td>Relevant social laws and policies e.g. those related to poverty alleviation such ERS</td>
<td>PCT, Government agency representatives including district-level officials, Local Government, Private Sector, NGOs, CBOs, Extension staff, and community members.</td>
</tr>
<tr>
<td>Soil and Water management strategies</td>
<td>Cooperatives, District Officers, LWH District Staff, Extension staff</td>
</tr>
</tbody>
</table>

### Table 11: Training directly linked to implementation ESMF
<table>
<thead>
<tr>
<th>Role of ESMF in LWH</th>
<th>PSC and Central Gov. Agencies</th>
<th>Local Auth.</th>
<th>Private Sector</th>
<th>NGO &amp; CBO</th>
<th>Community</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identification of Indicators and data collection</td>
<td>T</td>
<td>TS</td>
<td>TS</td>
<td>TS</td>
<td>TS</td>
</tr>
<tr>
<td>Identification of environmental and social Impacts</td>
<td>T</td>
<td>T</td>
<td>T</td>
<td>T</td>
<td>T</td>
</tr>
<tr>
<td>Determination of negative and positive projects and sub projects</td>
<td>T</td>
<td>T</td>
<td>T</td>
<td>T</td>
<td>A</td>
</tr>
<tr>
<td>Development of mitigation measures and Environmental Management Plan including Institutional Responsibility Framework and Budget.</td>
<td>T</td>
<td>T</td>
<td>T</td>
<td>T</td>
<td>T</td>
</tr>
<tr>
<td>EIA procedures, Environmental Management policies &amp; guidelines, WB safeguards, implementation and enforcement</td>
<td>T</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>Use and application of ESMF tools (Screening checklists, EIA, EA)</td>
<td>T</td>
<td>T</td>
<td>T</td>
<td>T</td>
<td>T</td>
</tr>
<tr>
<td>Review of ESMF tools, implementation and enforcement</td>
<td>T</td>
<td>T</td>
<td>S</td>
<td>T</td>
<td>S</td>
</tr>
<tr>
<td>Reporting, monitoring and follow-up of ESMF</td>
<td>S</td>
<td>T</td>
<td>T</td>
<td>T</td>
<td>S</td>
</tr>
</tbody>
</table>

*Training of community members at the grassroots level will be undertaken by extension officers on site.*

A=Awareness-T=Training-S=Sensitization

The training and capacity building exercises will take into consideration during their development, the integration and fulfilment of the requirements of World Bank social and environmental policies and guidelines, as well as those of the Organic Law on Environmental Protection (including relevant policies, regulations and guidelines). Where institutional capacity in terms of availability of human resource is inadequate, the project will engraing support for this through hiring of qualified staff to provide necessary expertise.

Inadequacy in institutional infrastructure, facility resources and equipment will be addressed through an initial needs assessment or the identified implementing institutions and a gap analysis generated. The project will develop a priority list and thereafter provide financial support to purchase necessary equipment and facility strengthening items. The priority list will ensure that key necessities to successful implementation of the ESMF are addressed in order of their strategic importance.

Training directly linked to the implementation of the ESMF should be undertaken first and subsequently followed with regular interval training on aspects influencing success of ESMF. The training program/agenda below provides a sample training outline and course content. The training programmes have been clustered into appropriate groups to facilitate for various target groups.
Target groups for training, awareness and sensitization will be as follows.

- LWH staff
- DEOs
- RADA Project Environmental Compliance personnel
- NGO & CBO Project Team Leaders
- Community Implementing Units e.g. Self-Help Groups, women’s groups, youth groups,
- Community Implementing Units coordinating teams
- Contractors managers and personnel
<table>
<thead>
<tr>
<th>Component</th>
<th>subcomponent</th>
<th>Activity</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
<th>Total US$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implementation of ESMF</td>
<td>Community mobilization and sensitization of ESMF</td>
<td>Community Mobilization</td>
<td>5,000</td>
<td>5,000</td>
<td>5,000</td>
<td>2,500</td>
<td>2,500</td>
<td>20,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sensitization workshops for community groups</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>District level Training</td>
<td>(District Environment Officers, DFOs, DDC, DWO, DAO, Private sector)</td>
<td>Detailed training on use implementation and management of ESMF and associated tools (SEA, EIA, EA, Screening checklists)</td>
<td>5,000</td>
<td>5,000</td>
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<td>National Level</td>
<td>(PCT, REMA, MINITERE, MINAGRI, RURA,</td>
<td>Training on fundamentals of ESMF, application and use</td>
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<td>Sustainable land management and IPM</td>
<td>Capacity building in sustainable land management for district level officials including District Environment Committee, DAO, Private sector, Extension staff</td>
<td>5,000</td>
<td>5,000</td>
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<td>5,000</td>
<td>5,000</td>
<td>25,000</td>
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<tr>
<td>Policy and Regulatory Frameworks for ESMF to be undertaken for PSC, Central Gov. representatives, MoLG, NGOs, CBOs, Private Sector</td>
<td>Training workshop</td>
<td>5,000</td>
<td>5,000</td>
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<tr>
<td>Community engagement in LWH</td>
<td>Training workshops once a year for PSC, Extension staff</td>
<td>5,000</td>
<td>5,000</td>
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<td>5,000</td>
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8.4 ESMF Implementation Budget
The breakdown of estimated costs for implementing the ESMF is provided in Table 12 and 13. This includes costs for undertaking capacity building as outlined below.

**ESMF Implementation Budget for LWH Project**
The estimated total cost for ESMF implementation is indicated in the table 13 below.
### Table 13. ESMF Implementation Budget for LWH Project

<table>
<thead>
<tr>
<th>Component</th>
<th>Broad Activities</th>
<th>Activities</th>
<th>Costs (US$)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land Husbandry, Water Harvesting and Hillside Irrigation</td>
<td>Dam Construction, Irrigation system installation</td>
<td>Environmental Impact Assessment</td>
<td>250,000.00</td>
<td>25 ESIA for the construction of dams, irrigation infrastructure and land husbandry at a cost of 10,000 per study. * The project has over 101 sites and it is envisaged that consultant will work with LWH environmental specialists to undertake at least 25 ESIAs then the rest should be undertaken by LWH after the capacity is built.*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>75,000</td>
<td>25 environmental audits at a cost of US$ 5,000 per audit will be undertaken throughout project life</td>
</tr>
<tr>
<td>Sustainable Land Management and Integrated Pest Management</td>
<td>Training in IPM, Development of IPM Strategy</td>
<td>Project Reports</td>
<td>Cost factored in a separate IPM Consultancy not yet awarded</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td><strong>335,000.00</strong></td>
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</table>
8.4.1 Mainstreaming Costs
Some costs of environmental management and impact mitigation are directly integrated into the main project budget. Specifically these are:

- Costs related to mitigation measures for subprojects, which will be assessed and internalized as part of the overall subproject cost; and
- Cost of studies related to strategic issues of natural resource management, which are internalized.

8.4.2 Costs of Training
The total estimated cost for expenses associated with training and sensitization is included in Table 13 above.
9.0 PUBLIC CONSULTATION AND DISCLOSURE

The objective of the public consultations with stakeholders is to gather information on their concerns, perceptions and fears of the livelihood changes to be brought about as a result/consequence of LWH project.

Public consultations were organized as a way to collect first-hand accounts of benefits and grievances from interested/affected parties by LWH project. They involved organized group discussions with purposively selected individuals/stakeholders (between 6 and 10) to gain information on their concerns, perceptions, reactions and experiences of livelihood changes brought as a result/consequence of LWH project. Group discussions provided multiple views within a group context and were particularly useful in exploring the level of consensus on a given felt impact.

The exercise identified all the stakeholders within and in the surrounding area including local community, local authorities, civil society, government ministries and agencies, government projects and private sector among other stakeholders. The meetings were organized in each selected sector and have also met a group of representatives of sectors and cells in the project area. At the sector level, consultants met with the executive secretary, agronomist, Environment officer and officer in charge of Social Affairs.

At every project site, the consultants met with a number of representatives of the people and most of them were farmers who live at site surrounding.

Interviews were conducted around the following points:

- Awareness, concerns, perceptions and interests of the LWH project
- Other development projects operating in the project area (district).
- Employment opportunities during the project implementation (Gender, youth and Vulnerable people)
- Education, health and welfare of the community
- Erosion control.
- Land tenure, conflicts and use of fertilizers
- Concerns, risks and fears of the community
- Conclusions and Recommendations

9.1 Selection of visited sectors

Public consultations were organised in 5 districts: Kayonza district (one site in Rwinkwavu sector), Gatsibo district (two sites in Kigarama and Gatsibo sectors), Karongi district (two sites Rubengera and Rwabicuma sector), Nyanza (one site in Rwabicuma sector) and finally Bugesera (two sites in Musenyi and Gashora sectors).
9.4 Summary of Environmental and Social Issues Identified

1. Crop and vegetation Loss
2. Loss of buildings and houses
3. Increases soil erosion
4. Spread of malaria and other water borne diseases
5. Loss of land for crop cultivation and buildings
6. Drowning and accidents in the dam areas especially in the reservoir area
7. Flooding and inundation of the areas downstream of the dam

9.5 Incorporation of Public Consultation Concerns in Specific Project Design

The design of the LWH project has during the feasibility studies incorporated these issues in its mitigation strategy as reflected in the individual EMPs. Specifically in each feasibility study and EMP, the designs of the proposed dams and reservoir area has taken into account the above concerns and instituted the following mitigation measures namely;

9.5.1 Accidents/Drowning
In each proposed project site, the dams have been designed complete with fencing to keep off any unauthorized persons from accessing the reservoir area which could lead to drowning. At the same time, there will be public awareness on the possible risks in accessing the reservoir area and security guards will be hired to keep watch of the dam areas on a daily basis. LWH will fence the reservoir area, erect warning signs and employ a security guard to ensure that children do not access the dam reservoir for swimming.

LWH will also construct water drinking points for the local communities as a strategy and a way for reducing increased access to the dam reservoir to get water which causes incidents.

9.5.2 Crop/Vegetation/Structures and Buildings
Loss of Crops, Trees, Vegetation, buildings etc; A Resettlement Policy Framework has already been prepared outlining the key steps and procedures that will be pursued in ensuring that all the PAPs are compensated for the loss of crops, trees, vegetation etc. The RPF is in line with the World Bank policies and procedures for involuntary resettlement as well as the Government of Rwanda. There will be preparation of complete Resettlement Action Plan for each project and compensation will be done using the existing market rates.

9.5.3 Loss of Land
All land acquired for the purpose of the proposed projects will be compensated in full using the RPF already prepared and following the World Bank involuntary resettlement policy and procedures as well as the laws of Rwanda.

9.5.4 Spread of Water Borne Diseases
The project has already anticipated the possible spread of water borne diseases during the feasibility study phase and identified in built mitigation measures including; Introducing fish in all the proposed dam reservoir areas.
9.5.5 Flooding Mitigation

The proposed project design has included spillways to address this potential adverse impact which is considered long term and expected to occur throughout the project operation phase. During the sensitization and awareness meetings, it will be important to reassure them of the intentions of having a spillway to address this.

The program plans to buy and install instruments for recording seismic events in all the dams. The instruments for recording of seismic events proposed to be installed for the dam consists of one acceleograph at the base of the dam and one at the top of the dam. Strong motion accelerographs and structural response recorder will be installed at the base and at the top of dam. The location selected should be free from the background seismic noise erected due to vibrations of the appurtenant works. The instrument located at the top would provide information about responses of structure resulting from earthquake.
REFERENCE

b) Boyle, J., 2005. Cadre de Gestion Environnementale et Sociale pour les projets comportant de multiples sous projet de petite taille
d) Knowledge Synthesis Report No. 3 Food and Agriculture Organization of The United Nations Rome.
e) FAO, Rwanda country paper. The agricultural characterization and the classification of wetlands of Eastern and Southern Africa, in Wetland Characterization and Classification or Sustainable Agricultural.

o) Environment Department, the World Bank 1818 H Street, N.W, Washington, D.C.

q) RSSP II Environment and Social Management Framework
## ANNEX

### Annex A. Stakeholders Consulted

**List of People Contacted in Gatsibo District (2sites)**

<table>
<thead>
<tr>
<th>Name</th>
<th>Organization</th>
<th>Contacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Mushumba John</td>
<td>Executive Secretary / Rugarama sector</td>
<td>078-845-7044</td>
</tr>
<tr>
<td>2 Urujeni console</td>
<td>Executive Secretary / Gastibo sector</td>
<td>078-875-0842</td>
</tr>
<tr>
<td>3 Ndayiragije Jean Claude</td>
<td>Officer in charge of social Affairs / Gastibo sector</td>
<td>078-889-7776</td>
</tr>
<tr>
<td>4 Karera Francois Xavier</td>
<td>Agronomist / Gatsibo Sector</td>
<td>078-857-9398</td>
</tr>
<tr>
<td>5 BUTERA Jean Claude</td>
<td>District agronomist</td>
<td>078-850-7206</td>
</tr>
<tr>
<td>6 Kimenyi Dickson</td>
<td>Director of infrastructure</td>
<td></td>
</tr>
<tr>
<td>7 Gatete John</td>
<td>Officer in charge of social affairs</td>
<td></td>
</tr>
<tr>
<td>8 RURINDA Dieudonne</td>
<td>Sector Agronomist</td>
<td>078-859-4845</td>
</tr>
<tr>
<td>9 Jonas MWISENEZA</td>
<td>environmental officer</td>
<td>078-877-1016</td>
</tr>
<tr>
<td>10 Hypolite NDIMANYE</td>
<td>Executive Secretary</td>
<td></td>
</tr>
<tr>
<td>11 KAGARAMA John Jacob</td>
<td>Chief of District land Bureau</td>
<td></td>
</tr>
<tr>
<td>12 MBANDA Jean Paul</td>
<td>Documentation specialist</td>
<td></td>
</tr>
<tr>
<td>13 Nemeye oscar</td>
<td>Farmer</td>
<td></td>
</tr>
<tr>
<td>14 Sekaganda Joseph</td>
<td>Farmer</td>
<td></td>
</tr>
<tr>
<td>15 Haruna Muvunyi</td>
<td>Farmer</td>
<td></td>
</tr>
<tr>
<td>16 Mbonigaba Vestine</td>
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<tr>
<td>17 Mudahemuka Moses</td>
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<tr>
<td>18 Nshimiyimana Amani</td>
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</tr>
<tr>
<td>19 Bizumutima Aloys</td>
<td>farmer</td>
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</tr>
<tr>
<td>20 Ngabonzima Frederic</td>
<td>Farmer</td>
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<tr>
<td>21 Nsanzamuhore Jean De Dieu</td>
<td>Farmer</td>
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</tr>
<tr>
<td>22 Munyamana Innocent</td>
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<tr>
<td>23 Ntawizera</td>
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</tr>
<tr>
<td>24 Ndimubandi Jean De Dieu</td>
<td>Farmer</td>
<td></td>
</tr>
<tr>
<td>25 Mucyowera Fiacre</td>
<td>Farmer</td>
<td></td>
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### List of People Contacted in Kayonza District (1 site)

<table>
<thead>
<tr>
<th></th>
<th>Name</th>
<th>Occupation</th>
<th>Contact Number</th>
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<tbody>
<tr>
<td>1</td>
<td>Niyibizi Ntabyera Hubert</td>
<td>Executive Secretary/Rwinkwavu sector</td>
<td>0-78-861-2838</td>
</tr>
<tr>
<td>2</td>
<td>Mushumba John</td>
<td>Executive Secretary Rugarama sector</td>
<td>0-78-845-7044</td>
</tr>
<tr>
<td>2</td>
<td>Ndagahayo Francois Xavier</td>
<td>Executive cellule Gihinga</td>
<td>0-78-841-4098</td>
</tr>
<tr>
<td>3</td>
<td>Murangira Francois Xavier</td>
<td>Director of Good Governance</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>NiyONSENGA Puttin</td>
<td>Farmer</td>
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<tr>
<td>5</td>
<td>Twagirimana Vincent</td>
<td>Business woman</td>
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<tr>
<td>6</td>
<td>Ilibagiza Donata</td>
<td>Business woman</td>
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<td>7</td>
<td>NTAMBARA Peter</td>
<td>Farmer</td>
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<td>8</td>
<td>GASANGWA Bosco</td>
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<td>8</td>
<td>NZIGUHEBA Theoneste</td>
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<td>10</td>
<td>HAGENIMANA Joseph</td>
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<td>11</td>
<td>NYIRABAHIRE Evelyne</td>
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<td></td>
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<tr>
<td>12</td>
<td>Ntabubuyaruta Pierre Celestiontel</td>
<td>School teacher</td>
<td>078-830-5789</td>
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<tr>
<td>13</td>
<td>Nshimiyimana Alexandre</td>
<td>School teacher</td>
<td>078-831-7642</td>
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<tr>
<td>14</td>
<td>Ntamakiriro Francois</td>
<td>School teacher</td>
<td>078-859-1017</td>
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<tr>
<td>15</td>
<td>Mutebutsi Gerard</td>
<td>Health officer</td>
<td>078-852-5878</td>
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### List of People Contacted in Nyanza District (1 site)

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<td>1</td>
<td>MUKAMURARA Angélique</td>
<td>Veterinary sector</td>
<td>078-844-4314</td>
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<tr>
<td>2</td>
<td>Mutesi Jean Pierre</td>
<td>Agronomist</td>
<td>078-882-0026</td>
</tr>
<tr>
<td>3</td>
<td>BAYINGANA Fidele</td>
<td>Sector agronomist</td>
<td>078-852-4628</td>
</tr>
<tr>
<td>4</td>
<td>Nkundiye Jean Pierre</td>
<td>Executive Secretary/Rwabicuma</td>
<td>078-846-0179</td>
</tr>
<tr>
<td>5</td>
<td>Hatunguramye Marcellin</td>
<td>Executive Secretary/Gacu cell</td>
<td>078-889-7155</td>
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<tr>
<td>6</td>
<td>NZAMUSANGANIRA Euphralie</td>
<td>Farmer</td>
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<td>7</td>
<td>Mushimiyimana Bibiane</td>
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<td>8</td>
<td>Ntungrirwanahe Emmanuel</td>
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<td>9</td>
<td>Nimufasha Drocella</td>
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<td>12</td>
<td>Minani Faustin</td>
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### List of People Contacted/Karongi district (2 sites)

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<tr>
<td>Mukabalisa Simbi Dative</td>
<td>V/maire in charge of social affairs</td>
<td>078-876-0363</td>
</tr>
<tr>
<td>NZEYIMANA Sylvere</td>
<td>District Agronomist</td>
<td></td>
</tr>
<tr>
<td>Muhoza Claude</td>
<td>District Agronomist/rubengera</td>
<td>078-865-4427</td>
</tr>
<tr>
<td>Niyondagije Josue</td>
<td>Officer in charge of social affaires/rubengera</td>
<td></td>
</tr>
<tr>
<td>Bihoriki Narcisse</td>
<td>Executive Secretary/Rugabano sector</td>
<td>078-854-0236</td>
</tr>
<tr>
<td>NYIRASHYIRAMBERE Jeanette</td>
<td>Land bureau officer</td>
<td></td>
</tr>
<tr>
<td>Nyirabuyange bonifilda</td>
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</tr>
<tr>
<td>Kayumba Pierre</td>
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<tr>
<td>Nsengiyumva Nasti</td>
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<tr>
<td>Ingabire Jean Pierre</td>
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<tr>
<td>Bavakure ildephonse</td>
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<tr>
<td>Ngwabije Antoine</td>
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<tr>
<td>Ndhokuryayo Laurent</td>
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<tr>
<td>Nyrangirinshuti Josephine</td>
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<tr>
<td>Mukantaganira Vestine</td>
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<tr>
<td>Nyrabiziyaremye Petronille</td>
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<tr>
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<tr>
<td>Nyiransabimana Dancille</td>
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<td></td>
</tr>
<tr>
<td>Ndagijimana Leonard</td>
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### List of People Contacted/ Bugesera District (2 site)

<table>
<thead>
<tr>
<th>Name</th>
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<tr>
<td>Ndayisabye Viateur</td>
<td>Executive Secretary</td>
<td>078-866-2323</td>
</tr>
<tr>
<td>Nsabimana Eric</td>
<td>Coordinator/Kagomasi cell</td>
<td>078-845-8033</td>
</tr>
<tr>
<td>Minani</td>
<td>Coordinator/ Ramiro Cell</td>
<td>078-824-6381</td>
</tr>
<tr>
<td>MUKAMURARA Ancilla</td>
<td>Farmer</td>
<td></td>
</tr>
<tr>
<td>Nyirahabimfura Gaudence</td>
<td>Farmer</td>
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</tr>
<tr>
<td>MUNYESHYAKA Boniface</td>
<td>Farmer</td>
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</tr>
<tr>
<td>Mukarugwiza</td>
<td>farmer</td>
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</tr>
<tr>
<td>Mukamana Gertrude</td>
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<tr>
<td>Kagoboka pascal</td>
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<tr>
<td>Serubaya Celestin</td>
<td>farmer</td>
<td></td>
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<tr>
<td>Nyiraneza vestine</td>
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<tr>
<td>Mugore Claudine</td>
<td>Farmer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Name</td>
<td>Role</td>
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</tr>
<tr>
<td>13</td>
<td>Majawamariya Noella</td>
<td>Farmer</td>
</tr>
<tr>
<td>14</td>
<td>Nyiramatama Justine</td>
<td>Farmer</td>
</tr>
</tbody>
</table>
Annex B Suggested Format for EA Studies

The environmental impact assessment study report will incorporate, but not be limited to, the following information:

a) The proposed location of the project;
b) A concise description of the national legislative and regulatory framework, baseline information, and any other relevant information related to the project;
c) The objectives of the project;
d) The technology, procedures and processes to be used in the implementation of the project;
e) The materials to be used in the construction and implementation of the project;
f) The products, by-products and waste generated by the project;
g) A description of the potentially affected environment;
h) The environmental effects of the project including the social and cultural effects and the direct, indirect, cumulative, irreversible, short-term and long term effects anticipated;
i) Alternative technologies and processes available and reasons for preferring the chosen technology and processes;
j) Analysis of alternatives including project site, design and technologies and reasons for preferring the proposed site, design and technologies;
k) An environmental management plan proposing measures for eliminating, minimizing or mitigating adverse impacts on the environment; including the cost, time frame and responsibility to implement the measures;
l) Provision of an action plan for the prevention and management of foreseeable accidents and hazardous activities in the cause of carrying out activities or major industrial and other development projects;
m) The measures to prevent health hazards and to ensure security in the working environment for the employees and for the management of emergencies;
n) An identification of gaps in knowledge and uncertainties which were encountered in compiling the information;
o) An economic and social analysis of the project;
p) An indication of whether the environment of any other state is likely to be affected and the available alternatives and mitigating measures; and
q) Any other matters as NEMA may require.
Annex C. Suggested Format for a Simple EMP

The ESMF emphasizes that an environmental management plan (EMP) should fit the needs of a subproject and be easy to use. The basic elements of an EMP are:

1. A description of the subproject activity;
2. A description of potential environmental impacts;
3. A description of planned mitigation measures;
4. An indication of institutional/individual responsibility for implementing mitigation measures (including enforcement and coordination);
5. A program for monitoring the environmental effects of the subproject both positive and negative (including supervision);
6. A time frame or schedule; and
7. A cost estimate and source of funds.

<table>
<thead>
<tr>
<th>Subproject Activity</th>
<th>Potential Environmental Impacts</th>
<th>Proposed Mitigation Measures</th>
<th>Responsibility (including Enforcement and coordination)</th>
<th>Monitoring Requirements (including supervision)</th>
<th>Time Frame or Schedule</th>
<th>Cost Estimate</th>
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*The above matrix should be filled out for each subproject that will have the need for a separate EMP (the screening process using the screening checklist should determine this).*