

MINISTRY OF AGRICULTURE AND LIVESTOCK

**LIVESTOCK DEVELOPMENT AND ANIMAL HEALTH
PROJECT**

**ENVIRONMENTAL AND SOCIAL
MANAGEMENT FRAMEWORK
Volume I
(without RPF and PMP)**

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ACRONYMS

CBD	Convention on Biological Diversity
CITES	Convention on International Trade for Endangered Species
DFP	District Focal Point
DFZ	Disease Free Zone
EA	Environmental Assessment
ECZ	Environmental Council of Zambia
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
EPB	Environmental Project Brief
EPPCA	Environmental Protection and Pollution Control Act
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
GIS	Geographical Information System
GMO	Genetically Modified Organisms
GRZ	Government of the Republic of Zambia
IBA	Important Bird Area
IPCC	Intergovernmental Panel on Climate Change
IPM	Integrated Pest Management
IUCN	International Union for the Conservation of Nature (World Conservation Union)
LDAHPP	Livestock Development and Animal Health Project
LDT	Livestock Development Trust
LSC	Livestock Service Centre
MDG	Millennium Development Goals
M&E	Monitoring and Evaluation
MoAL	Ministry of Agriculture and Livestock

NCS	National Conservation Strategy
NHCC	National Heritage Conservation Commission
NPCO	National Project Coordination Office
PHA	Public Health Act
PRA	Participatory Rural (Rapid) Appraisal
PMP	Pest Management Plan
PPCO	Provincial Project Coordination Office
REDD	Reducing Emissions from Deforestation and Forest Degradation
RPF	Resettlement Policy Framework
SNDP	Sixth National Development Plan
ToR	Terms of Reference
UNCCD	United Nations Convention to Combat Desertification
UNFCCC	United Nations Framework Convention on Climate Change
WB	World Bank
WHO	World Health Organisation
ZAWA	Zambia Wildlife Authority
ZEMA	Zambia Environmental Management Agency

0 EXECUTIVE SUMMARY

The Government of the Republic of Zambia (GRZ) has taken a policy decision to prioritize agriculture among the main economic growth and poverty reduction sectors. In implementing this policy, the GRZ intends to provide substantive support to smallholder livestock farmers and

producers as a sustainable way to reduce poverty by improving their incomes, while at the same time contributing to increased agricultural production for food security and growth. Consequently, the GRZ has requested the World Bank (WB) and its other major development partners for support for its Livestock Development and Animal Health Project (LDAHP). The LDAHP subprojects will be implemented through the Ministry of Agriculture and Livestock and Fisheries Development (MoAL) and its structures at Provincial, District and Camp levels. However, since the exact locations of the areas where the LDAHP subprojects are to be located was not known at the time the LDAHP was being prepared, the Laws of the GRZ and Operational Policy 4.01 of the Bank require the Ministry to prepare an Environmental and Social Management Framework (ESMF), including the Resettlement Policy Framework (RPF) and Pest Management Plan (PMP), which are to establish a mechanism to determine and assess future potential environmental and social impacts of all project activities to be financed under LDAHP, and then to set out mitigation, monitoring and institutional measures to be taken during implementation and operation of the project activities to eliminate adverse environmental and social impacts, offset them, or reduce them to acceptable levels.

The overall objective of the ESMF is to systematically assess and address potential anticipated environmental and social impacts of the project components and their subprojects and to develop a framework to mitigate or reduce adverse consequences on the natural and social environment. The Framework prescribes clear guidelines, procedures and methodologies for environmental and social screening, planning, review, approval and implementation of the project components and subprojects.

This ESMF has been designed so that all subprojects funded under the LDAHP will comply with all the Environmental laws of the GRZ and the Environmental and Social Safeguards Policies of the WB. At national level, environmental management procedures are outlined in the Environment Management Act (EMA) and include the requirement for a project proponent to prepare and submit the Environmental Project Brief (EPB) to the Zambia Environmental Management Agency (ZEMA) for review. Depending on the outcome of the EPB, the proponent may also be required to prepare an Environmental Impact Statement (EIS) and undertake an Environmental Impact Assessment (EIA). These requirements aim at enhancing the environmental acceptability of a proposed project by ensuring that all adverse and good benefits are catalogued. Alternative implementation options are examined in order to choose options that minimize adverse effects. The ZEMA therefore is responsible for facilitating the EIA process and for quality control of environmental assessment statements. Although the ZEMA is responsible for the supervision of the implementation of the environmental management plans (EMPs), in the case of the LDAHP, this role will be played by the National Project Coordination Office (NPCO) at the MoAL in consultation with ZEMA.

The Ministry is further required to disclose the ESMF, RPF and PMP in country as three separate and stand-alone documents so that they are accessible by the general public, local communities, potential project-affected groups, local NGO's and all other stakeholders and also at the InfoShop of the World Bank and the date for disclosure must precede the date for appraisal of the project.

The key highlights in this ESMF are as follows.

1. Detailed and comprehensive environmental and social baseline data which will provide the environmental and social management process with key baseline information when identifying adverse impacts. The information contains data on bio-physical environmental features, such as (i) the physical environment (geology, topography, soils, climate and climate change, surface and groundwater hydrology), (ii) biological environment (flora, fauna, endemic and endangered species, critical/sensitive habitats, including protected areas and reserves, significant natural sites) and (iii) socio-economic environment (land-use, land tenure, and land titling and human settlements) in the LDAHP target districts.

2. A thorough review of the World Bank Safeguards Policies is made. Out of the ten Operational Safeguards Policies, the following five are triggered by the LDAHP:

- (i) Environmental Assessment (OP 4.01, BP 4.01, GP 4.01)
- (ii) Natural Habitats (OP 4.04, BP 4.04, GP 4.04) and
- (iii) Physical Cultural Resources (OPN 11.03/ OP 4.11)
- (iv) Pest Management (OP 4.09)
- (v) Involuntary Resettlement (OP/BP 4.12)

These WB Safeguards Policies apply to all activities funded under the LDAHP irrespective of whether or not they are being funded in whole or in part by the World Bank, GRZ or any other donor.

OP/BP 4.01 for Environment Assessment (EA) is triggered because Component 1 activities of the LDAHP will support laboratory infrastructure improvement and provide equipment, material and consumables which are likely to generate bio-medical wastes which would have to be properly managed. In addition, all waste from livestock production systems is required to be disposed of in a safe manner that would prevent infectious waste being exposed to the general public resulting in possible outbreaks of infectious diseases. In addition OP/BP 4.01 is also triggered by activities under Component 2 which include support to the MoAL and local councils for the rehabilitation and/or construction of essential livestock industry infrastructure, such as livestock service centers, markets and slaughter facilities which may result in negative impacts related to poor hygiene and solid waste management.

OP 4.04 Natural Habitats is triggered because in parts of the project target area, such as Namwala, Mazabuka and Itezhezhi in Southern Province and Shang'ombo, Sesheke and Kalabo in Western Province, livestock/wildlife interfaces could result in degradation of natural habitats and competition for foraging and water resources which could result in displacement or reduction of wildlife populations by reduction of the habitat.

OP4.11 Physical Cultural Resources is triggered because in parts of the project target area there are cultural resources or sites having archaeological (prehistoric), palaeontological, historical, religious and unique natural values that could be significantly damaged or lost through the implementation of the LDAHP if not properly managed.

OP4.09 for Pest Management is triggered because: (i) under Component 1 pesticides with potential negative impacts to the biophysical environment could be used and (ii) activities under Component 2 which include support to the MoAL and local councils for the rehabilitation and/or construction of essential livestock industry infrastructure, such as livestock service centers, markets and slaughter facilities () may require use of chemicals and pesticides for ensuring good hygiene conditions and proper solid waste management.

OP/BP 4.12 for Involuntary Resettlement is triggered because the project will support construction of livestock service centers including houses, crush pens, handling facilities, market centers, etc that could potentially displace people. A Resettlement Policy Framework (RPF) will be prepared as appropriate for these proposed activities.

3. The LDAHP has been screened and assigned to WB Category B while the subprojects are categorized as either Category B or C. Being category B or C, the LDAHP and its subprojects, under the Zambia's Environmental Management Act (ZEMA) will require the preparation of an Environmental Project Brief (EPB) by their respective proponents. The EPB will be submitted to the ZEMA for approval through the NPCO before implementation can start. Section 7 outlines generic steps that the different Project Management levels will undertake to facilitate, coordinate and oversee subproject identification, preparation, screening, approval and implementation.

4. The generic potential environmental concerns for the LDAHP that may arise from an increase in livestock populations in the target districts include overgrazing, soil erosion, deforestation, loss of biodiversity and natural habitats and pollution. The subprojects under the LDAHP involve the establishment of livestock service centers (LSCs) that include the development of a cluster of other subprojects such as (i) spray races, (ii) abattoirs/slaughter houses or slabs, (iii) animal handling facilities, (iv) marketing facilities, (v) processing facilities, for example at milk collection centers and (vi) laboratories. Some of these subprojects may cause specific negative environmental impacts, the details of which are presented in Section 8 of the report. Section 9 focuses on how these potential negative impacts can be minimized and in some cases eliminated altogether through mitigation measures in order to ensure the environmental sustainability of the LDAHP.

5. The environmental and social monitoring plan assists to measure the level of success in the implementation of the mitigation measures, as provided in the EMP and also provides a link to the mitigation measures in the EMP and specifies the activities to be undertaken to ensure that the mitigation measures are efficiently, effectively and timely implemented. The monitoring plan and indicators for the LDAHP are presented in Section 10. The costs for ESMF monitoring are estimated at US\$300000.00.

6. One of the most serious problems facing environmental management in Zambia is the lack of capacity to enforce legislative requirements and therefore the problem of inadequate capacity needs to be addressed if this ESMF for the LDAHP is to be successfully implemented. Institutional capacity is assessed in Section 11 and a training program for the LDAHP and the MoAL is also presented in that Section. The cost of the LDAHP training requirements is estimated at US\$1.25million while that for the MoAL is estimated at US\$13.00 million.

1 INTRODUCTION

1.1 Background

Government of the Republic of Zambia (GRZ) has taken a policy decision to prioritize agriculture among the main economic growth and poverty reduction sectors. This is reflected in the Sixth National Development Plan (SNDP), a guiding document for economic growth and poverty reduction in the country. Government further recognizes the need to partner with local development agents to drive livestock development, such as the Livestock Development Trust (LDT). The GRZ intends, through LDT, to provide substantive support to smallholder livestock farmers and producers as a sustainable way to reduce poverty by improving their incomes, while at the same time contributing to increased agricultural production for food security and growth.

Cattle, sheep, goats, pigs, poultry, and other livestock are integral to rural livelihoods and economic activities in Zambia. Livestock provides food and income security (meat, milk, eggs and dairy products), materials (hide, horns, wool etc.), draught power, and manure which is important in soil organic fertility management. Livestock effectively contributes to poverty reduction through provision of savings and currency (barter) and can therefore contribute to achieving the Millennium Development Goals (MDGs), especially those that focus at poverty reduction (MDG 1) and environmental sustainability (MDG 7).

In most rural communities livestock has cultural value, as gifts of livestock may serve to resolve conflicts or cement marriages and is used in many traditional ceremonies and rites. On one hand, well managed livestock leads to high productivity that has tremendous economic, social and cultural value and significance. However, improperly managed, livestock production may cause significant economic, social and environmental damage, such as soil erosion, destruction and conversion of habitat, deforestation and generation of greenhouse gases, such as methane. Inappropriate or excessive use of pesticides often results in a reduction of sustainable livestock production, increase in disease vectors, adverse environmental and public health effects, and negative effects on other economic activities, such as fisheries and tourism. This in turn, leads to increased economic costs, both at the farmer level and for the country as a whole. Increasing livestock production on rangelands may also have negative impacts on wildlife populations, by competing for vegetation and water resources, and livestock owners may be inclined to kill wildlife for food or eliminate them as pests, particularly predator species.

The GRZ has requested the World Bank (WB) and its other major development partners for support for its Livestock Development and Animal Health Project (LDAHP) for which this Environmental and Social Management Framework (ESMF) is designed.

1.2 Environmental and Agricultural/Livestock Policies

1.2.1 Environmental Policy

The national environmental policy (NEP) in Zambia recognizes the imperative of socio-economic development in addressing the underlying causes of poverty, the resulting deterioration in the environment is now highlighted by a realization that unfettered development, while it may yield immediate benefits in the short-term gain, can undermine the development process; mainly by causing irreparable damage to the natural resources that support it. Optimizing development and maintaining its sustainability, will only be possible by safeguarding the environment through conserving nature and its life support systems.

The NEP is a comprehensive framework for effective natural resource utilization and environmental conservation that is sensitive to the demands of sustainable development. The policy addresses concerns about (i) loss of rangeland, (ii) land dereliction, (iii) loss of biodiversity, (iv) loss of heritage value, (v) exposure to radioactive materials, (vi) industrial waste, (vii) commercial waste, (viii) urban, pollution, sprawl and ribbon development, (ix) human resettlement issues, (x) poor sanitation and public health, (xi) licensing procedures, (xii) inadequate legal and policy frameworks and (xiii) inadequate management of water resources. This policy draws a great deal from existing sector policies and urges for the implementation of cross-cutting issues in order to achieve the strategic goal of a policy that bridges all sectors of society and engenders a widely accepted sense of responsibility and care for the environment. These include, among other issues, inadequate inclusion of youth and gender issues, good governance, environmentally sound development planning in all sectors and at all levels and involvement of local communities, heritage, culture and religion in environment management and protection.

The NEP incorporates a clear set of objectives, guiding principles and strategies that bind all organizations and individuals to exercise due care to avoid depletion of natural assets and environmental degradation. It emphasizes that it is the duty of any institution, government or non-governmental organization, any community group or people's organization or any individual that uses or otherwise carries out activities that affect the environment in any way, to exercise proper control to maintain the productivity and integrity of the environment.

1.2.2 Agricultural and Livestock Policy

The agricultural policy in Zambia aims at promoting agricultural development particularly increasing the production of crops, livestock and fisheries for which the country has a comparative advantage. Based on this premise, the long-term vision for the agricultural sector aims at the following:

- (i) To achieve food security for the majority of the Zambian population through increased yields and improved post-harvest management and utilization;

- (ii) To develop a commercial agriculture with most farmers (small and large) producing for the domestic and export markets;
- (iii) To promote a competitive and efficient agriculture based on regional comparative advantage;
- (iv) To develop a diversified agriculture linked to well developed agribusiness industry for value adding and exports;
- (v) To facilitate the entry of co-operatives and farmer organizations into highly competitive and commercial agriculture;
- (vi) To facilitate development of Fisheries and Livestock sub-sectors;
- (vii) To have agriculture that utilizes natural resources on a sustainable basis for income and employment generation and economic growth.

In the livestock sub-sector the main thrust is to control livestock diseases of national economic importance, that is those diseases of an epidemic nature and have trans-boundary (regional/international) significance. The other area of emphasis is the re-stocking and increasing overall production, productivity and management of marketable livestock and livestock products, especially in the traditional sector. The focus is also on providing public goods that are needed for efficient growth such as infrastructure, basic research, disease epidemic and pest control.

1.3 Description of ESMF Purpose, Objectives and Principles

1.3.1 General purpose and objectives

The overall objective of the ESMF is to systematically assess and address anticipated but unintended environmental and social impacts of development projects. The aim is to mitigate or reduce adverse consequences on project beneficiaries, the bio-physical environment, and others. In this regard, the ESMF for the LDAHP (Project ID No.P122123) must prescribe clear guidelines, procedures and methodologies for environmental and social screening, planning, review, approval and implementation of the project as per Terms of Reference (ToR) given at Annex I. The ESMF also includes specific guidelines for the use of pesticides in the form of Pest Management Plan (PMP) and, where necessary, a Resettlement Policy Framework (RPF).

1.3.2 Pest Management Plan

The overall objective of the Pest Management Plan (PMP) is to provide guidance for the screening of pesticides, veterinary drugs, and other chemicals and their safe handling and disposal. The specific objectives of the PMP are to:

- (i) Promote ecologically based Integrated Pest management (IPM) and reduce reliance on synthetic pesticides;
- (ii) Reduce health and environmental risks;
- (iii) Strengthen capacity of the country's (a) regulatory framework for pesticide distribution and use and (b) institutions to promote and implement safe, effective and environmentally sound pest management.

The PMP also provides for an improved biomedical waste management strategy to bring pest and vector management activities under the LDAHP in line with IPM or Integrated Vector Management (IVM) and to avoid new infections and ensure food security and higher incomes from livestock production at national and farm levels; and that the risks to human health and the

bio-physical environment associated with biomedical waste and pesticide use are kept to an acceptable minimum.

1.3.3 Resettlement Policy Framework

The Resettlement Policy Framework (RPF) seeks to address the adverse social impacts relating to acquisition of land and the attendant resettlement-related impacts. In the case of the LDAHP, land may need to be acquired for the establishment of livestock breeding centres and Livestock Service Centres (LSCs). The acquisition of such land may involve displacement of local populations. The overall objective of the RPF is to ensure that, where land acquisition-related adverse impacts cannot be avoided, affected or displaced persons are compensated for lost assets and sources of livelihoods. The RPF for the LDAHP therefore provides a framework of procedures and methods to be followed to identify and compensate project affected persons (PAPs).

2. PROJECT DESCRIPTION, COORDINATION AND IMPLEMENTATION

2.1 Project Description

The LDAHP comprises three components which are briefly described below.

Component 1: Livestock Services Provision. The objectives of the component are: (i) to strengthen the zoonotic and contagious animal diseases surveillance and control systems including laboratory diagnostic capacities; (ii) build institutional capacity within the MoAL to improve service delivery and rehabilitate or construct essential public livestock industry infrastructure; and (iii) to improve the capacity to monitor food safety of facilities (slaughterhouses, milk collection centers, etc.) in the targeted project areas. This component will support the strengthening of the Veterinary Services, as defined by the World Organization for Animal Health (OIE), which focuses the tripod, “public veterinary system, private veterinary network and producers”. It will build on the evaluation of the performance of the Veterinary Services using the PVS Tool, that was carried out in July 2008 by the OIE and the subsequent Gap Analysis conducted recently where national priorities are defined. The component will improve capacities of key national public institutions of the livestock sector with the specific objectives of: (i) improving the delivery of advisory and technical services to enhance the adoption of good husbandry practices and innovative technologies; and (ii) promoting the development of a framework appropriate for the sustainable development of the livestock sector.

Component 2: Productive On-Farm Investments. The objective of this component is to improve productivity of identified production systems through support to investments directed to producers and their organizations, but also private services providers. In the traditional sector the priority would be on introducing technologies that reduce livestock mortality particularly in young stock, improve reproductive efficiency and enable animals to reach optimum slaughter weight more quickly. Producers' access to services would be improved through group formation, the provision of essential livestock infrastructure, and the delivery of improved technology packages by Ministry field staff augmented by Community Livestock Workers and private service providers. More specialist advisory services and technical packages would be made available to emergent farmers. Support would also be provided for range and pasture improvement and utilization and dry season feeding technologies.

Component 3: Project Management. The objective of this sub-component would be to ensure efficient and timely delivery of project resources in accordance with the project's objectives. The sub-component would support the operational costs of the national Project Steering Committee and the Technical Committee responsible to ensure overall performance oversight and policy guidance of the project. It would support the establishment, equipment and operations of the Project coordination offices, at both national and provincial levels, responsible for project implementation, procurement, financial management, safeguards monitoring and oversight, and overall monitoring and evaluation (M&E). The sub-component would support technical assistance, training, office equipment and vehicles, minor office upgrading works and incremental operating costs in support of project management. It would support the establishment and operations of an M&E system, including the establishment of a Geographic Information System (GIS) to spatially monitor report and display the results, and regular evaluation studies. The sub-component would also provide funding for outsourcing of quality oversight through independent financial and technical audits, and evaluation of project activities. It would support the preparation and implementation of a communication strategy for the project.

The Project Development Objective (PDO) is to improve the productivity of key livestock production systems for targeted smallholder producers in identified areas. Specifically, the project will target selected species including cattle, small ruminants (sheep and goats), pigs and poultry for smallholder producers in Central, Eastern, Lusaka, Northern, Southern, Western and parts of Copperbelt provinces.

The LDAHP subprojects will be implemented through the Ministry of Agriculture and Livestock (MoAL) and its structures at Provincial, District and Camp levels. However, since the exact locations of the LDAHP subprojects would not be known by project appraisal,, the Operational Policy 4.01 of the Bank requires the Ministry to prepare an Environmental and Social Management Framework (ESMF).

The World Bank Operational Policy 4.09 requires the preparation of a Pest Management Plan (PMP) to provide guidance for the management of the major livestock pests and diseases. The Plan contributes to improved pest management, personal safety and environmental sustainability.

The PMP (presented in a separate volume) has been prepared to provide guidelines for implementing integrated approaches to pest management.

The Ministry is required to prepare a Resettlement Policy Framework (RPF) to address the needs of those who might be affected when a subproject implementation may cause the involuntary taking of land and other assets resulting in: (a) relocation or loss of shelter, (b) loss of assets or access to assets (c) loss of income sources or means of livelihoods, whether or not the affected person must move to another location. The RPF has been prepared as a stand-alone and separate document (see volume II).

The GRZ is also required to disclose all these documents (the ESMF, RPF and PMP) in country as three separate and stand-alone documents so that they are accessible by the general public, local communities, potential project-affected groups, local NGO's and all other stakeholders and also at the InfoShop of the World Bank and the date for disclosure must precede the date for appraisal of the project.

Since the participating and qualifying districts will only be known during the LDAHP implementation, each LDAHP subproject location that is subsequently identified and approved by the MoAL, would be subjected to environmental and social planning prior to their approval for funding. Projects that trigger other policies beyond those triggered in the ESMF will not be considered for funding under the LDAHP.

2.2 Project Coordination and Implementation

The LDAHP will be implemented under the overall responsibility of the MoAL. A Project Steering Committee, chaired by the Permanent Secretary of MoAL, and assisted by a Technical Committee will provide policy guidance and oversight. Within the Ministry, a National Project Coordination Office (NPCO) headed by a National Project Coordinator (NPC) will be established to ensure overall project management and coordination and will serve as the lead implementation agency. More specifically, the NPCO will (i) prepare annual work plans and budgets (AWPB) and consolidated project reports; (ii) develop communication and outreach strategies and tools including guidelines and standard formats for the disbursement of grants and Monitoring and Evaluation (M&E); (iii) pre-qualify and organize training of technical service providers for use under Component 2, (iv) establish and undertake M&E of the Project. Coordination at provincial levels will be carried out by Provincial Project Coordination Offices (PPCOs). Both NPCO and PPCOs will comprise (i) civil servants from the public administration to be assigned to the project on a full time basis, and (ii) contracted staff in specific areas to fill technical gaps not available in the ministry.

Additional support to project implementation will be provided through: (i) provincial and district extension structures of the MoAL and other relevant government departments to strengthen links with producers and participate in sub-projects pre-screening and selection; (ii) local service providers to assist Livestock Improvement Grant Facility (LIGF) applicants groups in preparing their sub-projects; (iii) Grant Committees (GC) and technical specialists to

assess sub-projects and ensure final quality and selection; and (iv) specific implementation agreements for activities under the overall oversight of the NPCO.

A Project Implementation Manual (PIM) will be prepared prior to project effectiveness. The PIM will detail the organizational and technical procedures that will govern the project, including the mechanism, fiduciary and technical procedures regarding the co-financing of sub-projects under the Matching Grant, financial management and procurement for the project.

With respect to this ESMF, the responsibilities that are assigned to the different Project Management levels and inter-level interactions are summarized in Figure 2.1 while details of some of the responsibilities are given in Section 7. In addition to the responsibilities shown in Figure 2.1, Performance Reviews will be undertaken by an independent consultant contracted to visit each of the subproject.

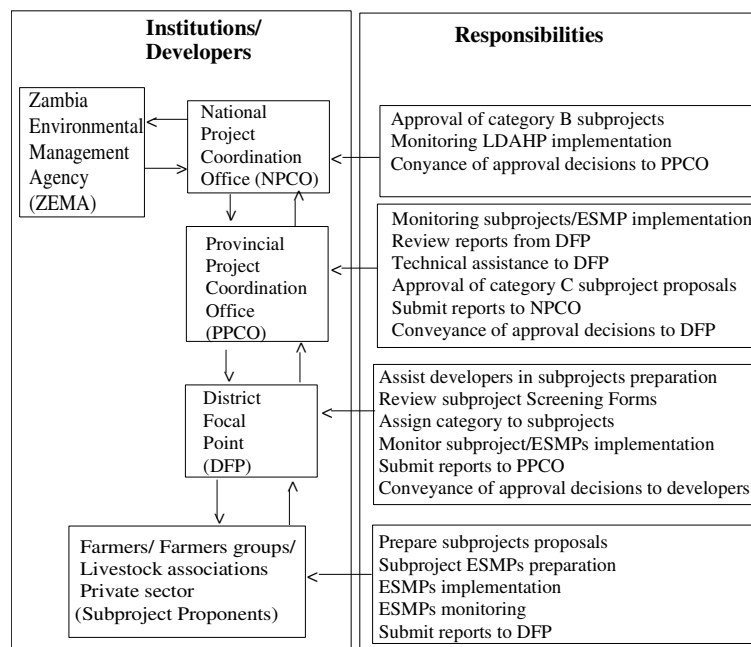


Figure 2.1. The Organogram for ESMF Implementation Arrangements of the Livestock Development and Animal Health Project in Zambia

3. ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK METHODOLOGY

The assessment is largely based on four methodologies of gathering data and analysis. These are literature review, discussions with key resource persons and stakeholder consultations,

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targeted site visits and participatory rapid appraisal (PRA). Geographic Information Systems (GIS) was applied, wherever appropriate, to analyze the spatial extent of ecosystems, land cover and protected areas and location of physical cultural resources, and to present data and information.

3.1 Review of Literature

Available documents were carefully reviewed and data therein analyzed and data gaps identified. From the literature, all possible envisaged social and environmental impacts were listed and evaluated based on policy and legal requirements using matrices and maps. Existing literature were also the primary source for defining institutional, policy and legal frameworks as described below.

3.2 Site Visits

The LDAHP will be implemented in various districts within seven provinces (Central, Copperbelt, Eastern, Lusaka, Northern, Southern and Western) of Zambia (Figure 3.1). Site visits were intended to gather data and information to fill gaps identified during literature review. The visits were conducted in eight sample districts in which the LDAHP will be implemented. The criteria for selecting sample districts for site visits were (i) environmental conditions, such as grazing ecosystems, (ii) vector distribution, (iii) cattle population, (iv) the presence of livestock/wildlife interactions, including human/wildlife conflict and (v) presence of livestock services, such as market centers. The selected sample districts are Chipata and Petauke in Eastern Province, Kalomo and Namwala in Southern Province and Kaoma and Senenga in Western Province. Visits to these sample districts were also aimed at acquiring direct knowledge of the existing environmental and social situations and potential impacts in the representative districts. The sites visited included existing and potential livestock service centers, dip tanks, abattoirs, milk collection centers, veterinary camps and district veterinary laboratories.

planning and implementation of the components and subprojects in the selected provinces and districts was assessed.

3.5 Consideration of National Policies and Legislation

The World Bank Safeguard policies also demand compliance to all national and international environmental requirements. Nationally, some environmental policies and regulations need to be satisfied in order to implement the subprojects of the LDAHP. All these were assessed for full compliance. Because of the nature of livestock development projects, other relevant legislation that the project may be required to adhere to are administered by other Departments not directly concerned with livestock matters, namely the Ministry of Agriculture and Cooperatives, Ministry of Tourism, Environment and Natural Resources, Ministry of Lands, Ministry of Local Government and Housing and Ministry of Health. The requirements of these policies and laws were also assessed.

3.6 Baseline Environmental Data and Analysis

The purpose for collecting baseline environmental data is to describe and evaluate the current environmental status of proposed project districts and include environmental information relevant to the project. The description of the baseline environment was therefore based on data on (i) the physical environment (geology, topography, soils, climate and meteorology, surface and groundwater hydrology), (ii) biological environment (flora, fauna, endemic and endangered species, critical/sensitive habitats, including protected areas and reserves), and (iii) socio-economic environment (land-use, land tenure, and land titling and human settlements). The data on geology and soils, climate, water resources, biodiversity, human and livestock populations, farming systems and livelihood systems was obtained from existing literature, especially maps which cover all the targeted districts.

The Intergovernmental Panel on Climate Change (IPCC) report 1998 indicate that the climate in Africa will undergo rapid warming in the 21st century with significant impacts on the biophysical environment and livelihood systems, including agricultural systems. Climate change may also manifest itself through the increased frequency and severity of droughts and floods which may impact significantly on animal health and distribution of livestock disease vectors. This study therefore assessed how climate change may impact on animal health and vector distribution using some climate change scenarios. Climate change may also impact significantly on the productivity of grazing lands with consequences for the carrying capacity of these rangelands. The assessment therefore also attempted to determine these trends and provide some guidelines for dealing with these potential threats.

4 BASELINE ENVIRONMENTAL CONDITIONS

4.1 The Biophysical Environmental Features

4.1.1 Topography, Geology and Soils

Analysis of topography and geology was based on data from maps produced by the Surveyor General and data on soils were obtained from the Soils map of Zambia prepared by the Department of Agriculture (Soils Section) at Mt Makulu. The major topographic regions in the country are plateaus and valleys. The plateaus stand at altitudes of 1000 m to 1500 m above sea level (asl) with occasional high ground (1500 to 2000 m) in the northeast of the country consisting of mountains in Nyika and Mbala areas. The plateau is also covered by large expanses of floodplains in the north (Bangweulu Swamps), central parts (Kafue Flats) and west (Barotse Floodplain). The valleys (500 – 1000 m asl) occur along the Luangwa river and middle Zambezi (Figure 4.1) and are separated from the plateaus by escarpments.

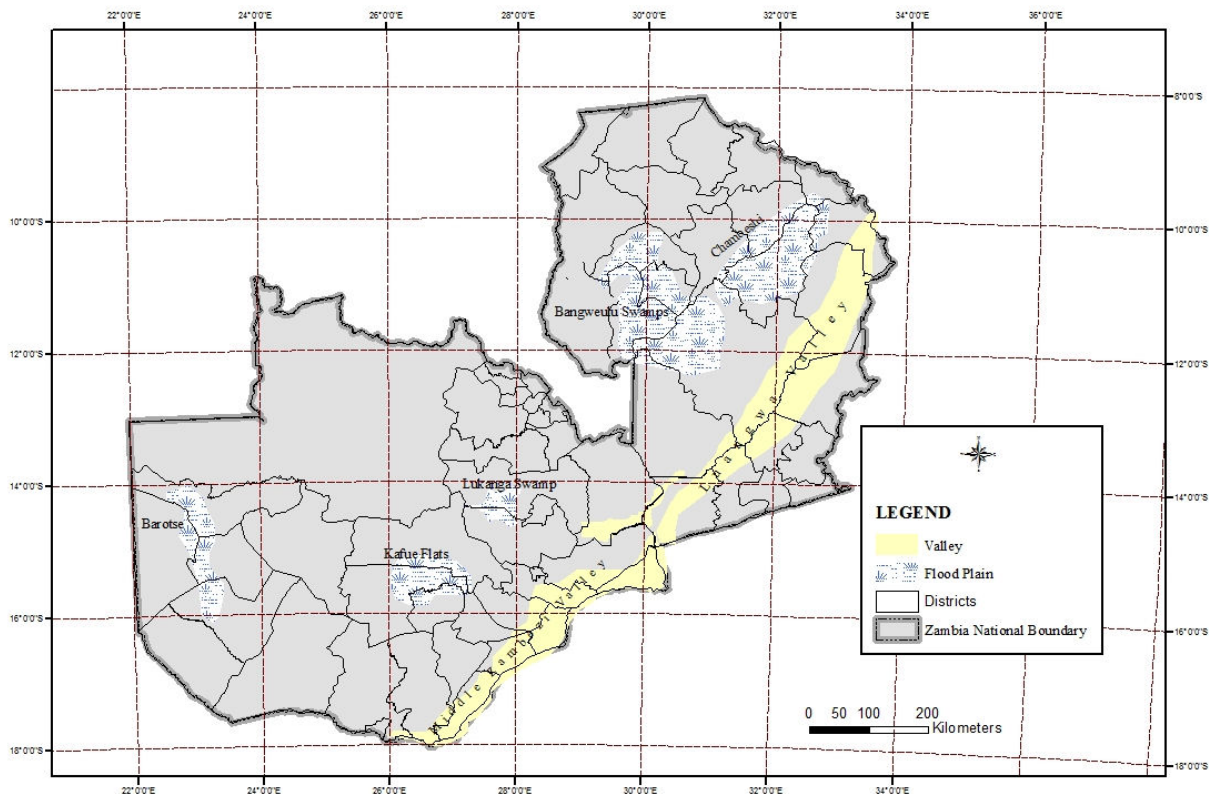


Figure 4.1 Major valleys and floodplains/swamps in the LDADP regions in Zambia. Based on the present study.

The Basement Complex is the oldest rock system in Zambia and occupies large parts of Eastern and Northern Provinces and some higher plateau areas of Southern Province. The main rock types of the Complex are gneisses, mica, hornblende, kyared, schists and micaceous quartzites. The upper part of the Complex is characterized by quartzites, schists and conglomerates. In some areas the Complex is overlain by sediments of the Katanga age, particularly in the southeast, east and north of the country. The rocks of the Katanga system occur extensively in Northern,

Luapula, Copperbelt, Northwestern, Central and Lusaka Provinces. The younger rocks of Karroo system formed from the Upper Carboniferous to the Jurassic geological periods occur in the valleys of the Luangwa and middle Zambezi systems. The Karroo system consists of mudstones, grit and sandstones with an upper layer of basaltic lava around Livingstone. However, in the west this is covered by the Kalahari system which consists of poorly consolidated sandstones and unconsolidated windblown sands that cover extensive parts of Western Province and smaller areas of Northwestern, Central and Southern Provinces. Recent deposits of alluvium are most extensive in the Upper Zambezi and its tributaries, on the Kafue Flats, the Lukanga and Bangweulu swamps and along the upper Chambeshi River in Northern Province (Figure 4.1).

Based on the FAO/UNESCO classification, the northern plateau soils in Northern and Copperbelt Provinces and northern parts of Central Province are orthic ferrasols that are strongly leached brownish clayey to loamy soils derived from acidic rocks with a pH of 4.0 – 4.5 while the plateau in the rest of Central Province, Eastern, Lusaka and Southern Provinces have ferrasols that are moderately leached with a pH of 4.5 – 6.0. The Luangwa and Middle Zambezi valleys have vertisols, luvisols and fluvisols that are slightly acid to alkaline (pH 5.0 – 7.5) and these are separated from plateau soils by lithosols of the escarpment zone. The Kafue Flats in Central and Southern Provinces have clay vertisols that are slightly acid to alkaline (pH 5.0 – 7.5). In Western Province, the Kalahari sands with a pH of 4.0 – 4.5 cover most of the upland areas in the Province and some parts have strongly acid podzols and arenosols (pH 4.0 – 5.0) while the floodplain soils consist of dystric gleysols and arenosols that are also strongly to very strongly acid.

Soil erosion has been identified as one of Zambia's environmental problems. Major factors that determine the erodibility of soil are topography, soil type, rainfall and vegetal cover. In Zambia, less than 9% of the country has slopes of more than 10% that have a high erosion hazard, however, in addition to this 9%, nearly 18% of the country has highly erodible soils while 15% of the country receives rainfall with a high erosive power of over 23,000 joules/m²/year (Chiti, 1991). In terms of vegetation cover, about 23% of Zambia has inadequate vegetation cover to effectively intercept erosive rainfall (Chiti, 1991). The causes of soil erosion include bad agricultural practices, deforestation, poor infra-structure construction, such as roads, and overgrazing by livestock and wildlife. The LDAHP districts can be classified by soil erosion hazard using the soil erosion hazard map of Zambia (Chiti, 1991). Erosion hazard is generally high to very high in the escarpment region along the Luangwa and Middle Zambezi valleys and is very low to low on the Kalahari sands of Western Province. The Copperbelt Province and Chibombo, KapiriMposhi and Mumbwa districts in Central Province also have a low erosion hazard just as Kasama, Mungwi, Luwingu, Chilubi, Mporokoso, Mpulungu and Kaputa in Northern Province and Itezhetzhi, Namwala, Kazungula, Monze and Mazabuka in Southern Province. Mambwe district in Eastern province has low erosion hazard unlike other districts such as Chadiza, Katete and Chipata that have low to average erosion hazard. All the districts that have both plateau and escarpment zones in Eastern and Southern Provinces have low to average erosion hazard on the plateau and high to very high erosion hazard in the escarpment zone.

4.1.2 Climate

The climate in Zambia is characterized by alternating wet (rainy) and dry seasons. The rainy season lasts from November to March or April. Rainfall in Zambia is influenced by the southward movement of the equatorial low pressure belt in the summer months that is linked to

the migration of the overhead sun and the Inter-Tropical Convergence Zone (ITCZ) which is a zone in which the Congo air and southeast and northeast trade winds converge (Davies, 1971). The mean annual rainfall distribution in Zambia is characterized by a decrease from north to south (Figure 4.2) that may be attributed to the shorter time the south is influenced by the ITCZ. The coefficient of variation (CV) of annual precipitation currently ranges from 10 – 20% in Copperbelt and Northern Provinces and the northern districts of Kalabo and Lukulu in Western Province to 20 – 30% in Central, Eastern, Lusaka and Southern Provinces and the rest of Western Province.

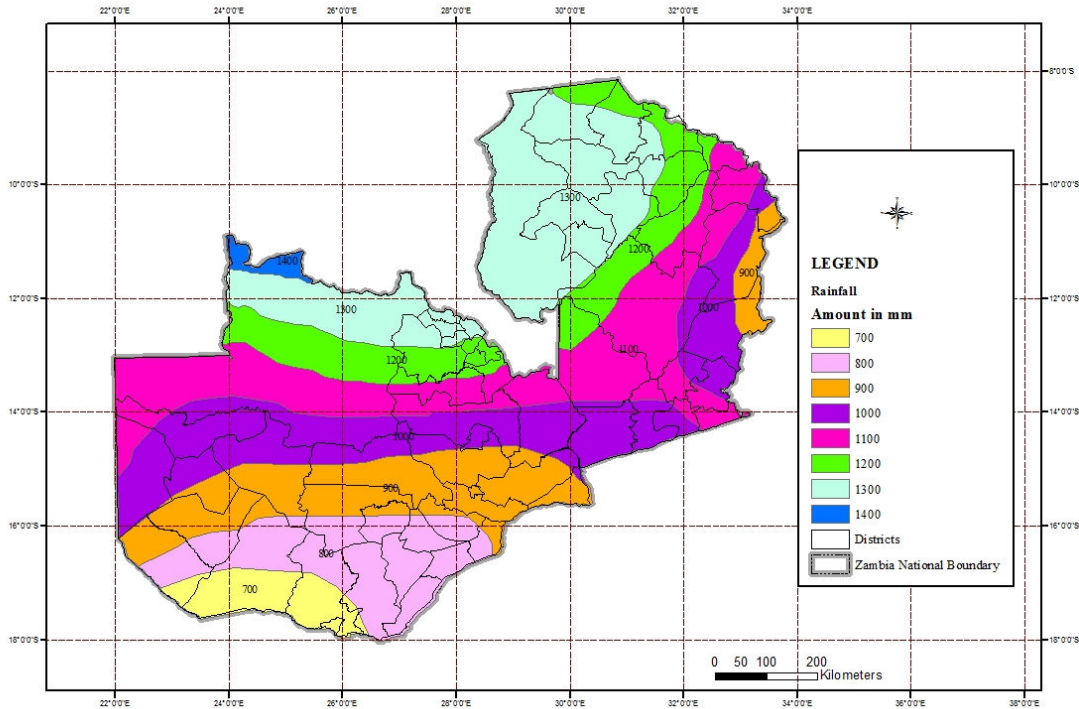


Figure 4.2 Mean annual rainfall distribution in Zambia for the period 1970 – 2008. Based on the present study using data from the Zambia Meteorological Department Headquarters in Lusaka. The average temperature in the LDAHP districts in Zambia during 1961 to 1990 ranged from 20 to 24 with the valley areas experiencing the highest temperatures.

4.1.3 Climate Change

Climate change is expressed as deviations from a regional climatology determined by analysis of long-term measurements, usually over a period of at least 30 years, or the normally experienced climate conditions and a different, but recurrent, set of climate conditions over a given region of the world (IPCC, 1998). Climate change may also refer to a shift in climate, occurring as a result of human activities (Wigley, 1999). In climate modeling and assessment of impacts of climate change on biodiversity the deviations or anomalies from normals are based on the climatology for the period 1961 to 1990 calculated from observed instrument records (New *et al.*, 1999). Although IPCC scenarios project that sub-Saharan Africa will experience a declining trend in rainfall during the 21st century, there has been little change in annual rainfall in Zambia during

1970 to 2010; however, variability in annual rainfall remains high and this is likely to continue during most of this century while the pattern in the frequency of floods and droughts is also expected to continue during the LDAHP implementation period.

The analysis of climate change is based on the Hadley Center Coupled Models (HadCM3 B1-low and A2-high) climate change scenarios (IPCC, 2007), average temperature anomalies (i.e., departures from the 1961 – 1990 mean values) in Zambia will increase by 1.3 to 2.0°C by 2020 and 2.25 to 3.00°C by 2050 (see Table 3.1). Thus LDAHP will be implemented during a period of rising mean temperatures throughout the country and potential impacts of climate warming on the success of the project need to be considered. The majority of grasses in Zambia are C₄ species that normally grow better under warm conditions while the dominant trees are C₃ species that do not growth well under warmer climate. Thus the productivity of these grasses may increase while that of trees may decline under a warmer climate. For example, observations made at a Makeni savanna site in Lusaka Province show that the growth of the majority of trees declined due to the additive effects of temperature factors which explained a significant proportion of the variation in tree annual growth, while the productivity of most grasses at the same site increased under a warming climate (Chidumayo, 2011). This implies higher productivity of grazing lands and therefore higher carrying capacity of grazers which would have positive impact on the LDAHP. Climate change may also alter the distribution range of disease vectors. For example, the current distribution of the main tick vector species (*Rhipicephalus appendiculatus*) (Figure 4.3) that is involved in the transmission of East Coast fever (*Theileriosis*) is projected to expand in Zambia (Olwoch *et al.*, 2008). This implies expansion in surveillance and control activities of this vector species in the future.

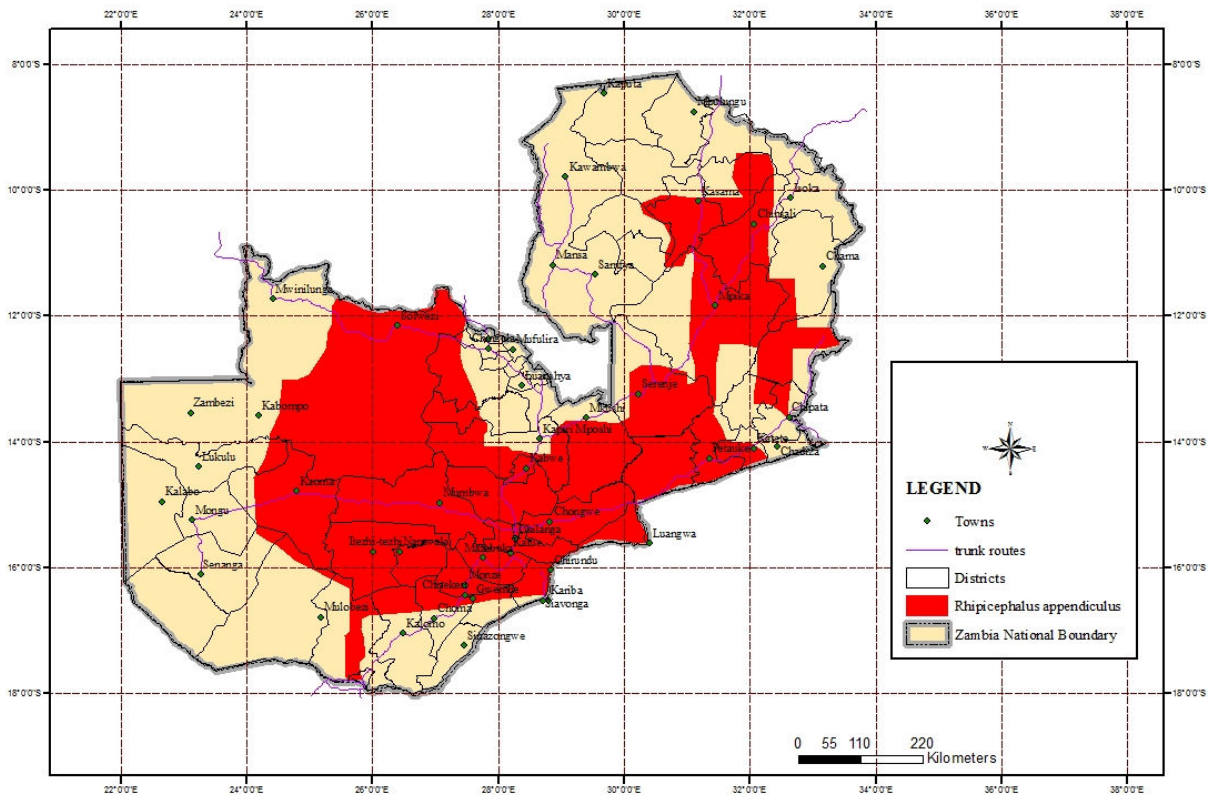


Figure 4.3. Current distribution pattern of *Rhipicephalus appendiculatus* in Zambia. Based on Olwoch et al. (2008).

4.1.4 Hydrology

Zambia is drained by the Congo in the north and Zambezi in the south. The main Zambezi drainage system occupies most of the western portion of the country and some discontinuous areas in the south. The Kafue system originates in the Copperbelt region and drains the central region of the country. The Luangwa system, with its tributary of Lunsemfwa, drains much of the eastern parts of the country. In the north the Chambeshi River originates in the north-east and drains much of the southern parts of Northern Province before discharging into the Bangweulu swamps. The drainage into Lake Tanganyika in the north consists of the Lufubu and some minor streams.

Almost all the rainfall in the country falls during the period November to April, so that the dry season months of May to October do not contribute to stream flow. Consequently, most small streams dry up while in the many larger streams flow is reduced to a small fraction of the wet season discharge. Surplus water (i.e., the amount of precipitation that goes to stream flow and groundwater recharge) varies throughout the country but ranges from 150 – 550 mm in the Copperbelt and Northern Provinces and northern parts of eastern Province to 50 – 100 mm in Central, Lusaka, Southern and Western Provinces and the southern parts of eastern Province. Runoff in the Luangwa basin is approximately 13% of the mean yearly rainfall compared to 24% in the Kafue basin (Sharma, 1985). The quality of water is generally good except in the Kafue

River system where surface water may be contaminated in some places due to industrial, urban and agriculture activities.

Natural wetlands in the form of swamps and floodplains (see Figure 3.1) hold considerable amounts of runoff water but also lose a lot of water through evaporation especially in the dry season. Dambos are seasonal wetlands that are waterlogged during the wet season and occur in the upper reaches of drainage systems and constitute up to 10% or more of the landscape on the plateau.

4.1.5 Flora and Fauna

The Biodiversity analysis study for Zambia estimated species diversity in the country to be at 7,774 of which microorganisms constitute 7%, flora 49% and fauna 44% (Chidumayo and Aongola, 1998). Fish biodiversity is highest in Lake Tanganyika which contains 62% of the 409 total fish fauna in the country. Generally, fish diversity increases from south to north.

According to the IUCN classification, a taxon is Endangered when the best available evidence indicates that it is facing a very high risk of extinction in the wild while a taxon is considered Vulnerable when the best available evidence indicates that it is facing a lower risk of extinction in the wild than that for an Endangered species. When the risk of extinction is based on a small geographical scale, these classes can be referred to as locally Endangered or locally Vulnerable. A taxon is endemic if at least 75% of its known range is within a particular ecological region. Based on these definitions, there are 316 endemic, and 31 Endangered/Vulnerable species of plants and animals in Zambia. These figures may be underestimations because knowledge about most species is scanty. Table 4.1 lists the endangered and vulnerable species in Zambia.

Table 4.1. List of Endangered and Vulnerable species in Zambia. Based on Chidumayo and Aongola (1998).

Group/ Subgroup	Species (Common name)	Threat status
Fauna		
Mammalia	<i>Crocidura ansellorum</i>	Endangered
	<i>Crocidura pitmani</i>	Vulnerable
	<i>Rhynchocyon cirnei</i> (Checkered Elephant shrew)	Vulnerable
	<i>Plerotes anchietae</i>	Vulnerable
	<i>Pipistrellus anchietae</i>	Vulnerable
	<i>Otomops martiensseni</i>	Vulnerable
	<i>Lycaon pictus</i> (African wild dog)	Endangered
	<i>Acinoyx jubatus</i> (Cheetah)	Vulnerable
	<i>Panthera lea</i> (Lion)	Vulnerable
	<i>Loxodonta africana</i> (Elephant)	Endangered
	<i>Diceros bicornis</i> (Black rhinoceros)	Endangered
	<i>Kobus leche kafuensis</i> (Kafue lechwe)	Vulnerable
	<i>Kobus leche smithemani</i> (Black lechwe)	Vulnerable
Aves	<i>Egretta vinaceigula</i> (Slaty Egret)	Vulnerable
	<i>Falco fasciinucha</i> (Taita Falcon)	Vulnerable
	<i>Falco naumanni</i> (Lesser Kestrel)	Vulnerable
	<i>Bugeranus caranculatus</i> (Wattled Crane)	Vulnerable

	<i>Crex crex</i> (Corncrake)	Vulnerable
	<i>Sarothrura ayresi</i> (White-winged Flufftail)	Endangered
	<i>Agapornis nigrigenis</i> (Black-cheeked Lovebird)	Endangered
	<i>Pogoniulus makawai</i> (White-chested Tinkerbird)	Vulnerable
	<i>Hirundo atrocaerulea</i> (Blue Swallow)	Vulnerable
Insecta	<i>Erikssonina acraeina</i>	Vulnerable
	<i>Monardithemis flava</i>	Vulnerable
	<i>Lanistes neavei</i>	Vulnerable
	<i>Bellamyia crawshayi</i>	Endangered
	<i>Bellamyia mweruensis</i>	Endangered
	<i>Bellamyia pagodiformis</i>	Endangered
Trees	<i>Pterocarpus angolensis</i>	Locally Vulnerable
	<i>Azelia quanzensis</i>	Locally Vulnerable
	<i>Daniela ostiniana</i>	Locally Vulnerable
	<i>Khaya nyasica</i>	Locally Vulnerable
	<i>Mitragyna stipulosa</i>	Locally Vulnerable

4.1.6 Ecosystems and Land Cover

Based on the vegetation of Zambia, there are 16 main ecosystems in the country. These ecosystems are dynamic due to the influence of climate and geomorphological processes. Over the last million years, there have been drastic changes in the extent of these ecosystems which have been triggered by changes in climate. In recent times, biotic factors, such as cultivation, fire and herbivory, have played a significant role in altering the structure and functioning of these ecosystems. These are important considerations in biodiversity management. Ecosystems with the highest species biodiversity are Acacia savanna (munga) and *Brachystegia-Julbenardia* (miombo) woodlands followed by *Colospospermum* (mopane) woodland and floodplain/swamp grassland. Termitary is a transition ecosystem between wetland grassland and upland woodland that is characterized by wooded termite mounds (termitary) surrounded by grassland and is important for grazing (see Table 3.3). Montane forest, although of limited extent in the country, has the highest number of endemic woody plants. The diversity of ferns and orchids is correlated to ecosystem diversity. The diversity of some invertebrates (Arachnids and butterflies) and ferns shows a south-north increase while that of other invertebrates (Hemiptera and Hymenoptera) shows the opposite trend. These diversity gradients are related to rainfall/moisture gradient. Table 4.2 shows the major land cover types (proxies for ecosystems) in the LDAHP districts.

Table 4.2 Major land cover types in LDAHP districts. Based on the present study.

Province	District	Area (km ²)	Major land cover types (%)				
			Area under fallow and cropland	Area where forest cover has been loss	Area with forest cover	Grazing lands	Water

						Dambo	Wetland	Termitary	
Copperbelt	C/beltUrban	7757	12	36	46	6	0	0	0
Copperbelt	Lufwanyama	7914	11	34	47	9	0	0	0
Copperbelt	Masaiti	4578	12	37	49	2	0	0	0
Copperbelt	Mpongwe	11079	10	32	46	11	0	0	0
Central	KabweUrban	1572	0	91	2	5	0	2	0
Central	Chibombo	53795	4	7	65	5	15	4	0
Central	KapiriMposhi	33460	3	1	61	12	15	8	0
Central	Mkushi	22608	16	4	79	1	0	0	0
Central	Mumbwa	21103	12	25	44	4	10	5	0
Central	Serenje	23351	32	18	43	3	3	1	0
Eastern	Chadiza	2574	21	47	29	3	0	0	0
Eastern	Chama	17630	21	27	49	3	0	0	0
Eastern	Chipata	5863	21	27	49	2	0	0	0
Eastern	Katete	3989	20	44	30	6	0	0	0
Eastern	Lundazi	14058	21	27	51	1	0	0	0
Eastern	Mambwe	6123	22	20	57	1	0	0	0
Eastern	Nyimba	8885	22	20	58	0	0	0	0
Eastern	Petauke	9800	21	19	55	4	0	0	0
Lusaka	Chongwe	12654	16	20	64	1	0	0	0
Lusaka	Kafue	5411	15	46	33	3	3	0	0
Lusaka	Luangwa	3471	15	19	65	0	1	0	0
Lusaka	Lusaka Urban	360	0	100	0	12	0	0	0
Northern	Chilubi	4648	10	6	22	4	52	4	2
Northern	Chinsali	15395	32	18	38	6	0	7	0
Northern	Isoka	8393	30	17	39	4	0	10	0
Northern	Kaputa	13004	26	15	37	5	10	1	6
Northern	Kasama	11815	30	17	42	6	4	1	0
Northern	Luwingu	8892	37	20	33	10	0	0	0
Northern	Mbala	8834	34	19	40	6	0	1	0
Northern	Mporokoso	12043	34	19	42	5	0	0	0
Northern	Mpika	40935	32	18	38	3	9	1	0
Northern	Mungwi	8739	20	11	32	11	0	26	0
Northern	Mpulungu	9674	26	15	34	6	0	1	18
Northern	Nakonde	5453	17	10	29	11	0	33	0
Southern	Choma	7296	34	19	43	4	0	0	1
Southern	Gwembe	5033	18	17	31	0	0	0	34
Southern	ItezHITEZHI	16917	11	10	49	6	17	4	3
Southern	Kalomo	18208	16	15	60	6	2	0	1

Southern	Kazungula	12895	15	14	63	6	2	0	0
Southern	Livingstone	1427	16	15	64	5	0	0	0
Southern	Mazabuka	6842	12	11	54	0	21	2	0
Southern	Monze	4854	16	15	66	3	0	0	0
Southern	Namwala	4834	8	7	40	14	12	19	0
Southern	Siavonga	2614	19	17	62	0	0	0	2
Southern	Sinazongwe	4964	3	3	55	0	0	0	39
Western	Kalabo	17526	5	4	38	2	45	6	0
Western	Kaoma	23315	12	8	70	5	1	4	0
Western	Lukulu	16291	4	3	60	5	28	0	0
Western	Mongu	10075	9	6	61	8	16	0	0
Western	Senanga	13743	10	7	70	6	6	2	0
Western	Sesheke	129272	2	1	88	3	3	2	0
Western	Shang'ombo	16162	7	5	50	12	1	26	0

4.1.7 Protected Areas

The Convention on Biological Diversity (CBD) defines a protected area as a geographically defined area which is designated or regulated and managed to achieve specific conservation objectives. Similarly, in-situ conservation refers to the conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural surroundings and, in the case of domesticated or cultivated species, in the surroundings where they have developed their distinctive properties.

The protected area system in Zambia consists of national parks (IUCN protected area category II), bird sanctuaries (IUCN protected area category IV), game management areas (GMAs, IUCN protected area category VIII), important bird areas (IBAs, IUCN protected area category IV), forest and botanical reserves (IUCN protected area categories IV and VIII) and national heritage sites (IUCN protected area categories III and X). National parks were established by government primarily for the conservation of biodiversity. There are 19 national parks in Zambia and these cover a total area of 6.358 million hectares (ha). Sustainable use of wildlife and its habitats in national parks is promoted through eco-tourism while settlements and hunting are prohibited.

Bird sanctuaries have the same status as national parks but are usually smaller in size. There are two bird sanctuaries in the country. Important Bird Areas (IBAs) are identified based on internationally agreed criteria and are established for the long term viability of naturally occurring bird populations across the range of those species for which a site-based conservation approach is appropriate. There are 42 IBAs in Zambia and some of these are in national parks and these also include the two Ramsar sites (Bangweulu Swamps and Kafue Flats) in the country.

Game management areas (GMAs) were established by government to control the hunting of game and protected animals through a licensing and monitoring system. There are 34 GMAs in Zambia which cover a total of 16.57 million ha. Because other forms of land use, such as settlements and agriculture are allowed, GMAs are not strictly protected areas.

Forest reserves were established by government to conserve forest resources for sustainable use by local people in the case of local forests and to protect major catchment areas and biodiversity in the case of national forests. There are 432 forest reserves in Zambia which cover a total of 7.4 million ha. Settlements and cultivation are normally not permitted in forest reserves while removal of any plant is only permissible under license as is livestock grazing. Other forest reserves are managed as botanical reserves that serve three objectives: (i) preservation of relic vegetation types and/or plant species, (ii) genetic banks for multiplication and breeding programs, (ii) reference sites in determining human impacts on forest ecosystems outside reserves. There are 59 botanical reserves in Zambia which cover a total area of 148,000 ha but form part of the country's forest reserve system.

Since the ratification of the World Heritage Convention in 1994, Zambia has enlisted the Victoria Falls as a World Heritage site which allows the protection of both the cultural and natural attributes of the Victoria Falls area. There are 374 national heritage sites in the LDAHP target districts (Table 4.3).

Table 4.3. Protected areas in the LDAHP target districts in Zambia. Percent total for national parks, forest reserves and GMAs may exceed 100 because some forest reserves are also found in Game Management Areas. Based on the present study.

Province	District	Area (km ²)	Extent (% of area in district)			Number per district	
			National Parks	Forest Reserves	Game Management Areas	Important Bird Areas	National Heritage Sites
Central	Chibombo	53795	0	1	0	2	1
Central	KabweUrban	1572	0	10	0	0	3
Central	KapiriMposhi	33460	0	4	10	1	2
Central	Mkushi	22608	0	6	39	2	10
Central	Mumbwa	21103	37	5	42	1	3
Central	Serenje	23351	14	4	31	1	11
Copperbelt	C/beltUrban	7757	0	29	0	0	19
Copperbelt	Lufwanyama	7914	0	20	0	0	0
Copperbelt	Masaiti	4578	0	26	0	0	15
Copperbelt	Mpongwe	11079	0	0	9	1	4
Eastern	Chadiza	2574	0	11	0	0	8
Eastern	Chama	17630	0	19	98	0	12
Eastern	Chipata	5863	0	24	0	0	19
Eastern	Katete	3989	0	6	0	0	2
Eastern	Lundazi	14058	37	9	32	1	14
Eastern	Mambwe	6123	0	0	79	0	0
Eastern	Nyimba	8885	0	10	47	0	0
Eastern	Petauke	9800	0	10	16	1	3
Lusaka	Chongwe	12654	20	0	28	1	5
Lusaka	Kafue	5411	0	14	22	0	16
Lusaka	Luangwa	3471	48	0	33	0	0

Lusaka	LusakaUrban	360	0	1	0	0	0
Northern	Chilubi	4648	0	0	20	0	0
Northern	Chinsali	15395	0	6	1	2	1
Northern	Isoka	8393	1	11	0	2	7
Northern	Kaputa	13004	23	2	32	1	6
Northern	Kasama	11815	7	14	0	0	7
Northern	Luwingu	8892	0	10	12	0	1
Northern	Mbala	8834	0	32	0	2	18
Northern	Mporokoso	12043	0	1	0	1	6
Northern	Mpika	40935	30	12	14	5	6
Northern	Mungwi	8739	0	1	0	0	1
Northern	Mpulungu	9674	0	0	0	1	5
Northern	Nakonde	5453	0	0	0	0	0
Southern	Choma	7296	0	13	0	1	3
Southern	Gwembe	5033	0	18	0	0	3
Southern	Itezhitezhi	16917	44	0	33	1	6
Southern	Kalomo	18208	0	10	34	0	26
Southern	Kazungula	12895	0	15	54	1	42
Southern	Livingstone	1427	5	12	0	1	26
Southern	Mazabuka	6842	3	10	4	1	10
Southern	Monze	4854	0	2	0	1	8
Southern	Namwala	4834	4	12	64	1	1
Southern	Siavonga	2614	0	0	0	1	14
Southern	Sinazongwe	4964	0	0	0	0	4
Western	Kalabo	17526	21	3	87	1	0
Western	Kaoma	23315	0	5	0	0	0
Western	Lukulu	16291	0	7	23	1	1
Western	Mongu	10075	0	7	0	1	2
Western	Senanga	13743	0	6	0	0	4
Western	Sesheke	129272	2	1	4	1	16
Western	Shang'ombo	16162	20	12	0	1	3

4.2 The Socioeconomic Environment

After 30 years of relatively dismal economic performance, Zambia's macroeconomic situation changed in 1999 with gross domestic product (GDP) growth averaging 4.8% between 1999 and 2009. Growth continues to be driven by increased output in the construction, mining and agriculture sectors. Gross domestic product growth was 5.5% in 2010 is likely to recover to 5.7% in 2011. Real GDP growth is forecast at 6.4% in 2012 as producers of maize continue to receive input subsidies; copper production continues to rise and construction is boosted by a sharp increase in public investment.

Inflation is expected to remain moderate at 9% in 2010, 7.7% in 2011 and 7.5% in 2012, provided that oil prices rise less rapidly and domestic food production remains strong, although this is conditional on adequate rainfall.

The livestock sector comprises around 3.038 million cattle, 751,000 goats, 711,707 sheep and 466,000 pigs, with the largest population found in the traditional sector (83% cattle, 97% goats, 64% sheep and 90% pigs). Poultry production is estimated at around 32 million broiler birds per year and about 4 million commercial layers for egg production in the commercial and small-scale sector. The proportion of households keeping cattle in the small scale and subsistence farming is estimated at 28%.

An estimated 42% of the land in Zambia is suitable for agriculture/livestock activities with 21% of the total land area suitable for rangeland grazing. According to Sinyangwe and Clinch (2004), the livestock sector contributes around 35% to the agricultural industry in Zambia. It provides essential food products, sustains employment and income of the rural population. Through animal draught power, it contributes directly to increased agricultural production in general and food security in particular. In terms of employment opportunities, agriculture's contribution to the labour market has increased from 42% in 1980 to more than 50% by 1990.

Mixed crop livestock farming is widespread in the traditional sector and where cattle have additional value for traction and manure. The social relevance of cattle is also high, for prestige, dowry, as savings for school fees and other expenses, and as a bridge when crops fail. Livestock distribution in the country indicates that Southern, Eastern, Western and Central Provinces account for 89% of the total cattle population with the remaining 11% found in Northern, North-western, Lusaka and Luapula Provinces. Eastern and Southern Provinces have 80% of the goat population and 83% of the total pig population.

However, per capita consumption of meat is only 2.4 kg, about half the average consumption for Africa. The estimated marketable meat is approximately US\$ 380 million but the slaughter off take is only 7%, of which 75% is sold at a value of US\$ 25 million. Consumer prices of livestock products in Zambia are much higher than in some other SADC countries. While some of the differences in consumption are due to lower per capita incomes, high prices are also a major factor, primarily due to inefficiencies in the production and marketing chain. Although it is recognized that Zambia has vast potential for livestock (including poultry) production, this potential is under-utilized and the productivity of livestock is described as low.

Productivity of cattle in the traditional sector is characterized by slow growth rates (5-8 years to reach market weight), high calf and adult mortality rates (20-30% and 9% respectively) and low reproductive performance. Low reproductive performance is exhibited by low conception and calving rates (50%) and long calving intervals. National herd growth rate is estimated at 3% with an average off take of 8-9%. In comparison, production ratios for the commercial sector feature low calf mortality (1-2%), high reproductive rates (65-70%) and an off take of 17-18%.

Between 1980 and 2010, Zambia's life expectancy at birth decreased by almost 5 years, although mean years of schooling increased by over 3 years the expected years of schooling decreased by less than 1 year and the GNI per capita decreased by 11%. In spite of this, Zambia's HDI had risen by 14.5% in 2010 from the level in 2000, the country is ranked at 150 out of 160 countries.

In general, the social vulnerability of Zambia is partially due to the rural nature of livelihoods of which 60% and 40% of the population is respectively rural and urban. Other reasons are due to low levels of production, knowledge and skills among the county's population.

There are vast disparities in living conditions between Zambia's rural and urban populations. For example, 64% of the urban population has access to safe water compared to 27% of the rural population. Moreover, 46% of the urban population lives below the poverty line compared to 88% of the rural population. In more general terms, the disparity of wealth between Zambia's rich and poor is also considerable. The poorest 60 percent of the population share 25% of the nation's wealth, whereas the wealthiest 10% benefit from 39% of the wealth; the remaining 36% of the wealth is shared by 30% of the population. Incomes have not grown as fast as inflation which, in combination with the introduction of user fees for health and education services, means that a majority of Zambians cannot afford to provide themselves with even basic social services. The pattern of household expenditures prevailing in the country is characteristic of a poor society because the bulk of expenditures, 52% on average and 64% among the poor is spent on food items. Other essential expenditures, fuels, health and education account for 22% of average household expenditures, as opposed to a developed country situation where at least 51% of household expenditures are on other items other than food, clothing, fuel, health, education and transport.

4.2.1 Land Tenure and Titling System

The details about land tenure and titling systems are covered in the RPF and therefore only brief descriptions of these issues are included here.

Land tenure is the way in which rights in land are held and in Zambia tenure is categorized into two tenure systems namely, statutory tenure and customary. Statutory land tenure refers to state Land which is administered by the Lands Commissioner through local authorities on behalf of the President since all land in the country is vested in the Republican President on behalf of the people. The president of Zambia holds the country's land in perpetuity on behalf of the Zambian people. The president has delegated his powers to make and execute grants and disposition of land to the Commissioner of Lands. The Commissioner has agents who plan the land into plots and thereafter select and recommend suitable candidates to the Commissioner of Lands for issuance of certificate of title. the Commissioner's agents in this regard, are the District, Municipal, and City Councils. These agents use the Town and Country Planning Act to plan the land in their areas in their capacities as planning authorities under the Act.

Customary land tenure system applies in areas under the jurisdiction of traditional authorities (chiefs/chieftainesses). The traditional system of tenure is the most prevalent among the majority Zambians who live in rural areas. Approximately 94% of the country is officially designated as customary area. It is occupied by 73 tribes, headed by 240 chiefs, 8 senior chiefs and 4 paramount chiefs (Chileshe, 2005).

Usually, tenure under customary lands does not allow for exclusive rights in land. No single person can claim to own land as the whole land belongs to the community. Land is deemed as belonging to members of the community for their own use (Republic of Zambia, 1995). It is a valuable heritage for the whole community. Communal lands in most of the African countries including Zambia have sprung from a concept of ancestral trust committed to the living for their own interest and for the interest of the unborn.

4.2.2 Livelihood Zones

A representation of Zambia's livelihoods is given by the *Zambia Livelihood Map Rezoning and Baseline Profiling (2004)* prepared by the Zambia Vulnerability Assessment Committee. The zones are profiled against agro-climatic peculiarities and a total of 16 are given. *Livelihoods* are defined as the means by which households obtain and maintain access to essential resources to ensure their immediate and long term survival. In Marxian terms, livelihoods are defined as the way society generates social values; in product and labour forms.

The Zambia Livelihood and Profiling system employs a household economy approach, organised around the concept of Disaster Risk Reduction framework. Accordingly, risk is understood as being dependent on an array of hazards and vulnerabilities that households face, underpinned by their coping strategies. Hazards are derived from information related to either natural or social and economic factors. Thus, hazards range from climatic elements, such as rainfall; floods or droughts, production and market (failure) factors; policy and institutional factors and access to information and services. Risk therefore is the combination of the information related to these factors, revealing the likelihood of gaps in food or income at household levels.

Using information available from the Central Statistical Office (CSO) on household sources of food and income for each zone, it is possible to assess vulnerability to particular events (i.e., which stresses will impact which populations and how).

Table 4.5 Population of Zambia by Livelihood Zones

Zone	Code	Zone name	Population	Percent
4A	Central	Maize-Cotton	332952	0.03
4B	Chama-Lundazi	Rice	413905	3.17
12A	Chiawa-Zambezi	Lowlands	138404	1.06
7B	Chongwe-Nyimba	Plateau	117513	0.90
2A	Copperbelt	Mining	2173983	16.66
5B	Eastern province	Cash crop	1053696	8.08
11A	Gwembe	Valley	362983	2.78
16B	Kaputa	Rice	39171	0.30
7A	Kazungula-Mwandi	Plains	257222	1.97
11B	Lake Kariba	Fishing	16974	0.13
5A	Line of rail	Commercial Farming	3137586	24.05
15C	Luangwa-Mfuwe	Valley	117513	0.90
7C	Luano	Valley	244165	1.87
15B	Luapula	Valley	322507	2.47

16A	Luapula	Northern wetlands	212828	1.63
12B	Mambwe-Petauke	Valley	154072	1.18
13	Mkushi	Commercial Farming block	90093	0.69
3B	Muchinga	Escarpment	82259	0.63
3A	Mufumbwe	Kasempa	385180	2.95
9	Mulobezi	Woodlands	23503	0.18
2B	Northern province	Plateau	1278276	9.80
1A	Northwest	High rainfall	262445	2.01
6	Sioma	Plain	488330	3.74
1B	Tuta-Luapula	Corridor	778194	5.96
10B	Zambezi	East	129264	0.99
14	Zambezi	Floodplain	91399	0.70
10A	Zambezi	West bank	342092	2.62
Total	Total population	0	13046508	100.00

Based on Zambia Livelihood Map Rezoning and Baseline Profiling (2004. Population estimates by Study team (2011)

Information in Table 4.5 can be overlaid on that of livestock populations and their types in order to discern the baseline information and to classify household livelihood options (food, cash and expenditure patterns) and coping capacity/expandability for different wealth groups in the livelihood zone, highlighting market linkages, and constraints and opportunities for economic growth. They can be used to predict who will be impacted by which shocks, how, and to what degree. They can be linked to population information to estimate numbers of beneficiaries and assistance requirements.

A livelihood analysis of the situation obtaining in each of the LDAHP target districts is suggested. The analysis is based on livestock and the important roles that livestock play in supporting the livelihoods of poor farmers, consumers, traders and labourers in the country. The greatest impact of livestock in sustainable development designed to help the poor is enhancement of livestock-production systems. Animal diseases are crucial constraints in this: the animals of poor people are particularly vulnerable to disease because of the expense, absence or unsuitability of animal-health and production inputs. For instance, poor farmers have few animals and few reserves on which to survive during lean times and use for recovery, so the loss of individual animals has a proportionally greater impact.

On a national basis, precise estimates by region and system are not available but could be used to estimate numbers of poor livestock keepers, traders, labourers and consumers, or the livestock animals that contribute to their livelihoods. Crude aggregate estimates available from summary reports, which provide a picture of the importance of livestock to poor people, can be generated from previous census and these could be supplemented by field level estimations. However, a working definition must be made of poor and vulnerable people and how they rely on livestock. A number of definitions of the poor have been suggested and Zambia uses \$1 per day expenditure to set the poverty line. However, people representing different livelihood systems could suggest poverty in livestock (wealth) sense, rather than in terms of income or expenditure. These refinements are necessary for the development of indicators of vulnerability and access to resources and markets.

Livelihood profile used by the Vulnerability Assessment Committee and Food Early Warning Systems can be deployed for assessment of household impacts and response strategies to livestock hazards or planning development interventions and Annex C gives some guidelines on conducting such analysis.

5. WORLD BANK ENVIRONMENTAL AND SOCIAL SAFEGUARDS POLICIES

5.1 World Bank Safeguards Policies

In this section World Bank Operational Policies that are triggered by the project are reviewed. The purpose of this review is twofold: (1) to ensure that the proposed project concept is environmentally and socially sound, and (2) to assess the relevance and implementability of mitigation measures for triggered safeguard policies to the proposed project. Of the ten WB Operational/Safeguards Policies, five are likely to be triggered by the LDAHP (Table 5.1).

Table 5.1 World Bank Operational/Safeguards Policies and those triggered by the LDAHP in Zambia.

Safeguard policy	Policy triggered by LDAHP	
	Yes	No
Environmental Assessment (OP/BP 4.01)	X	
Natural Habitats (OP/BP 4.04)	X	
Forests (OP/BP 4.36)		X
Pest Management (OP 4.09)	X	
Physical Cultural Resources (OP/BP 4.11)	X	
Indigenous Peoples (OP/BP 4.10)		X
Involuntary Resettlement (OP/BP 4.12)	X	
Safety of Dams (OP/BP 4.37)		X
Projects on International Waters (OP/BP 7.50)		X
Projects in Disputed Areas (OP/BP 7.60)		X

The actions required by the triggered policies are summarized in Table 5.2.

Table 5.2 Measures required for addressing World Bank Safeguards Policies triggered by the LDAHP in Zambia.

Bank Safeguards Policy Triggered	Action Required by Triggered Policy	Responsibility for Action
Environmental Assessment (OP/BP/GP 4.01)	Preparation of ESMF (this report)	ESMF by Ministry of Livestock and Fisheries Development (MoAL)
Natural Habitats (OP/BP 4.04)	Preparation of subproject ESIA's (see relevant sections of this report)	EMP's by subproject proponents
Pest Management (OP 4.09)	Preparation of a Pest Management Plan	Implementation of PMP provisions/guidelines for full compliance.
Physical Cultural Resources (OPN 11.03/ OP 4.11)	Preparation of management plans for PCRs	EMP's by subproject proponents

The WB's environmental assessment operational policy establishes the fact that some level of environmental assessment is required for all Bank financed development projects. According to OP 4.01 the WB classifies proposed projects into one of three categories, depending on the type, location, sensitivity, and scale of the project and the nature and magnitude of its potential environmental impacts.

Category A: if it is likely to have significant adverse environmental impacts that are sensitive, diverse, or unprecedented. For a Category A project, the borrower is responsible for preparing a report, normally an environmental assessment (EA) or a suitably comprehensive regional or sectoral EA.

Category B: if it's potential adverse environmental impacts on human populations or environmentally important areas (including wetlands, forests, grasslands, and other natural habitats) 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 mitigatory measures can be readily designed.

Category C: if it is likely to have minimal or no adverse environmental impacts. Beyond screening, no further EA action is required for a Category C project.

5.1.1 OP 4.01 Environmental Assessment

This policy requires environmental assessment (EA) of projects/programs proposed for Bank financing to help ensure that they are environmentally sound and sustainable, and thus improve decision making. The EA is a process whose breadth, depth, and type of analysis depends on the

nature, scale, and potential environmental impact of the subprojects under the LDAHP. The EA process takes into account the natural environment (air, water, and land); human health and safety; social aspects (involuntary resettlement and cultural property) and trans-boundary and global environmental aspects.

OP/BP 4.01 for Environment Assessment (EA) is triggered because Component 1 activities will support laboratory infrastructure improvement and provide equipment, material and consumables which are likely to generate bio-medical wastes which would have to be properly managed. In addition, all waste from livestock production systems is required to be disposed of in a safe manner that would prevent infectious waste being exposed to the general public resulting in possible outbreaks of infectious diseases. In addition OP/BP 4.01 is also triggered by activities under Component 2 which include support to the MoAL and local councils for the rehabilitation and/or construction of essential livestock industry infrastructure, such as livestock service centers, markets and slaughter facilities which may result in negative impacts related to poor hygiene and solid waste management.

5.1.2 OP 4.04 Natural Habitats

This policy recognizes that the conservation of natural habitats is essential for long-term sustainable development. The Bank, therefore, supports the protection, maintenance and rehabilitation of natural habitats in projects funded by it. The Bank supports and expects the Borrowers to apply a precautionary approach to natural resources management to ensure environmentally sustainable development.

OP 4.04 Natural Habitats is triggered because in parts of the project target area, such as Namwala, Mazabuka and Itezehitezhi in Southern Province and Shang'ombo, Sesheke and Kalabo in Western Province, livestock/wildlife interfaces could result in degradation of natural habitats.

5.1.3 OP 4.11 Physical Cultural Resources

The objective of this policy is to ensure preservation of cultural property in the project area. This includes preservation of sites having archaeological (prehistoric), palaeontological, historical, religious and unique natural values.

OP 4.11 Physical Cultural Resources is triggered because in parts of the project target area there are cultural resources or sites having archaeological (prehistoric), palaeontological, historical, religious and unique natural values that could be significantly damaged or lost through the implementation of the LDAHP if appropriate measures are not put in place.

5.1.4 OP 4.09 Pest Management

This Policy encourages promotion and use of biological or natural pest control methods and reduced dependence on chemical pesticides. This policy requires that the selection and use of pesticides should be designed according to the principles of environmentally sound and

economically sustainable pest management which recognize the use of pesticides as an integral component of Integrated Pest Management (IPM).

OP 4.09 for Pest Management is triggered because (i) under Component 1 pesticides with potential negative impacts to the biophysical environment may/could be used for controlling animal diseases. This policy is further discussed in the PMP (separate volume).

5.1.5 OP 4.12 Involuntary Resettlement

The objective of this policy is to avoid or minimize involuntary resettlement, exploring all viable alternatives. Furthermore, it intends to assist displaced persons in improving their living standards; to encourage community participation in planning and implementation of resettlement; and to provide assistance to affected people, regardless of their legal status on the title of land.

OP/BP 4.12 for Involuntary Resettlement is triggered because the project will support construction of livestock service centers including houses, crush pens, handling facilities, market centers, etc. that could potentially displace people. A Resettlement Policy Framework (RPF) will be prepared as appropriate for these proposed activities.

5.1.6 Other Requirements for the LDAHP

OP 4.01 further requires that the ESMF report must be disclosed as a separate and stand alone document by the Ministry and the WB as a condition for Bank Appraisal of the LDAHP. The disclosure should be both in Zambia where it can be accessed by the general public and local stakeholders 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 LDAHP as a whole to be environmentally screened to determine the extent and type of the EA process. The LDAHP has thus been screened and assigned an EA Category B.

6. NATIONAL LEGAL AND REGULATORY FRAMEWORK

6.1 Legislative and Regulatory Framework

The LDAHP will be implemented by the MoAL that has offices in the Provinces, Districts and Camps. The MoAL will provide overall policy and coordination of the LDAHP and has the responsibility for policy making and coordinating the implementation of the LDAHP and monitoring its performance to ensure that the objectives of the project are achieved. In doing this the MoAL will actively involve other Ministries, the private sector and other stakeholders including farmer-groups. Environmental issues cut across a wide variety of sectors and there are a number of government institutions and agencies outside of the Zambia Environmental Management Agency (ZEMA), which are involved in aspects of environmental management and these institutions and their legislative responsibilities are summarized in Table 6.1. Depending on the nature of the LDAHP subprojects, representatives of these institutions may provide technical

assistance to the Project District Focal Point in the preparation and implementation of subprojects and Environmental Management Plans (EMPs).

Table 6.1. Other potentially applicable legislative requirements relevant to the LDAHP in Zambia.

Title and date of legislation and policy	Applicability to LDAHP	Responsible institution	Purpose of legislation
Water Resources Management Act, Cap. 2010	Applicable to subprojects that will involve use of water for people and animals	Water Affairs Department in the Ministry of Energy and Water Development	Delegates the management of water resources through catchment councils established under the Act. The catchment councils consist of the water users of the catchment.
Public Health Act, No. 22 of 1995	Applicable to subprojects that will involve slaughter houses, milk collection and processing	Ministry of Health	Provides for the prevention and suppression of diseases and general regulation of all matters connected to public health.
Town and Country Planning Act. Cap 283, of 1962	Applicable to subprojects that will involve resettlement	Ministry of Local Government and Housing	Provides for the appointment of planning authorities, to prepare, approve and revoke development plans; to control the development and subdivision of land.
Forest Act No. of 1973 National Forest Policy of 1999	Applicable to subprojects that will involve use of forests and forest products and forest reserves	Forest Department in Ministry of Tourism, Environment and Natural Resources	Provides for the control, management, conservation and administration of national and local forests, participation of local communities, traditional institutions and NGOs, conservation and sustainable use of forests and trees, and implementation of international instruments.
Natural Resources Conservation Act	Applicable to LDAHP as a whole	Forest Department in Ministry of Tourism,	Provides for the monitoring of natural

of 1970, read with Part X of EPPCA of 1990 as replaced by the Environmental Management Act (EMA) of 2011 National Policy on Wetlands Conservation of 2001	and subprojects that might cause natural resources and land degradation	Environment and Natural Resources	resources and conservation and utilization outside forest reserves and national parks. Policy provides for the promotion of conservation and wise use of wetland ecosystems, especially as habitats for fish and other wildlife species.
Zambia Wildlife Act No. 12 of 1998	Applicable to subprojects that will affect biodiversity and wildlife protection	Zambia Wildlife Authority (ZAWA) in Ministry of Tourism, Environment and Natural Resources	Provides for the control and management of national parks, game management areas and bird sanctuaries for the purpose of conserving and enhancing wildlife ecosystems.
Fisheries Act of 2011	Applicable to subprojects that might negatively affect fish	Fisheries Department in Ministry of Livestock and Fisheries Development	Provides for the development of commercial fishing and the registration of fishermen and their boats and the protection of endangered species.
National Heritage and Conservation Act of 1989	Applicable to subprojects that will affect heritage sites and objects	National Heritage Commission in Ministry of Tourism, Environment and Natural Resources	Provides for the conservation of ancient, cultural and natural heritage, relics and other objects of aesthetic, historical, pre-historical, archaeological or scientific interest.

6.2 Zambia Environmental Management Agency

Several environmental management procedures are outlined by the Zambia Environment Management Agency (ZEMA), and include the Environmental Project Brief (EPB), the Environmental Impact Statement (EIS) and the Environmental Impact Assessment (EIA). Before commencement of projects, projects are required to submit an EPB or EIS to ZEMA. The ZEMA details the circumstances under which each of the instruments is to be applied. Similar to the Environmental Assessment (EA) discussed under the WB's safeguards policies, the EPB, EIS or

EIA aim at enhancing the environmental acceptability of a proposed project by ensuring that all adverse and good benefits are catalogued. Alternative implementation options are examined in order to choose options that minimize adverse effects.

The Environmental Management Act (EMA), 2011, No. 12 of 2011, having replaced the Environmental Protection and Pollution Control Act (EPPCA) of 1990, Cap 204, of the Laws of Zambia, is the supreme environmental law in Zambia. The EMA identifies projects, plans and policies for which an EIA is necessary. Through the EIA Regulations No. 28 of 1997, the ZEMA is responsible for facilitating the EIA process and for quality control of environmental assessment statements. Under the LDAHP the NPCO will consult ZEMA on the review and approval of EPBs and EMPs and ZEMA where appropriate may also be involved in monitoring the implementation of mitigation measures, especially for category B subprojects.

6.2.1 Environmental Project Brief

A project brief is required if:

- a. For a developer of any project set out in the First Schedule of the EIA Regulations No. 28 of 1997, whether or not the development is part of a previously approved project;
- b. For any alterations or extensions of any existing project which is set out in the First Schedule;
- or
- c. For any project which is not specified in the First Schedule, but for which the ZEMA determines a project brief should be prepared.

The EPB is submitted by the Authorizing Agency (MoAL and/or Local Authority in the case of the LDAHP) to ZEMA for evaluation and decision.

A project brief means a report made by the developer including preliminary predictions of possible impacts of a proposed project on the environment and constituting the first stage in the environmental impact assessment process. Once a developer has determined that he/she needs to prepare a project brief, he/she must conduct such studies that will enable him/her, or his/her consultant to compile a document which states the following in a concise manner (Regulation 4 of the EIA Regulations, 1997):

- (a) The site description of the environment;
- (b) The objectives and nature of the project and reasonable alternatives;
- (c) The main activities that will be undertaken during site preparation, construction and after the development is operational;
- (d) The raw and other materials that the project shall use;
- (e) The products and by-products, including solid, liquid and gaseous waste generation;
- (f) The noise level, heat and radioactive emissions, from normal and emergency operations;
- (g) The expected socio-economic impacts of the project and the number of people that the project will resettle or employ, directly, during construction and operation etc;
- (h) The expected environmental impact of the project, taking into account the provisions of items (c) to (g);
- (i) The expected effects on biodiversity, natural lands and geographical resources and the area of land and water that may be affected through time and space; and

(j) A description of adverse mitigation measures and any monitoring programs to be implemented.

Regulation 5 of the EIA Regulations relates to the submission of the project brief to the ZEMA:

- (1) A developer shall submit *six copies* of the project brief to the Agency.
- (2) If the Agency considers the project brief to be complete, the Agency shall transmit the project brief to the authorizing agency for comments within *seven* days of receiving the project brief.
- (3) The authorizing agency referred to in sub-regulation (2) shall make comments and transmit them to ZEMA within *thirty* days of receiving the project brief.
- (4) Where the agency fails to make comments or transmit the project brief to ZEMA within the period specified in sub-regulation (2), ZEMA shall proceed to consider that project brief.

Regulation 6 of the EIA Regulations relates to the consideration of the project brief and the ZEMA's decision:

- (1) The Agency shall consider the project brief and the comments received.
- (2) If the Agency is satisfied that the project will have no significant impact on the environment, or that the project brief discloses sufficient mitigation measures to ensure the acceptability of the anticipated impacts, the Agency shall within the *forty* days of receiving the project brief from the developer, issue a decision letter, with conditions as appropriate, to that effect, to the authorizing agency.

6.3 International Conventions

Zambia is a party to many international agreements, including the following that are relevant to the LDAHP.

- Convention Concerning the Protection of the World Cultural and Natural Heritage which is concerned with the conservation of ancient, cultural and natural heritage, relics and other objects of aesthetic, historical, pre-historical, archaeological or scientific interest.
- Convention on Biological Diversity (CBD) which requires the country to conserve genetic, species and ecosystem diversity.
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) which is concerned with the regulation of trade in endangered species.
- United Nations Convention to Combat Desertification (UNCCD) which is concerned with the conservation of the productivity of land and the control of land degradation, such as soil erosion.
- Lusaka Agreement on Co-operative Enforcement Operations Directed at illegal Trade in Wild Fauna and Flora that is concerned with the control of illegal trade in animals and plants.
- United Nations Framework Convention on Climate Change (UNFCCC) which is concerned with the reduction in emissions of greenhouse gases into the atmosphere.

- Ramsar Convention which is concerned with the conservation and management of wetlands.

6.4 Gaps and Overlaps Between Zambian Legislation and World Bank Operating Safeguard Policies

Comparisons between the Zambian legislation and WB Operating Safeguard policies on Pest management and Involuntary Resettlement are covered in separate reports and will therefore not be included in this section. There are considerable overlaps between the Zambian legislation and WB Safeguard Policies on environment, natural habitats and physical cultural resources as presented below.

There are a lot of similarities between the WB OP 4.01 Environmental Assessment (EA) and EIA under EMA. Both these policies/legislations require that category A projects are subjected to an environmental impact assessment to protect the environment from potential negative impacts.

The EA and EIA are process whose breadth, depth, and type of analysis depends on the nature, scale, and potential environmental impact of the subprojects under the LDAHP and both processes take into account the natural environment (air, water, and land); human health and safety; social aspects of a development project.

The OP 4.04 Natural Habitats WB Safeguard policy recognizes that the conservation of natural habitats is essential for long-term sustainable development and therefore supports the protection, maintenance and rehabilitation of natural habitats in development projects. The requirements for development projects to protect, maintain and rehabilitate natural habitats are covered in a number of national laws, including the EMA, Forest Act No. of 1973, Zambia Wildlife Act and Fisheries Act. Both the ZEMA and OP 4.04 Natural Habitats require that where natural habitats are to affected by a development project, management plans should be developed and implemented to conserve natural habitats. In the case of the LDAHP there may be need in some cases for the subproject proponent to prepare a Natural Habitat Management Plan (NHMP) to ensure the maintenance of environmentally sensitive areas. The guidelines for preparing a NHMP are provided for in the EMA of 2011.

The World Bank's OP/BP 4.11 for Physical Cultural Resources aims at ensuring the preservation of cultural property, including palaeontological, historical, religious and unique natural values, in a project area. Two important national laws that aim at the conservation of ancient, cultural and

natural heritage, relics and other objects of aesthetic, historical, pre-historical, archaeological or scientific interest in the country are the National Heritage and Conservation Act and EMA. In fact these national laws are perhaps more comprehensive than the WB OPN 11.03/OP 4.11 Physical Cultural Resources because they include more items of cultural significance.

With respect to the LADHP the study did not find serious gaps between the WB Operational Safeguard Policies and Zambian legislation.

7. POTENTIAL IMPACTS AND MITIGATION MEASURES

The overall environmental impact of the LDAHP has been assessed and potential negative impacts will mainly be localized during the implementation of project activities while proper mitigation measures during construction and/or production would minimize or even eliminate impacts. The LDAHP has been classified as a category B project for environmental assessment. Depending on the complexity of the LSC, infrastructure will include the following structures, cattle crush pen, a holding pen, a watering point, closed circuit spray race and two improved ventilated pit latrines for LSC Tier I facility; and in addition to these, weighing scales, off-loading bays, two camp/staff houses, office accommodation, store room, a training shed, livestock demonstration facilities (such as pasture/forage plots and simple, on-farm feed mixing equipment for LSC Tier II facility; and for LSC Tier III, all the above structures and a marketing facility (with a cattle observation terrace and catwalk erected near the holding pen), a training facility (dormitories, biogas digester, agro-meteorological station), demonstration structures (goat housing, pig pens, poultry pens/housing), sustainable pasture development and rangeland

management plots, four improved ventilated pit latrines, landscaping with external drainage system and waste management area.

Rangeland-based systems depend on feed from extensive areas of rangelands and species supported under this system in Zambia include cattle, goats and sheep. Most cattle herds in customary lands consist of indigenous breeds managed under an open-access rangeland grazing system in which controlled rangeland management practices are usually difficult to apply. Consequently, overgrazing and attendant land degradation can be serious environmental problems under this production system. In addition, heavy grazing can contribute to the disappearance of palatable species and the subsequent dominance by other, less palatable, plants with a lower carrying capacity. Thus overgrazing can undermine the project’s long term sustainability.

Rangelands are also an important habitat for wildlife and are thus crucial for the conservation of biodiversity, especially in GMAs where livestock and wildlife co-exist. In these areas livestock and wildlife share land, water, forage and diseases, and the fate of wildlife in such areas largely depends on both the interactions between wildlife and livestock and on the people who live close to conservation areas. Disease transmission between wildlife and livestock can therefore be an important constrain in the productivity of both stock types. In some cases, improper disposal of waste generated by livestock production systems result in exposure of wildlife to such infectious waste that may cause disease outbreak among wildlife. In other cases, interaction between livestock and wildlife has the potential of spreading diseases from wildlife to livestock, such as foot and mouth disease. In some instances, human disease outbreaks would occur from zoonotic diseases arising from livestock production systems themselves.

In mixed crop-livestock production systems, crop and livestock production tend to complement each other, especially in the smallholder sector, and the degree of intensification is higher than that in the rangeland-based livestock production system. However, under this system there is little interaction between wildlife and livestock but problems of overgrazing can usually be more severe than under the rangeland-based systems, requiring more concerted mitigation measures.

The main livestock species in landless production systems are pigs and poultry and these species have higher food conversion efficiency and reproductive rates than ruminant species. Landless systems are the most intensive in terms of requirements for labour, feeding, housing, water and other production inputs. Thus this production system has higher risks of pollution from animal waste products and, in the case of piggeries, the potential for increased emissions of greenhouse gases, such as carbon dioxide and methane, is high if not properly managed. In addition poultry production systems are sometimes affected by diseases, such as avian flu and new castle disease, which require professional management that may not be available for both smallholders and industrial producers.

7.1 Environmental Impacts

The main impacts arising from the implementation of the LDAHP are summarized in Table 7.1. However, during the construction of LSCs, offices, livestock infrastructure and labs special measures are required during construction and operation that are summarized in Box 7.1 below.

Box 7.1 Mitigation measures during the construction of infrastructure and operation	
Phase	Mitigation measures
Construction	(i) Construction in dry season. (ii) Protection of soil surfaces during construction.

	<ul style="list-style-type: none"> (iii) Employ all unskilled labor from where the subproject is located and semi-skilled labor first from subproject area when available there in. (iv) Source goods and services from local districts first, when available. (v) Provision of adequate waste disposal services. (vi) Proper disposal of chemicals and other hazardous materials. (vii) Appropriate and suitable storage of building materials on site. (viii) Siting of latrines at safe distances from wells and other water points and using closed systems for sewage drainage. (ix) Minimize loss of natural vegetation during construction; alternative sites; various special measures for sensitive species. (x) Restoration of vegetation; cleanup of construction sites. (xi) Safety designs (signage) (xii) Ensure availability of clean potable water for use in latrines, canteens and for drinking. (xiii) Use of appropriate building materials.
Operation	<ul style="list-style-type: none"> (i) Use facilities/infrastructure as designed and as intended. (ii) Employ trained staff to man and secure facilities. (iii) Log and report any damages done and repairs needed. (iv) Perform periodic monitoring of all aspects as contained in the sub project Environmental and Social Monitoring Plan. (v) Prepare and adopt suitable maintenance plan. (vi) Maintain appropriate budget necessary to implement maintenance plan. (vii) Implement maintenance plan in two stages : for activities requiring day-to-day maintenance such as repairs to damages done, regular inspections etc and longer/periodic term maintenance. (viii) Have suitably trained staff to carry out maintenance and access to materials/goods/equipment.

Table 7.1 Main Potential impacts arising from the implementation of the LDAHP

PROJECT SUB-COMPONENT	IMPACT	CAUSE	DURATION OF IMPACT	PROBABILITY OF OCCURENCE
Livestock Service Centers	Pollution of water courses and drains.	<ul style="list-style-type: none"> • Contaminated runoff and waste water 	<ul style="list-style-type: none"> ▪ Ongoing: Impact expected to last during project implementation 	<ul style="list-style-type: none"> ▪ Moderate to high
	<ul style="list-style-type: none"> • Human diseases transmission 	<ul style="list-style-type: none"> • Open defecation due to poor or non-existent sanitary facilities 	<ul style="list-style-type: none"> ▪ Could be indefinite if not controlled 	<ul style="list-style-type: none"> ▪ Moderate to high ▪ Moderate
	<ul style="list-style-type: none"> • Localized land degradation 	<ul style="list-style-type: none"> • Overgrazing, soil compaction and soil erosion 	<ul style="list-style-type: none"> ▪ Ongoing during project implementation 	<ul style="list-style-type: none"> ▪ Moderate
	<ul style="list-style-type: none"> • Pollution of surrounding area 	<ul style="list-style-type: none"> • Packaging containers or veterinary medicine 	<ul style="list-style-type: none"> ▪ Ongoing as project is implemented 	<ul style="list-style-type: none"> ▪ Moderate
	<ul style="list-style-type: none"> • Localized 		<ul style="list-style-type: none"> ▪ Ongoing as project 	<ul style="list-style-type: none"> ▪ Moderate

PROJECT SUB-COMPONENT	IMPACT	CAUSE	DURATION OF IMPACT	PROBABILITY OF OCCURENCE
	deforestation	<ul style="list-style-type: none"> Cutting down trees for firewood /charcoal 	is implemented	
Livestock Markets	<ul style="list-style-type: none"> Localized land degradation. Spread of infectious diseases Injuries to animals due to congestion resulting in accidents 	<ul style="list-style-type: none"> Overgrazing, soil compaction and erosion around the market area Contact between infected and healthy animals High numbers of animals brought in at the same time. 	<ul style="list-style-type: none"> Continuous: Occasional Short as/when accidents happen 	<p>Moderate</p> <p>Low</p>
Slaughter slabs/houses.	<ul style="list-style-type: none"> Air Pollution Contaminati on of surface and ground water Pollution of surrounding environment. Soil and water pollution. 	<ul style="list-style-type: none"> Odours and foul smell from slaughter waste Improper disposal of slaughter waste including blood Improper disposal of solid wastes 	<ul style="list-style-type: none"> Ongoing Continuous Ongoing 	<p>High</p> <p>Moderate</p> <p>Moderate</p>
Breeding Centers	<ul style="list-style-type: none"> Pollution from poor sanitary conditions Increased emissions of greenhouse gases such as carbon dioxide and methane Infections to humans Localized land degradation 	<ul style="list-style-type: none"> Poor maintenance of breeding center facilities Increased production of manure and other animal wastes Transmission of infectious diseases from animals (poultry and pigs) High numbers of animals at center 	<ul style="list-style-type: none"> Ongoing Continuous Periodic – during disease outbreaks Periodic 	<p>Moderate</p> <p>Moderate</p> <p>Moderate to low</p> <p>Moderate to low</p>

PROJECT SUB-COMPONENT	IMPACT	CAUSE	DURATION OF IMPACT	PROBABILITY OF OCCURENCE
Milk Collection Centers and dairies	<ul style="list-style-type: none"> ▪ Pollution of water courses and drains ▪ Human sicknesses and diseases ▪ Pollution of surrounding areas 	<ul style="list-style-type: none"> ▪ Contaminated runoff and waste water ▪ Infections to humans caused by contaminated milk ▪ Poor solid Waste management of fodder and veterinarian medicine packaging 	<ul style="list-style-type: none"> ▪ Ongoing during sub-project implementation ▪ Occasional ▪ ongoing 	<p>Moderate to high</p> <p>Moderate</p> <p>Moderate</p>
Laboratories	<ul style="list-style-type: none"> ▪ Air pollution ▪ Noise from heavy machinery ▪ Land pollution ▪ Infections to humans and animals 	<ul style="list-style-type: none"> ▪ Dust during rehabilitation ▪ Rehabilitation works ▪ Construction waste ▪ Laboratory diagnostic procedures and Biomedical waste 	<ul style="list-style-type: none"> ▪ Rehabilitation phase ▪ Short duration ▪ Short ▪ Ongoing/ 	<p>Moderate</p> <p>Moderate</p> <p>Moderate</p> <p>Moderate</p>
Livestock/wildlife interface areas	<ul style="list-style-type: none"> ▪ Loss of bio-diversity. ▪ Disturbance of wildlife migration patterns. ▪ Reduction in wildlife numbers. ▪ 	<ul style="list-style-type: none"> ▪ Encroachment on protected areas by livestock ▪ Livestock encroachment of wild habitats. ▪ Killing by farmers and out-competition by livestock ▪ 	<ul style="list-style-type: none"> ▪ Periodic during dry season grazing ▪ Periodic: during dry season grazing ▪ Seasonally 	<p>Moderate to high</p> <p>Moderate to high for some areas</p> <p>Moderate</p>
Other Livestock Activities	<ul style="list-style-type: none"> • Localized land degradation and disappearance of palatable species 	<ul style="list-style-type: none"> • Increased numbers of animals per household 	<ul style="list-style-type: none"> • Periodic 	<p>Moderate to low</p>

7.2 Potential Socio-economic Concerns and Impacts

7.2.1 Socio-economic Impacts

The project will benefit smallholders and emergent farmers in the targeted areas who rear cattle, small ruminants, pigs and poultry (chickens) and have direct access to veterinary and animal production services provided by MoAL and other service providers. This includes (i)

members of the Poultry Association of Zambia; (ii) members of the Beef Association of Zambia and (iii) members of the Dairy Association of Zambia. The project will specifically target women group members of these organizations. Other beneficiaries include staff members in the MoAL who will receive training using project funds. In addition, with improved efficiency by the MoAL to control animal diseases many more farmers who keep livestock and are in areas not directly targeted by the project but will benefit from increased supply and reduced livestock product prices. Livestock industry service providers, including private extension agents and veterinarians, and veterinary medicines suppliers will also benefit from the LDAHP.

Therefore the overall socio-economic impact of the sub-projects resulting from the LDAHP main development components and sub-components of the Project will be positive through improved livestock production and marketing, and in general, improved socioeconomic conditions of the rural population. Other aspects of the Project including improvement in extension services and others, will all contribute to an improved socio-economic environment in the rural areas. The Project will further contribute to the country's food security; hopefully contribute to the generation of foreign exchange through increased exports of livestock products. The LDAHP will also significantly contribute to the alleviation of rural poverty, especially among participating women and women groups.

7.2.2 Socio-economic Concerns

The potential negative social impacts of the LDAHP are likely to be small-scale and site-specific. It is also anticipated that project activities will not lead to land acquisition or major restriction of access to sources of livelihood and therefore avoid the need for Resettlement. However, in the event that people are physically or economically displaced because of the Project's activities, a Resettlement Action Plan (RAP) will be prepared in accordance with the requirements of OP4.12, before the commencement of any relocation activities. This plan will be cleared by the Bank, consulted upon, and disclosed. When repercussions are minor (i.e., affected people are not physically displaced and less than 10 percent of their productive assets are lost) or affected people are less than 200, an Abbreviated Resettlement Action Plan (ARAP) will be prepared. An RPF is prepared for the LDAHP which provides a framework for addressing these issues.

7.3 Mitigation Measures for Potential Negative Impacts

In the previous section a number of potential negative impacts arising from the implementation of the LDAHP have been presented. This section focuses on how these potential negative impacts can be minimized and in some cases eliminated altogether through mitigation measures in order to ensure the environmental sustainability of the Project. These mitigation measures are given in Table 7.3.

Table 7.3 Mitigation measures for negative environmental impacts arising from the implementation of LDAHP.

Component or Subproject	Negative Impact	Mitigation Measures
Construction of L LSCs, offices, livestock infrastructure and labs	Infections to humans and contamination of air, water and soil	<ul style="list-style-type: none"> (i) Incorporate biosafety structures at the construction/rehabilitation phase of laboratories; (ii) Strengthen the practice of biosafety in laboratories through procedural/administrative controls; (iii) Ensure physical security exists at the laboratory facilities to keep out unauthorized persons; (iv) Adhere to authorized methods of chemical waste disposal; (v) Provide adequate safety and hygiene facilities for handling, storing and processing microbiological materials, including safety cabinets and laminar flow hoods; (vi) Provide adequate measures for the disposal of infectious material, including inactivation by chemicals and incineration; (vii) Waste material should be autoclaved, incinerated or decontaminated before disposal; (viii) Provide and use biological safety cabinets whenever aerosols are generated in the laboratory. (ix) Maintain veterinary diligence to ensure healthy animals; (x) Increase and maintain effective disease surveillance in piggeries and poultry production systems; (xi) Effective use of disinfectants and sanitary inspections to maintain required standards
	Localized land degradation	<ul style="list-style-type: none"> (i) Training of farmers and livestock owners on soil conservation methods. (ii) Construction of anti-erosion infrastructure (iii) Introduce integrated grazing system and planting of fodder species. (v) Control bush burning and fires. (vi) Protection of roadsides by planting of vegetation. (vii) Prepare an effective and sustainable maintenance plan of soil conservation works.

	<p>Water and land pollution</p>	<p>(i) Promote environmental health measures and public health education. (iii) Improve management of wastes from slaughter houses and animal farm operations (iv) Review, update and enforce pollution control legislation. (v) Strengthen public health safeguards enforcement capacity. (vi) Locate sub projects at far/safe distances from water points and sources. (vii) Increase public awareness about dangers of pollution</p>
	<p>Localized deforestation</p>	<p>(i) Awareness raising to prevent encroachment on protected areas, such as forest reserves and national parks. (ii) Training local people and farmers on bush fire management (e.g., carrying out early dry season burning in protected and buffer areas) (iii) Training people in sustainable wood energy harvesting. (iv) Promotion of wood/charcoal saving/efficient cook stoves. (v) Installation and maintenance of biogas generation systems. (vi) Training in, and promotion of, tree planting/agroforestry (vii) Training in alternative methods of pest control other than bush clearing and/or indiscriminate burning of grazing lands. (viii) Strengthen protected areas enforcement capacity, especially by local communities and government institutions.</p>

	<p>Encroachment upon protected areas and loss of biodiversity</p>	<ul style="list-style-type: none"> (i) Awareness raising to prevent encroachment on protected areas, such as forest reserves and national parks. (ii) Consideration of alternative locations/siting of LSCs. (iii) Reduce biomass use through provision of alternative energy sources (cooking stoves, photovoltaics, biogas) and construction materials. (iv) Strengthen natural resource management capacities (v) Decrease overgrazing through constant monitoring of carrying capacity and adopting integrated grazing management. (vi) Promote agroforestry. (vii) Training in wetlands management. (viii) Protect sensitive ecosystems such as forests and wetlands and prevent further encroachment into protected areas. (ix) Enforce existing laws. (x) Locate sub projects appropriately. (xi) Training of communities in sustainable uses of resources. (xii) Identify certain species of trees and animals that must be protected. (xiii) Exclude ecosystems that provide important habitat for protected species. (xiv) Establish buffer zones around protected parks and wetlands. (xv) Strengthen local and government institutional capacity to resolve conflicts involving wildlife and livestock.
	<p>Pollution from animal waste products</p>	<ul style="list-style-type: none"> (i) Promote environmental health measures and public health education. (ii) Improve management of wastes from slaughter houses and animal farm operations (iii) Review, update and enforce pollution control legislation. (iv) Strengthen public health safeguards enforcement capacity. (v) Locate sub projects at far/safe distances from water points and sources. vi) Increase public awareness about dangers of pollution

	Increased emissions of greenhouse gases, such as carbon dioxide and methane	<ul style="list-style-type: none"> (i) Manure should be recycled or allowed to mature in an impervious containment before application as fertilizer for crop production or on pastures; (ii) Maintain good sanitary conditions and dispose of manure in a timely fashion; (iii) Use manure for biogas generation and utilize the biogas;
	Degradation of national heritage objects and sites	<ul style="list-style-type: none"> (i) Identify national heritage objects and sites that must be protected. (ii) Increase public awareness about the importance of national heritage objects and sites. (iii) Strengthen local and government institutional capacity to protect national heritage objects and sites. (iv) Enforce existing laws. (v) Consideration of alternative locations/siting of sub projects.
Livestock Markets	Pollution of local drains and water courses	(i) Provide safe disposal of waste water
	Human disease transmission	(i) Provide adequate and proper sanitary facilities, such as ventilated pit-latrines;
Slaughter Houses	Pollution of local drains and water courses	(i) Provide safe disposal of waste water
	Pollution of the surrounding environment	(i) Provide adequate and proper sanitary facilities
	Disease transmission to humans and scavenging animals	<ul style="list-style-type: none"> (i) Appropriate disposal of waste in designated areas (ii) Provision of protective clothing; (iii) Effective use of disinfectants; (iv) Effective sanitary inspections leading to required standards being met; (v) Effective regulatory animal and meat inspection.

	Odour and contamination of groundwater and surface water	(i) Avoid escaping NH ₃ ; (ii) Maintain good sanitary conditions; (iii) Dispose of manure in a timely fashion (iv) Ground waste bone, meat and offal into flour for animal feed; (v) Use blood for blood sausage; (vi) Other water and blood waste must be collected and treated before proper disposal into municipal waste treatment systems; (vii) Manure should be recycled or allowed to mature in an impervious containment before application as fertilizer for crop production or on pastures.
	Ozone depletion	(i) Avoid refrigerants that use ozone depleting substances (NH ₃ and chlorofluorocarbons)
	Groundwater depletion	(i) Water apportioning; (ii) Efficient use of water including recycling.
	Injuries to workers	(i) Provide safety instructions; (ii) Provide safety clothing where appropriate (e.g. hard hats).
Dairies and Milk Collection and Processing Centers	Pollution of local drainage systems and water systems	(i) Effective collection and treatment of whey before discharge; (ii) Make available all whey to farmers for feedstock.
	Human disease transmission	(i) Origin of milk should be known and identify reliable sources of milk; (ii) Use effective Pasteurization processes; (iii) Workers must be protected with effective clothing and workers should not come in direct contact with milk products; (iv) Veterinary diligence to ensure healthy animals.
	Ozone depletion	(i) Avoid refrigerants that use ozone depleting substances (NH ₃ and chlorofluorocarbons)
	Injuries to workers	(i) Provide safety instructions; (ii) Provide safety clothing where appropriate (e.g. hard hats); (iii) Install protective guards on all machinery.

8. SUBPROJECT PREPARATION AND APPROVAL

The LDAHP has been screened and assigned to WB Category B and under the Zambia's Environmental Management Act (EMA) will require the preparation of an Environmental Project Brief (EPB) for some of its subprojects by their respective proponents. The EPB will be approved by the National Project Coordination Office (NPCO), in consultation with the ZEMA,

before implementation can start. This section outlines roles that the different stakeholders will play to facilitate, coordinate and oversee subproject identification, preparation, screening, approval and implementation.

8.1 Subproject Preparation, Field Appraisal and Requirements for an Environmental Management Plan

The preparation of project activities by the proponent should be participatory and shall be facilitated by the District Focal Point (DFP) outreach and extension staff, and/or subcontracted external facilitators. Technical guidance and input into preparation of subproject proposals is crucial to ensure that all environmental and social concerns are thoroughly considered from the start of the identification and planning process. To facilitate environmental and social screening, the ESMF has provided a checklist for subproject screening (Annex II) that will assist stakeholders, proponents and project staff with the identification of environmental and social issues relating to the subproject location and the surrounding environment based on available knowledge and field investigations. Once a subproject/subcomponent is specified for a particular location, the proponent with assistance from the DFP will complete the environmental and social checklist at the community level, and in consultation with the relevant local communities and authorities as well as potentially affected persons. In some instances, a field appraisal may be required depending on the information in the environmental and social checklist. The criteria for determining the need for and the purpose of a field appraisal are summarized in Table 8.1.

Table 8.1 Criteria for requiring and purpose of a field appraisal

Criteria		Purpose of field appraisal
A field appraisal is required when a subproject involves any of the following:		
1	A subproject may affect a natural habitat or forest area	A field appraisal determines if the subproject will adequately avoid adverse effects on a natural habitat or forest area.
2	A subproject may have an impact on ecologically sensitive ecosystems e.g., wetlands or river mouths or areas of high biodiversity/endemism or habitat for endangered species	A field appraisal determines the scale and level of impact. The application may need to be revised to describe how the subproject will avoid or minimize adverse impacts to ecologically sensitive areas. This may require a distinct Environmental Management Plan (EMP).
3	A subproject may involve, or result in: (i) Diversion or use of surface waters; (ii) Construction and/or rehabilitation of infrastructure (camp sites);	A field appraisal determines the scale and level of potential impact. The application may need to be revised to avoid or minimize potential adverse effects, and may include an Environmental Management Plan.

	(iii) Reclamation of degraded land or soil erosion control; or (iv) Publicly accessible water points, latrines, recreational facilities and educational facilities.	
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One of the purposes for a field appraisal is to determine whether the subproject will need a distinct Environmental Management Plan (EMP) that outlines how adverse impacts will be addressed during the planning, construction and operation phases of the subproject. The EMP usually includes the following components:

Description of adverse effects: A description of the possible adverse effects that the EMP is intended to deal with are identified and summarized.

Description of mitigation measures: A description of planned mitigation measures, and how and when they will be implemented. Each measure is described with reference to the effect(s) it is intended to deal with. As needed, detailed plans, designs, equipment descriptions, and operating procedures are described.

Description of monitoring program: Monitoring provides information on the environmental compliance of the subproject. It helps identify how well mitigation measures are working, and where better mitigation may be needed. The monitoring program should identify what information will be monitored, how, where and how often. It should also indicate at what level of effect there would be a need for further mitigation. How environmental effects are monitored is discussed below.

Responsibilities: A description of who will be responsible for implementing the EMP: the people, groups, or organizations that will carry out the mitigation and monitoring activities are defined, as well as to whom they report and are responsible. There may be a need to train people to carry out these responsibilities, and to provide them with equipment and supplies.

Implementation schedule: The timing, frequency and duration of mitigation measures and monitoring are specified in an implementation schedule, and linked to the overall subproject schedule.

Cost estimates and sources of funds: These are specified for the initial subproject investments and for the mitigation and monitoring activities for subproject. Funds to implement the EMP have been budgeted for and may come from the subproject grant, from the community, or both. Government agencies and NGOs may be able to assist with monitoring.

The scale of subproject impacts will determine the level of the EMP. A small-scale subproject’s EMP can be elaborated in a few paragraphs or in tabular format, keeping it as simple as possible with concrete mitigation actions, timelines and responsible persons.

The EMP should also contain a description of how mitigation measures and their impacts will be monitored. An example of this is given in Table 8.2.

Table 8.2 Institutional arrangements for subproject responsibilities for monitoring and evaluation of the mitigation measures as presented in the EMP.

Organization	Responsibility	Phase	Accountability
Subproject proponent/operator	Compliance and monitoring	Planning	Reports quarterly to DFP
		Implementation	

		Operation and maintenance	
DFP	(i) Environmental and social assessment; (ii) Supervision of civil works;	Construction	Reports quarterly to PPCO
	(iii) Monitoring implementation of EMP	Operation and maintenance	
Independent consultant	(i) Review of compliance with ESMF objectives and procedures; (ii) Recommendations for improving future performance and potential cumulative impacts.	Operation and maintenance	Reports annually to PPCO

Environmental monitoring needs to be carried out during all phases including operation and maintenance of subprojects in order to measure the success of the mitigation measures implemented. Monitoring provides opportunities to alert relevant authorities and provide timely information about the success or otherwise of implementation of the ESMF process, to enable changes to be made to the system, if required and to determine whether the mitigation measures of subprojects have been successful.

8.2 Review and Approval of Subproject Proposals

Institutional arrangements for the review and approval of LADHP subproject proposals are summarized in Table 8.3.

Table 8.3 Institutional arrangements for review and approval of LADHP subproject proposals.

Subproject category	Requirements	Project Management Level	Responsibility
C	Completed environmental and social screening checklist, designs, and EMP	District Focal Point (DFP)	In consultation with the Local Authority, (i) Review subproject proposal; (ii) Submit recommendation to Provincial Project Coordination Office
		Provincial Project Coordination Office (PPCO)	(i) Evaluate recommendation by DFP; (ii) Approve or reject proposal

B	Completed environmental and social screening checklist, designs, and EMP	District Focal Point (DFP)	In consultation with the Local Authority, (i) carry out a preliminary review of proposal; (ii) submit proposal and review report to PPCO
		Provincial Project Coordination Office (PPCO)	(i) Review proposal and evaluate report from the DFP; (ii) Submit recommendation to National Project Coordination Office (NPCO)
		National Project Coordination Office (NPCO)	In consultation with ZEMA, (i) Evaluate PPCO recommendation; (ii) Approve or reject proposal

8.3 Public Consultation

The consultation that was carried out during the ESMF preparation emphasised the importance of beneficiary involvement. At meetings held in proposed project sites, stakeholders were not fully aware of the project and expressed desire for improved communications with project proponents throughout the project cycle. Stakeholders emphasised the need for involvement of traditional land authorities in project site identification to ensure that negative social impacts are minimised as well as ensuring that the selected locations for proposed livestock services are appropriate. They also stressed the need for the project to minimise social impacts such as the need to displace some families that the project is supposed to benefit.

Farmers also stressed the importance of the proposed project with regards to breed improvement. They wanted to have a say on the design of the breeding programmes to ensure that desired livestock of indigenous livestock traits are not lost in the process. They lauded the need to establish effective market linkages because the current practice where farmers have to sell their livestock to buyers in towns complicated the spread of HIV/AIDS. All in all, stakeholders stressed the need for beneficiary involvement at all stages of the project.

Indeed, public consultation is a part of the environmental screening and environmental assessment process. It is critical in preparing effective and sustainable subprojects. Public consultation is a requirement for promotion of local ownership of project and preparation of sub-projects. This requirement is complemented by the participatory planning process that is followed by the Project at the community level when subprojects are being identified. The reason for public consultation, as stipulated in the EIA regulation 10 of 1997, is to uphold transparency in decision making and provide for involvement of the public/stakeholders in making decisions that affect them, such as for example, land acquisition for project activities, location of service centres and resettlement. Public consultation sets a framework for negotiating remedial measures for negative project impacts, but also enhancement of positive outcomes. In rural settings, public consultation, serves as a communication tool for project management with potential beneficiaries and stakeholders. It is useful for increasing public awareness of the project activities and impacts and communicating change.

The first step in this regard, during sub-project identification will be to have public consultations with the local communities and all other relevant stakeholders during the screening process.

These consultations should identify key issues and determine how the concerns of all parties will be addressed. The concerns of vulnerable and marginalised groups, such as women and the poor must be taken into account fully in subproject planning. Once a Category B subproject proposal has been reviewed by PPCO and approved by the NPCO, in consultation with the ZEMA, the proponent shall inform the stakeholders about the results of the review.

To facilitate meaningful consultations, subproject planners will provide all relevant material and information concerning the subprojects in a timely manner prior to the consultation and in a form and language that are understandable and accessible to the groups being consulted.

Once a proposed subproject has been reviewed by qualified Project staff and approved by the NPCO, the Project will inform the public about the results of the review. For all subprojects that will be implemented at the community level, the Project will be responsible for disclosing the findings and recommendations of the environmental and social screening process to the communities. The disclosure methods will be in form that is accessible to the public; including audio, print and electronic formats.

9 ENVIRONMENTAL AND SOCIAL MONITORING PLAN

The objectives for environmental and social monitoring plan are to:

- (i) Alert the project developer and controlling authorities through the provision of timely information about the success or otherwise of the subproject implementation process as outlined in the ESMF/EPB/EIS. This will facilitate changes to be made in the implementation of the subprojects where appropriate;
- (ii) Determine whether the mitigation measures designed for the subprojects have been successful. This evaluation compares the pre-subproject environmental and social condition with that at the time of monitoring of the subproject in order to determine whether the original environmental and social conditions have been restored, improved or made worse;
- (ii) Ensure that the operation and maintenance activities are being carried out in a manner that protects the environmental and social conditions, as well as the health and social wellbeing of the workers and the general public; and
- (iv) Ensure that changes, if any, to the subproject EMP are made and suggest additional training capacity building that may be required to improve the performance of the EMP implementation.

9.1 Monitoring Plan

The environmental and social monitoring plan assists to measure the level of success in the implementation of the mitigation measures, as provided in the EMP. The environmental and social monitoring plan provides a link to the mitigation measures in the EMP and specifies the activities to be undertaken to ensure that the mitigation measures are efficiently, effectively and timely implemented. An example of a monitoring plan is given in Table 9.1.

To assess whether the goals of the environmental and social management plan are being met, the environmental monitoring plan will indicate parameters to be monitored, institute monitoring milestones and provide resources necessary to carry out the monitoring activities.

Specifically, the environmental and social monitoring plan provides:

- (i) Actions or mitigation measures to be undertaken;

- (ii) A description or list of parameters to be measured and monitoring locations where appropriate;
- (iii) Indicators to measure and verify level or extent of implementation of the mitigation measures;
- (iv) Frequency of measuring and verifying the indicators; and
- (v) Institutions or persons responsible for carrying out the monitoring.

Table 9.1 Example of an environmental and social monitoring plan for LDAHP subprojects.

Project Phase/ Impacts	Mitigation Measures	Monitoring Indicator	Frequency of monitoring	Responsibility for monitoring
Planning (including surveying and design)				
Localized land degradation	Training farmers in soil conservation	Number of farmers trained	Once during planning and design	District Extension Officers (DEOs)
Water and land pollution	Public awareness campaigns about dangers of pollution	Number of farmers that have gone through awareness campaigns	Once during planning	District Extension Officers (DEOs)
Degradation of national heritage objects and sites	Consider alternative sites	Number of alternatives sites selected	Once during planning	Subproject proponent
Operation				
Localized land degradation	Planting of fodder species	Area planted with fodder species	Annually	Subproject proponent and DEOs
Increased emissions of greenhouse gases, such as carbon dioxide and methane	Train pig farmers in manure recycling	Number of pig farmers recycling pig manure	Quarterly	Subproject proponent and DEOs

9.2 Monitoring Indicators

Monitoring indicators are a very important part of the monitoring plan. The indicators should be:

- (i) Specific to avoid ambiguity of items being measured;
- (ii) Measurable to facilitate quantification; and
- (iii) Quantifiable to be easily translated into units of measurement and to facilitate verification.

Indicators should be related to issues raised in section 7 and can be measured in units of, for example, time (duration), frequency (how often), area or volume (size of land cleared), length (length of stream affected), number (number of livestock killed by lions). In some cases indicators may be qualitative. For example, when comparing the state of the environment before and after subproject using the following:

- (a) state of natural resources (worse or same or better);
- (b) state of grazing (less or same or more)
- (c) state of wildlife (fewer or same or more abundant)
- (d) state of stream water (bad or same or better)

Some of the main socioeconomic indicators, by which to evaluate the successful implementation of the EMPs are:

- (i) Affected individuals, households, and communities able to maintain their pre-subproject standard of living, and even improve on it; and
- (ii) Number of farmers and farmer groups that have remained supportive of the subproject.

The following are some of the general parameters and verifiable indicators that could be used to measure the overall project’s success in terms of implementing the intended mitigation plans and achieving the desired environmental and social performance.

1. Number of subprojects adopted after screening as required by the ESMF;
2. Percent improvement or degradation in the environmental health of the farmers using or affected by the subprojects;
3. Percent improvement or degradation of bio-physical state of the environment;
4. Number and types of the key benefits to the participating farmers, from the subproject as a result of using the ESMF and the screening process;
5. Percent decrease in human-wildlife conflicts, as a result of adoption of safeguard guidelines, compared with pre-subproject situation;
6. Efficiency of sub-projects’ maintenance and operation performance;
7. District Focal Points that have successfully received technical training in screening methods etc.; and
8. Numbers of women farmers participating in subprojects activities.

Specific environmental and social indicators target the mitigation measures in the EMPs. Examples of specific indicators that could be used for the LDAHP subprojects are provided in Table 9.2.

Table 9.2 Some of the monitoring indicators to be used for the LDAHP components and subprojects.

Component or Subproject	Mitigation Measures	Monitoring Indicator
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<p style="text-align: center;">LDAHHP components</p>	<p>(i) Incorporate biosafety structures at the construction/rehabilitation phase of laboratories;</p> <p>(ii) Strengthen the practice of biosafety in laboratories through procedural/administrative controls;</p> <p>(iii) Ensure physical security exists at the laboratory facilities to keep out unauthorized persons;</p> <p>(iv) Adhere to authorized methods of chemical waste disposal;</p> <p>(v) Provide adequate safety and hygiene facilities for handling, storing and processing microbiological materials, including safety cabinets and laminar flow hoods;</p> <p>(vi) Provide adequate measures for the disposal of infectious material, including inactivation by chemicals and incineration;</p> <p>(vii) Waste material should be autoclaved, incinerated or decontaminated before disposal;</p> <p>(viii) Provide and use biological safety cabinets whenever aerosols are generated in the laboratory.</p> <p>(ix) Maintain veterinary diligence to ensure healthy animals;</p> <p>(x) Increase and maintain effective disease surveillance in piggeries and poultry production systems;</p> <p>(xi) Effective use of disinfectants and sanitary inspections to maintain required standards</p>	<p>(i) Number of biosafety structures in the laboratory</p> <p>(ii) Manual on biosafety produced and number of workers using manual</p> <p>(iii) Physical security at laboratories present</p> <p>(iv) Manual on authorized chemical waste disposal methods produced and number of workers using the manual</p> <p>(v) Number of Safety cabinets and laminar flow hoods available and in use</p> <p>(vi) Number of autoclaves and incinerators installed and in use</p> <p>(vi) Presence and use of autoclaves and incenerators</p> <p>(viii) Number of safety cabinets available and in use in the laboratory</p> <p>(ix) Farm animal inspections made by a livestock/veterinary officer per month</p> <p>(x) Number of times piggery or poultry production system visited by a livestock/veterinary officer per month</p> <p>(xi) Number of times disinfectants used per week</p>
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	<p>(i) Training of farmers and livestock owners on soil conservation methods.</p> <p>(ii) Construction of anti-erosion infrastructure</p> <p>(iii) Introduce integrated grazing system and planting of fodder species.</p> <p>(v) Control bush burning and fires</p> <p>(vi) Protection of roadsides by planting of vegetation.</p> <p>(vii) Prepare an effective and sustainable maintenance plan of soil conservation works.</p>	<p>(i) Number of farmers and livestock owners trained in soil conservation</p> <p>(ii) Number of anti-erosion structures constructed</p> <p>(iii) Communities practicing integrated grazing system and households that have planted fodder plants</p> <p>(v) Communities practicing bush fire management practices</p> <p>(vi) Roads with planted roadside vegetation</p> <p>(vii) Communities with maintenance plans for soil conservation works</p>
	<p>(i) Promote environmental health measures and public health education.</p> <p>(ii) Improve management of wastes from slaughter houses and animal farm operations</p> <p>(iii) Review, update and enforce pollution control legislation.</p> <p>(iv) Strengthen public health safeguards enforcement capacity.</p> <p>(v) Locate sub projects at far/safe distances from water points and sources.</p> <p>(vi) Increase public awareness about dangers of pollution</p>	<p>(i) Number of public health education campaigns conducted</p> <p>(ii) Number of slaughter houses and farmers recycling waste</p> <p>(iii) Number of laws reviewed, updated and being enforced</p> <p>(iv) Number of offenders charged with public health infringements</p> <p>(v) Number of subprojects located >100 m from water source</p> <p>(vi) Number of awareness campaigns on dangers of pollution conducted</p>

	<p>(i) Awareness raising to prevent encroachment on protected areas, such as forest reserves and national parks.</p> <p>(ii) Training local people and farmers on bush fire management (e.g., carrying out early dry season burning in protected and buffer areas)</p> <p>(iii) Training people in sustainable wood energy harvesting.</p> <p>(iv) Promotion of wood/charcoal saving/efficient cook stoves.</p> <p>(v) Installation and maintenance of biogas generation systems.</p> <p>(vi) Training in, and promotion of, tree planting/agroforestry</p> <p>(vii) Training in alternative methods of pest control other than bush clearing and/or indiscriminate burning of grazing lands.</p> <p>(viii) Strengthen protected areas enforcement capacity, especially by local communities and government institutions.</p>	<p>(i) Number of people that have gone through awareness campaigns</p> <p>(ii) Number of people trained in bush fire management</p> <p>(iii) Number of people trained in sustainable wood harvesting</p> <p>(iv) Number of households using efficient cook stoves</p> <p>(v) Number of installed biogas generation units</p> <p>(vi) Number of people trained and trees raised</p> <p>(vii) Number of farmers trained and practicing alternative methods for pest control</p> <p>(viii) Number of violations recorded</p>
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	<p>(i) Decrease overgrazing through constant monitoring of carrying capacity and adopting integrated grazing management.</p> <p>(ii) Promote agroforestry</p> <p>(iii) Training in wetlands management.</p> <p>(iv) Protect sensitive ecosystems such as forests and wetlands and prevent further encroachment into protected areas.</p> <p>(v) Enforce existing laws.</p> <p>(vi) Locate sub projects appropriately.</p> <p>(vii) Training of communities in sustainable uses of resources.</p> <p>(viii) Identify certain species of trees and animals that must be protected.</p> <p>(ix) Exclude ecosystems that provide important habitat for protected species.</p> <p>(x) Establish buffer zones around protected parks and wetlands.</p> <p>(xi) Strengthen local and government institutional capacity to resolve conflicts involving wildlife and livestock.</p>	<p>(i) Communities practicing integrated grazing system</p> <p>(ii) Farmers practicing agroforestry</p> <p>(iii) Number of local people trained in wetland conservation</p> <p>(iv) Number of people trained in the protection of sensitive ecosystems</p> <p>(v) Number of violations against existing laws</p> <p>(vi) Number of subprojects located away from sensitive ecosystems and sites</p> <p>(vii) Number of plants and animals identified for protection</p> <p>(viii) Number of subprojects located away from habitats of protected species</p> <p>(ix) Number of protected areas with buffer zones</p> <p>(x) Number of conflicts resolved</p> <p>(xi) Number of conflicts resolved</p>
	<p>(i) Identify national heritage objects and sites that must be protected.</p> <p>(ii) Increase public awareness about the importance of national heritage objects and sites.</p> <p>(iii) Strengthen local and government institutional capacity to protect national heritage objects and sites.</p>	<p>(i) National heritage objects and sites identified for protection</p> <p>(ii) Number of awareness campaigns conducted on importance of national heritage objects and sites</p> <p>(iii) Number of people trained in protection of national heritage objects and sites.</p>
Livestock Markets	<p>(i) Provide safe disposal of waste water</p> <p>(ii) Provide adequate and proper sanitary facilities, such as ventilated pit-latrines;</p>	<p>(i) Presence of approved waste water drains</p> <p>(i) Number of ventilated pit-latrines per market</p>
Slughter Ho	<p>(i) Provide safe disposal of waste water</p>	<p>(i) Presence of approved waste water disposal</p>

	(i) Provide adequate and proper sanitary facilities	(i) Presence of adequate sanitary facilities
	(ii) Appropriate disposal of waste in designated areas (iii) Provision of protective clothing; (iv) Effective use of disinfectants; (v) Effective sanitary inspections leading to required standards being met; (vi) Effective regulatory animal and meat inspection.	(ii) Presence and use of authorized waste disposal sites (iii) Number of workers with protective clothing (iv) Number of times disinfectants used per week (v) Sanitary inspections made per month (vi) Number of carcasses inspected per day
	(i) Avoid escaping NH ₃ ; (ii) Dispose of manure in a timely fashion (iii) Ground waste bone, meat and offal into flour for animal feed; (iv) Use blood for blood sausage; (v) Other water and blood waste must be collected and treated before proper disposal into municipal waste treatment systems; (vi) Manure should be recycled or allowed to mature in an impervious containment before application as fertilizer for crop production or on pastures.	(i) Number of fridges/cooling systems using hydrofluorocarbons (ii) Number of times manure is disposed per week (iii) Amount of bio-waste converted into animal feed (iv) Amount of blood used to make sausage (v) Presence of pre-disposal treatment facility and approved disposal into municipal waste treatment system (vi) Presence of a manure containment facility and amount of manure used as fertilizer or for biogas generation
	(i) Avoid refrigerants that use ozone depleting substances (NH ₃ and chlorofluorocarbons)	(i) Number of fridges using hydrofluorocarbons
	(i) Water apportioning; (ii) Efficient use of water including recycling.	(i) Amount of water apportioned to various uses (ii) Amount of water being recycled
	(i) Provide safety instructions; (ii) Provide safety clothing where appropriate (e.g. hard hats).	(i) Number of injuries recorded per day (ii) Number of workers with protective clothing
Dairies and Milk Collect	(i) Effective collection and treatment of whey before discharge; (ii) Make available all whey to farmers for feedstock.	(i) Amount of whey collected (ii) Amount of whey given to farmers as feedstock

Collect ion and Proces sing Center s	(i) Origin of milk should be known and identify reliable sources of milk; (ii) Use effective Pasteurization processes; (iii) Workers must be protected with effective clothing and workers should not come in direct contact with milk products; (iv) Veterinary diligence to ensure healthy animals.	(i) Up-to-date record of sources of milk (ii) Milk inspections made per week and amount of condemned milk (iii) Number of workers with effective clothing that minimizes contact with milk products (iv) Farm animal inspections made by a livestock/veterinary officer per month
	(i) Avoid refrigerants that use ozone depleting substances (NH ₃ and chlorofluorocarbons)	(i) Number of fridges using hydrofluorocarbons
	(i) Provide safety instructions; (ii) Provide safety clothing where appropriate (e.g. hard hats); (iii) Install protective guards on all machinery.	(i) Number of injuries recorded per day (ii) Number of workers with safety clothing (iii) Machines with protective guards

9.3 Monitoring Roles and Responsibilities

It is planned that the environmental and social impacts and their designed mitigation measures are to be monitored during implementation (construction/rehabilitation works) and operation (including maintenance) stages of the subprojects by the owners/implementers/operators, themselves. No assignment of monitoring responsibilities to other parties will absolve whatsoever, the owners/operators of their responsibility to successfully manage, mitigate or monitor any adverse impacts caused by their subproject. The main roles and responsibilities of the subproject owners/operators in monitoring impacts of their subprojects and their corresponding mitigation measures given in Table 9.3.

Table 9. 3 Roles and responsibilities of owners and operators of subprojects

Role/Responsibility	Reporting frequency
Monitoring environmental and social impacts and mitigation measures at the site of their subprojects	Quarterly
Evaluate the environmental and social impacts and mitigation measures at the site of their subprojects	Quarterly
Monitoring the environmental and social impacts and mitigation measures of their subproject activities at sites beyond their subproject sites, such as in rights of way, servitudes etc. and on nearby protected areas and national heritage sites	Annually
Maintain suitable records to be made available to their respective Project District Focal Points (DFPs) and Provincial Project	Monthly

Coordination Office (PPCOs)	
Submission of monitoring and evaluation reports to DFP and PPCO	Quarterly and annually as the case may be (see above)

9.4 ESMF Monitoring Requirements and Budget

This sub-section sets out requirements for monitoring of this ESMF implementation. Monitoring of the indicators set out here will be mainstreamed into the overall monitoring and evaluation (M&E) system for the project.

Indicators of ESMF implementation are:

- Number of national, provincial, district levels staff trained in implementation of this ESMF;
- Number of staff attending training course in EIA and ESMF implementation;
- Number of subprojects correctly submitted for approval;
- Number of mitigation measures implemented;
- Number of written warnings of violation of ESMPs issued to project proponents;
- Number of recommendations from the Audit that have been implemented

The costs associated with the Environmental Social Management Process would be made up of the cost of service providers/technical assistance/allowances of staff etc, to support the efforts of the district and/or the farmer group and payments to consultants and ZEMA for the review of ESIA/ESMPs. These costs are estimated at US\$300000.00.

10. CAPACITY BUILDING AND TRAINING

10.1 Institutional Capacity Assessment

One of the most serious problems facing environmental management in Zambia is the lack of action in tackling environmental problems. This is often a reflection of a lack of capacity rather than a lack of awareness amongst Zambian institutions. Similarly, the legislative framework is more than adequate in catering for the requirements of environmental management in the country but the enforcement and implementation of that legislation is often ineffective. Thus the problem of inadequate capacity needs to be addressed if this ESMF for the LDAHP is to be successfully implemented. Capacity needs to be strengthened at community and subproject operation levels and at the three Project Management Levels: District, including local Authority, Provincial and National Levels.

The MoAL will be responsible for overseeing the implementation of the ESMF under the LDAHP. The Ministry has structures at national, provincial, district and sub-district (camp) levels. However, the MoAL has many vacant posts at district and sub-district levels. Unless the ministry can fill-up the vacant posts in the existing staff establishment, it will have inadequate capacity to monitor and enforce the ESMF. Furthermore, the majority of the existing staff may not have the necessary training to monitor and enforce the guidelines developed for the successful implementation of the ESMF.

10.2 Training Program and Budget

10.2.1 LDAHP Specific Training Requirements

The successful implementation of the LDAHP will in part depend on how well the various groups involved in the project implementation process understand and implement this ESMF. Such an understanding can be enhanced through training in the various aspects of the ESMF. Table 10.1 sets out the general training requirements of each of the groups and Table 10.2 presents details of the training to be carried out and the chronological order of training. For each training session, consideration should be given to involving the participation of other stakeholders, such as those from District authorities and the local private sector.

Table 10.1 Training and sensitization requirements for various groups involved in the LDAHP and ESMF implementation.

Training component	National level project management	Provincial level project management	District level project management	Extension workers/contact farmers/NGOs	Livestock organizations/farmers associations/leaders etc
Integrating Environmental Management into Development Planning	T	T	S	A	-
Linkages between environmental, social and natural resource management and sustainable rural livelihoods	A	T	T	S	S
Environmental Assessment legislation and relevant environmental policies (national and international)	A	A	T	S	A
EPB/EIA procedures and methods for impact assessment and monitoring	A	T	T	S	S
Potential impacts of sub-projects and suitable mitigation measures	A	A	T	T	T
Addressing land acquisition and access to resources through resettlement planning and compensation	A	T	T	T	S
Public Consultation	T	T	S	S	A
Use of this ESMF, its procedures, resources and forms (including the	A	T	T	T	T

PMP)					
Methods of community involvement	A	A	T	T	A

Legend: T =Technical training, S =Sensitization, A = Awareness-raising

Table 10.2 Proposed specific training packages and timing for the different groups involved in the implementation of the LDAHP.

Target audience	Training component	Length	Timing
National Project Management	In-depth training in integrating environmental management into developing planning and Public consultation	1 day	Quarterly for 3 years to update
	Awareness on EIA procedures, legislation, use of this ESMF; Potential impacts; community involvement; linkages between environmental, social and natural resource management; Sustainable rural livelihoods and land and resources acquisition.	1 day	One-off at LDAHP kick-off

Provincial level project management	In-depth training in Integrating Environmental Management into Development Planning; Linkages between environmental, social and natural resource management and sustainable rural livelihoods; EIA procedures and methods for impact assessment and monitoring; Addressing land acquisition and access to resources through resettlement planning and compensation; Public Consultation; and Use of this ESMF, its procedures, resources and forms (including the PMP).	3 days initially and 1 day after that	Half-yearly for 3 years to update
	Awareness raising in EA legislation and relevant environmental policies (national and international), Potential impacts of sub-projects and suitable mitigation measures, and Methods of community involvement.	1 day	One-off at LDAHP kick-off

District level project management	In-depth training in Linkages between environmental, social and natural resource management and sustainable rural livelihoods; EA legislation and relevant environmental policies (national and international); EIA procedures and methods for impact assessment and monitoring; Potential impacts of sub-projects and suitable mitigation measures; Addressing land acquisition and access to resources through resettlement planning and compensation; Use of this ESMF, its procedures, resources and forms (including the PMP); and Methods of community involvement.	4 days initially and 2 days after that	Half-yearly for 3 years to update
	Sensitization about Integrating Environmental Management into Development Planning; and Public Consultation	1 day	One-off at LDAHP kick-off

Extension workers/contact farmers/NGOs	In-depth training in Potential impacts of sub-projects and suitable mitigation measures; Addressing land acquisition and access to resources through resettlement planning and compensation; Use of this ESMF, its procedures, resources and forms (including the PMP); and Methods of community involvement.	2 days initially and 1 day after that	Half-yearly for 3 years to update
	Awareness raising in Integrating Environmental Management into Development Planning	¼ day	One-off at LDAHP kick-off
	Sensitization about Linkages between environmental, social and natural resource management and sustainable rural livelihoods; EA legislation and relevant environmental policies (national and international); EIA procedures and methods for impact assessment and monitoring; Public Consultation.	½ day	One-off at LDAHP kick-off
Livestock organizations/farmers associations/leaders	In-depth training in Potential impacts of sub-projects and suitable mitigation measures; and Use of this ESMF, its procedures, resources and forms (including the PMP).	1 day	Half-yearly for 3 years to update

	Awareness raising in EA legislation and relevant environmental policies (national and international); Public Consultation; and Methods of community involvement.	½ day	One-off at LDAHP kick-off
	Sensitization about Linkages between environmental, social and natural resource management and sustainable rural livelihoods; EIA procedures and methods for impact assessment and monitoring; and Addressing land acquisition and access to resources through resettlement planning and compensation	½ day	One-off at LDAHP kick-off

The cost estimates for the above training requirements are based on the assumption that the training program for the livestock organizations/farmers associations/leaders, Extension workers/contact farmers/NGOs, District level project management and Provincial level project management will be held at the provincial or district centers and that resource persons are likely to come from other parts of the country and therefore will require travel allowances and per diems. These estimates include an allowance for travel expenses and all costs of the consultants. The total estimated cost is US\$1671000.00 broken down as shown in Table 10.3.

Table 10.3 Training and mitigation cost estimates

Expenditure Head	Expenditure Line	Role Players	Estimated Number	Cost Estimate (US\$)
Training	Travel	Members of livestock/farmer organizations	470	105000.00
		Contact farmers and NGO members	470	105000.00
		District/Camp staff	300	0.0
		Provincial Project staff	42	0.0
		National Project staff	8	0.0
		Consultants	7	35000.00

		Sub-total		245000.00
	Per diem	Members of livestock/farmer organizations		210000.00
		Contact farmers and NGO members		210000.00
		District/Camp staff		0.0
		Provincial Project staff		0.0
		National Project staff		0.0
		Consultants		35000.00
		Sub-total		455000.00
	Fees	Consultants		21000.00
	Consumables			100000.00
	Total			821000.00
Mitigation measures	Total			850000.00
Grand Total				1671000.00

10.2.2 Training and Capacity Building Needs and Budget for MoAL

Training and capacity building in the livestock sector will contribute to strengthening staff capacities of key national public and private institutions in order to: (i) improve the delivery of advisory and technical services to enhance the adoption of good husbandry practices and innovative technologies; and (ii) support the development of a framework appropriate for the sustainable development of the livestock sector. Budget allocations are therefore required for:

- formal and in-service training of MoAL staff in selected disciplines where major gaps have been identified;
- the supply of vehicles and office equipment to improve efficiency of advisory and technical services to farmers;
- supporting the preparation and implementation of development plans of key training institutions offering tertiary and advanced level training in animal health and livestock production;
- assisting in developing and rolling out at the decentralized level the Livestock Information and Management System (LIMS);
- the development of an M&E system for the MoAL.

The following is the budget for training and capacity building in the MoAL.

Costs for training and capacity building of the LDAHP (US\$)	
<i>Institutional support to MoAL</i>	5000000.00
<i>Capacity Building for Laboratory Diagnosis</i>	3000000.00
<i>Strengthening the Capacity of Livestock Producer Organizations</i>	2000000.00
<i>Project Management</i>	3000000.00
Total	13000000.00

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ANNEX I: TERMS OF REFERENCE FOR THE ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK FOR THE LDAHP IN ZAMBIA

1. ASSIGNMENT BACKGROUND

1. Through the recent creation of the Ministry of Livestock and Fisheries Development (MLFD), the Zambian government is increasingly recognizing the importance of the livestock sector to economic growth and poverty reduction. The importance of the sector is highlighted through recent survey result which reveals that approximately 45% of the rural population own livestock and animal sales alone account for 26% of rural household income, higher than that contributed by field crops (21%). Among livestock owning households, cattle are owned by 310,000 households (CSO, MACO, FSRP Survey 2006/07, 2008/09).
2. Despite the importance of livestock in livelihoods, the sector's potential to contribute to economic growth is constrained, among other factors, by high disease prevalence, which affects the productivity of livestock either through direct losses caused by mortality and decreased production or indirect losses resulting from effects on trade, draught power. The importance of draught power to the economy was recently highlighted in the crop forecasting in 2010, with cereal production estimated up in response to good weather conditions and availability of healthy draught animals which allowed for an expansion of crop acreage.
3. Despite Government support and the recognition of the considerable potential for increased livestock production, Zambia is reputedly to be the most animal disease stricken country in the SADC region, registering in 2008 and 2009, registered incidents of all animal disease, especially FMD and East Coast Fever. Increasing concern about the economic and financial costs of disease outbreaks on household and the economy has led the Government of Zambia (GoZ) to propose the establishment of a disease free zone in the Central Province which has, until now remained relatively free of major animal diseases.
4. The Government of Zambia (GRZ) has since sort a concessionary credit from the International Development Agency (IDA) for the Livestock Development and Animal Health Project. The Project Development Objective (PDO) is to improve the productivity of key livestock production systems for the targeted smallholder and emergent producers in the identified areas and improve the safety of meat and milk products in slaughter houses markets and milk collection centers supported by the project. Specific objectives are to: (i) increase yield of targeted production systems by participating smallholder and emergent producers in the targeted areas; (ii) decrease the incidence of key animal diseases in project areas; and (iii) build the capacity of the Animal Health system and Veterinary Services.
5. The project will support the government in improving the productivity of key production systems, namely meat and milk from cattle and small ruminants, and from pig and poultry sectors. It will specifically strengthen the veterinary services (public and private) to better control major animal diseases and improve food safety. It will also tackle other

identified constraints by supporting productive investments (infrastructure, equipment, and technologies) and improving access to advisory and extension services for the producers and their organizations. This will directly lead to productivity improvements in the smallholder livestock sector. The project will support the rehabilitation of animal health and veterinary services by the provision of equipment, rehabilitation or construction of critical public and community infrastructure and skills training of front line animal production and veterinary staff. IDA support will cover the major animal rearing provinces including Eastern, Southern and Western Provinces and the designated Disease Free Zone (DFZ) if the cost benefit analysis will deem this feasible.

2. Assignment

6. The purpose of the consultancy is to prepare an Environmental and Social Management Framework (ESMF), a Resettlement Policy Framework (RPF) and a Pest Management Plan (PMP) that establish a unified process for addressing all environmental and social safeguards issues of the project. The framework will prescribe the process from the preparation, through review and approval to implementation of the sub-projects that will ensure that the substantive concerns of all World Bank (WB) safeguard policies and relevant Zambian legislation will be adequately addressed.

7. The ESMF and RPF are required because area-specific assessments can not be ascertained in advance of project implementation which makes it difficult to identify the possible project impacts, and consequently site specific safeguard policy instruments such as environmental impact assessments (EIA) and resettlement action plans (RAPs) cannot be prepared before appraisal. It is expected that during the preparation, some project sites will be identified while others may be identified during implementation. The ESMF and RPF will, therefore, provide guidelines for the development of Environmental Management Plans (EMPs), Resettlement Action Plans (RAPs) and the design of environmental and social impact mitigation measures.

8. Livestock Development and Animal Health will include the control of vectors of livestock diseases and improved treatment of vector-borne diseases to keep disease vector populations in check. The use of pesticides to reduce vector populations may be included in this project.

9. The use of pesticides may contribute to increased livestock production and improved human health. However, inappropriate or excessive use of pesticides often results in a reduction of livestock production or its sustainability, increases in disease vectors, adverse environmental and health effects, and negative effects on other economic activities (e.g. fisheries, tourism). This, in turn, leads to increased economic costs, both at the farmer level and for the country as a whole.

10. Adequate measures are therefore required at project development to promote the appropriate management of pests and pesticides. This is to ensure that increased and sustainable livestock production and farm incomes are achieved; that vector-borne

diseases are managed in a sustainable manner, and that the risks to human health and the environment associated with pesticide use are kept to an acceptable minimum.

11. The World Bank's Pest Management Safeguard Policy (OP 4.09 and BP 4.01 Annex C) was established to address these concerns and to assist borrowers to manage pests in an appropriate manner. A major provision of the Safeguard Policy is the preparation of a comprehensive Pest Management Plan, (PMP), that will outline the various elements of and actions needed to be taken to adequately address these concerns during project implementation.

3. Scope of Work

The consultant is expected to undertake the following activities;

- Determine the nature and magnitude of both environmental and social impacts and mitigation measures for those impacts for the project investments;
- Assess the extent to which livestock owners are in conflict with protected areas, because of the need to access resources such as fodder or water;
- Increasing livestock productivity will indirectly incentivize increased animal drugs and veterinary medicinal products use. To address these concerns, a Pest Management Plan (PMP) will be prepared to screen pesticides and guide their safe handling. This study will also look at livestock waste disposal activities in place and propose measures for appropriate management of such.

3.1 Environmental and Social Management Framework (ESMF).

Specific ESMF objectives would include:

- To establish clear procedures and methodologies for the environmental and social planning, review, approval and implementation of subprojects to be financed under the Project;
- To specify appropriate roles and responsibilities, and outline the necessary reporting procedures, for managing and monitoring environmental and social concerns related to subprojects;
- To determine the training, capacity building and technical assistance needed to successfully implement the provisions of the ESMF;
- To establish the Project funding required to implement the ESMF requirements; and
- To provide practical information resources for implementing the ESMF.

12. The consultant will prepare an ESMF according to the objectives stated above
General tasks would include the research, interviews and field work needed to develop:

- a) **A detailed description of the Project**, The consultant will provide a detailed description of the project, its components and implementation arrangements with a focus on Eastern,

Northern (for small ruminants), Southern and Western Provinces and the proposed disease free zone;

b) **Present baseline Data.** The consultant will describe and evaluate the current environmental status of proposed project area and include environmental information relevant to the project. The following elements will be surveyed: (i) physical environment e.g. geology; topography; soils; climate and meteorology; surface and groundwater hydrology; (ii) biological environment; flora; fauna; rare and endangered species; sensitive habitats – including protected areas and reserves; significant natural sites, etc.; and (iii) socio-economic environment: land-use; land tenure; and land titling and human settlements;

c) **An understanding of the legislative, regulatory and administrative regime** (e.g. pollution control, environmental management, land acquisition and use, protection of cultural heritage) that the Project will operate within, with a focus on requirements that will apply to the planning, approval and implementation of subprojects. All relevant Zambian environmental legislation and policies as well as World Bank operating safeguard policies should be provided. The framework should highlight any gaps that exist between Zambian environmental legislation and WB safeguard polices;

d) An understanding of the **institutional needs** for implementing the ESMF. This should include a review of the authority and capability of institutions at different levels (e.g. local, district, provincial/regional, and national), and their capacity to manage and monitor ESMF implementation. The analysis may extend to new laws and regulations, new agencies or agency functions, intersectoral arrangements, management procedures and training, staffing, operation and maintenance training, budgeting, and financial support.

e) A **training and capacity building programme** for the institutions responsible for implementing the ESMF.

f) Requirements for **technical assistance** to communities, service providers and public-sector institutions to support their ESMF implementation work.

g) **Guidelines for sub-projects.** The consultant will prepare a Procedures Manual that will be based on the national environmental legislation and the WB safeguard policies that will cover the following aspects: (i) environmental screening of sub-projects and standards for categorization; (ii) environmental assessment of sub-projects, including checklists; (iii) design of environmental impact mitigation; (iv) description of the process by which Environmental Management Plans (EMPs) will be prepared and approved once site specific impact is known; and (v) a monitoring plan for sub-projects;

h) **Public Consultation.** The ESMF will specify public consultation requirements to be included in the area-specific EMPs that will involve various stakeholders, such as NGOs, public and private entities operating in the proposed project areas, as well as other interested and affected parties; Consultation and information gathering should extend from the national level to at least the lowest level (e.g. district) where subprojects will be proposed, approved and then implemented

i) A **budget** for implementing the ESMF.

3.2 *Resettlement Policy Framework (RPF)*

13. The RPF will be prepared because details about the scope of work and exact

site locations will not be known by Appraisal. The RPF must ensure that the necessary tasks for compliance with WB social safeguard policies (e.g. involuntary resettlement¹) issues and Zambian legislation are included; appropriate standards and procedures are applied and all salient issues are covered. The consultant is expected to undertake the following activities:

- a) **Project Description.** The consultant will provide a description and the locations of the expected impacts. The RPF will summarise all project components, and provide more detail of those components and/or activities which could trigger O.P. 4.12 Involuntary resettlement that requires land acquisition, resettlement, and/or restrict access to natural resources;
- b) **Principles, objectives and terms of preparation of the RPF.** The consultant will describe the principles and objectives governing the preparation of the RPF; state conditions/triggers for the actions taken; and describe basic steps in developing the RPF;
- c) **Preparation and Approval of the Resettlement Action Plans (RAPs).** The RPF will describe how the RAP will be prepared, approved and monitored once impact location is well defined and known;
- d) **Impacted Population.** The RPF will identify the population which is expected to be impacted by the project. This will include individuals and groups, categories of impacted people, numbers impacted, a degree of impact and budget estimates. This aspect will be further detailed in the RAP once activity and location are clearly known. The RPF will estimate if there is likely displacement or not and the likely categories of people to be displaced to the extent feasible;
- e) **Eligibility.** The RPF will establish a framework method for determining a cut-off date for compensation; provide a description of different categories of impacted people determined by degree of impact and assets lost; and will define criteria to be used in identifying who is eligible for compensation for each category of population impacted. This will serve as a guideline for the development of RAP to further elaborate on amount of losses, ownership status, tenancy status, and any other relevant information. It will identify who and how impacted persons will be compensated, who will determine eligibility, and how the process will work;
- f) **Legal framework.** The RPF will include a general review of the applicable legal framework. The review will include relevant national laws especially with regards to land ownership and tenure rights, taking of land and other assets, access to resources, as well as any other items worth noting. The RPF will also describe the political economy and governance in Zambia in relation to land issues;
- g) **Overlaps and gap identification.** The RPF will highlight similarities and gaps (if any) between Zambian legal requirements and WB requirements and recommend measures for bridging the gaps. If there are discrepancies between WB requirements and government requirements, WB polices will prevail;
- h) **Valuing Assets.** The RPF will include general description of method/s by

¹ It should be noted that involuntary resettlement safeguard policy is triggered not only for the displacement of population, but also when access to productive resources like land, shelter, etc, is constrained (i.e. it covers all direct economic and social losses, together with consequent compensatory and remedial measures).

which assets will be valued and deemed eligible for compensation and will establish guidelines for the drafting of the RAP. This includes explanation of inventorying the assets, assigning values to each type of asset, and terms of agreement for affected persons and groups. The RPF should include a table showing expected types of people impacted, types of losses, compensation actions and estimated amounts;

i) **Organizational procedures for the delivery of entitlements and**

definition of responsibilities. The RPF should identify the organisation and procedures for the delivery of compensation by responsible agencies;

j) **Description of the arrangements for implementation, the**

implementation schedule linking resettlement to civil works schedule and costs. The RPF will include a framework for assessing how project activities trigger safeguard policies and what actions will be taken to ensure due process. It will include how the RAP will be implemented and linked to civil works (civil works should not begin until implementation of resettlement measures has been completed), how compensation will be paid, and other implementation related activities;

k) **Grievance redress mechanism.** The RPF will include a framework

describing the mechanisms available to affected people for complaints about aspects of their treatment under the project activities. It will detail the specific mechanisms and how they will be used (including language and cost to affected people) and what recourse/appeal may be available to them. The RPF will include lessons learnt on the grievance mechanisms that work best under the circumstances.;

l) **Arrangements for funding.** The RPF will provide estimates of a likely

range of overall resettlement costs and funding arrangements. It will provide also a framework for the detailed cost estimates to be conducted as part of the sub-project specific RAP, including oversight and sub-project implementation. The RPF should provide a description of how compensation will be funded, who will fund, who will dispense, how will funding be dispensed, and when will it be dispensed, including guidance for developing cost estimates, sources and flow of funds and contingency arrangements;

m) **Description of mechanisms for consultations with and participation**

of displaced/affected persons in planning, implementation and monitoring. The consultant will describe the consultation process followed by the RPF preparation team in its preparation, and that which the RAP preparation team will follow to ensure participation and inclusion of all relevant stakeholders including the likely project affected persons in the planning, implementation and monitoring of the RAP. Therefore the consultant will carry out consultations with a broad array of stakeholders, including MLFD officials, at every level, including the types of expected beneficiaries, types of affected people, and typical sub-projects. The consultant will ensure that the draft RPF is to be, or has been, circulated to interested parties, and that further consultations will take place before finalization. A record of all such consultations will be inserted as an annex to the RPF. Once specific livestock activities are known the affected people will be consulted throughout the process of the RAP; and

n) **Arrangements for monitoring.** The consultant will describe how the RPF

will be implemented and monitored. This will include identification of the implementing agency responsible for the monitoring, and how the monitoring will be done, including frequency of monitoring. Guidelines to ensure that all affected people will be monitored to ensure achievement of resettlement goals will be provided. The consultant will include reporting

mechanism, how this information will be utilised in the project implementation, as well as reporting of non-compliance and grievances.

3.3 Pest Management Plan

14. In consultation with the project Task Team Leader (TTL) and the Borrower, the Consultant will prepare the PMP, addressing the following 4 major issues, namely:

- (i) Pest and Vector Management approaches;
- (ii) Pesticide use and management;
- (iii) Policy, regulatory Framework and institutional capacity, and
- (iv) Monitoring and evaluation

Details of these components may be elaborated upon as follows:

Pest or vector management approaches

a) Current and anticipated pest or disease vector problems, relevant to the project. Prepare an overview of the major animals reared and the key pest and diseases problems experienced, especially by small holder farmers. Provide estimates (preferably based on local studies) of the economic losses that can be attributed to the key pests and diseases and carry out a similar analysis for disease vectors. Assess the potential changes in pest or vector-borne disease problems that can be anticipated as a result of the project's activities.

b) Current and proposed pest management practices. Describe the current methods for pest or vector management practised in the country. Describe the non-chemical pest control methods, IPM or IVM approaches that are available in the country.

Assess the activities of the national livestock extension services aimed at providing vector management advice to farmers. Evaluate to which extent the system includes integrated pest or vector management. Assess the extent to which vector management information is transmitted to farmers. Assess the economic and environmental sustainability of the present and proposed pest or vector management practices.

Inventorize the pest or vector control methods or approaches that have been field-tested or introduced in the past in the country, but which have not established themselves as current practices. Evaluate the reasons for this lack of success.

Describe any new pest or vector control methods or approaches that are being tested or introduced into the country.

Assess the potential changes in pest or vector management that can be anticipated as a result of the project activities.

c) Relevant IPM/IVM experience within the project area, country or region. Describe any IPM or IVM methods locally available for the management of the major pests and diseases of animals that are the target of the project.

Assess the strengths and weaknesses of implementation of IPM or IVM activities in the country to guide the choice of activities that could be carried out during project implementation.

Identify relevant existing IPM or IVM projects or programs which are operational in the country and which should be approached/included for collaboration.

Review the development and conduct of IPM research programs within the national agricultural research institute, or in any regional or international agricultural research centers, relevant to the project activities.

d) Assessment of proposed or current pest management approaches, and recommendations for adjustment where necessary.

Where the current practices, or those proposed under the project, are not consistent with the principles of IPM or IVM, the discrepancies should be discussed. Either a detailed technical justification should be provided for this discrepancy, or a strategy should be proposed to bring pest or vector management activities under the project into line with IPM or IVM.

Pesticide use and management

(i) Review of present, proposed and/or envisaged pesticide use.

Compile a list of pesticides in use in the country and the vectors for which they are used. Classify the (commercial formulations of the) pesticides according to the WHO classification of pesticides by hazard.

Describe the current pesticide use patterns in the country and assess whether pesticides are used in the context of IPM.

Assess if envisaged pesticide use under the project is justified by (a) explaining the IPM approach and the reason why pesticide use is considered, (b) providing an economic assessment demonstrating that the proposed pesticide use would increase farmers' revenues, or, provide evidence that the proposed pesticide use is justified from the best available (preferably OIE supported) animal health evidence.

(ii) Indication of type and quantity of pesticides envisaged to be financed by the project and/or assessment of increase in pesticide use resulting from the project.

Estimate the quantity (in volume and value) of pesticides envisaged to be financed (either directly or indirectly, e.g. through grants/credit provision) by the project.

If pesticides are not financed by the project, identify project activities that may lead to increased pesticide use, and estimate this increase.

For both the above mentioned situations, evaluate if higher pesticide use would also result in increased farmer dependence on pesticides.

(iii) Circumstances of pesticide use and the capability and competence of end-users to handle products within acceptable risk margins.

Assess user access to, and use of, protective gear and appropriate application equipment; levels of knowledge and skills of users to handle pesticides correctly; users' product knowledge and understanding of hazards and risks; appropriateness of on-farm storage facilities for pesticides;

(iv) Assessment of risks.

Evaluate the actual potential environmental, occupational and public health risks associated with the transport, storage, distribution and use of the proposed products under local circumstances, and the disposal of empty containers.

Assess to what extent the project's activities will increase or reduce such risks.

(v) Pre-requisites and/or measures required to reduce specific risks associated with envisaged pesticide use under the project.

Identify the strengths and weaknesses in the country for proper handling of pesticides and propose the measures needed in the project to guarantee judicious use of pesticides. For example, outline details of training activities to build capacities in pesticide management, risk reduction, use of appropriate application equipment and protective gear, and recognition of circumstances leading to pesticide poisoning.

(vi) Selection of pesticides authorized for procurement under the project

If required, prepare provisional lists of pesticides which may be procured under the project taking into consideration (a) the criteria in OP 4.09 on Pest Management, (b) the above hazards and risks, and (c) the availability of newer and less hazardous products and techniques (e.g. bio-pesticides, traps)

Policy, regulatory framework and institutional capacity

a) Policies on plant protection.

Assess the government policies on pest management (crop protection and vector control) and their consistency with IPM approaches. Evaluate if there direct or indirect subsidies for pesticides, donated pesticides that distort market prices, or other factors that may increase reliance on (unnecessary) pesticide use.

Study if a national IPM/IVM Policy exists and determine whether it is integrated into the national agricultural development policy/strategy.

- b) Description and assessment of the national capacity to develop and implement ecologically-based IPM.

Assess the quality of public and private sector extension services, extension services provided by NGOs and research institutions, and their practical capacity to develop and implement (participatory) IPM or IVM.

- c) Assessment of the country's regulatory framework for control of the distribution and use of pesticides.

Inventorize the presence and quality of pesticide legislation. Assess if a pesticide registration scheme has been set up and is operational. Assess if a pesticide distributor and/or user licensing scheme exists.

If relevant, evaluate if local pesticide production and/or formulation is appropriately regulated.

- d) Assessment of the institutional capacity for effective control of the distribution and use of pesticides.

Evaluate if the country has the institutional and financial capacity to enforce the above mentioned legislation. In doing so, assess if:

- sufficient trained personnel is available for inspection and control tasks;
- the government actively monitors pesticide use and storage;
- pesticide products are properly packaged and labeled;
- effective measures can be taken to limit access to Class II pesticides to licensed users if the use of such products is proposed (a specific requirement OP in 4.09);
- the government monitors the quality of imported/locally produced pesticides (is there a quality control laboratory);
- pesticide residues are being monitored on export crops and crops for the domestic market;
- poisoning statistics are available, especially in rural areas;
- medical staff at rural clinics are trained to recognize and treat pesticide poisoning, and are antidotes available in rural areas;
- etc.

Assess the system for managing unwanted and obsolete pesticides; to what extent might the project activities contribute to the accumulation of obsolete pesticides?

Strengthening of national capacities

On the basis of the outcome of the above reviews, and if necessary, propose an action plan containing appropriate measures, in project sub-components, to strengthen the national capacities to improve the regulatory system for pesticides, and implement ecologically sound management of pests and vectors.

Identify which components should be covered by the project/programme, and which may be funded/executed under other (existing) government or donor activities.

Estimate the financial requirements and suggest funding mechanisms for the implementation of the plan.

Monitoring and evaluation

- i. Description of activities that require local monitoring during implementation and during supervision missions.

Describe these activities and propose realistic performance indicators that can be used to evaluate progress towards the implementation of sustainable pest management, effectiveness of measures to mitigate pesticide risks, progress in strengthening regulatory framework and institutional capacity, etc.

- ii. Monitoring and supervision plan, implementation responsibilities, required expertise and cost coverage.

Prepare a monitoring and supervision plan that would be adopted during project supervisory missions. For example, in the plan include the types of expertise required at different stages of project implementation, actual monitoring activities and detailed budget.

4. Consultant Qualification

15. The consultant will demonstrate that the proposed team has the expertise required to fully appreciate the requirements of all the Safeguards Policies to be addressed in the ESMF/RPF and PMP, and complete all required sections of the ESMF/RPF and the PMP. The consultant will be particularly familiar with the environmental assessment of small-scale projects, and with systems for the environmental review and approval of development projects in developing countries like Zambia. The consultant is expected to assemble a team with in-depth technical and local knowledge. It is expected that the team will comprise, but not be limited to, the following professionals: (i) Environmental scientist; (ii) Animal scientist; (iii) Rural social scientist with resettlement experience and intimate familiarity with the World Bank's resettlement policy, and (iv) a specialist in asset evaluation (for determining methods).

For PMP, the consultant will be specialized in one or more of the following fields:

- a) agricultural pest management in the tropics or subtropics, with particular experience in (participatory) integrated pest management (IPM);
- b) Disease vector management in the tropics or subtropics, with particular experience in (participatory) integrated vector management (IVM);
- c) Pesticide management in developing countries, with particular experience in pesticide legislation and regulation, pesticide risk assessment and registration, and the enforcement/implementation of pesticide regulations;
- d) Pest management extension methods and/or participatory integrated crop production, pest or vector management;

- e) Agricultural policy development in developing countries, with particular experience in integrated pest & vector management policies and the economic, trade and fiscal aspects of agricultural input use (particularly pesticides).

16. The consultant will have experience in the identification and the analysis of technical and policy constraints with respect to agricultural or public health projects/programs in developing countries. She/he should be capable of working, using a strongly participatory approach, with the (potential) Borrower's technical and policy staff.

17. The Consultant must be familiar with both the relevant World Bank safeguard policies and Zambian Legislation. Prior experience in carrying out the ESMF/RPF and PMP is strongly desired.

5. STUDY SCHEDULE AND DELIVERABLES

18. The study will be carried over a time laps of 3 months. They will be expected to deliver the following deliverables for all the four outputs: (a detailed work plan, (b interim report, (c draft final ESMF/RFP and PMP reports, (d final report. The detailed work plan shall be produced within 1 week, interim report within 3 weeks, and final draft ESMF within 12 weeks of contract signature), and the overall duration of the consultancy will be 12 weeks from contract signature. The consultant shall be required to submit the following reports and a Procedures Manual to the GRZ in English:

5.1 The ESMF Report

19. The ESMF report will at the minimum contain, but not limited to, the following topics:

- a) Executive summary;
- b) Introduction describing the ESMF purpose, objective, principles and methodology;
- c) Description of the project and its components;
- d) Major sections addressing the requirements of individual safeguard polices applicable to the project;
- e) Baseline (environmental) data;
- f) Policy and legal framework for both environmental and agricultural/livestock sectors;
- g) Analysis of potential environmental impacts as a result of execution of the project interventions;
- h) Analysis of alternatives;
- i) Mitigation plan;
- j) A Monitoring Plan
- k) Stakeholder consultation;
- l) Training and capacity building needs and budget;
- m) ESMF implementation budget; and

- n) Technical annexes to support ESMF implementation.
- o) The Pest Management Plan will be prepared as a separate volume.

5.2 The Resettlement Policy Framework (RPF) report.

20. The consultant will prepare a RPF that follows WB requirements as stated in the World Bank's policy on Involuntary Resettlement (OP 4.12). The RPF will also be designed to meet legal requirements of the Government. Where there are gaps between Bank and government requirements, the team is to set these out clearly and to generate, with other stakeholders as appropriate, decisions as to how to handle such gaps. Indicate that the RPF should have clear and fully elaborated sections on:

- a) Project Description (see above, which should be repeated and elaborated in the RPF)
- b) Impacts, land acquisition, and resettlement. The consultant should discuss the land acquisition, or restrictions of access, that may be required. Given the nature of the project, the consultant should describe why resettlement is necessary, and why there needs to be an RPF. State the reasons that a full resettlement plan (RAP) or a Process Framework (see OP 4.12 for details) cannot be prepared before project appraisal, and what the sequence of RAP preparations may be during the life of the project.
- c) Principles and objectives governing resettlement preparation and implementation. Describe the basic principles and vision of the resettlement program. State that the resettlement objectives are to move (or deprive from resources) as few people as possible consistent with the requirements of the project, and that general principles of doing no harm, of avoiding or minimizing resettlement are to be followed in all subprojects. Show why acquisition of land or resources is needed and resettlement cannot be avoided in every case. Demonstrate that the commitment is to ensure that affected people are meaningfully consulted, compensated fully and fairly for their losses, and assisted in their efforts to improve their livelihoods and standards of living or at least to restore them. Describe any particular conditions in the project and subprojects that may present special problems or opportunities, and show how the resettlement will be done, in principle, so as to overcome risks or take advantage of such opportunities.
- d) RAP preparation, review, and approval. Describe the relationship of the RPF to the individual RAPs that will be done later for each subproject where there is resettlement. Show who will write future RAPs, and how the implementing agency or some other body (bodies) will be involved in reviewing and approving them. Recommend whether some or all RAPs should be reviewed by the Bank, and how this will happen.
- e) Estimated population displacement and categories of affected people. There may be some projects for which it is impossible to estimate eventual displacement, but every effort should be made, in part to estimate budgets, but also to evaluate consultation requirements and potential challenges to the project staff. Different categories of those displaced may include, for example, those losing legal title and those without it, those losing lands or those losing housing or those losing both, those losing temporary access or those losing permanent rights, business or residential property. Discuss the unit of analysis, whether "cases" (such as properties or fields), or households or individuals. Discuss whether uniform approaches will be taken across all subprojects, and how records will be kept.

- f) Legal frameworks for resettlement. Review the national laws governing the taking of land or other assets. Because such legal instruments may come from many sources – land and water law, customary law or sharia, land tenure legislation, urban construction regulations, constitutional guarantees of compensation for takings for public utility, and so on – make this section as extensive as is warranted by the case in question. Set out the requirements of the process for takings should be set out. Discuss discrepancies among the various legal instruments, if found. Summarize what laws and regulations may apply to different categories of affected people. Next, set out any requirements of the Bank for resettlement that applies to the types of cases that will arise in the project. Analyze all gaps between national and Bank requirements, and say how such gaps may be bridged.
- g) Eligibility criteria for various categories of affected people. (i) Determine the method for setting a cut-off date [see OP 4.12] for eligibility for compensation. (ii) Set out the different categories of people affected by the project, and show the types of losses such people may suffer, whether to land, income, rights of access, housing, water sources, proximity to work, and others, and including combinations (house and land, for example). Define the criteria that are to be used to identify the eligibility for compensatory measures for each category of affected people, whether losses are partial or total, whether people have their own land or also rent land, what happens when buildings are occupied by more than one business tenant or household, for example. Make the criteria user-friendly, so that those applying the principles to subprojects “on the ground” will be able quickly to identify whether people affected there are eligible for compensatory measures, and how. Describe who will judge eligibility in difficult cases, for example by the use of neighbourhood or village committees, or outside experts, and how such processes will work.
- h) Methods of valuing affected assets. Describe the borrower’s methods of valuing those assets that it deems eligible for compensation, and those that must be compensated under the policy principles that meet the World Bank’s requirements. Explain the methods for inventorying assets, assigning values to each type of asset, and coming to agreements with each affected person or group on the total profile of losses and compensation. Present, to the degree possible, an “entitlement matrix” which shows the types of affected people, the types of losses, and the forms and amounts of compensatory actions that will be taken for each type.[2]
- i) Organizational elements and procedures for delivery of entitlements, including the responsibilities of each actor. Describe the process by which individual RAPs for subprojects will be submitted to project authorities, considered and approved, and how entitlements will be delivered. State who in the overall project organization will be responsible for Resettlement, and what facilities the overall resettlement officials will have available to them. If there is no unit or officer(s) with the training and job description to oversee resettlement issues, describe the way in which such capacity will be developed, structured, and given authority. In an annex, provide TOR for such a unit or officer(s) and describe interim arrangements until such capacity is functioning. Describe how subprojects will be reviewed for resettlement, how implementation will be carried out once a subproject is accepted, and how the delivery of compensatory activities will take place.
- j) Generic aspects of the implementation schedule, including how resettlement will be linked to the civil works. Set out the schedule by which resettlement will arise and be treated, both in terms of the overall management of the project and the flow of subprojects.

- k) Grievance redress mechanisms. Describe the mechanisms available to affected people for complaints about aspects of their treatment under this policy framework. Show how the mechanism will be accessible (in terms of language, distance, and cost) to affected people, and what recourse/appeal from the local grievance mechanism may be available.
- l) Budget, and funding arrangements. Estimate the overall costs of resettlement, including funds for general oversight and for implementation of subprojects. Show the sources of funds. For large subprojects, show the sources of and arrangements by which funds for implementation will be made available, and either estimates for “off-the-shelf” (average) subprojects or average subprojects by type. For community and other small subprojects, estimate the types and numbers of subprojects and a nominal resettlement budget based on an estimate of how many subprojects may involve resettlement. Show that the overall budget estimates have been included in the project budget.
- m) Methods for consultation with, and participation of, affected people. Consultation is to be done for both the Resettlement Policy Framework, which sets many of the parameters by which resettlement will be carried out, and the individual RAPs which will be done for each subproject. For the RPF, show that meaningful consultation is being carried out with a broad array of stakeholders including both borrower officials at every level, and the types of people who may be the beneficiaries of, and affected by, typical subprojects. Show that the draft RPF is to be, or has been, circulated to interested parties, and that further consultations will take place before finalization. Insert a record of all such consultations as an annex to the RPF. For the individual RAPs, show how the people affected by the particular subprojects will be consulted throughout the process of RAP formulation, as prescribed by OP 4.12.
- n) Monitoring arrangements. Provide an appropriate mechanism for monitoring the effective implementation of resettlement, either as part of the overall monitoring of project progress, or separately to affirm the achievement of resettlement goals of ensuring that all affected people are addressed. Describe how subproject and overall project achievements will be monitored, and at what frequency, by selected reviews of a sample of micro-projects, by formal supervision of larger subprojects, or by the use of independent monitoring agencies (NGOs, researchers, committees of affected people, or some combination of actors). Show how the results of monitoring will be fed back into project implementation. Where appropriate, set up monitoring checklists or templates to focus the work of local monitors.

O) Template for the design of subproject RAPs taking account of the degree of detail achieved in the RPF design, provide a template for, or description of the contents of, individual raps for those subprojects which will require them. Include in the design the minimum information required to complement what has already been decided at project level through the RPF. at a minimum, ensure that the individual RAP will include the nature of the subproject, the resettlement impact, the number of people affected, baseline census and socio-economic survey information (for larger subprojects) a matrix that shows – in the same terms as the RPF – the entitlements of the categories of affected people, a description of resettlement sites and programs for improvement or restoration of livelihoods and standards of living, the subproject budget and implementation schedule, and a commitment to follow the RPF guidance and requirements in all general matters. insofar as possible, show any further information that may be needed when the RPF has not been fully developed before project approval, or where the general issues in the RPF are in need of supplementation on account of differing local laws, special situations or effects on people, or the additional contributions of specialists to the individual rap preparation.

5.3 Pest Management Plan

21. The Consultant will submit the following reports (depending on the organization of the mission):

- i. The first phase draft PMP discussed during the 1st stakeholders consultation
- ii. The recommendations made by the 1st stakeholders consultation
- iii. The second phase draft PMP discussed during the 2nd stakeholders consultation
- iv. The recommendations made by the 2nd stakeholders meeting
- v. The final PMP
- vi. A memo justifying which recommendations of the stakeholders meeting were not included in the PMP by the Consultant
- vii. Paragraphs containing the key elements of the PMP that need to be included in the EA and/or PAD

6. ORGANIZATIONS AND MANAGEMENT

6.1. Responsible agency

22. The Ministry of Livestock and Fisheries Development (MLFD) will be the executive agency of the project. The Project Coordinator (PC) has been appointed for the project preparation. The consulting firm directly reports to the Project Coordinator to undertake the facilitating interventions of the consultant team and coordinating its activities and providing the link between the consultant, government and the WB.

7. MODALITY OF PAYMENT OF FEES

7.1 Payment of Fees

23. The Consultant's fees shall be fixed for the whole components of the

implementation period covering all expenses and payments in foreign and local currencies. The methods of payment shall be detailed in the proposed contract format attached to the letter of invitation for submission of bids.

7.2 Payment Schedule

24. The modalities of payment shall be in accordance with the terms and conditions of the contract agreement, which will be signed between the GRZ and the Consultant following successful negotiations and approval.

8. OBLIGATIONS

8.1. Obligations of the Government

25. The Government shall appoint a Project Co-coordinator to co-ordinate and manages the project implementation. The Government would be expected to place all available documents and reports at the disposal of the Consultant, and also facilitate all contacts necessary for the proper implementation of the project and access to available information.

8.2 Obligations of the Consultant

26. The Consultant shall carry out the project implementation according to the terms of reference and in keeping with internationally accepted standards, using qualified and appropriate staff. They shall take all necessary steps to ensure that the assignment entrusted to them is executed properly and within the time agreed upon in the contract. In this regard, the consultant shall submit to the approval of the GRZ and WB, the list and curriculum vitae of the personnel who will participate in the project implementation, and maintain them for the time they have been contracted. The consultant and his staff shall be ready and willing to work with local staff and provide wherever possible on-the-job training.

27. The Consultant shall replace any team member who is unable to carry out his tasks, or is reasonably considered by the Executing Agency to be unsuitable, with another person of equal or superior qualifications, but also at the same cost, subject to the approval of the profile by the GRZ.

28. At the end of the contract all the equipment and supplies procured for the project, or for whom reimbursement was claimed and received by the Consultant, shall be handed over to the GRZ. The consultant shall also hand over all original documents, working files and computer data that have been produced during the studies. All data shall be properly organized and filed. All programs/software/photographs/images should be delivered to the GRZ.

ANNEX II: CHECKLIST FOR ENVIRONMENTAL AND SOCIAL SCREENING OF LDAHP SUBPROJECTS

Name of the Project:

Sub-projects Name:

Sub-projects Location:

Community Representative and Address:

District Team Representative and Address:

Site Selection:

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

Issues	Site Sensitivity			Rating
	Low	Medium	High	
Natural habitats	No natural habitats present of any kind	No critical natural habitats; other natural habitats occur	Critical natural habitats present	
Water quality and water resource availability and use	Water flows exceed any existing demand; low intensity of water use; potential water use conflicts	Medium intensity of water use; multiple water users; water quality issues are important	Intensive water use; multiple water users; potential for conflicts is high; water quality issues are important	

Issues	Site Sensitivity			Rating
	Low	Medium	High	
	expected to be low; no potential water quality issues			
Natural hazards vulnerability, floods, soil stability/erosion	Flat terrain; no potential stability/erosion problems; no known volcanic/seismic/flood risks	Medium slopes; some erosion potential; medium risks from volcanic/seismic/flood/ hurricanes	Mountainous terrain; steep slopes; unstable soils; high erosion potential; volcanic, seismic or flood risks	
Cultural property	No known or suspected cultural heritage sites	Suspected cultural heritage sites; known heritage sites in broader area of influence	Known heritage sites in project area	
Involuntary resettlement	Low population density; dispersed population; legal tenure is well-defined; well-defined water rights	Medium population density; mixed ownership and land tenure; well-defined water rights	High population density; major towns and villages; low-income families and/or illegal ownership of land; communal properties; unclear water rights	

Completeness of Sub-projects Application:

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

	Yes	No	N/A
Description of the proposed project and where it is located			
Reasons for proposing the project			
The estimated cost of construction and operation			
Information about how the site was chosen, and what alternatives were considered			
A map or drawing showing the location and boundary of the project including any land required temporarily during			

construction			
The plan for any physical works (e.g. layout, buildings, other structures, construction materials)			
Any new access arrangements or changes to existing road layouts			
Any land that needs to be acquired, as well as who owns it, lives on it or has rights to use it			
A work program for construction, operation and decommissioning the physical works, as well as any site restoration needed afterwards			
Construction methods			
Resources used in construction and operation (e.g. materials, water, energy)			
Information about measures included in the sub-projects plan to avoid or minimize adverse environmental and social impacts			
Details of any permits required for the project			

Environmental and Social Checklist

		Yes	No	ESMF Guidance
A Type of activity – Will the sub-projects :				
1	Involve food processing?			Section 2
2	Build or rehabilitate any structures or buildings?			Section 2
3	Support agricultural activities?			Section 2
4	Be located in or near an area where there is an important historical, archaeological or cultural heritage site?			RPF
5	Be located within or adjacent to any areas that are or may be protected by government (e.g. national park, forest reserve, world or national heritage site) or local tradition, or that might be a natural habitat?			Section 4
<i>If the answer to any of questions 1-5 is “Yes”, please use the indicated Resource Sheets or sections(s) of the ESMF for guidance on how to avoid or minimize typical impacts and risks</i>				
B Environment – Will the sub-projects :				
6	Risk causing the contamination of drinking water?			Section 7
7	Cause poor water drainage and increase the risk of water-related diseases such as malaria or bilharzia?			Section 7
8	Harvest or exploit a significant amount of natural resources such as trees, soil or water?			
9	Be located within or nearby environmentally sensitive areas (e.g. intact natural forests, mangroves, wetlands) or threatened species?			Section 4
10	Create a risk of increased soil degradation or erosion?			Section 7
11	Produce, or increase the production of, solid or liquid			Section 7

		Yes	No	ESMF Guidance
	wastes (e.g. water, medical, domestic or construction wastes)?			
12	Affect the quantity or quality of surface waters (e.g. rivers, streams, wetlands), or groundwater (e.g. wells)?			Section 7
13	Result in the production of solid or liquid waste, or result in an increase in waste production, during construction or operation?			Section 7
<i>If the answer to any of questions 6-13 is “Yes”, please include an Environmental and Social Management Plan (ESMP) with the sub-projects application.</i>				Indicate Annex
C Land acquisition and access to resources – Will the sub-projects :				
14	Require that land (public or private) be acquired (temporarily or permanently) for its development?			RPF
15	Use land that is currently occupied or regularly used for productive purposes (e.g. gardening, farming, pasture, fishing locations, forests)			RPF
16	Displace individuals, families or businesses?			RPF
17	Result in the temporary or permanent loss of crops, fruit trees or household infrastructure such as granaries, outside toilets and kitchens?			RPF
18	Result in the involuntary restriction of access by people to legally designated parks and protected areas?			
<i>If the answer to any of the questions 14-18 is “Yes”, please consult the ESMF and, if needed, prepare an Resettlement Action Plan (RAP)</i>				RPF
D Pesticides and agricultural chemicals – Will the sub-projects :				
19	Involve the use of pesticides or other agricultural chemicals, or increase existing use?			Section 7 & PMP
<i>If the answer to question 19 is “Yes”, please consult the ESMF and PMP.</i>				PMP

CERTIFICATION

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

Community representative (signature):

Extension team representative (signature):

Date:

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Desk Appraisal by Review Authority:

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

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

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

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

.....

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

Name of desk appraisal officer (print):

.....

Signature:

Date:

ANNEX III: Environmental and Social Field Appraisal Template

Livestock Development and Animal Health Project (LDAHP) Subproject Application Number:.....

Part A: Identification

1. Name of District: Name of Owner/Operator:
2. Subproject Location (this may be more than one location for a sub project package):
3. Reason for Field Appraisal: *Summarize the issues from the ESIA or ESMP that determined the need for a Field Appraisal.*
4. Date(s) of Field Appraisal:
5. Field Appraisal Officer and Address:
6. Extension Agent/Service Provider/Owners/Operators ESIA Consultant’s Representative and Address:
7. Owners/Operators Representative and Address:

Part B: Description of the Owners/Operators Sub project Application

8. LDAHP Sub project application Details: *Provide details that are not adequately presented in the sub project application. If needed to clarify application details, attach sketches of the subproject component(s) in relation to the community and to existing facilities*

Part C: Environmental and Social Issues

9. Will the sub project:
- (i) Need to acquire land? Yes..... No.....
 - (ii) Affect an individual or the community’s access to land or available resources? Yes..... No.....
 - (iii) Displace or result in the involuntary resettlement of an individual or family? Yes..... No..... **If “Yes”, tick one of the following boxes:**
- The Resettlement Action Plan (RAP) included in the subproject application is adequate. No further action required.
- The RAP included in the subproject application must be improved before the application can be considered further.
- A RAP must be prepared and approved before the application can be considered further.
10. Will the sub project:
- (i) Encroach onto an important natural habitat? Yes..... No.....
 - (ii) Negatively affect ecologically sensitive ecosystems? Yes..... No.....
- If “Yes”, tick one of the following boxes:**
- The ESMP included in the operators’ application is adequate. No further action required.
- The ESMP included in the operators application must be improved before the application can be considered further.
- An EMP must be prepared and approved before the application can be considered further.
11. Are there any other environmental or social issues that have not been adequately addressed?
If “Yes”, summarize them:

and tick one of the following boxes:

- Before it is considered further, the application needs to be amended to include suitable measures for addressing these environmental or social issues.
- An Environmental Management Plan needs to be prepared and approved before the application is considered further.

Part D: Field Appraisal Decision

- The sub project application can be considered for approval.**

Based on a site visit and consultations with both interested and affected parties, the field appraisal determined that the community and the proposed operator adequately address environmental and/or social issues as required by the LDAHP's ESMF and meets the requirements of Environment Management Act in Zambia (EMA) and the World Bank OP4.01

- Further subproject preparation work is required before the application can be considered further.**

The field appraisal has identified environmental and/or social issues that have not been adequately addressed. The following work needs to be undertaken before further consideration of the application:

All required documentation such as an amended application, EMP, RAP and PMP. Screening Forms, draft civil works contracts, etc., will be added to the operators application package before it is considered further.

Name(s) of Authorized Officer(s):

Signature: Date: