

ZAMBIA - SUSTAINABLE LIVESTOCK INFRASTRUCTURE MANAGEMENT PROJECT'S (SLIMP)

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP) SUMMARY

Project Title: Sustainable Livestock Infrastructure Management Project's (SLIMP)

Project Number: P-ZM-AAE-003

Country: Zambia

Department: AHAI

Division: RDGS.2

Project Category: 2

1. Introduction

The Zambian Government's development agenda are articulated in the National Vision 2030 and the Seventh National Development Plan (7NDP: 2017-2021). The National Vision 2030 sets the long-term vision which reflects the understanding, aspirations and determination of the people to be a "*prosperous middle-income country by 2030*". The main goal of 7NDP (2017-2021) is to create a diversified and resilient economy for sustained growth and socio economic transformation driven among others, by agriculture. The 7NDP departs from sectoral-based planning to an integrated (multi-sectoral) development approach under the theme "*Accelerating development efforts towards the Vision 2030 without leaving anyone behind*". The integrated approach recognises the multi-faceted and interlinked nature of sustainable development which calls for interventions to be tackled simultaneously through a coordinated approach to implementing development programmes.

The Government has developed the Second National Agricultural Policy (SNAP, February 2016) which provides policy guidelines for the development of the agriculture sector in Zambia. The SNAP provides great scope for attaining sustainable food security and nutrition particularly at national level and contributing significantly to profitability of agricultural enterprises, job creation, increased income generation, poverty reduction, as well as increased contribution of the Agriculture Sector to Gross Domestic Product (GDP). The National Agricultural Extension and Advisory Services Strategy (NAESS: 2017-2020) covers activities in both the Ministry of Agriculture and MFL and provides various stakeholders, in extension services delivery, with a framework within which to deliver effective pluralistic extension services in order to accelerate agricultural transformation and contribute to poverty reduction. The objective of NAESS (2017-2020) is to transform small-scale farming into sustainable, commercialised and profitable agriculture that contributes to poverty reduction through improved household food security, nutrition, and incomes. The NAESS (2017-2020) ensures efficient utilization of scarce resources, eliminate dissemination of distorted and conflicting extension messages and improve on the adoption and adaptation of innovative technologies. The Government also prepared the National Agriculture Investment Plan (NAIP: 2014-2018) within the context of the Comprehensive Africa Agriculture Development Programme (CAADP), which considers gender as a cross-cutting issue. The investment programmes under

NAIP II (Rural infrastructure and markets), Pillar III (Food supply and hunger), and Pillar IV (Agriculture research and technology dissemination).

The proposed Sustainable Livestock Infrastructure Management Project (SLIMP) will focus on consolidating gains from the earlier Livestock Infrastructure Support Project (LISP) which made significant progress and scored tremendous successes in developing various livestock production, disease control and marketing infrastructure. SLIMP is in line with Zambia's 7NDP (2017-2021), SNAP (2016) and NAESS (2017-2020). The Zambian Government has been developing infrastructure in diverse developmental sectors and hence this project will serve to strengthen an aspect that is already in the nation's ambitions.

Despite the earlier work on the LISP, an Environmental and Social Management Plan (ESMP) was prepared in order to assess the current status of the areas covered after implementation and actualisation of LISP infrastructure development and activities. It was further prepared to fulfil the ADB environmental policy requirements, and the Zambia Environmental management legislative requirements.

Policy and legal review of Zambia legislation established that the agricultural system is supported by a host of laws and regulations for the protection of humans and the environment at large. Among them the Zambia Environment Management Act, (2011) establishes the Zambia Environmental Management Agency as the lead agency in environmental protection. The Agency in turn has established itself countrywide to further institutionalize its functions nationwide. On the other hand, the ADB Environmental Policies require appropriate measures to be taken to protect the physical environment from all forms of degradation and to prevent any potential social impacts.

The principal aim of this ESMP is to identify and evaluate potential environmental and social impacts associated with the Sustainable Livestock Infrastructure Management Development Project activities and to provide mitigation measures for such impacts. The ESMP also removes the burden of in-depth site-specific assessments for the sub-projects and provides a framework for screening the environmental issues and development of site specific impacts. It establishes a unified process for addressing all environmental and social policy issues in sub-projects from preparation, through review and approval, to implementation.

Zambia is endowed with diverse natural resources, which include some of the most fertile soils, forest and water resources which accommodate diverse species of flora, fauna and fish resources. However, these resources are currently challenged by complex interaction of several factors which include the rate of population growth of about 3.1% (2011) per annum. This imposes ever intensive pressure on the natural resources utilisation, leading to unsustainable land use, depletion of forest resources, and loss of biodiversity, heavy soil erosion and water pollution. Some of the proposed livestock infrastructure project activities will generate several environmental and social impacts from planning, implementation, as well as during operation. This is because the livestock infrastructure development activities may involve some amount of civil works, abstraction and use of natural resources such as water, depletion of forest resources and interaction of many people within the project location area. The activities will

also generate impacts that may result in incidences of water-borne and water related diseases, pollution by agro-chemicals/vaccines and degradation of wild lands. Consequently, several environmental components are affected in one way or the other by such activities.

The potential associated impacts were then analysed and mitigation measures /or environmental management plans for the potential identified impacts were proposed. The lead implementing Agent (MFL) with the help of relevant authorities must monitor the environmental effects and the success of mitigation measures. This monitoring is an important part of managing the impacts of the project. It is recommended that an independent team should monitor the implementation of the recommendations of this report. The said team must consist of experts from all spheres of the environment that may be affected.

Successful implementation of the project activities will require dynamic and multi-disciplinary professionals. Therefore, regular short and tailor made training courses and seminars will be required to reinforce the capacity and skills of the stakeholders and farmers during the entire project period. Training and seminars will also be required for building capacity and awareness in social and environmental issues including effects of deforestation and HIV/AIDS.

It is assumed that the farmers initially selected the most environmentally suitable sites for the activities. The selection of a site for an agro industrial facility is dependent on a number of economic, ecologic and socio-political concerns regardless of the livestock raised, livestock product manufactured or processed. The main areas where alternatives for decreasing the potential for negative environmental impacts are in the agricultural activity size, siting and operation. Each sub-project must consider all possible alternatives and must undergo the whole screening process to minimise any associated impacts.

In general the preparation of the ESMP consisted of the following aspects: (i) establishment of baseline socio-environmental conditions, (ii) review of policy, regulations, institutional framework, (iii) assessment of potential environmental impacts, (iv) assessment of potential social impacts (iv) analysis of alternatives, (v) assessment of capacity building requirements (vi) preparation of the environmental mitigation plan and a monitoring plan and (vii) providing guidelines for preparation, appraisal, approval and implementation of sub-projects. Thus the ESMP ensures that the substantive concerns of the relevant ADB Environmental policies and the Zambia legislation will be taken into account during the implementation of the selected agricultural activities.

2. Brief project description and key components

SLIMP objectives are to contribute to poverty reduction through enhanced sustainable use of livestock infrastructure for improved smallholder livestock production and productivity, commercialization and institutional capacity building. This will lead to improved household food and nutrition security. The Project outcomes include (i) increase in incomes of small-scale livestock farmers including entrepreneurs, and (ii) improved food security through empowerment of livestock-keeping farmer organizations with exposure to public and private sector services. The Project will also contribute to enhanced management of livestock

infrastructure, value addition, and improved integration of private sector. This will consolidate the gains from LISP, by implementation of improved institutional management and leveraging private sector investments in the livestock infrastructure developed.

The SLIMP consists of three (3) components, namely: (a) **Component 1 TAAT-based Climate Resilient Livestock Production and Productivity**, with 3 sub-components (1.1 Range and Pasture Improvement, 1.2 Livestock Breed and Dairy Improvement/Development, and 1.3 Disease Management and Surveillance); (b) **Component 2 Infrastructure Development, Management and Commercialisation**, with 2 sub-components (2.1 Infrastructure Development, Commercialisation and Utilisation, 2.2 Livestock Market Development and 2.3 Promotion of PPP Investments/SAPZ); and (c) **Component 3 Institutional Support and Capacity Building**, with 3 sub-components (3.1 Project Coordination, 3.2 Women/Youth Empowerment and Nutrition Education, and 3.3 Knowledge Management, Monitoring and Evaluation). The Project will be implemented over a period of 3 years and the executing agency is the Ministry of Fisheries and Livestock (MFL). The Project activities will be coordinated by a Project Coordination Unit (PCU) using the existing Government decentralised structures.

The proposed SLIMP shall be implemented in the same provinces of Zambia as was LISP, namely Eastern, Muchinga and Northern Provinces. The Project will be implemented over a period of 3 years. The Executing Agency (EA) is the Ministry of Fisheries and Livestock (MFL).

The Project is expected to directly benefit 248 registered livestock-keeping groups with more than 100,000 households (HH) with fully-paid-membership status (33,600 female headed HH). In addition, 90,000 livestock keeping HH, within participating Districts, will indirectly benefit from improved livestock infrastructure and services. About 800,000 people, including 400,000 women and 70,000 youths, will indirectly benefit from increase in supply of quality livestock products. The Project will directly create 120 permanent jobs, 18,000 seasonal jobs, and 60,000 indirect seasonal jobs along the livestock value chain. About 20,000 women between 12-49 years, and 12,000 children under 2 years will be reached through nutrition interventions and outputs which will be targeted towards improving access by women of reproductive age (including adolescent girls) and children to nutritionally valuable milk and also meat products. In addition, the community based and mass media Social and Behaviour Change Communication (SBCC) activities will benefit many women, men, boys and girls in Zambia.

3. Major environmental and social impacts and climate change risk

The situation analysis comprises the environmental impact analysis, the social impact analysis and the analysis of alternative livestock development approaches. Since the actual Livestock infrastructure development sites are as yet unknown, potential impacts described below are general and serve as a guideline for a thorough assessment once the sites have been selected. The potential environmental and social impacts were identified through a comprehensive stakeholder consultation process (tabulated below).

Project Sub-Component	Impact	Cause	Duration Of Impact	Probability Of Occurrence
Livestock Service Centers Tier 1	Pollution of water courses and drains.	Contaminated runoff and waste water.	Ongoing: Impact expected to last during project implementation.	Moderate to high
	Human diseases transmission	Open defecation due to poor or non-existent sanitary facilities	Could be indefinite if not controlled	Moderate to high
	Localized land degradation	Overgrazing, soil compaction and soil erosion	Ongoing during project implementation	Moderate
	Pollution of surrounding area	Packaging or containers of veterinary medicine	Ongoing as project is implemented	Moderate
	Localized deforestation	Cutting down trees for firewood /charcoal	Ongoing as project is implemented	Moderate
Other Livestock Activities	Localized land degradation and disappearance of palatable species	Increased numbers of animals per household	Periodic	Moderate to low

Environmental Impact Analysis: The following is a detailed outline of the potential environmental impacts that the rehabilitation/construction of livestock infrastructure in Northern, Muchinga and Eastern Provinces will exhibit. The potential environmental impacts were identified through a comprehensive stakeholder consultation process and field investigations of the potential sites. Identified Environmental Impacts include:

- i. Clearing of Vegetation:* The rehabilitation/construction of Livestock infrastructure will involve clearing and depletion of vegetation that will result in the loss of plant cover, compaction of soil, exposure of topsoil and possibility for erosion, disturbance and loss of fauna habitats, weakening and degradation of soils, disturbance of the natural landscape and disfiguring of the natural morphology.
- ii. Soil and Land Degradation:* Although construction work will be limited to local areas, some projects may involve works that will expose the soils to erosion and also compact it and break down the soil structure which will potentially decrease the drainage of the areas. This will generally result in soil erosion, defacing of the countryside and generation of dust. Furthermore, the risk of accidental discharge of hazardous products, leakage of hydrocarbons, oils or grease from construction machinery also constitute potential sources of soils and water pollution.
- iii. Wildlife disturbances:* Noise and vibrations from the development activities may disturb the normal roaming patterns of wild animals and cause them to migrate away from the area. Any contamination of the rivers may cause fish kills and destruction of other aquatic life.
- iv. Disturbance of marginal areas:* Because of the general terrain of the country, some marginal lands exist and these tend to be chosen sites for some livestock infrastructure. Establishing the projects in such areas can pose serious threats to further degradation of the marginal lands.
- v. Exposure to Agro-chemicals:* Rehabilitation/construction of Livestock infrastructure may have the ripple effect of increased use of chemicals, pesticides, vaccines, to realise better heads and control pests and diseases. However the farmers have limited knowledge of the poisonous nature of the chemicals, may employ poor disposal methods, wash empty containers and equipment in rivers and apply the vaccines wrongly. This poor handling of the chemicals, exacerbated by potential accidental

spillages, can then expose the farmers to these toxic chemicals resulting in the poisoning of farmers, aquatic animals and soils.

- vi. Loss of fragile ecosystems: Establishment of Livestock infrastructure in some areas may impact on fragile ecosystems like wetlands and mountain tops. The farmers may drain the wetlands to create usable land, unsustainably graze in these wetlands, and also on steep slopes and mountain tops without adequate conservation measures. This will result in the fast degradation of the wetlands, erosion of the mountain tops and sides and subsequent loss of the natural purpose of these systems (systems failure).
- vii. Effluent and Solid Waste: Most agricultural, livestock, agro-industries, packaging and marketing operations produce solid waste. Waste is generated in settling ponds and dust filtration systems: steam and hot water boilers produce ash, milk processing produces various waste streams, fresh food and processed food markets, e.g. slaughter facilities and livestock production units produce manure. The Effluent pollutes soil and water resources. Littering and indiscriminate dumping of solid waste pollutes the land and ultimately the water resources.
- viii. Ambient air quality: Air Quality will be impacted by emissions from processing plants. Some agricultural processing operations using steam boilers, heating systems or food processors, will produce smoke. All drying processes of agricultural products produce dust. All these require smoke and dust control and air filtration to bring air quality both inside and outside the plant within the WHO recommended guideline levels. These include animal feed mills, drying towers for milk powder, egg York, meat smoking sheds, abattoirs and slaughter slabs and slaughter houses. These operations result in the pollution of air, increases in bronchial disorders, impaired visibility on the roads, disturbs normal developments of vegetation and can cause acid rain.

Water Quality: Wet processes livestock products processing require liquid waste water

- i. treatment to meet national standards. These include: slaughter houses meat and meat products, leather industries; skin, leather and leather goods processing, milk and milk products factories, cheese and ice cream production. All agro-industries involving wet processing or chemical cleaning of the process. These operations result in the pollution of water resources, death of aquatic animals and general Loss of the ordinary use of water. The polluted water affects plant growth and treatment cost of that water becomes very high.
- ii. Temporary Visual Intrusion: Rehabilitation/construction of Livestock infrastructure will change the aesthetics of the project areas and leave marred landscapes. In addition, the clearing of vegetation required for the refurbishment of existing buildings will impact the visual amenity of nearby houses and surrounding communities.

The summary of the environmental impacts is tabulated below:

No.	ENVIRONMENTAL IMPACTS FROM LIVESTOCK INFRASTRUCTURE DEVELOPMENT AND MANAGEMENT	Affected environmental components																					
		Air		Water			Land			Flora & Fauna			Human use				Quality of life						
		Dust levels	Other Pollutant levels	Surface Water inflows	Surface water quality	Groundwater	Erosions/sediment deposition	Drainage Patterns	Slope stability	Sensitive habitats	Terrestrial Flora & fauna	Aquatic flora and fauna	Infrastructure / services	Public facilities	Housing	Agriculture	Forestry / plantations	Fisheries	Social structure / stability	Public health & safety	Family finances	Noise Level	Landscape quality
(i)	Clearing of Vegetation	X	X	X	X		X	X	X	X	X		X	X	X		X						X
(ii)	Soil and Land Degradation	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X			X	X		X
(iii)	Wildlife disturbances.									X	X	X					X	X					
(iv)	Disturbance of marginal areas		X	X	X	X			X	X	X		X	X			X	X			X	X	X
(v)	Exposure to Agro-Chemicals			X	X	X	X			X	X	X					X				X		
(vi)	Loss of fragile ecosystems		X	X	X	X	X	X	X	X	X		X	X	X	X	X	X			X	X	X
(vii)	Effluent and Solid Waste	X	X	X	X	X	X	X		X	X	X						X	X	X			X
(viii)	Ambient air quality	X	X	X	X					X				X							X		X
(ix)	Water Quality		X	X	X		X	X		X		X	X			X	X	X			X		
(x)	Temporary Visual Intrusion	X	X	X	X	X				X	X	X		X						X			X

Significance Rating of Livestock Infrastructure Development Impacts: The significance of the adverse environmental impacts from the rehabilitation/construction of livestock infrastructure is rated on the basis of the combination of the effect, magnitude and duration of the impact, as tabulated below. The scale of low, moderate and high was used to see the change from the baseline due to the impact.

No.	ENVIRONMENT IMPACTS FROM LIVESTOCK INFRASTRUCTURE DEVELOPMENT AND MANAGEMENT	Impact characterization											Baseline Change					
		Type		Effect		Duration			Change		Aerial extent			Low	Moderate	High		
		Beneficial	Adverse	Direct	Indirect	Short term	Medium Term	Long Term	Reversible	Permanent	Localised	Widespread	Extensive					
(i)	Clearing of Vegetation		X	X	X				X	X					X			X
(ii)	Soil and Land Degradation		X	X					X		X				X			X
(iii)	Wildlife disturbances.		X	X					X		X			X				X
(iv)	Disturbance of marginal lands.		X	X					X		X			X				X
(v)	Exposure to Agro-Chemicals		X	X					X		X			X				X
(vi)	Loss of fragile ecosystems.		X	X					X		X			X			X	
(vii)	Effluent and Solid Waste		X	X		X					X			X				X
(viii)	Ambient air quality		X		X			X			X			X				X
(ix)	Water Quality		X		X			X			X				X			X
(x)	Temporary Visual Intrusion		X	X		X					X			X				X

Social Economic Impact Analysis: By "social impacts" we mean the consequences to human populations of any public or private actions-that alter the ways in which people live, work, play, relate to one another, organize to meet their needs and generally cope as members of the society. The term also includes cultural impacts involving changes to the norms, values, and beliefs that guide and rationalize their cognition of themselves and their society. In this monograph, however, we define social impact assessment in terms assessments or estimates, in advance, of the social consequences that are likely to follow from specific policy actions and programs related to the proposed Livestock infrastructure rehabilitation/construction. Identified Social Impacts include:

- i. Anxiety and anticipation: The planning stage is bringing a lot of anxiety and anticipation as most stakeholders do not know exactly what will happen and when it will happen. They are holding the whole process with suspicion and do not want the planning phase to drag for too long. This is resulting in the locals not fully cooperating with the project preparation team and not disclosing all the relevant information during consultations.
- ii. Poor Stakeholder Participation: The level of participation of all relevant stakeholders during project planning and designing is of paramount importance as a buy in process. Communities are used to top down approaches were projects are just handed over to them without their initial consent. This poor stakeholder participation will result in the lack of ownership of the project by the locals, poor participation in project implementation and low chances of sustainability of the project.
- iii. Loss of assets or access to assets: Establishment of sub-projects in some areas will interfere with the normal access to assets like grazing, fields or hunting grounds. This will be caused by the demarcation of certain areas to cater for the Livestock infrastructure, e.g. the service centres, which can take up considerable amounts of land.
- iv. Loss of natural and cultural heritage: The Rehabilitation/construction of Livestock infrastructure may affect some natural features, antics and relics in the project area. The excavations for the works will cause destruction of the natural features, antics and relics.
- v. Loss of income sources, and or means of livelihood: If people were depending on exploiting resources from the communal lands and sub-projects are then established on these lands, their usual source of incomes or livelihoods may be removed causing people to be poorer and forcing them to migrate to other areas for alternative livelihoods. This may happen when extensive sub-projects like rangelands are established.
- vi. Disruption of footpaths: Establishment of sub-projects in some areas will have a disruptive effect on the day to day life of the locals, like cutting off their usual footpaths or routes and forcing them to use longer routes.
- vii. Occupational Safety and Health: The safety of the local population may be at risk during the rehabilitation/construction of Livestock infrastructure which may entail heavy construction work. The operation of various equipment and machinery and the actual construction activities will expose the workers to work-related accidents and injuries. Pollutants such as dust and noise could also have negative implications for the health of workers and near-by communities such as bronchial diseases from dust and hearing impairments due to prolonged working under noisy conditions.
- viii. Impacts of Construction Activities on farmers or other stakeholders: Various works on the sub-projects have potential to cause inconveniences or even injuries to the farmers as they continue with their day to day duties. At all sites, these works may have the following potential hazards to staff and farmers: (a) Falling from tripping on building materials; (b)

- Noise and vibrations during works; (c) Injury from falling or flying debris; (d) Cracking of existing structures from vibrations; and (e) Spillages and dust during transportation of materials.
- ix. Noise: All construction, processing and production equipment produce various levels of noise and vibration. These impacts can affect the quietness of the communities and provoke irritation and anger. Other negative health effects may include hearing impairments due to prolonged working under noisy conditions.
 - x. Social misdemeanour by construction workers: While most workers may originate from the local community where they have families, there might be others from distant places and working away from their families. Contractors might be lionized as being wealthy by local people especially for agricultural activities in rural settings or trading centres. With some disposable income to spend, this might induce illicit sexual relationships. This will have an impact of breaking the social fabric and spreading diseases such as STIs and HIV/AIDS.
 - xi. Income to material/equipment suppliers and contractors: The proposed rehabilitation/construction of Livestock infrastructure will necessitate the procurement of equipment, construction materials and services, providing income to suppliers and contractors. This is a positive but short-term and reversible impact where the income levels for the suppliers and contractors will be raised.
 - xii. Employment opportunities: Expanded Agricultural facilities and programmes will result in the creation of more long-term job opportunities.
 - xiii. Improvement in livelihoods and local economies. Improved agricultural outputs will enhance the livelihoods of the communities, raising their incomes and hence further improve productivity and lifestyles. However social conflicts may arise due to increased wealth differentials among the population.
 - xiv. Improved aesthetics and life of agricultural facilities: Rehabilitation/construction of Livestock infrastructure may improve their aesthetics and this should be maintained.
 - xv. Misuse or inability to use installed equipment: Use of the improved facilities will be impaired if the farmers are not fully trained. This may result in the under-utilisation and damage of equipment and may also result in the injury of the farmers.
 - xvi. Conflicts over natural resources (water and Grazing lands): Water resources and Grazing lands, though abundant in the study area, are not evenly distributed in the selected districts and establishing agricultural activities which may draw substantial amounts from the sources may trigger conflicts over resource allocation in the project areas.

Summary of social impacts are indicated below:

No.	SOCIAL IMPACTS FROM LIVESTOCK INFRASTRUCTURE DEVELOPMENT AND MANAGEMENT	Affected environmental components																					
		Air		Water			Land		Flora & Fauna			Human use				Quality of life							
		Dust levels	Other Pollutant levels	Surface Water inflows	Surface water quality	Groundwater	Erosions/sediment deposition	Drainage Patterns	Slope stability	Sensitive habitats	Terrestrial Flora & fauna	Aquatic flora and fauna	Infrastructure / services	Public facilities	Housing	Agriculture	Forestry / plantations	Fisheries	Social structure / stability	Public health & safety	Family finances	Noise Level	Landscape quality
(i)	Anxiety and anticipation																	X	X				
(ii)	Poor Stakeholder Participation													X				X	X				
(iii)	Loss of assets or access to assets												X	X	X	X	X	X	X	X			X
(iv)	Loss of natural and cultural heritage.							X	X	X	X	X	X					X		X			X
(v)	Loss of income sources, and or means of livelihood																	X	X	X			
(vi)	Disruption of footpaths						X					X	X	X	X	X	X	X	X	X			X
(vii)	Occupational Safety and Health	X						X				X							X		X		
(viii)	Impacts of Construction Activities on farmers or other stakeholders	X	X	X	X	X	X	X				X	X	X	X	X	X	X	X	X	X	X	X
(iv)	Noise								X			X	X	X				X	X			X	
(x)	Social misdemeanour by construction workers																	X	X	X	X		
(xi)	Income to material/ equipment suppliers and contractors													X				X		X			
(xii)	Employment opportunities												X					X		X			
(xiii)	Improvement in livelihoods and local economies											X	X	X	X	X	X	X	X	X	X	X	X
(xiv)	Improved aesthetics and life of agricultural facilities											X	X	X	X	X	X	X	X				X
(xv)	Misuse or inability to use installed equipment	X	X	X	X	X						X	X					X	X			X	
(xvi)	Conflicts over natural resources (water and Grazing lands)			X		X								X	X	X	X	X	X	X			

Significance of the adverse Social impacts from rehabilitation/construction of Livestock infrastructure is rated on the basis of the combination of the effect, magnitude and duration of the impact, as tabulated below. The scale of low, moderate and high was used to see the change from the baseline due to the impact.

No.	SOCIAL IMPACTS FROM LIVESTOCK INFRASTRUCTURE DEVELOPMENT AND MANAGEMENT	Impact characterization																				
		Type		Effect		Duration		Change		Aerial extent		Baseline Change										
		Beneficial	Adverse	Direct	Indirect	Short term	Medium Term	Long Term	Reversible	Permanent	Localised	Widespread	Extensive	Low	Moderate	High						
(i)	Anxiety and anticipation		X		X	X			X		X											X
(ii)	Poor Stakeholder Participation		X		X		X		X					X								X
(iii)	Loss of assets or access to assets		X		X			X			X			X								X
(iv)	Loss of natural and cultural heritage.		X		X		X				X	X										X
(v)	Loss of income sources, and or means of livelihood		X		X		X		X				X									X
(vi)	Disruption of footpaths		X		X		X		X		X		X									X
(vii)	Occupational Safety and Health		X	X					X		X			X				X				X
(viii)	Impacts of Construction Activities on farmers or other stakeholders		X	X					X		X		X		X			X				
(ix)	Noise		X	X		X			X		X		X									X
(x)	Social misdemeanour by construction workers		X		X		X		X		X			X								X
(xi)	Income to material/ equipment suppliers and contractors	X		X		X						X		X								X
(xii)	Employment opportunities	x		x		x			x				x									x
(xiii)	Improvement in livelihoods and local economies	X		X				x		x			X									X
(xiv)	Improved aesthetics and life of agricultural facilities	X		X					X		X		X		X							X
(xv)	Misuse or inability to use installed equipment		X	X					X		X		X									X
(xvi)	Conflicts over natural resources (water and Grazing lands)		x		x						x			x								x

The proposed environmental and social management plan (ESMP), indicated below, for SLIMP's rehabilitation/construction of livestock infrastructure, provides guidelines for the management of potential environmental and social aspects at all possible project sites. In each case, the ESMP identifies parties responsible for monitoring actions, and any training or capacity building needs. Mitigation measures have been identified that will reduce both existing and potential impacts associated with both the existing and new livestock activities on the proposed project. In addition, mitigation measures are identified as either social or physical measures. Social mitigation

includes the measures used to mitigate effects such as noise, land use, and other effects to the human environment. Physical mitigation includes measures that address impacts to the physical environment, such as biological communities, vegetation, air quality, and others. The Environmental Management Plan considers only the impacts that have been rated moderate and high significance, as these present impacts that need attention.

Climate Change Resilient Activities: The livestock sub-sector generates more greenhouse gas emissions as measured in CO₂ equivalent (18%) than transport. A dairy cow can produce up to 650 litres of methane per day and it is also a major source of land degradation. Livestock business is among the most damaging sectors to the earth's increasingly scarce water resources. Livestock's presence in vast tracts of land and its demand for feeds contribute to biodiversity loss since 15 out of 24 important ecosystem services which have been assessed as in decline, were being affected by livestock. Some ways of remedying the situation, will include Biogas technology. Installing these at livestock facilities will reduce the Green House Gases (GHGs) potential. Production of Biogas will not only reduce methane emissions but will help reduce dependence on charcoal and fuel wood, which is destroying forests. The biogas technology can produce gas for cooking and lighting in rural areas. As for adaptation to climate change, for climate proofing the SLIMP, and for rendering the vulnerable livestock-related populations more resilient to climate change (Climate Resilient Agriculture or Conservation Agriculture), SLIMP will set up Sustainable Rangeland and Pasture Management Demonstration Systems to demonstrate best adaptation practices.

Gender Mainstreaming: Gender and livestock in Northern, Muchinga and Eastern provinces: Zambia's National Development Plans and Bank's Gender Strategy set out ambitious goals including those on gender equality. Gender mainstreaming activities will be aligned to the 7NDP (2017-2021), which entrenches gender as one of the crosscutting issues and incorporation in the development. Women and youth will comprise at least 50% of beneficiaries in order to improve their economic status. A preliminary gender analysis indicates that women in the Project areas are already active in production and sale of goats for meat and milk, either as individuals or in associations/cooperatives. Small ruminants have the potential to provide decent employment for women and improve the nutrition status especially for pregnant and breastfeeding women, adolescent girls and young children. The Project will also focus on mother-to-mother support groups to promote adequate nutrition for women and girls, as well as adequate infant and young child feeding practices. In addition, the Project will support community based nutrition campaigns to promote consumption of small ruminants products and by products. The Project will also facilitate community based cheese processing from goat milk and support market linkages. Women in Northern, Muchinga and Eastern provinces are mainly responsible for small stock such as goats, sheep and poultry, as well as for young and sick animals kept at the homestead. Poultry are probably the most important livestock species for many poor women in Zambia. The majority of the tribes (e.g. the Bembas) in the study provinces, are matrimonial and common land is normally managed by the Chief, who allocates it to the members of the tribe per family. However the case, when common land is converted into state ownership and then to private land, women often lose their traditional rights and are often not considered when new laws are introduced. That doesn't affect livestock per say since livestock is left to graze around

and led by a herdsman in the common land. Although Northern and Muchinga provinces are matrilineal societies (with descent through the mother), official livestock services are often controlled by men and extension personnel are primarily men who are not accustomed or trained to teach technical subjects to women. In that case, extension programmes and educational materials are mainly designed by and oriented towards men. Generally all household members are involved in some way or another in livestock production, and the decision making processes within the family and the responsibility of labour for activities such as feeding, milking, health care, processing and marketing differs between men and women. At present, Zambian women's access to information and training in modern livestock management and dairying continues to be limited and even indirect. Successful training should be oriented towards those household members which execute these tasks. For example, in areas where sick animals are mainly treated by women, they should be afforded the knowledge of the symptoms and cures for animal diseases. But if they have no access to training, progress in best practices and appropriate herding to reduce diseases is difficult.

Gender mainstreaming in SLIMP: About 51% of Zambia's population are female while an estimated 33% of all rural households are female headed. The gender mainstreaming strategy in SLIMP will focus on increasing access to project activities for women and youth as well as increasing their participation in project implementation, community representation and decision-making. The project will support, at least 30%, involvement of women in management of livestock infrastructure, at least 80% in pilot milk processing units, pasture development and rangeland management. These will be monitoring indicators for both the quarterly and annual progress reporting. SLIMP will support also gender sensitisation and awareness raising for relevant MFL staff, Provincial and District staff, beneficiaries (farmers) and local (traditional and political) leaders. Such training will assist to (i) increase the gender awareness; (ii) strengthen the community leadership and participation skills with special emphasis on women and youth (iii) contribute to improved decision making and empowerment skills training for women beneficiaries. The MFL's Gender Desk Officers will be fully supported by the project so as to take a leading role in the proposed gender specific activities and to properly monitor and evaluate them. The main gender issues to be addressed are as follows: (i) When designing market centers, training facilities, infrastructure should be catered to both men and women's needs including lavatories for both genders for example (ii) Extension services should focus on training needs relevant to women's role in relation to livestock. This is since only through a carefully planned gender approach can livestock production goals and successful training of women and men be achieved. To increase productivity in livestock production, training should be oriented towards those persons directly involved in these activities. Special training material for women has to be elaborated. Training should be oriented towards the specific needs which in sometimes can only be reached through separate courses for men and women.

HIV and AIDS: Zambia is affected by the HIV and AIDS pandemic with a rate of about 16% amongst 15 to 49 years age groups. About 1 million Zambians are infected with HIV. The MFL's HIV/AIDS strategy focuses on modification of the extension and research priorities; incorporation of HIV/AIDS related information in extension messages; and introduction of

HIV/AIDS in the curricula of agricultural training institutions. SLIMP will use and disseminate the MFL's extension messages. HIV/AIDS continues to gradually spread, killing extension workers and livestock farmers. The risk posed by HIV/AIDS pandemic will be mitigated by awareness campaigns, incorporation of HIV/AIDS messages in training of community leaders and staff, and through improved behavioural patterns, nutrition and income.

4. Enhancement/mitigation measures and complementary initiatives

Enhancement/mitigation measures and complementary initiatives has been included in the ESMP in the table below.

Environmental and Social Management Plan

TEXT REF.	IMPACT	MITIGATION/ENHANCEMENT	RESPONSIBILITY	CAPACITY BUILDING
1.1	ENVIRONMENTAL IMPACTS			
(i)	Clearing of Vegetation			
	<ul style="list-style-type: none"> • Limited Vegetation clearing may occur during rehabilitation/construction of Livestock infrastructure. • Over abstraction of resources may occur for construction purposes. • Sensitive habitats may be affected as materials are sought,, e.g. Grass from wetlands. • Overgrazing from the increased stocks of animals 	<ul style="list-style-type: none"> • Sensitive habitats should be avoided. • Clearing should be limited to working areas only. • Revegetation and reforestation must be prioritized. • Over abstraction of construction materials should be avoided. • Habitat restoration must be done where effects have been caused. • Sustainable range management must be practiced 	MFL, PCU and Contractor	Environmental awareness training
(ii)	Soil and land degradation			
	<ul style="list-style-type: none"> • Point source contamination from diesel, lubricants etc, around working areas. • Increased soil erosion due to vegetation clearing, soil trampling and compaction. • Increased rapid runoff due to vegetation clearing and soil compaction diminishing infiltration capacity. • Deterioration of soil characteristics due to increased erosion. 	<ul style="list-style-type: none"> • Appropriate containment measures for all operational areas and proper disposal of used lubricants. • Soil erosion control measures (e.g. re-vegetation, reseeding of grasses, land preparation, terracing, use of gabions, etc.) • Restoration of borrow pits, sand and quarry stone abstraction sites and brick moulding sites. 	MFL, PCU and Contractor	Environmental awareness training
(III)	Wildlife Disturbances			
	<ul style="list-style-type: none"> • Noise and vibrations cause wild animals to migrate, • Contamination of the rivers may cause fish kills and destruction of other aquatic life, • Migration routes for wildlife may be affected by establishment of new sites. 	<ul style="list-style-type: none"> • Conduct feasibility studies, • Minimize vibrations and strong noise, • Enforcement of parks and wildlife law, • Avoid contamination of soil and water. 	PCU, District Livestock Officer NGOs	Requirement of the Parks and Wildlife Act.
(iv)	Disturbance of marginal areas			
	<ul style="list-style-type: none"> • Establishing the projects in such areas poses serious threats to their further degradation. 	<ul style="list-style-type: none"> • Avoid extraction of raw materials from marginal areas, • No construction of structures in marginal areas. 	PCU, NGOs and beneficiaries	
(v)	Exposure to Agro-chemicals			
	<ul style="list-style-type: none"> • Use of pesticides may increase yields and control pests and diseases. • But this can then expose the farmers to these toxic chemicals 	<ul style="list-style-type: none"> • Encourage limited and proper use and handling of chemicals. • Conduct awareness training & workshops on safe handling of chemicals. 	MFL, PCU, Scheme Management Committee	
(vii)	Effluent and Solid Waste			
	<ul style="list-style-type: none"> • Most agricultural, livestock, agro-industries, packaging and marketing operations produce solid waste. <ul style="list-style-type: none"> - Steam and hot water boilers produce ash - Fresh food and processed food markets, waste from canning - Livestock production units produce manure, dairy waste, waste from slaughter houses 	<ul style="list-style-type: none"> • Seek guidance of local environmental officers to identify acceptable disposal sites. • Waste from agricultural activities can be further processed into other uses, e.g. organic manure. • Reuse and recycling must be preferred over disposal of the waste. 	PCU; Local Environmental Officer.	Likely hazardous and non-hazardous construction waste
(viii)	Ambient air quality			
	<ul style="list-style-type: none"> • Air Quality will be impacted by emission waste from piggery, chicken manure, cattle manure, processing waste etc. • Air Quality will be impacted by emissions from vehicles, earthmoving equipment and released particulate matters. • Demolition to modify the built environment will lead to considerable levels of cement dust which can affect workers and the public 	<ul style="list-style-type: none"> • Animal waste must be handled properly to avoid smell. • Contractors should use dust screens or nets in windows, doorways and ventilators of rooms where demolition or other dusty construction activities are occurring. • Dust suppression measures must be instituted at all sites. 	PCU and Contractor	None

TEXT REF.	IMPACT	MITIGATION/ENHANCEMENT	RESPONSIBILITY	CAPACITY BUILDING
(ix)	Ambient Water Quality			
	<ul style="list-style-type: none"> Water quality will be impacted by waste water discharges from construction activities including onsite sewage and rainwater run-off. Soil and water pollution resulting from the accumulation of solid and liquid waste. Soil and water pollution from chemicals, pesticides & vaccines meant for production. Water quality may be impacted by waste streams from piggery or processing plants. 	<ul style="list-style-type: none"> Contractors to erect proper sanitary facilities. Pollution from lubricants and other wastes to be avoided. Controlled disposal of wastes and effluent by use of appropriate disposal facilities, use of appropriate drainage structures, use of cleaner technologies, proper storage of materials, awareness campaigns Waste must be recycled and reused to avoid dumping in waterways. 	PCU and Contractor, District Livestock Officer	None
(x)	Temporary Visual Intrusions			
	<ul style="list-style-type: none"> Rehabilitation/construction of Livestock infrastructure like dip tanks, crush pens, Farmer training centres, slaughter houses, milk processing plants and other possible facilities will change the characteristics of the area and leave a marred landscape. 	<ul style="list-style-type: none"> Contractor should ensure minimum footprint of construction activities and provide decent accommodation for workers. All altered landscapes (Sand pits, borrow pits, brick moulding sites etc) should be rehabilitated by the contractor. 	Contractor and DFLCO.	none
1.2	SOCIAL AND HEALTH IMPACTS			
(i)	Anxiety and Anticipation			
	<ul style="list-style-type: none"> Project planning lacks transparency and may take rather long. Stakeholders anxious as they do not know exactly what will happen and when it will happen 	<ul style="list-style-type: none"> The planning stage must be shortened and on commencement the implementation must be within schedule. 	MFL, PCU and Contractor	None
(ii)	Poor Stakeholder Participation			
	<ul style="list-style-type: none"> Poor participation of communities, staff members and other stakeholders in the planning and designing of the project. 	<ul style="list-style-type: none"> All relevant stakeholders should be continuously involved and attend meetings from planning to construction 	MFL, PCU	None
(iii)	Loss of assets or access to assets			
	<ul style="list-style-type: none"> Interference with the normal access to assets like grazing or hunting grounds especially in the creation of large rangelands. 	<ul style="list-style-type: none"> Where ever possible avoid impacting on people. Create alternative access routes. Preparation and implementation of a Resettlement Policy Framework which will include compensation plans. 	MFL, PCU, Min. of Local Govt.	
(iv)	Loss of natural and cultural heritage			
	<ul style="list-style-type: none"> Natural features, antics and relics destroyed in the project area e.g. during excavations. 	<ul style="list-style-type: none"> Conduct feasibility studies, fencing, introduce proper antiquity education programmes. Come up with a Physical cultural resources management plan Establish procedure for chance finds. 	MFL, PCU, District Agric. Officer, NGOs National Heritage Conservation Commission.	Requirement of the National Heritage and Conservation Act.
(vi)	Disruption of footpaths			
	<ul style="list-style-type: none"> Establishment of Livestock infrastructure cutting off usual footpaths or routes. 	<ul style="list-style-type: none"> Engage in good Livestock infrastructure designs Relocate the footpaths and construct foot bridges where possible. 	PCU, Association Management	
(vii)	Occupational Health Safety risks			
	<ul style="list-style-type: none"> The movement of trucks to and from the site, the operation of various equipment and machinery and the actual Livestock agricultural activities will expose the workers to work-related accidents and injuries. Pollutants such as dust and noise could also have negative implications for the health of workers. 	<ul style="list-style-type: none"> All safety precautions must be enforced. Provide PPE to all workers. Institute dust and noise suppression measures. 	MFL, PCU and Contractor	Application of various types of PPE and their proper use.
(ix)	Noise			

TEXT REF.	IMPACT	MITIGATION/ENHANCEMENT	RESPONSIBILITY	CAPACITY BUILDING
	<ul style="list-style-type: none"> Noise and vibration caused by machines, site vehicles, pneumatic drills etc Noise from the chicken, pigs or whatever animals which are being raised. Noise from the processing of agricultural produce. 	<ul style="list-style-type: none"> Contractor to avoid old equipment. Heavy duty equipment to be minimized. Noisy operations to be limited to certain times. Noise levels to be limited to within acceptable levels. Animal raising to be in designated areas to avoid being a nuisance to the general public. Processing plants should be sited away from residential areas. 	MFL, PCU and Contractor	None
(x)	Social misdemeanour by construction workers			
	Impacts associated with the contractor's camp include: <ul style="list-style-type: none"> Disposal of liquid and solid wastes. Theft, alcoholism and sexually transmitted diseases (especially HIV/AIDS). 	<ul style="list-style-type: none"> As a contractual obligation, contractors should be required to have an HIV/AIDS policy and a framework (responsible staff, action plan, etc) to implement it during project execution. Contractor to curb thefts and misbehaviour through a code of conduct. Contractor to manage any of its waste properly. 	MFL, PCU and Contractor	None
(xi)	Income to equipment and material suppliers			
	<ul style="list-style-type: none"> Project will promote local procurement where technically or commercially reasonable and feasible. 	<ul style="list-style-type: none"> For building materials, procure from legitimate sources to avoid encouraging environmental degradation. Environmentally friendly processes should be encouraged. 	MFL, PCU and Contractor	None
(xii)	Employment Opportunities			
	<ul style="list-style-type: none"> Expanded Agricultural facilities and programmes will result in the creation of more long-term job opportunities. 	<ul style="list-style-type: none"> Offer appropriate training for staff to manage the improved facilities. 	MFL, PCU and Association Managers	Staff training in operation
(xiii)	Improvement in livelihoods and local economies			
	<ul style="list-style-type: none"> Improved agricultural outputs will enhance the livelihoods of the communities, raising their incomes and hence further improve productivity and lifestyles. Social conflicts may arise due to increased wealth differentials among the population. 	<ul style="list-style-type: none"> Leadership should promote viable economic activities. Awareness on replication by others should be a continuous process 	MFL and local leadership	Stake holder training in entrepreneurship.
(xiv)	Improved aesthetics and life of agricultural facilities			
	rehabilitation/construction of Livestock infrastructure will improve their aesthetics and this should be maintained.	<ul style="list-style-type: none"> Maintenance teams to be stationed at readily accessible places for the agricultural facilities. Planned maintenance of machines and buildings to be instituted. 	MFL, PCU and Agricultural facility management	Staff training in the maintenance
(xvi)	Conflicts over natural resources. (water and grazing lands)			
	<ul style="list-style-type: none"> Over-abstraction of water may trigger conflicts in the project areas. Over grazing may trigger conflicts in the areas 	<ul style="list-style-type: none"> Provide water management training to farmers. Introduce alternative sources of water such as boreholes. Introduce good rangeland management programmes 	District Fisheries & Livestock Coordinating Officer	

Environmental and Social Monitoring Plan

ISSUE	METHOD OF MONITORING	AREAS OF CONCERN	POSITIVE INDICATOR	FREQUENCY	RESPONSIBLE AUTHORITIES
Soils	The Developer should make a daily inspection of earth works, and ensure that slopes are suitably graded. Once earthworks are complete the PCU should monitor the restoration measures implemented by the Contractor, such as re-vegetation	<ul style="list-style-type: none"> • Soil erosion • Conservation activities • Rangelands management 	an absence of rills, gullies or other erosion features occurs	Regularly and ongoing as project is implemented	Department of Forestry
Vegetation	The farmers must clear area to be used and site works only.	<ul style="list-style-type: none"> • Clearing of the project site and disturbance of animals. • flora and fauna 	No unnecessary vegetation cleared	Regularly and ongoing as project is implemented	<ul style="list-style-type: none"> • Department of Forestry • Zambia Environmental Management Agency (ZEMA).
Animals (Game corridors)	The farmers and the Environment Department staff should carry out regular inspections of the area and check that usual animal access routes are maintained.	<ul style="list-style-type: none"> • Game corridors 	Usual animal access routes are maintained /not disrupted. Reduced, human, animal conflict.	Regularly and ongoing as project is implemented	<ul style="list-style-type: none"> • Zambia Environmental Management Agency (ZEMA). • Zambia Wildlife Authority
Birds	Interference with nesting sites	<ul style="list-style-type: none"> • Nesting sites • Migratory routes 	Reproductive patterns of birds undisturbed	Regularly and ongoing as project is implemented	<ul style="list-style-type: none"> • Zambia Environmental Management Agency (ZEMA). • Zambia Wildlife Authority
Small mammals habitat loss	Ensure that no unnecessary habitat loss occurs.	<ul style="list-style-type: none"> • Animal habitats 	No Mammals are displaced from their habitats.	Regularly and ongoing as project is implemented	<ul style="list-style-type: none"> • Zambia Environmental Management Agency (ZEMA). • Zambia Wildlife Authority
Poaching	Monitoring is the responsibility of the Zambia Wildlife Authority and the Police Departments.	<ul style="list-style-type: none"> • Poaching 	Number of poaching incidences reduced or eliminated.	Regularly and ongoing as project is implemented	<ul style="list-style-type: none"> • Zambia Environmental Management Agency (ZEMA). • Zambia Wildlife Authority • Police department
Crime	The PCU should Liaise with police department if crime/theft becomes a problem.	<ul style="list-style-type: none"> • Criminal activities in the area 	Crime theft kept to a minimum. Incidences of stock theft and house breaking minimized.	Regularly and ongoing as project is implemented	<ul style="list-style-type: none"> • Zambia Wildlife Authority • Police department • District Administrator
Noise	Noise monitoring should be carried out on an ad-hoc basis by the Environmental Monitor or the PCU to establish noise levels in the work areas.	<ul style="list-style-type: none"> • Noise Levels 	Noise levels at the nearest sensitive receiver would be kept to a minimum.	Regularly and ongoing as project is implemented.	<ul style="list-style-type: none"> • Ministry Of Health • Zambia Environmental Management Agency (ZEMA).

ISSUE	METHOD OF MONITORING	AREAS OF CONCERN	POSITIVE INDICATOR	FREQUENCY	RESPONSIBLE AUTHORITIES
Health	The PCU must ensure that education and awareness campaigns are implemented. The Ministry of Health, local authority should carry out awareness campaigns on animal related diseases, water-borne diseases and carry out vector control methods such as regular spraying of potential breeding sites (ponds)	<ul style="list-style-type: none"> Public health Ensure that stagnant water is sprayed to destroy mosquito larvae. Waste management at Sub-project sites. Disease outbreak due to concentration of people at the Sub-project sites. Disease outbreak due to dust and water pollution. Control and management of various animal diseases 	Reduction in number of cases of such diseases as Avian flu, foot and mouth, AIDS/STD related diseases recorded at hospital and medical clinic Reduction in number of diseases such as malaria and cholera	Regularly and ongoing as project is implemented	<ul style="list-style-type: none"> Health ministry Project PCU MFL
Archaeology	Provision should be made to allow archaeologists to be present on site during the excavation periods if they so wish. The PCU should inspect all excavations, and where archaeological remains are found work must stop until the PCU has given the all clear to proceed. The PCU should contact the Museums Authorities in the event of a significant archaeological find.	Archaeological Findings	Archaeological remains not excavated, disturbed or destroyed.	<ul style="list-style-type: none"> Regularly and ongoing as project is implemented Room for chance finds 	National Heritage Conservation Commission
Energy	The Developer must inspect the provisions made by the Contractor to supply energy to the workforce, and ensure that fuel wood is not being collected. The Environmental Department should enforce legislation which prohibits cutting down of trees. The Environmental Department, PCU and local leadership (cultural and political) should sensitize the workers against cutting down of trees.	Types of energy sources used in the project	Energy supplied by electric generator or other suitable source. Deforestation and resultant erosion controlled and reduced	Regularly	<ul style="list-style-type: none"> Department of Forestry. Zambia Environmental Management Agency (ZEMA).
Air Pollution	Observations should be made on the level of dust generated during the Agricultural Activity implementation by the Environmental Monitor or PCU. Dampening should be carried out if levels are unacceptable.	Levels of dust emissions	Deposition of dust on surfaces should decrease with increased dampening	Regularly	<ul style="list-style-type: none"> Health ministry Project PCU MFL
Water resources	<ul style="list-style-type: none"> Water resources should be managed well The Ministry of Health should test borehole water quality in the area to ascertain the suitability for human consumption. 	<ul style="list-style-type: none"> Watercourses and impoundments. Surface water quality Ground Water Quality Recommended distances from watercourses. Possible dam construction 	<ul style="list-style-type: none"> Water made available for environmental concerns. Pollution of water resources monitored/detected early and remedial measures taken on time 	Tests for water pollution to be done regularly	<ul style="list-style-type: none"> Health ministry Project PCU MFL Department of Water Development, (DWD) Zambia Environmental Management Agency (ZEMA).

ISSUE	METHOD OF MONITORING	AREAS OF CONCERN	POSITIVE INDICATOR	FREQUENCY	RESPONSIBLE AUTHORITIES
		sites.			
Landscape	The PCU should make visual inspection of earth works to ensure that excessive excavation is not being carried out. Temporary screening may be appropriate in some cases.	<ul style="list-style-type: none"> Visual intrusions Aesthetics 	Landscape alteration reduced to a minimum	Monthly	<ul style="list-style-type: none"> National Heritage Conservation Commission Zambia Environmental Management Agency (ZEMA).
Complaints	The PCU should inspect the record of complaints made by local residents, to be kept by the farmers, and should check that action is taken quickly and that the number of complaints do not rise significantly.	<ul style="list-style-type: none"> Complaints 	Number of complaints decreases.	Regularly	<ul style="list-style-type: none"> Project PCU MFL Zambia Environmental Management Agency (ZEMA).
Local governance	MLGC to ensure the following <ul style="list-style-type: none"> compliance to designs Employment opportunities and recruitment are transparent. Allocation of land is overboard Cultural values are respected. 	<ul style="list-style-type: none"> Land management Land allocations Socio cultural issues Local governance Social Aspects, Land rights 	<ul style="list-style-type: none"> Disputes over land reduced Cooperation of local leadership is secured Locals employed in the projects 	Regularly	<ul style="list-style-type: none"> Ministry of Local Government District Councils Project PCU MFL
Agricultural Activities	<ul style="list-style-type: none"> Ensure that Agricultural Activities follow designs and recommendations given for proper agricultural practices. Ensure overall management of the Programme. Appropriate land use downstream is done and no pollution of crops from contaminated water from spillages occur. 	<ul style="list-style-type: none"> Siting of works, plan 	Land degradation curbed Program running smoothly	Regularly	<ul style="list-style-type: none"> PCU MFL

5. Environmental and social monitoring program

The lead implementing Agency (MFL) with the help of relevant authorities must monitor the environmental effects of project implementation and the success of mitigation measures. This monitoring is an important part of managing the impacts of the project. This should be done by an independent team of experts drawn from all spheres of the environment that may be affected. Areas to be monitored include: (i) **Soils** - Soil degradation occurs as the soils are exposed and or compacted during the Livestock sub-project implementation potentially decreasing the drainage of the areas. The farmers must ensure that no gullies or rills develop in the project area. This can be avoided by taking such soil erosion measures as construction of embankments and designing drainage along work areas. The absence of gullies and rills will be used as a measure of the success of the control measures. The soil can be scotched by chemical spillages. This will render the soil poisonous and it must be discouraged at all cost; (ii) **Vegetation**: Unnecessary vegetation clearing and grass fires must be prevented at all costs. The trees should not be gathered for firewood or cut for other purposes. The local residents must be monitored to ensure that firewood is not excessively collected; (iii) **Loss of natural and cultural heritage**: The rehabilitation/construction of Livestock infrastructure may affect some natural features, antics and relics in the project area. Measures must be put in place for chance finds and any such incidences must be treated as required by the relevant Act; (iv) **Wildlife** - Under such situations, farmers may want to snare small animals. All wildlife should be treated in accordance with the Wildlife Act; (v) **Marginal lands/fragile ecosystems** - Marginal lands and fragile ecosystems must be protected against abuse; (v) **Chemical pollution** - A great likelihood of chemical pollution of the water and the soil exists and in order to monitor the amount of pollutants in the soil or water, samples must be taken regularly from them for pollution testing; (vi) **Water resources** - Both quality and quantity of water resources in the rivers must be properly managed for sustainable livestock management to persist; (vii) **Ambient air quality** - All air polluting activities need to be checked regularly to minimise their effect on air quality; (viii) **Socio-Cultural Issues** - Regular health checks of the work force/farmers are a way to monitor disease patterns of the members of the community to ensure that no new strains of diseases are being introduced; (ix) **Noise and Vibrations** - It will be important to routinely monitor noise levels from the machinery to ensure that it conforms to the limits recommended for noise levels. It is recommended that all environmental parameters mentioned above be monitored during the implementation and operation stages and any impacts should be mitigated as soon as possible. The farmers and the PCU should monitor on a daily basis. In the course of monitoring, if and when any significant impacts are detected, the monitoring team should meet and address the issue. All team members should keep records of such meetings.

6. Public consultations and disclosure requirements

Public consultations are critical in preparing an effective proposal for the Livestock activities. The first step is to hold public consultations with the local communities and all other interested/affected parties during the screening process and in the course of any further environmental work. These consultations should identify key issues and determine how the concerns of all parties will be addressed. The public consultation methods include press conferences, information notices, brochures/fliers, interviews, questionnaires and polls, open houses, community meetings, advisory committees, and public hearings. The guidelines for public consultation include, among others, a requirement that major elements of the consultation

program should be timed to coincide with significant planning and decision-making activities in the project cycle. In terms of Zambia's EA process, public consultation should be undertaken during (i) the preparation of the EA terms of reference; (ii) the carrying out of an EA; (iii) government review of an EA report; and (iv) the preparation of environmental terms and conditions of approval. To meet the consultation and disclosure requirements of the Bank, the Zambia Government will issue a disclosure letter to inform the Bank of (i) the Government's approval of the ESIA; (ii) the actual disclosure of these documents to all relevant stakeholders and potentially affected persons in Zambia, and (iii) the Government's authorization to the Bank to disclose these documents. The steps towards disclosure of the Environmental documents have to be completed prior to appraisal of the Project.

The implementing agency, Ministry of Fisheries and Livestock has the responsibility to effectively engage stakeholders in achieving the project objectives for the benefit of all. This Public Consultation Plan (PCP) forms part of the ESMP and is the same for all categories of livestock projects. It is for use during public consultation in the screening processes for every Bank funded sub-project.

Objectives: This plan provides a framework for achieving effective stakeholder involvement and promoting greater awareness and understanding of issues so that the project is carried out effectively within budget and on-time to the satisfaction of all concerned. To ensure effective implementation of this plan, MFL shall be committed to the following principles: (i) promoting openness and communication; (ii) ensuring effective stakeholder involvement; and (iii) evaluating the effectiveness of the engagement plan in accordance with the expected outcomes.

Identifying Stakeholders: Stakeholders for the purpose of this project shall be defined as all those people and institutions that have an interest in the successful planning and execution of the project. This includes those likely to be positively and negatively affected by the project. The consultation process shall ensure that all those identified as stakeholders are conferred with. Subject to MFL coordinator's approval, the Environmental/Social consultant will share information about the project with the public to enable meaningful contributions and thus enhance the success of the project. Public consultation will take place through workshops, seminars, meetings, radio programs, request for written proposals/comments, questionnaire administration, public reading and explanation of project ideas and requirements

7. Institutional arrangements and capacity building requirements

The successful implementation and monitoring of the ESMP depends on collaboration of different stakeholders, at local level (area level), district level, Provincial level and National level. This is necessary because the implementation of the activities will require inputs, expertise and resources which will be adequately taken care of if the concerned parties liaise. The following sections outline some of the selected and recommended activities to be done by each stakeholder in the environmental activities.

Local, District and Provincial Level: The District Officers together with their Field Extension Officers, which include Livestock Assistants, will be responsible for completing the

environmental and social screening form to be able to identify and mitigate the potential environmental and social impacts of rehabilitation/construction of Livestock infrastructure. The screening process will be under the supervision of the District Environmental Officers (ZEMA) and as required, they will receive environmental training to be able to carry out this task. The District Officers (DFLCO) with the assistance of the Environmental Units, will be responsible for (i) determining the environmental category and the extent of environmental work required based on the screening results; determining the need for EIA and for RAP and proposing mitigation measures for identified impacts. The Provincial Livestock Officer (will review the recommendations in the screening form, review the proposed mitigation measures, conduct public consultations and make recommendations to the National Level for approval. Monitoring of the Livestock infrastructure activities, to ensure that environmental designs are taken into consideration will be done by the Provincial Livestock Officer.

National level: In the event that a project activity under the SLIMP falls under the listed projects in the Environmental Management Act, MFL will review the recommendations from the District and Province and undertake the process of seeking the approval of the EIA through ZEMA. ZEMA may also arrange for public consultations as part of the EIA process.

Training of Stakeholders in Environmental Management and Monitoring: The proposed SLIMP activities will be numerous and challenging. Successful implementation of the project activities will require dynamic and multi-disciplinary professionals. Therefore, regular short and tailor made training courses and seminars will be required to reinforce the capacity and skills of the stakeholders and farmers during the entire project period. Training and seminars will also be required for building capacity and awareness in social and environmental issues including effects of deforestation and soil erosion. The estimated costs include training costs/fees, hire of rooms, food for participants, per diems, and transport costs.

8. Estimated costs

The total Project cost, including physical and price contingencies, is UA 4.90 million which will be financed by (i) ADF Loan of UA 3.92 million (80.0%), (ii) Government of Zambia (GRZ) in-kind contribution of UA 0.52 million (10.7%), (ii) beneficiaries in-kind and matching fund contribution of UA 0.04 million (0.8%) and (iv) International Funds for Agricultural Development (IFAD) funded Enhanced Smallholder Livestock Investment Programme (IFAD E-SLIP) parallel financing of UA 0.42 million (8.5%).

Source of Funding for Environmental Management and Monitoring Activities: The resettlement and land acquisition programme (if applicable) will have to be funded by the Government through normal procedures for payment of compensation and through the Ministry of Local Government. The proposed environmental training activities for the project will be funded directly by the project resources and summary of the budgetary requirements is **USD 26,100** broken down as follows: (i) Training in Environmental and Social Impact Assessment (USD4,700); (ii) Training in Pest and disease Management (USD5,100); (iii) Training in Pesticide Management (USD10,300); (iv) Maintenance and Hygiene and Sanitation (USD6,000). Cost estimates for the rest of the activities in the environmental management plan cannot be given now since some of the project sites and activities are not known and will be demand driven. The Environment Consultant for the project will therefore, have to cost these

activities, together with the other main project activities, to ensure that the environmental recommendations made in the environmental management plan are implemented.

9. Implementation schedule and reporting

The ESMP includes an implementation schedule taking into account all activities related to the proposed measures (enhancement and mitigation), the monitoring program, consultations, complementary initiatives, institutional arrangements and reporting.

10. Conclusion

The proposed SLIMP project has potential to significantly improve smallholder production, productivity and income from livestock enterprises in the target provinces of Northern, Muchinga and Eastern. An improvement in the income of the smallholder livestock farmers will translate to improved food security as they now will have cash to secure other livelihood needs. Besides, project development and operation will provide considerable economic opportunity for material/equipment suppliers, construction contractors and agriculture professionals in the value chains. The environmental impacts that the developmental activities are likely to induce include disturbance of soil from digging of pits and foundations, and road construction activities, tree cutting and general vegetation clearing, emission of dust and generation of noise. These envisaged environmental impacts will be experienced during the construction phase and will be localized, minimal, short term and can be mitigated. The SLIMP has been categorise as 2.

During the operation phase of the expanded Livestock services, the potential environmental impacts will include solid and liquid waste, chemical and biological wastes, which will be generated from the normal operations of the facilities and can be managed by incorporating the requisite waste and effluent handling units to the facilities. This impact would be exacerbated by inadequately trained livestock staff, However the ESMP presented will be used to mitigate the impacts during and after the rehabilitation of the livestock infrastructure. The final benefits of this project to the nation will, by far outweigh potential negative effects. It is therefore recommended that:

- All livestock infrastructure must include the requisite waste disposal or handling systems.
- The choice and type of construction materials and finish should maximize the blending concept.
- It is important that stakeholder organisations such as Rural District Councils (RDCs), Department of Works, Zambia Environmental Management Agency (ZEMA), NGOs and other interested parties are consulted and kept informed of the implementation progress so that they can play their part.
- Reduction and control of noise levels to minimize any disruption to the living conditions of wildlife be strictly adhered to.
- The land around any sub-project works should be left intact and pollution be minimised.
- Bush clearance should be confined to the absolutely necessary part, buffer strips be maintained and huge indigenous trees in the area should be preserved as much as possible.
- Labour intensive methods should be encouraged as they benefit the local community in terms of job creation. For this the project should employ locals as much as possible to ensure that benefits remain in the area where development is taking place.

- The use of destructive machinery should be avoided as much as possible. Machinery will adversely affect soils and undergrowth.
- The recommended mitigation measures should be implemented to reduce significant environmental impacts.

Overall, SLIMP will not have any apparent significant environmental impacts if the recommended mitigations are carried out.

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