



REPUBLIC OF ZAMBIA

MINISTRY OF AGRICULTURE

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FINAL REPORT



FOR THE PROPOSED NANSANGA COMMODITY VALUE CHAIN TRANSFORMATION PROJECT

IN

NANSANGA FARM BLOCK, SERENJE DISTRICT, CENTRAL PROVINCE, ZAMBIA.

January, 2024

Executive Summary

Project Overview

Transformation of the agriculture sector remains one of the most strategic options towards the achievement of the country's medium to long-term objective of macro-economic stability, growth, poverty reduction and diversified economic development. The Government's development agenda is articulated in the National Vision 2030 and the Eighth National Development Plan (8NDP) sets out Zambia's strategic direction in terms of the development priorities and implementation strategies for the period 2022 to 2026. This Plan is a successor to the Seventh National Development Plan (7NDP) that was implemented over the period 2017 to 2021. This is the fourth in the series of National Development Plans (NDPs) towards the National Vision 2030 in which Zambians aspire to live in a prosperous middle-income country. 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 Government has developed the Second National Agriculture Policy (SNAP, February 2016) which provides policy guidelines for the development of the agriculture sector in Zambia. Government has completed the preparation of the Comprehensive Agriculture Transformation Support Programme (CATSP) and its Food and Agriculture Delivery Compact to set strategic goals and targets to enhance marketable surpluses for maize, wheat, soyabeans, poultry, beef and dairy and aquaculture. Project is aligned with National Gender Policy (2000), Food and Nutrition Policy (2006), National Food and Nutrition Strategic Plan, and the First 1,000 Most Critical Days. Zambia's Nationally Determined Contribution (NDC) to the Paris Agreement identifies the importance of agricultural sector in reducing vulnerability to climate change, including measures to increase yields and to strengthen research, knowledge, extension services and agricultural infrastructures to target climate actions.

Nansanga Commodity Value Chain Transformation Project will be financed by the African Development Bank and executed by the Ministry of Agriculture. The Project will provide improved infrastructure, agribusiness services and opening up of 3,500 hectares for the 350 beneficiaries in Nansanga Farm Block to scale up resilient farming systems to higher levels of productivity, applying transformative approaches to promote adoption of improved technology and efficient management systems to optimize efficiency, inclusiveness and resilience against climate change.

Project Objective

The overall objective of the project is to contribute to increased income and improved and resilient livelihoods of farmers and investors in the farm block by increasing sustainable crop production, productivity, and export-oriented market access.

The specific project objectives are as follows:

- i. To expand utilization of land, production and productivity in the farm block.
- ii. To improve market access and competitiveness of commodity value chains, and
- iii. To enhance institutional and technical capacity of value chain players for management, value addition, and integration of smallholder farmers and private sector. (Medium Scale Farmers)
- iv. To open up 10 hectares of idle land each, which will accumulate to 3,500 hectares of crop production and 400 small scale farmer beneficiaries located in open areas of the farm block
- v. To open up 0.25 hectares each of irrigated land, which will accumulate to 100 hectares under surface irrigation system for horticulture production system in Nansanga Farm Block

Project Justification and Rationale

Zambia is plagued with high levels of poverty, food insecurity and malnutrition caused by low farm productivity and weak market integration of smallholder and medium scale farmers. The situation is exacerbated by rising threats from climate change. Between 2006 and 2020, the GDP growth rate declined from 13.2% to - 4.8 % (IMF, 2020). The agricultural share of GDP shrunk from 13.2 % to 2.7% (GRZ, 2021). The allocated budget to the sector reduced to less than 6 % in 2020. Debt servicing obligations took up 38.5 % of national budget (IAPRI, 2020; World Bank, 2020; GRZ, 2021). Therefore, Nansanga Commodity Value Chain Transformation Project is a fundamental step towards accelerating farm productivity, production, scaling up through mechanization, value addition and marketing of agriculture products to enhance the sector contribution to Gross Domestic Product, poverty reduction and resilience building against the threats of climate change.

Project Location

The Nansanga Farm Block is located about 60 Kilometers North-west of Serenje District of Central Province of the Republic of Zambia. The farm block lies within Latitudes 12° 30' and 13° 15' South and Longitudes 29° 50' and 30° 15' east. Nansanga Farm Block covers an extent

of more than 150,000 hectares. It is the largest farm block in Zambia. The Farm Block is one of the ten (10) farm blocks, the Zambian Government has identified and earmarked for commercial agricultural development. Nansanga Farming Block has about 363 farms which comprises of one (10,000 hectares) Core Venture, large (1000 – 5000 hectares) commercial farms, medium (50 – 900 hectares) farms and small (20 – 40 hectares) farms. The farm block has an existing road network, schools, rural health post and two dams for irrigation. The Nansanga Farm Block has Zambia Correctional Service farm and Serenje Properties limited currently established and producing maize, soya beans, and macadamia nuts. Other crops are irrigated wheat. Smallholder farmers primarily grow maize, cassava, groundnuts and soya beans on a small scale.

Shareholders

There are no shareholders in this project. This is a government program to support crop production and productivity among the smallholder farmers in Nansanga Farm Block.

Investment Cost

The table below summarises the total project cost

Sources of financing	Costs (UA million)	Costs (ZMW million)	% of Total Project Cost
African Development Fund (ADF-16) Loan	10.00	238.87	68.2
Government Contribution	1.58	37.74	10.8
ZAMGRO-World Bank	3.03	72.38	20.7
Beneficiaries Contribution	0.05	1.19	0.3
Total Project Cost	14.66	350.18	100.0

The Korean Trust Fund (KOAFEC) has approved a USD870, 000 grant facility for promoting improved seed systems for farmers in the farm block and surrounding areas. Efforts are also underway to mobilize additional resources from the CIF Nature People and Climate (NPC) as well as from Transitional Support Facility (TSF). This is meant to meet as much of the infrastructure and development needs of the farm block as possible to transform it into a production and export hub for Zambia.

Project Description

The proposed project will support 350 smallholder farmers to clear vegetation and land preparation of 10 hectares each, which will accumulate to 3,500 hectares across the farm block for production of maize, soyabeans and cassava. The vegetation clearing and land preparation will be done in patches of 10 hectares per beneficiary selected. The following are some of the activities to be implemented.

- i. Commercial maize production (2,000 hectares, targeting 200 smallholder farmers)
- ii. Comercial soyabeans production (1,000 hectares, targeting 100 smallholder farmers)
- iii. Commercial cassava production (500 hectares, targeting 50 smallholder farmers)
- iv. Construction of 1(one) kilometre irrigation canal to support 400 horticultural farmers
- v. Rehabilitation of the existing 80 kilometres road
- vi. Rehabilitation of Musangashi dam
- vii. Drilling of 10 solar powered commercial boreholes for the local community
- viii. Construction of three low cost houses for Agricultural Extension Officers
- ix. Construction of two low cost houses management trust staffs
- x. Construction of project coordination unit and Management trust office blocks
- xi. Construction of 1 km Irrigation Canal
- xii. Construction of 1 x 3 classroom block at Mutale and Ntenge Primary School
- xiii. Rehabilitation of Kabundi and Kapumbu rural health post

Project Alternatives

Site Alternative: The alternative site considered the Nansanga Farm Block in Serenje district, and Manyonyo Sugarcane Plantation in Mazabuka district. Nansanga Farm Block was selected for assessment because of the locality, availability of land, accessibility, and good climate condition for Soyabeans, Maize and Cassava production, while Manyonyo Sugarcane Plantation was not assessed because of its sugarcane based mono-cropping production system, and therefore, the site was not selected.

Power Supply Alternative: The alternative power supply source will be hydro power source connected through the existing Zambia Electricity Supply system and Solar System. The solar system will power the commercial boreholes drilled by the project.

Agriculture Type Alternative: There are two alternatives considered for the project; namely, Rain-fed crop production and irrigated horticulture type. Tree plantations (pine, eucalyptus, macadamia and fruits) will also be promoted.

Farming method Alternative: Climate Smart Agriculture technologies alternative will be promoted in Nansanga Farm Block, such as tillage, mulching, crop rotation etc. The bank's Technologies for African Agriculture Transformation (TAAT) has a compendium of proven Good Agriculture Practices and commodity technologies that will be deployed.

Water Supply Alternative: Water will be sourced from the existing dam reservoirs and boreholes and rivers in the farm block.

Do- Nothing alternative: This option is important for project implementation as it assesses the capacity of the Republic of Zambia to undertake the development of the farm blocks in the country, without any loan and grant from the donors. The farm block will remain undeveloped, which will result into loss of benefits to the government, and the local people. This may also lead to encroachment by local people and uncoordinated investors who may undertake indiscriminate deforestation due to mining and slash and burn cultivation.

Sewage Management Alternative: There are no sanitation services in Nansanga Farm Block. Therefore, sewage management will be managed through small sewage treatment Plant.

Fuel Storage Alternative: The project will engage the Fuel service provider to set up underground double fuel tank layer at one of the service centres in the farm block, upon the approval of the project brief. Currently, Zambia Correction service and Serenje Properties Limited have fuel surface tank for their operations.

Irrigation Method Alternative: The project will support surface irrigation system through the irrigation canal to the proposed 100 hectares in Musangashi area. Other methods available in the farm block are centre Pivot (Sprinklers) and drip irrigation system.

Chemical Storage Alternative: The project will engage agro-dealers to set up agro-shops in the farm block. The agro-chemicals will be stored in a well-ventilated storerooms to be constructed by the agro-dealers.

Criterion of beneficiaries Alternative: This alternative caters for 350 medium scale farm beneficiaries (10-40ha), who have state leasehold land. Another 400 smallholder communal farmer under traditional/Customary consent to qualify for selection for rainfed and irrigated crop production of maize, soyabeans, and cassava. Other 400 beneficiaries with customary consent will be selected for horticulture production crops such as tomatoes, rape, onions, cabbages etc.

Project Life Span

The proposed project will be implemented by Ministry of Agriculture in Nansanga Farm Block in Serenje district over a period of 5 years, starting June 2024 to 31st June, 2029.

Brief description of the project site and the major environmental and social stakes/challenges

Climate:

Nansanga Farm Block, like the rest of Serenje District, falls under agro-ecological zone II, with average annual rainfall between 800mm and 1000m.. The climatic conditions are typical with three distinct seasons: the warm wet season (rainy season), stretching from November through to April; cool dry cold season from May to July with the mean temperatures varying between 13°C and 22°C. Minimum temperatures in the cold season at times drop below the 12°C, especially between June and July. The hot dry season is experienced during the months of August to October with temperatures ranging from 15°C to 35°C. Warm winter days are accompanied by cold nights.

Hydrology

The Nansanga Farming Block's drainage System is supported by the Central Watershed, which runs from the South to the North of the District. This watershed is the source of the main rivers namely the Luombwa, Munte and the Kasanka. There are also sub-catchment areas within and outside the farm block which are of significant importance to the farm block.

Topography

The topography of the project site contains only modest variations in elevation across the farm block with an average elevation above sea level of 1,120meters. The project area is composed of ridges, plains, pans and undulating surfaces.

Geology

The geology of Nansanga Farm Block is described as Kibaran and Karroo system. The Kibaran has a basement complex of the pre-Katanga formations that were affected by the Kibaran orogeny and includes Granites, Gneisses, Migmatites, Metasediments, Phylites, Cataclasites, Amphibolites and Metavolcanics. The basement complex consists of highly deformed gneiss, schists and migmatites caused by erosion and rifting systems. The basement complex is overlain by undeformed Precambrian to lower Paleozoic sediment known as the Plateau Series and Muva Group.

Soils

According to JAICAF (2008), the characteristics and distribution of the soils are largely influenced by climate particularly rainfall. The soils are highly weathered and strongly leached. Generally, the soils in the project area include Acrisols, Lithosols and Ferrasols. Ferrasols are less fertile than Acrisols. The CEC is less than 16meq and base saturation is low. Soil pH is strongly acidic with values less than 4.5. Phosphorous deficiency and Aluminium toxicity of crops are prominent. These soils are characterized by weakly structured, loamy topsoils, clayey sub soils. Ferrasols are easy to form stable structures due to the clay properties. The major difference between the two soils is that Ferrasols generally tend to have a uniform texture throughout the profile while Acrisols display a marked clay increase with depth. Topsoil textures of Acrisols show loamy sand or sandy loam while Ferrasols show clayey textures.

Noise level

Noise levels in Nansanga Farm Block are very low. The noise level range is between 40 to 110 Decibels across the farm block, though the land clearing and preparation of 3,500 hectares by the excavators and tractors will impact on the noise level. The impact will be minimal and manageable during the initial land clearing and preparation.

Air Quality

ESIA study team recorded that air quality is very good because Nansanga Farm Block is not yet developed, though the construction of access road network will impact on the air quality and may change the current status. The impact will be minimal and manageable mainly during construction phases.

Flora and Fauna Assessment

Tree cover was the largest land cover type in the Nansanga Farm Block covering about 76 percent of the land. Common cover tree were mature Miombo woodlands with average height of 26 metres and average diameter of 90 centimetres. There are generally 28 different tree species available in Nansanga Farm Block. The table below summaries tree species.

S/N	Botanical Nomenclature	Local Name	IUCN Red List Conservation Status
1.	<i>Azelia quenzensis</i>	Mupapa	Least Concern
2.	<i>Albizia antunesiana</i>	Musasa	Least Concern
3.	<i>Brachystegia boemii</i> (Miombo)	Ngansa	Least Concern
4.	<i>Brachystegia longifolia</i> (Miombo)	Musamba	Least Concern
5.	<i>Brachystegia spiciformis</i> (Miombo)	Muputu	Least Concern
6.	<i>Brachystegia floribunda</i> (Miombo)	Mubombo	Least Concern
7.	<i>Combretum molle</i>	Mulama	Least Concern
8.	<i>Diplorynchus condylocarpon</i>	Mwenge	Least Concern
9.	<i>Erythoeum africanum</i>	Kaimbi	Least Concern
10.	<i>Faurea saligna</i>	Saninga	Least Concern
11.	<i>Isobertina angolensis</i>	Mutobo	Least Concern
12.	<i>Julbernardia paniculata</i>	Mutondo	Least Concern
13.	<i>Monotesia africanus</i>	Chimpampa	Least Concern
14.	<i>Ochna pulchra</i>	Kabanga	Least Concern
15.	<i>Parinari curatefolia</i>	Mupundu	Least Concern
16.	<i>Pericopsis angolensis</i>	Mubanga	Least Concern
17.	<i>Pterocarpus angolensis</i>	Mukwa	Least Concern
18.	<i>Protea gauged</i>	Musoso	Least Concern
19.	<i>Syzigium guinense</i>	Mufinsa	Least Concern
20.	<i>Swartzia madagariensis</i>	Ndale	Least Concern
21.	<i>Piliostigma thonningi</i>	Musekese	Least Concern
22.	<i>Ficus species</i> (Fig Tree)	Mukunyu	Least Concern
23.	<i>Strychnos cocculoides</i>	Kasongole	Least Concern
24.	<i>Uapaka kirkiana</i>	Musuku	Least Concern
25.	<i>Anisophylea boemii</i>	Imfungo	Least Concern
26.	<i>Strychnos pungens</i>	Mutotelakubili	Least Concern

27.	<i>Azanza garckeana</i>	Mukole	Least Concern
28.	<i>Vangueriopsis lanciflora</i>	Mungolomya	Least Concern

Habitats for Fauna

Generally, Nansanga Farm Block has a variety of existing biological diversities and fauna which included: Algae, Aloe-vera, Bees, Beetles, Birds, Butterflies, Caterpillars, Chameleon, Frogs, Flies, Lichens, Lizards, Millipedes, Mantis, Molles, Scorpions, Spiders, Red ants (Impashi), Small ants, Snakes, Snails, Termites, Tortoise, Warsps, Wild-brooms, Wild-Mushroom, Wild-Mice, and many others. The Nansanga Commodity Value Chain Transformation Project threatens the fauna mentioned above. The major common habitats present include miombo woodlands and riparians. Although, the Nansanga Commodity Value Chain Transformation Project will offer a lot of opportunities for increased food production and employment creation, threats to biodiversity and conservation values of the site exists, but these will be restricted to permanent fields which will ensure farmers have permanent fields and thus reduce on chitemene system of production there by conserving the ecosystem in the long run. At any one time even in full production, more than 3,500 hectares of the 150,000 hectares of land will be cleared in patches, thus maintain nature reserves for fauna and flora. Forest breaks and patches will be maintained between cleared fields. Forest plantations of pines and macadamia and fruit trees will also be planted. Accordingly to the IUCN Red List Categories and Criteria, the biological diversity and fauna in the Nansanga Farm Block are categorized as Least Concern. A least-concern species is a species that has been categorized by the International Union for Conservation of Nature as evaluated as not being a focus of species conservation because the specific species is still plentiful in the wild. They do not qualify as threatened, near threatened, or conservation dependent.

Aquatic Biodiversity

The common aquatic biodiversity in Nansanga Farm Block are fish species (*Tilapia sparmanii*, *Tilapia rendalli*, *Oreochromis macrochir*, *Pseudocrenibrus*, *philander*, *Brycinus* species and *Serranochromis* species), Frog species (Puddle frog, Ridged Frog and Clawed frog). Others are worm's species (flatworms, roundworms, and rotifers) they dwell in the bed of material at the bottom of river and streams. Worms work as scavengers. During the implementation of Nansanga Commodity Value Chain Transformation project, no agriculture activities will be carried out along the riverine, no pesticides and herbicides to be allowed and 50 metres buffer

zone will be created to protect the aquatic fauna such as fish, frogs, bird, worms etc. Accordingly to the IUCN Red List Categories and Criteria, the Aquatic biodiversity in the Nansanga Farm Block are categorized as Least Concern. They do not qualify as threatened, near threatened, or conservation dependent. The table below summaries terrestrial and aquatic biodiversity in Nansanga Farm Block.

Mammals			IUCN Red List Conservation Status
	Scientific Name	Common Name	
1	<i>Cercopithecus pygerythrus</i>	Vervet monkeys	Least Concern
2	<i>Lepus victoriae</i>	Hare	Least Concern
3	<i>Paraxerus cepapi</i>	Bush squirrel	Least Concern
Reptiles			
	Scientific Name	Common Name	
1	<i>Bitis arietans</i>	Puff Adder	Least Concern
2	<i>Chamaeleo dilepis</i>	Common Flap-Necked Chameleon	Least Concern
3	<i>Gerrhosaurus nigrolineatus</i>	Black-Lined Plated Lizard	Least Concern
4	<i>Kinixys spekii</i>	Tortoise	Least Concern
5	<i>Python sebae natalensis</i>	African Python	Least Concern
Amphibians (Aquatic)			
	Scientific Name	Common Name	Least Concern
1	<i>Phrynobatrachus natalensis</i>	Puddle Frog	Least Concern
2	<i>Ptychadena oxyrhynchus</i>	Ridged Frog	Least Concern
3	<i>Xenopus laevis pertersii</i>	Clawed Frog	Least Concern
Fish (Aquatic)			
	Scientific Name	Local language	
1	<i>Tilapia sparmanii</i>	Katanga	Least Concern
2	<i>Tilapia rendalli</i>	Impende/ mpende	Least Concern
3	<i>Oreochromis macrochir</i>	Ikamba	Least Concern
4	<i>Pseudocrenibrus philander</i>	Infindu	Least Concern
5	<i>Clarias ngamensis</i>	Mulonge	Least Concern
6	<i>Brycinus species</i>	Imisenga	Least Concern
7	<i>Serranochromis species</i>	Imbilya	Least Concern
Birds			

	Scientific Name	Common Name	
1	Gallinula chloropus	Common Moorhen	Least Concern
2	Kaupifalco monogrammicus	Lizard Buzzard	Least Concern
3	Milvus migrans	Black (Yellow-billed) Kite	Least Concern
4	Oriolus larvatus	Eastern Black-headed Oriole	Least Concern
5	Parus griseiventris	Miombo Grey Tit	Least Concern
6	Pycnonotus barbatus	Common Bulbul	Least Concern
7	Streptopelia semitorquata	Red-eyed Dove	Least Concern

Administrative

Nansanga Farm Block administratively, like any other farm blocks is under the Ministry of Agriculture. For Nansanga Commodity Value Chain Transformation Project, it is proposed that an independent Farm Block Management Trust will be established to ensure sustainable management of nature and physical resources.

Resettlement Action Plan

No person(s) will be displaced during the implementation of the project. The project beneficiaries will be selected from the smallholder farmers with title deeds and traditional consent letters already settled in Nansanga Farm Block.

Land ownership and tenure

Nansanga Farm Block land allocation was carried out between 2009 and 2011 to the private developers, the commercial, medium and smallholder farmers, and land is held under the 99 year lease land tenure. Patches of indigenously settled communities were retained and are part of the target beneficiaries of the project.

Current Socio – Economic Activities

The livelihood of the people in the Nansanga Farming Block largely depend on agricultural activities and collection of non-wood forest products. Cassava and Maize are the main crops grown in the area. Other crops grown in medium to small quantities include, soya beans, groundnuts, beans, sorghum, finger millet and sweet potatoes.

Crop Production

The main crops grown in Nansanga Farm block are white maize, seed maize, wheat, soyabeans, mixed beans, cassava, groundnuts, tobacco, cow pea and macadenia nuts.

Pest and crop diseases

The common pest and crop diseases are alphids, termites in green maize, soybean rust, cassava mosaic virus and fall army worm affecting the major crops such as maize, soyabeans and cassava production in Nansanga Farm Block.

Mining activity

Mining of manganese ore is one of the major economic activity in the Nansanga Farm Block. Only 10% of agriculture arable land on title deeds are affected. Currently, the mining activities are reducing due to the depletion of the manganese ore. Land reclamation, re-vegetation and rehabilitation is in progress in the farm block. Therefore, implementation of Nansanga Commodity Value Chain Transformation project will not be affected by the mining activities as 90% of the farm block is free from mining of manganese.

HIV/AIDS Assessment

HIV/AIDS assessment indicates that the number of people living with HIV/AIDS, currently stands at 8,042, out of a population of 158,192 in Serenje District, with a positivity rate of 4.40%. As part of government intervention, people are receiving antiretroviral drugs from Serenje district hospital. Though, it is anticipated that the development of Nansanga Farm Block will increase the positivity rate due to the influx of people from different parts of the country looking for employment and other business opportunities in agro-marketing services. HIV/AIDS will be minimized through dissemination of HIV/AIDS information, awareness of the dangers of the disease to the people in the community and encouraging adherence to the ARV drug treatment. Local rural clinics will be rehabilitated to act as information centers, and for distribution of condoms for sex active age groups.

Environmental and Social Challenges

Farm blocks face environmental and social challenges such as soil degradation, water scarcity and biodiversity loss due to intensive farming practices. Social challenges may include skilled labor shortages, unfair wages and the impact of agricultural activities on local communities' especially in landuse and displacement. Balancing productivity with sustainable socially

responsible practices shall be crucial to addressing these challenges. It is the policy of the Zambian Government (as provided in Section 3(1) of the Environmental Protection and Pollution Control Act and the Environmental Impact Assessment Regulation (Statutory Instrument No. 28 of 1997) that before any major development project is undertaken, an ESIA study be conducted. Similarly, the AfDB environmental screening guidelines provides that projects involving commercial agriculture production are classified under “Category 1”, requiring detailed environmental and social impact assessment. Therefore, an ESIA was deemed a mandatory requirement before the Nansanga Commodity Value Chain Transformation Project could be approved to be implemented in Nansanga Farm Block.

ESIA Requirements:

The ESIA regulations provide schedules in which projects are classified in categories. All development projects listed under First and Second Schedules of the EIA regulations of 1997 are required to undertake an EIA. However, for projects not specified in these schedules, ZEMA determines whether an EIA should be carried out. Therefore, The Nansanga Commodity Value Chain Transformation Project falls under second schedules of the EIA regulations of 1997, which requires an EIA to be carried out. Similarly, AfDB Environmental and Social Assessment Procedures of 2015 and updated Integrated Safeguards System (ISS) for 2023 places projects that are financed by the Bank into four broad categories based on a combination of considerations. These projects categories are Category 1, 2, 3 and 4. The Nansanga Commodity Value Chain Transformation Project was classified under “Category 1, triggering a requirement for an EIA assessment.

Applicable AfDB Policies

The Bank Integrated Safeguards System (ISS) for 2013 which is designed to promote the sustainability of project outcomes by protecting the environment and people from the potentially adverse impacts of projects. The ISS embodies the Integrated Safeguards Policy Statement and the five operational safeguards that will be triggered by the project are (i) *Environmental and Social Assessment*, (ii) *Involuntary Resettlement, Land acquisition, Population Displacement and Compensation*, (iii) *Biodiversity and Ecosystem Services*, (iv) *Pollution Prevention and Control, Hazardous Materials and Resource Efficiency* and (v) *Labour Conditions, Health and Safety*. These bank policy instruments have informed the conduct and framing of the ESIA process for the Nansanga Commodity Value Chain Transformation Project to ensure the project is both environmentally and socially sound and

meeting not only national environmental requirements but also, international commitments. The ESIA is being submitted on behalf of the Ministry of Agriculture to Zambia Environmental and Management Agency (ZEMA) and African Development Bank (AfDB), in fulfilment of the bank's safeguard policies. The report covers environmental and social impact assessment for the Nansanga Commodity Value Chain Transformation Project, Environmental management plans, environmental and social management and monitoring systems.

Project Alignment with Government Policies and Strategies

Nansanga Commodity Value Chain Transformation Project is a key priority project listed under the Zambia Food and Agriculture Delivery Compact through the Comprehensive Agriculture Transformation Support Program (CATSP). It shall also be aligned to the National Vision 2030 that articulates the Government's medium to long-term development agenda with the desire to become a prosperous middle-income country by the year 2030. The Eighth National Development Plan (8NDP: 2022-2026) operationalizes the Vision 2030 and sets out Zambia's strategic direction, development priorities and implementation strategies for the period 2022 to 2026, under the theme of "Socio-Economic Transformation for Improved Livelihoods" as well as with the African Development Bank's Technologies for African Agriculture Transformation (TAAT). TAAT is a key flagship model under the Feed Africa pillar that has stimulated transformational change in many countries.

Institutional and legal framework for implementation of the project

The project will be implemented by Republic of Zambia with the Borrower being the Ministry of Finance and National Planning, and the Executing Agency being the Ministry of Agriculture. The primary project beneficiaries are the farmers and SME agrodealers domiciled in Nansanga Farm Block.

Nansanga Commodity Value Chain Transformation Project fall under the second Schedule of the Environmental Impact Assessment (EIA) Regulations of the Environmental Management Act No. 12 of 2011, and it is therefore a requirement that an Environmental Impact Assessment (EIA) study be carried out. The EIA study should also include Environmental policies and frameworks.

This study took into account the relevant legislations including the Environmental policies and frameworks. The following are the relevant legislations for the proposed project:

- i. Environmental Management Act No. 12 of 2011,
- ii. The Environmental Impact Assessment Regulations SI no. 28 of 1997

- iii. The National Heritage Conservation Commission Act 1989
- iv. The Forests Act No. 4 of 2015
- v. The Zambia Wildlife Act No. 14 of 2015
- vi. The Fisheries Act, No. 22 of 2011
- vii. Employment Act Code No. 3 of 2019
- viii. Workers Compensation Act No. 10 of 1999
- ix. The Water Resources Management Act of 2011
- x. The Water Supply and Sanitation Act No. 28 of 1997
- xi. Public Health Act Cap 295 of 1995
- xii. The Land Acquisition Act Cap 184 of 1995 read as one with the Lands Amendment Act no.20 of 2015
- xiii. Local Government Act No. 2 of 2019
- xiv. Energy Regulation Act No. 12 of 2019
- xv. The Noxious Weeds Act, Cap 231
- xvi. Bio-Safety Act No. 10 of 2007
- xvii. The Solid Waste Regulation and Management Act No. 20 of 2018
- xviii. The Investment Act no 11 of 2006
- xix. Plant Variety and Seeds Act (Amended by Act No. 21 of 1995)
- xx. Agriculture (Fertilizers and Feed) amendment Act No. 32 of 2010
- xxi. The Equity and Equality Act No. 22 of 2015
- xxii. The National Council for Construction Act no.10 of 2020
- xxiii. The Zambia Development Agency (Amendment) Act 2011 no.15 read as one with the Zambia Development Agency Act no. 11 of 2006
- xxiv. Roads and Road Traffic Act No. 2 of 2011
- xxv. Standard (Amendment) Act No. 4 of 2017
- xxvi. International conventions and agreements.

Some of the key institutions in the proposed Nansanga Commodity Value Chain Transformation Project include:

- i. **Zambia Environment Management Agency - ZEMA:** a statutory agency for the protection of the environment. The ZEMA has the overall responsibility of approving and monitoring the project's compliance in line with its other standards relating to environment. ZEMA is responsible for the review and approval of the ESIA, thereafter it issues Decision

Letters, with conditions. ZEMA will also play a key role in the supervision and compliance monitoring of the road project.

- ii. **Water Resources Management Authority-** WARMA is statutory body to regulate, manage, protect and conserve Zambia's water resources for sustainable development. WARMA is responsible for water abstraction permit for both underground and surface water.
- iii. **Ministry of Agriculture** - it is a government ministry which is responsible for the agriculture policy implementation, administrative control, planning, research development, and extension advisories. The Ministry will establish a Project Implementation Unit which will have the Environmental and Social Safeguard expert responsible for monitoring compliance both during the construction and operation stages of the project. The PIU Environmental and Social Safeguard Unit will assume the responsibility of ensuring that, the project implementation complies with the environmental and social requirements as will be detailed in the contract documents. It is important to note that, during implementation of the Nansanga Commodity Value Chain Transformation Project, the oversight compliance role will rest with PIU implying that the staff ought to be well placed both technically and logistically to accomplish this role. Though the project proposed to have one staff as a specialist, there is a need to be supported in terms of skills development and logistics. The Staff in the Unit will require some short-term specialized trainings in areas such as: mainstreaming climate change into the development process; gender, OHS and HIV/AIDS mainstreaming; Strategic Environment Assessment (SEA/SESA); project monitoring, evaluation and reporting.
- iv. **Ministry of Green Economy and Environment** - The ministry is responsible for formulating legislation/regulations on carbon and environmental pricing such as carbon tax, carbon price, carbon fee & dividend, carbon finance, emissions trading, climate finance, ecotax etc., and it further promote opportunities and choice among poor people by increasing their access to a clean and safe environment.
- v. **The Nansanga Farm Block Management Trust** - The objective of the NFBMT will be to mobilise and coordinate investments in the farm block, including agriculture production and other value chain processes, development and maintenance of public infrastructure and assets, mobilizing and facilitating access to finance and markets for value chain investors,

leading to increased production and productivity, improved livelihoods and income levels for the farmers in the Farm Block.

Other institutions are Serenje District Council, the Ministry of Infrastructure, Housing and Urban Development, the National HIV/AIDS Council of Zambia, lower administrative entities such as Provisional Administrative Structures (especially the Provisional Committees), the Chiefdoms, the NGOs and CBOs will play key roles in the Nansanga Commodity Value Chain Transformation project implementation process.

On matters of HIV/AIDS mainstreaming into the project, the Serenje District HIV/AIDS Task Force and the District AIDS Coordinating Advisor together with the National AIDS/TB/STI Council will advise on an appropriate HIV/AIDS Service Provider who will undertake HIV/AIDS awareness and sensitization, conduct Voluntary Counseling and Testing (VCT) and distribution of condoms to workers and members of the public in the vicinity of the project area. The Contractor on his part will be responsible for planning, implementing and reporting on mitigation measures during the execution of the project works.

Consultations and Public Disclosure

Public Disclosure

The ESIA will be disclosed on the Ministry of Agriculture website and at the Bank's Public Information Centre in compliance with ZEMA regulations and the Bank Operational Policies. Further, the Ministry of Agriculture will provide copies of the ESIA reports to Serenje district council offices public access. The ESIA summary will be disclosed in the Bank for 120 days before board date since it is a Category 1 project.

In order to enrich the ESIA study, extensive series of stakeholder engagement meetings were held in the first and second quarter of 2023 in Nansanga Farm Block in Serenje district, to receive input on the main impacts and mitigations assessed by the baseline studies from the local communities, government institutions and non-governmental and faith-based organizations.

Environmental and Social Management Plan (ESMP):

Positive Impact	Mitigation Measure
Employment	Local people will be given priority for unskilled labour force. The skilled and semi-skilled will be advertised for

	<p>transparence, quality control and getting the right qualification. Youth and women will be given preference.</p> <p>employment contributes to raising the socio-economic well-being of the people and thereby improving their livelihoods</p>
Local skills and Knowledge Capacity	The project will involve land clearing, construction of houses, road and building and other activities that will be required, while maintaining site, health and safety standards will involve considerable management and planning skills and will contribute to capacity building among workers, co-operation between skilled and unskilled labor force will result in the transfer of skills and will also build additional local capacity.
Contributions to national food security from crop production	The crop production of maize, soyabeans and cassava will contribute positively to national food security through sustainable crop production. The proposed development will ensure food security not only at national level, but at regional level as well.
Economic multiplier effects at the national level	The project will engage service providers for seed, chemicals, agricultural equipment and associated services. These will have to be out-sourced from other firms and consequently provide increased opportunities for job creation and business. This will have an economic multiplier effect once successful and result in more income for government through various taxes.
Creation of market linkages at district level	At district level, local people will benefit from improved opportunities at COMACO and Chitambo Cassava Milling Plant for market linkages in various agricultural-related jobs making them more employable. This will result in increased income and improved standards of living for local households
Negative Impacts	Mitigation Measure
<p>Air quality deterioration</p> <p>Air quality will be negatively impacted by dust mainly during the clearing and preparation of the land,</p>	<ol style="list-style-type: none"> i. Regular watering of active construction areas and roads to reduce dust emissions is recommended. ii. Protective facemasks should be required for heavy plant operators and those working in confined spaces.

<p>construction of access roads and offices.</p> <p>Particulates, as well as methane, carbon dioxide or other potentially lethal gases may create these conditions, but are unlikely to exist in a Greenfield construction site.</p>	<ul style="list-style-type: none"> iii. Other personal protective equipment (PPE) should be mandatory for the handling of toxic chemicals, welding, high voltage electricity areas, and building sites. iv. The amount of dust generated will be monitored to ensure that it conforms to the set standards and does not go above 50mg/Nm³.
<p>Noise pollution</p> <p>During the construction phase the noise level will be localized, short duration (hours or days) noise impacts from excavators, bulldozers, heavy earth moving, grading, or land levelling and other steel fabrication equipment will create localized, short duration impact noise nuisance around storage shed erection areas and other building sites. Noise impacts may affect construction labour and operators but is unlikely to extend to workers and populations outside a 100m to 200m radius around the immediate construction areas</p>	<ul style="list-style-type: none"> i. During construction, working hours will be limited to day time to avoid disturbance in the night; ii. Provision of ear protective equipment to employees operating mobile equipment generating significant noise with noise levels of 85dBA and above; iii. Regular maintenance of equipment to include the checking and replacement, if necessary, of intake and exhaust silencers. iv. Continuous monitoring of noise to detect any changes of noise levels in haul truck and equipment for easy detection of any abnormal noise levels so as to implement mitigation measures
<p>Loss of Vegetation and Biodiversity</p> <p>The project will cut and clear 3,500 hectares of land for agriculture activities for the 350 beneficiaries. Removal of vegetation implies some loss of biodiversity. However, only</p>	<ul style="list-style-type: none"> i. The developers will physically demarcate in the field the boundaries between areas to clear and areas to maintain in order to reduce the risk of accidental land clearing by the heavy machine operators; ii. The developers will only clear vegetation where agriculture activities will take place. No unnecessary land and biodiversity disturbance will be done;

<p>vegetation and biodiversity within the footprint of the proposed project will be affected.</p>	<p>iii. Trees waste (wood) from clearing will be given to nearby villages as this is the raw material for their various construction works</p>
<p>Solid and hazardous Waste During the construction stage, solid wood waste is expected resulting from land clearance, levelling and soil waste from excavation. Another type of waste will be generated from the human activity involving workers on site</p>	<p>All solid wood waste will be stored in appropriate area and domestic solid waste will be separated into Domestic Waste, Industrial Waste and Hazardous Waste. The waste will be managed in- accordance with EMA no. 12 of 2011 (Stored and once the quantities are sufficient, will be transported to the Licensed waste disposal site). Separation of the waste will be prioritized as well. Biodegradable materials will be recycled as manure</p>
<p>Soil Erosion Soil erosion will be caused by stripping of topsoil during preparation and development of the site. Soil contamination can arise during the construction phase through spillages of fuels and oils at the site, uncontrolled waste disposal of materials such as used oil filters, waste oil containers including packaging. Soil erosion and siltation during the rainy season is expected to increase, particularly after clearing the site. Furthermore, the use of heavy equipment such as front-end loaders, bulldozers, and other construction vehicles can compact and change the texture of the soil. This has the</p>	<p>i. Restricting the clearance of land to the footprints of the project site to avoid over clearing of vegetation and topsoil layer to avoid future soil erosion; ii. Stockpiling topsoil stripped from the cleared areas at designated places and can be then used to rehabilitate areas of bare soils that may be created after construction works have been completed; iii. Soil contamination from oils and hazardous chemicals will be mitigated by adopting an emergency response procedure consisting of cleaning up immediately where spills and leaks have been identified. All leaking vehicles, equipment and tanks are taken back to the workshop as soon as a leak has been found; Fuels and lubricants will be stored in double layer tanks and in appropriate spill containment to avoid soil contamination; Routine inspection of all the mobile tanks and pipes on vehicles and equipment to ensure all oil spillages are cleaned; Dispose of waste generated at the project site during construction at</p>

<p>potential to leave the soil prone to erosion</p>	<p>designated and ZEMA approved industrial and domestic waste dump sites.</p>
<p>Aquifers and groundwater water quality</p> <p>Immediate impacts on the underlying aquifer during the construction phase are expected to be negligible. Nevertheless, there may be significant, delayed consequences in the first rainy season due to the infiltration of spilled automotive fuels and oils, painting materials, herbicide residues and faecal material deposited during the construction phase. Principal potential impact areas of all these substances will be the construction sites, and storage and workshop areas</p>	<ul style="list-style-type: none"> iv. Borehole sites should be separated from sanitation and work areas by a minimum of 100m and preferably be upslope from developments and working areas to mitigate against contamination from poor sanitation practices and from spilled hydrocarbons and toxic chemicals. Boreholes will be fitted with water filtration systems. v. Fuels and lubricants will be stored in double layer tanks located in appropriate spill containment to avoid surface water and groundwater contamination; vi. Waste generated at the project site during operations will be disposed of at designated industrial and domestic waste dump sites to avoid surface water and groundwater contamination. vii. Routine inspection of all the mobile tanks and pipes on vehicles and equipment to ensure all oil spillages are cleaned and avoided so that surface water and groundwater is not contaminated.
<p>Water Quantity</p> <p>There is enough water from Musangashi and Saasa dam, Luombwa and Munte river for both construction and operational phases. Musangashi dam reservoir capacity is 0.576million m³, and Saasa dam, estimated</p>	<ul style="list-style-type: none"> i. Water for dust suppression will be drawn from the existing Musangashi and Saasa dam, Luombwa and Munte River within the farm block. ii. During operational phase, water for surface irrigation will be abstracted from Musangashi dam.

<p>reservoir capacity is 395, 515 m³.</p>	
<p>Mining Activity During construction phase, there will be disruption on the traffic on the mining vehicles. Different type of wastes such as logs, shrubs, access soils, and domestic wastes will be generated during the construction and operation phase</p>	<ol style="list-style-type: none"> i. Traffic detours and diversions will be provided with clear traffic signage during construction and operation phase ii. All types of wastes to be generated, will be disposed off at a designated dumping site to be approved by the Local authority. iii. Dust suppression will be done by watering of the road after works. iv. No activities will be implemented in mining areas
<p>Occupational Health and Safety of Workers. The potential causes of accidents/incidents in farming activities are largely vehicle-related accidents, injuries from small sharp tools, intoxication from agrochemicals and machinery related incidents. Other risks include insect and snake bites, fire hazards from machineries, infrastructures or wildfires, and health issues such as those related to malaria and dehydration.</p>	<p>First steps, including who to call, how to call, and when to call; Employing proper H&S Officer to identify and resolve any health & safety risks; Training of 1st AID, HIV/AIDS, STIs Prevention Defining all communication systems to be used (i.e. two-way radio, cell phone); Required notification (e.g. Health and Safety inspector, District Emergency Personnel); In all serious emergencies the following response Procedures must be implemented: In case of accidents</p> <ol style="list-style-type: none"> i. Call on a member of the team trained in First Aid; ii. Apply first-aid at the scene i.e. stop victim from bleeding, put victim in rest position; iii. After stabilizing patients; and iv. Evacuate victim to the nearest health centre.
<p>Deplete of aquifers and or surface water bodies due to abstraction for the irrigation.</p>	<ol style="list-style-type: none"> i. The total catchment area is approximately 332Km² for the hydrology system in Nansanga Farm Block with rich aquifers recharging the river systems in the farm block. Therefore, there is no potential to deplete the

<p>During construction phase, water for dust suppression will be abstracted from Luombwa river.</p> <p>During operation phase, water for irrigation will be abstracted from Musangashi dam.</p>	<p>aquifers or surface water bodies during construction and operation phase.</p> <p>ii. Musangashi dam reservoir capacity is 0.576million m³, The Water demand requirement for Irrigation and domestic use for Correctional services is 0.2053 million m³. The proposed irrigation canal will abstract 0.09 million m³ from Musangashi dam for surface irrigation for the proposed 100 hectares. There is surplus over 0.2807 million m³, water in the reservoir not allocated at Musangashi dam.</p>
<p>Increase of evaporation from the 1km irrigation canal</p> <p>During the operation phase, there is potential to increase evaporation from the irrigation canal during the conversion of water in the main and sub-canals. Apart from the evaporation, other potential water losses from a unit length of 1 km earthen irrigation canals are determined by soil permeability, canal water depth, length of wetted perimeter, channel geometry, location of the groundwater table and velocity of flowing water.</p>	<p>i. The canal will be designed in such that the water level will be close to the design level, which means less evaporation and spillage.</p> <p>ii. Site selected of a canal will have low evaporation potential, high groundwater table, and favorable soil conditions.</p> <p>iii. The proposed canal will be aligned straight without unnecessary bends, slopes, or intersections that can increase the hydraulic resistance, turbulence, or head loss.</p> <p>iv. The project will adopt water management strategy that optimizes the water delivery and distribution, such as on-demand, rotational, or proportional methods. This can improve the water use efficiency and reduce the water waste.</p>

<p>Pesticides/agro chemicals on human and environmental.</p> <p>During the sustainable crop production phase, agro chemicals such as pesticides, fertilizers and herbicides will be used for increased production.</p> <p>Pesticides can contaminate soil, water and other vegetation.</p> <p>Pesticides are toxic to a host of other organisms including birds, fish, beneficial insects and no-target plants.</p> <p>Pesticides emit pollutants such as hazardous air and volatile organic compounds, which contributes to health problems that many affect human and animals.</p>	<ol style="list-style-type: none"> i. All agro-chemicals will be installed in original containers ii. During spraying and application of agro-chemicals, all employees to wear personal protective equipment in order to minimize exposure to hazards. iii. Pest management plan will be implemented during the construction and operation phase of the project. iv. No spraying and application of agro-chemicals along the riverine. A 50 metres buffer zone will be created from all water bodies during the operation stage. v. Only locally common approved agro-chemicals by ZEMA, ZARI and ZBS will be used in the project area. vi. All contaminated soils to be cleared immediately
<p>Eutrophication due to nutrient loads arising from runoff from fertilized fields</p> <p>In order to increase crop production of maize and soya beans, more fertilizers will be applied to the soils in form of basal and top dressings.</p> <p>Therefore, the use of excess fertilizers, and runoff of these nutrients into water bodies will lead to eutrophication, which will results in the overgrowth of algae and depletion oxygen in water bodies, this will lead to killing of vital and beneficial organisms in the water bodies.</p>	<ol style="list-style-type: none"> i. Soil analysis will be critical as part of good agriculture practices. Only right quantity of fertilizers as per recommendation from the soil results will be applied. ii. No application of fertilizers along the riverine, and a 50 metres buffer zone will be created from the water bodies. iii. All cultivations will be designed and planned across the slopes in order to reduce runoff. iv. Mechanical control measures will be establish in the intra-fields to control the runoff v. Only local common approved basal and top dressing fertilizers by ZEMA, ZARI and ZBS will be used in the farm block

<p>Burning of fields as a contributor to greenhouse gas emissions</p> <p>During operation phase, burning of crop residue releases climate pollutants (Carbon Dioxide, Methane, and nitrate), ozone, and aerosols. All these gases contribute to the greenhouse gas emissions.</p>	<ul style="list-style-type: none"> i. Climate smart agriculture technologies such as mulching, crop rotation, minimum tillage, ripping, harrowing etc, will be promoted during the operation phase. ii. No burning of crop residue will be allowed in the farm block. Good agriculture practices will be adhered to. iii. Crop residue will be used as mulching during the preparation of the land
<p>Impact of mono-cropping on biodiversity</p> <p>Mono-cropping can lead to unsustainable environments such as building up diseases and reducing particular nutrients in the soil.</p>	<ul style="list-style-type: none"> i. During operation phase, crop production of maize, soya beans and cassava will be promoted in the farm block. The project will promote crop diversification in a sustainable good agriculture practice. ii. Climate smart agriculture technologies such as crop rotation, mulching, minimum tillage etc will be promoted during the operation phase.

Mitigation and Monitoring Programme

- i. **Institutional Arrangements** - The PIU Environmental and Safeguards Expert will Monitor the ESMP linking environmental and social activities with opening up of 3,500 hectares of arable land, in line with guidance issued by the Zambia Environmental Management Agency and Ministry of Agriculture and the Farm Block Management Trust. The primary oversight to ensure that mitigation actions are implemented will rest with the Project Implementation Unit and the Ministry of Agriculture, Directorate of Projects working with the Environmental and Social Unit (ESU) under Directorate of Planning, but the Zambia Environmental Management Agency (ZEMA) from Central Province has regulatory supervisory and monitoring roles. The Ministry of Agriculture shall require contractors to comply with this ESMP and assign a fulltime staff (Environmental Officer) to undertake environmental supervision during construction. The project environmental specialist should guide the contractor's fulltime Environmental Officer in undertaking their own responsibilities, including reporting.

- ii. **External monitoring shall be done by the ZEMA according to their regulatory mandate prescribed in the Environmental Management Act of 2011.**

The Occupational Health & Safety (OHS) Department in the Ministry of Labour and Social Security shall also undertake external monitoring of labour issues and occupational health and safety compliance. The OHS Department has the mandate to inspect any facility for compliance with national requirements on safety in workplaces. Monitoring will be done through site inspection, review of grievances logged by stakeholders and on-site discussions with project affected persons amongst others. Monitoring will be undertaken quarterly over the construction period. On the part of the Bank, there will be scheduled 6 monthly Supervision Missions whose composition will include an Environmental and Social Team, Agricultural experts from the Head office, Province and District who will be interested in compliance aspects and whether agreed mitigation and complementary initiatives are being implemented.

Some of the key indicators to be monitored in the project will include:

- i. Awareness and sensitization stakeholder's consultation meetings planned and held.
- ii. Number of cases recorded and resolved on the Grievance Redress Mechanism register
- iii. Number of water and Soil erosion Control measures established;
- iv. Gender mainstreaming activities planned and implemented.
- v. Number of HIV/AIDS awareness and sensitization activities planned and held
- vi. Number of PPEs distributed and usage by the project workers
- vii. Number of noise level planned and tested
- viii. Number of air quality planned and tested
- ix. Number of Water quality testing planned and tested
- x. Number of Climate smart agriculture practices planned and implemented

- **Grievance Redress Mechanism**

It is anticipated that people displacement from land acquisition would be avoided at all costs or at least minimized, thereby reducing complaints arising from loss of land or resources as a result of implementing any sub-project activities. In this regard, the grievance redress mechanisms shall make provisions for the following: -Sub-district (Ward/Village Council), District/Local Government structures including laid down Committees, Provincial and National levels.

- **Institutional Arrangements and Capacity Building Requirements**


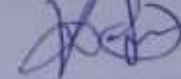


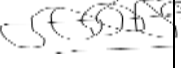

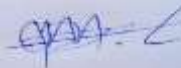
Under Policy Framework, the National Environmental policy (2009), emphasizes the need for Zambia to pursue development on a sustainable path implying the need for sound environmental and natural resources exploitation and management. Other policy instruments of relevance to Nansanga Commodity Value Chain Transformation Project include the Zambia Vision 2030, Agriculture policy and strategy paper, the National Gender policy 2015, the National HIV/AIDS/STI/TB policy 2007, Land Policy 2015 and the National Population Policy 2007. These amongst others, provide sectorial frameworks for the mainstreaming of their thematic areas into the planned Nansanga Commodity Value Chain Transformation Project.

Conclusion and Recommendation

The ESIA study team completed the identification, evaluation and mitigating measures of the concerns and impacts of the Nansanga Commodity Value Chain Transformation Project to be implemented in Nansanga Farm Block. From the ESIA consultations, studies and findings, it is evident that the Nansanga Commodity Value Chain Transformation Project to be executed by Ministry of Agriculture is environmentally, socially and economically viable and generally beneficial to the area. The project will result in overall economic growth and development as a result of the improvement in the availability of employment opportunities for the locals and improved food production from the soya beans, maize and cassava production.

The study shows that the project has some-negative impacts most of which will occur within the project area (Nansanga Farm Block). However, the positive impacts are many and they will be felt within the project area and beyond. The flora and fauna impacts are associated with the habitat loss and fragmentation as a result of vegetation clearing. Implementation of the mitigation measures proposed in the ESMP of this report will reduce the predicated impacts to minor in most cases. For the threatened species of conservation significance, impacts to aquatic macrophyte, freshwater fish and aquatic fauna species of conservation significance are highly unlikely to occur as a result of the Project and no detectable or measurable impacts to the aquatic ecology of Ramsar, as Nansanga Farm Block is not part of the listed Ramsar wetlands. In our opinion, it has been proven that the positive impacts of the project are more sustainable and outweigh those of the negative impacts. Based on the level of details and depth of the ESIA study, it is the view of ESIA study team that all foreseen environmental and Socio-economic impacts have been fully addressed within the limits of the current state of knowledge and reasonable practice. Hence, the Nansanga Commodity Value Chain Transformation Project will take into considerations commitment made in the ESMP.

Environmental and Social Impact Assessment Experts

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02	Patrick Munthali	Hydrologist (Watershed, land, river system)	Master in Climate Change and Sustainable Development Bsc in Land and Resource Management.	
03	Chibuye Paul Lee	Health Expert	BSc Sustainable Health and Environmental Studies	
04	Kachulu Msiska	Agronomist Expert (Maize, Soya beans Cassava, soils, climate assesment)	Master of Environment and Sustainable Development Master in Agronomy Bsc Agriculture Science (Crops)	
05	Claira Moonga	Gender/Sociologist Expert (Social issues, gender)	Bsc in Development studies	
06	Precious Mukamba	GIS Expert (Mapping of natural resources)	Masters in Spatial Planning BA with Education (Geography)	
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Signed.....Date:.....

ABBREVIATIONS AND ACRONYMS

AIA	Appropriation in aid
AIDS	Acquired Immune Deficiency Syndrome
CRB	Community Resource Board
DDCC	District Development Coordinating Committee
DENRC	District Environmental Natural Resource Committee
DEPT	Department
D-WASHE	District Water and Sanitation Health Education
EIA	Environmental Impact Assessment
EPPCA	Environmental Protection and Pollution Control Act
GMA	Game Management Area
GRZ	Government of the Republic of Zambia
HIV	Human-Immune Virus
IUCN	International Union for Conservation of Nature
NGOs	Non-governmental Organizations
MOA	Ministry of Agriculture
PH	Hydrogen Potential
PLGO	Provincial Local Government Officer
PRSP	Poverty Reduction Strategy Paper
P-WASHE	Provincial Water and Sanitation Health Education
STD	Sexually Transmitted Disease
TB	Tuberculosis
TORs	Terms of Reference
UK	United Kingdom
VCT	Voluntary Counseling and Testing
VNRMC	Village Natural Resource Management Committee
WARMA	Water Resources Management Authority
ZANA	Zambia News Agency
ZESCO	Zambia Electricity Supply Corporation
ZNFU	Zambia National Farmers Union
ZFBTP	Nansanga Commodity Value Chain Transformation Project

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1.0 Introduction

1.1 Background

Nansanga Farm Block, is one ten (10) farm blocks the Zambian Government has identified and earmarked for commercial agricultural development. It is over 150,000 hectares in size, and has been demarcated into one (10,000 hectares) Core Venture, (5) large (1000 – 5000 hectares) commercial farms, medium (50 – 900 hectares) farms (53) and small (20 – 40 hectares) (304) farms. The planning, demarcation and surveying of Nansanga Farm Block was completed in 2009. Farms were allocated between 2009 and 2011 by the Ministry of Lands and Natural Resources in collaboration with Serenje Town Council and Ministry of Agriculture.

In order to comply with Zambia Environmental and Management regulations, the Ministry of Agriculture commenced an ESIA study using a multi-disciplinary and multi-sectoral team of experts from Ministry of Green Economy and Environment, Ministry of Water Development and Sanitation, Ministry of Local Government and Rural Development, Ministry of Infrastructure and Housing, Ministry of Community Development and Road Development Agency. The study was focused within the activities of developing Nansanga Farm Block that includes crop production, construction of feeder roads and office shelters that may affect negatively the social and cultural systems, ecosystem and biodiversity, including rare and threatened species known to occur within the Nansanga Farm Block.

The environmental management Act No. 12 of 2011 applies on the protection of the environment and control of pollution in particular so as to provide for the health and welfare of people, animals, plants and the environment in general. It provides that an Environmental and Social Impact Assessment be carried out in order to assess the impact and decide the scope and nature of the environmental planning needed under statutory instrument no. 28 of 1997. It is under this instrument that the Ministry of Agriculture is required to produce and submit an ESIA and ESMP to ZEMA and the African Development Bank for mandatory disclosure before development of the Nansanga Commodity Value Chain Transformation Project can commence. The authority concerned with Environmental Assessments in Zambia is the Zambia Environmental Management Agency (ZEMA), the Co-coordinating and supervisory agency. The Environmental Impact Assessment was intended to ensure that environmental concerns are integrated into the proposed Nansanga Commodity Value Chain Transformation Project, and suggests ways of preventing, minimizing, mitigating and compensating for possible adverse environmental impacts which may arise due to the proposed project.

The ESIA study provided information about Nansanga Commodity Value Chain Transformation Project, the legal framework and a summary of the baseline information. It also provided an assessment of impacts on the natural and social environment, and presented recommendations to mitigate these effects as part of an environmental management plan. In order to enrich the ESIA study, extensive series of stakeholder engagement meetings were held in the first and second quarter of 2023 in Nansanga Farm Block in Serenje district, to receive input on the main impacts and mitigations assessed by the baseline studies from the local communities, government institutions and non-government based faith organizations. Annex 4 presents the lists of stakeholders consulted, the dates of the consultations and the key issues that were raised by stakeholders.

1.2 Current Situation

Zambia is facing various socio-economic and institutional challenges with regards to poverty, human development, environmental and climate change effects on livelihoods and the economy. The African Development Bank is supporting Zambia to development the Nansanga Farm Block, based on its comparative advantage in private sector-led agriculture development through its Ten-Year Strategy (TYS: 2013-2022), High 5's "Feed Africa", "Industrialize Africa", "Integrate Africa", and "Improve the quality of life for the people of Africa", including private sector participation, and enterprise development, Feed Africa Strategy for Agriculture Transformation in Africa (2016-2025), Gender Strategy (2021–2025), Jobs for Youth in Africa Strategy (2016–2025), Bank's Regional Integration Strategic Framework (RISF: 2018-2025), Climate Change and Green Growth Policy and Strategy (2021-2030). The proposed interventions would also reinforce the attainment of Sustainable Development Goals (SDGs), specifically SDG 2 (2.1 to 2.5), which recognizes interlinkages among supporting sustainable agriculture, empowering smallholder farmers, providing social services, promoting gender equality, improving private sector agri-business environment, ending rural poverty and tackling climate change.

The Bank's Zambia Country Strategy Paper (CSP- 2017-2021 extended to 2023) is aligned to Government's Eighth National Development Plan (8NDP – 2022-2026). Through its Feed Africa Pillar, the Bank has been supporting the agriculture sector under Pillar II of the CSP that focuses on Private Sector Development. The Bank has noted consistent government desire to develop farm blocks, resettlement schemes and processing hubs or zones as expressed in the 8NDP, the Comprehensive Agriculture Transformation Support Program (CATSP) and the Zambia Food and Agriculture Delivery Compact. Zambia presented its Compact during a high-

level Dakar II summit held in Dakar, Senegal in January 2023. It presented its priority areas of intervention to include agricultural Policy Reforms, Farm Block Development Programme, Extension Support Services, Post-production Management, Infrastructure and Irrigation Development. It also stated its priority value chains and raise production targets for Maize, Wheat, Soybeans, Ruminants, Broiler chicken and Aquaculture. The Compact provides great opportunities to unlock farm productivity and value addition and promote export-oriented agriculture by providing the critical public goods and an enabling environment for private sector investments in these strategic assets.

A lasting improvement in the resilience of people in the Nansanga Farm Block requires not only significant investment but also the widespread adoption of good agriculture practices (GAPs) and climate-smart agriculture (CSA) technologies, available through the Bank's flagship Transformation of African Agriculture Technologies (TAAT) available through partnerships with the Consultative Group (CG) institutions. The project would also build on enhanced partnerships with proven models of community empowerments such as Community Markets for Conservation (COMACO), and Star Agri Integrated Agri Market System (AMS) model for E-Extension, Financing and Post-Harvest Management Interventions that seeks to deliver technical support, maximize the effectiveness of the supply chain, and taps into digital platform marketplace ecosystem. The core of the agricultural supply network on Digital Platform Marketplace is a cutting-edge digital platform marketplace (AMS). Farmers, village entrepreneurs/youth, agro dealers, buyers, and processors are all seamlessly connected via this network. Additionally, it makes data-driven decisions easier to make, offers market insights, simplifies transactions, and promotes cooperation among value chain participants. The AMS shall play a critical role in implementing small holder aggregation systems, private sector led trust funds, agriculture marketing, innovative financial and risk sharing. A sustainable solution to food and nutrition insecurity in the region requires improved resilience to climate change, long-term financing of the agricultural sector, infrastructure, energy, and trade development and regional integration. By making sustained, longer-term investments in household resilience, the costs of emergency assistance will be significantly reduced, and the cycle of recurrent famines will be broken.

1.3 Project Justification

Zambia is plagued with high levels of poverty, food insecurity and malnutrition caused by low farm productivity and weak market integration of smallholder rural farmers. The situation is exacerbated by rising threats from climate change. Between 2006 and 2020, the GDP growth

rate declined from 13.2% to - 4.8 % (IMF, 2020). Agricultural share of GDP shrunk from 13.2 % to 2.7% (GRZ, 2021). Allocated budget to the sector reduced to less than 6 % in 2020. Debt servicing obligations took up 38.5 % of national budget (IAPRI, 2020; World Bank, 2020; GRZ, 2021). Support from Cooperating Partners has declined to less than 10% of National budget. Socio-economic indicators have been deteriorating and the proportion of people facing income poverty in rural areas stood at 77% in 2015. This is too high for a country ranked as middle-income country (MIC). People ranked very poor was higher among female headed households at 50.1% compared to male households at 37.9% (CSO, 2015). At least 50% of the districts suffered from food insecurity in 2019/2020. Under-5 stunting rate was more than 35% in 2018 (ZDHS 2018), below the average for lower MICs. The agricultural sector has been recording low productivity with the yield of staple maize below 2.0mt/ha compared to 10mt/ha potential with the use of hybrid seeds and external inputs. Zambia cultivates less than 14% of its 45 million hectares arable land and irrigates less than 155,912 hectares (5.7%) of its irrigable land. Zambia is spending valuable foreign exchange on importing foods that it can easily produce and export, with a huge potential in the farm blocks and settlement schemes. In developing agriculture under its 8NDP, the Government has formulated the Comprehensive Agriculture Transformation Support Program (CATSP) and the Zambia Food and Agriculture Delivery Compact (Post Dakar II), through which it targets priority value chains to raise production targets for Maize, Wheat, Soybeans, Ruminants, Broiler chicken and Aquaculture. The Nansanga Commodity Value Chain Transformation Project is a key flagship project under the CATSP and Compact.

1.4 Project objectives

The main objective of the project is to contribute to increased income, improved, equitable and resilient livelihoods of farmers and investors in the Nansanga Farm Block by increasing sustainable maize, soya beans and cassava production, productivity, and export-oriented market access. The main enterprise in Nansanga Farm Block is commercial and small scale crop and livestock production with an emphasis on maximizing yield per unit hectare of arable land without degrading the natural resources. The climate smart agriculture coupled with increased cropping of maize, soya beans and cassava will help to maintain natural health of the soils and the environment.

The specific objectives are:-

- i. To expand utilization of agriculture land with an extent of 3,500 hectares, crop production and productivity in the Nansanga Farm Block.

- ii. To improve market access and competitiveness of commodity value chains by establishment of bulking centers, storage facilities, agribusiness centres and market linkages within the Nansanga Farm Block.
- iii. To enhance institutional and technical capacity of value chain players for management, value addition, and integration of smallholder farmers, small and medium enterprises (SMEs), and private sector design.

Table 1: Contact Details of the Developer

S/N	Descriptions
Developer	Republic of Zambia, Ministry of Agriculture,
Project Name	Nansanga Commodity Value Chain Transformation Project (P-ZM-AA0-036)
Contact	Mr. Green Mbozi The Ministry of Agriculture Permanent Secretary, Technical Services Tel: +260 260 211 254645 Email: green.mbozi@agriculture.gov.zm
Postal Address	Mulungushi House, 15100 Ridgeway, P O Box 50197, LUSAKA, Zambia

1.5 Project Components

The project is designed with 3 components and sub-components that reflect the above four pillars, namely, (i) Component 1 - Crop Production and Productivity Support, (ii) Component 2 – Institutional Support and Business Development for Nansanga Farm Block, and (iii) Component 3 - Project Management. The summary of Project components, sub-components, major activities, and associated are discussed under section 3.2.

1.6 The Environmental and Social Impact Assessment

The ESIA objectives includes the following:-

- i. To review Nansanga Commodity Value Chain Transformation Project from an independent environmental and social-economic point in order to identify and assess its potential positive and negatives impacts and to recommend mechanisms to remove or mitigate negative impacts.
- ii. To incorporate environmental factors into the project from the onset in order to maximize the function of the project.
- iii. To provide management instruments for identified risks and hazards.

- iv. To minimize and avoid negative impacts, where possible.
- v. To prevent contamination of water, soil and air.
- vi. To establish monitoring tools to optimize project operation that also will minimize extreme environmental and social hazards.
- vii. To characterize social set up of communities within and surrounding the farm block.

1.6.1 Scope of Environmental and Social Impact Assessment

The ESIA study was carried out as per guidelines and requirement of the Zambia Environmental and Management Agency regulation and AfDB environmental screening guidelines, projects involving commercial agriculture production classified “Category 1” under the Bank’s environmental and social frameworks. This report consists of an Environmental and Social Impact Assessment and Environmental Management and Monitoring Plan.

The Term of Reference (ToRs) were prepared based on the vital information contained in the second Schedules of the Environmental Impact Assessment guidelines and the results from the expert ESIA team consultation, mission team from the Bank, Government agencies, non-government organization, local authority and local communities within Nansanga Farm Block.

1.6.2 Limitation

The ESIA study was successfully executed, and its objectives have been met. On contrary, the time frame to conduct the study was not sufficient. Therefore, some of the baseline information on surface water and ground water components could not be fully studied and analyzed. These studies will be extended during project life for a long period.

1.6.3 Methodology

A sevenstep process was adopted to undertake the ESIA, namely scoping meetings, consultation, impact assessment and mitigation, impact management, ESIA report and monitoring process. These are described below.

1.6.4 Scoping Meetings

Identification of parameters to be investigated and addressed were considered under scoping stage. Potentially significant parameters were determined during this stage, which formed a basis for development of TORs for the ESIA study. Other parameters unlikely to be any significance to the project were excluded during this stage.

Stakeholder consultative meetings were held in Serenje District, involving national, provincial and district stakeholders. Further, fourteen local community stakeholder consultative meetings in Nansanga Farm Block and surrounding areas were conducted.

The main purposes of the stakeholders meeting were:-

- i. Stakeholder identification.
- ii. Provide stakeholder with an opportunity to provide feedbacks on the proposed project.
- iii. Identify areas of likely environmental impacts that may require further investigation.
- iv. Determine the need for specialized studies.
- v. Determine need for multi-sectorial team formation for the study.
- vi. Provide a neutral platform for the stakeholders to speak out about the project.

1.6.5 Approach of the study

Taking into account the multi-sector project activities planned, and the vastness of the farming block, the assessment team was divided into three theme groups namely:

- i. **Socio-culture:** To assess the impacts of the various project activities on the socio-cultural norms of the local community.
- ii. **Ecological:** To assess the inputs of the various project activities on the ecological status of the area.
- iii. **Infrastructure:** To assess the impacts of infrastructure development on the ecological and social aspects of the area.

1.6.6 Team Composition

The team comprised professional experts from Ministry of Green Economy and Environmental Protection, Ministry of Local Government and Rural Development, Ministry of Community Development and Social Services and Ministry of Water Development and Sanitation. The team reviewed Terms of Reference in general. The Government opted to use internal staff to save cost, save time and build capacity for future studies and monitoring. Recruitment of a team would have taken too long, given the time constraint. The internal team had a mixture of relevant qualifications and experience to undertake the study.

1.6.7 Reconnaissance Survey

The team, which then included officers from Serenje district, undertook a two-day reconnaissance tour to obtain a general impression of the study area, and to note the significant environmental issues that would require further investigations.

1.6.8 Planning for Data Collection

Following a review of the reconnaissance survey, the significant environmental issues were presented and refined in plenary sessions.

1.6.8.1 Data Collection

Both primary and secondary data were collected.

1.6.8.2 Primary Data

- (i) **Direct Observation:** This process involved the noting of the ecological, social and economic factors as the groups walked, and drove through the area.
- (ii) **Transect Walks:** The groups walked through some parts of the study area in the company of community members who provided information on the prevailing social and economic lifestyles in relation to land use.
- (iii) **Focus Group Discussions:** The groups facilitated focus group discussions that included local councilors, traditional leaders (Indunas) and community members at Chief Muchinda's Palace at Mapepala and Kabundi
- (iv) **Consultations:** The groups made consultations with stakeholder agencies for expert advice.

1.6.8.3 Secondary Data

The team made reference to secondary sources that included topographic maps, project reports, administrative reports, as well as text materials.

1.6.8.4 Team Report and Feedback

Following data collection the team met in plenary session to review in details the data findings and discuss the possible environmental impacts and mitigation measures.

1.6.8.5 Final Report Compilation

A report-writing group comprising 4 officers from the main group was assembled to compile the draft Environmental and Social Impact Assessment Report. After this process, the draft report was subjected to Public Scrutiny.

2. Policy, Legal and Administrative Framework

2.1 Relevance and Compliance to Legislation and Regulations

Given the need to balance environmental requirements, economic activities and social needs, the Government of the Republic of Zambia (GRZ) adopted the National Conservation Strategy (NCS) in 1985, as a policy document which led to the establishment of environmental legislation and institutional reforms in the country. The Environmental Impact Assessment (EIA) process in Zambia is governed by the provisions of the Environmental Protection and Pollution Control Act (EPPCA) No. 12 of 1990, Statutory Instrument No. 28 of 1997– the Environmental Impact Assessment Regulations. Under EPPCA, it is mandatory that all development plans, policies and projects undergo a process of environmental impact assessment and the administrative clearance by the Zambia Environmental Management Agency (ZEMA) in conformity with the provision of the Act. ZEMA is a statutory body created under an EPPCA in 1992 with the mandate of environmental protection, pollution control, and monitoring implementation of mitigation measures highlighted in environmental and social management plans.

The Nansanga Farm Block Development will adhere to the below relevant and applicable regulations in the implementation of the activities.

- xxvii. Environmental Management Act No. 12 of 2011,
- xxviii. The Environmental Impact Assessment Regulations SI no. 28 of 1997
- xxix. The National Heritage Conservation Commission Act 1989
- xxx. The Forests Act No. 4 of 2015
- xxxi. The Zambia Wildlife Act No. 14 of 2015
- xxxii. The Fisheries Act, No. 22 of 2011
- xxxiii. Employment Act Code No. 3 of 2019
- xxxiv. Workers Compensation Act No. 10 of 1999
- xxxv. The Water Resources Management Act of 2011
- xxxvi. The Water Supply and Sanitation Act No. 28 of 1997
- xxxvii. Public Health Act Cap 295 of 1995
- xxxviii. The Land Acquisition Act Cap 184 of 1995 read as one with the Lands Amendment Act no.20 of 2015
- xxxix. Local Government Act No. 2 of 2019
- xl. Energy Regulation Act No. 12 of 2019

- xli. The Noxious Weeds Act, Cap 231
- xlii. Bio-Safety Act No. 10 of 2007
- xliii. The Solid Waste Regulation and Management Act No. 20 of 2018
- xliv. The Investment Act no 11 of 2006
- xlv. Plant Variety and Seeds Act (Amended by Act No. 21 of 1995)
- xlvi. Agriculture (Fertilizers and Feed) amendment Act No. 32 of 2010
- xlvii. The Equity and Equality Act No. 22 of 2015
- xlviii. The National Council for Construction Act no.10 of 2020
- xlix. The Zambia Development Agency (Amendment) Act 2011 no.15 read as one with the Zambia Development Agency Act no. 11 of 2006
 - 1. Roads and Road Traffic Act No. 2 of 2011
 - li. Standard (Amendment) Act No. 4 of 2017
 - lii. International conventions and agreements.

It is important to address the statutory policy and customary dimensions in order to establish a framework for setting environmental quality and performance standards, and the institutional framework for monitoring and enforcing compliance with environmental regulations.

2.1 The Environmental Management Act No. 12 of 2011

This Act was immediately preceded by the Environmental Protection and Pollution Control Act No. 12 of 1990. Provisions of the Environmental Management Act require that all new projects begin with an Environmental Impact Assessment (EIA) and thereafter, licensing, auditing and compliance inspections follow.

Applicable Regulations under the Environmental Management Act No. 12 of 2011 are described below:

(i) Environmental Protection and Pollution Control (Environmental Impact Assessment) Regulations, SI No. 28 of 1997. These Regulations provide the main framework under which EIAs are conducted, submitted to ZEMA and considered for either approval or rejection.

These regulations are relevant as a guide at every stage of the EIA process. The requirements of conducting an EIA are all stipulated under these regulations and the developer shall ensure compliance at every stage. The EIA regulations also give a guideline as to how much review fee will be paid to ZEMA for the purpose of reviewing the EIS for the proposed project and that development shall not be undertaken by a developer without an approval letter from ZEMA.

(ii) Statutory Instrument No. 12 of 2013 – Environmental Management (Licensing) Regulations. These Regulations provide standards and guidelines for mitigating air, wastewater, hazardous waste, pesticides and toxic substances and ozone depleting substances.

Relevance: The Environmental Management Act and subsequent regulations are relevant because the nature of the project given the projected impacts requires a full impact assessment is undertaken and that the developer only commences development of the project when the agency issued an approval letter. Further, the regulations are important in ensuring compliance by way of licensing the activities to be undertaken at the proposed farms.

Compliance thereof: Nansanga Farm block Development has so far complied with the provisions of the EMA by undertaking an impact assessment for the proposed project. The provisions of the Environmental Management Act will be adhered to by the developer during the implementation of the project.

2.2 Environmental Impact Assessment Regulations (SI No.28 of 1997 Part 2 and 3):

The Environmental Impact Assessment Regulations (No. 28 of 1997) prohibit the implementation of a project without undertaking an Environmental Impact Assessment. The client Ministry has undertaken relevant compliance measures as follows:

2.2.1 Stakeholder Consultation and Engagement

The Environmental Management and Environmental Impact Assessment Regulations are the key legislation that provides the requirements for stakeholder engagement.

The EMA states that the public has the right to be informed of the intention of public authorities to make decisions affecting the environment and of available opportunities to participate in such decisions.

The EIA Regulations requires that stakeholder engagement involves government agencies, local authorities, non-governmental, community-based organizations and interested and affected parties (affected communities, for example) and specifically states the following:

“The developer shall, prior to the submission of the EIS.... take all measures necessary to seek the views of the people in the communities which will be affected by the project. In seeking the views of the community in accordance with sub-regulation, the developer shall:

Publicize the intended project, its effects and benefits, in the mass media, in a language understood by the community, for a period not less than fifteen days and subsequently at regular intervals throughout the process: and after the expiration of the period of fifteen days.... hold meetings with the affected communities to present information on the project and to obtain the views of those consulted”.

Relevance: The proposed project falls under the second schedule of the EIA regulations which requires full ESIA studies.

Compliance: The Developer has undertaken detailed stakeholder consultations and produced an ESIA report for the project and prepared and submitted an Environmental Impact Statement report to ZEMA.

In addition, the EMA, through the **Environmental Management (Licensing) Regulations, SI No. 112 of 2013**, controls and regulates the following areas, relevant to the present study:

2.3 Air and Water Pollution: Part II

These regulations provide for the ZEMA and local authority under Public Health Unit to regulate the treatment and discharge of sewage and other effluents into the natural aquatic environment.

Relevance: The project will involve the generation, treatment and discharge of sewage from the project activities.

Compliance: The Developer will appoint a licensed sewer service provider to treat the expected wastewater so as to prevent seepage to ground water courses and cause air pollution.

2.4 Waste Management: Part III

These Regulations provide definitions of waste and set out the licensing requirements for transporters and waste disposal sites.

Relevance: Activities of the proposed project will result in the generation of solid waste such as domestic waste that has to be disposed of at approved sites.

Compliance: All solid waste will be collected in bins at various locations on site and then disposed of at ZEMA or Serenje District, approved dump site.

2.5 Hazardous Waste: Part IV

These regulations provide for the control of generation, collection, storage, transportation, pre-treatment, treatment, disposal, export, import and transboundary movement of hazardous waste as listed in Fifth Schedule or any waste specified in Sixth Schedule, if that waste exhibits characteristics found in the Seventh Schedule to these Regulations.

Relevance: The project is not expected to result in the generation of any significant amount of waste that can be considered hazardous under these regulations. However, a small amount of hazardous waste may result from construction activities comprising mainly of materials such as empty paint and chemical containers.

Compliance: Hazardous waste generated (material soiled with oils, chemical containers batteries) will be collected in bins marked as hazardous waste bins. These bins will be covered to ensure that hazardous waste is contained. The waste will then be removed from the site by hazardous waste collectors and disposed of at approved hazardous waste disposal sites.

2.6 The National Heritage Conservation Commission Act, 1989

The National Heritage Conservation Commission Act CAP 173 of 1989 stipulates preservation and protection of ancient cultural and natural heritage resources and objects of aesthetic, historical and archaeological value. In this Act, “Ancient Heritage is defined as being among other things, any structure, settlement previously inhabited, landmark, burial place or any other item designated by the commission which is known or believed to have been erected, constructed or used before 1st January 1924. The Act also provides for the formation of the National Heritage and Conservation Commission which is the responsible institution.

Relevance: This act is relevant since the clearing of vegetation; construction of the dam infrastructure may damage heritage sites if there are any.

Compliance there of: This act will guide Nansanga Farm Block development on implementation procedure in case such sites are found on the proposed project site on how to protect the site.

2.7 The Forests Act No. 4 of 2015

An Act to provide for the establishment and declaration of National Forests, Local Forests, joint forest management areas, botanical reserves, private forests and community forests; provide for the participation of local communities, local authorities, traditional institutions, non-governmental organizations and other stakeholders in sustainable forest management;

provide for the conservation and use of forests and trees for the sustainable management of forests ecosystems and biological diversity; establish the Forest Development Fund; provide for the implementation of the United Nations Framework Convention on Climate Change, Convention on International Trade in Endangered Species of Wild Flora and Fauna, the Convention on Wetlands of International Importance, especially as Water Fowl Habitat, the Convention on Biological Diversity, the Convention to Combat Desertification in those Countries experiencing Serious Drought and/or Desertification, particularly in Africa and any other relevant international agreement to which Zambia is a party; repeal and replace the Forests Act, 1999; and provide for matters connected with, or incidental to, the foregoing.

Relevance: The area under consideration for the development of the dams is partly undisturbed while the other areas are near the designated forest reserve (Musangashi Forest Reserve) within Kabundi area of Serenje, thus this Act is vital in ensuring protection of the flora species in the project area.

Compliance there of: The developer will endeavor to act within the provisions of this law in the implementation of the project to protect existing forest resources within the project area.

2.8 The Zambia Wildlife Act No. 14 of 2015

An Act to provide for the winding up of the affairs of the Zambia Wildlife Authority; establish the Department of National Parks and Wildlife in the Ministry responsible for tourism; provide for the appointment of a Director and other officers responsible for National Parks and Wildlife; Provide for the transfer of the functions of the Authority to the Ministry responsible for tourism, Department of National Parks and Wildlife and Director of National Parks and Wildlife; establish the Wildlife Management Licensing Committee; provide for the establishment, control and management of National Parks, bird and wildlife sanctuaries and for the conservation and enhancement of wildlife eco-systems, biological diversity and objects of aesthetic, pre-historic, historical, geological, archaeological and scientific interest in National Parks; provide for the promotion of opportunities for the equitable and sustainable use of the special qualities of public wildlife estates; provide for the establishment, control and co-management of Community Partnership Parks for the conservation and restoration of ecological structures for non-consumptive forms of recreation and environmental education; provide for the sustainable use of wildlife and the effective management of the wildlife habitat in Game Management Areas; enhance the benefits of Game Management Areas to local communities and wildlife; involve local communities in the management of Game Management Areas; provide for the development and implementation of management plans;

provide for the regulation of game ranching; provide for the licensing of hunting and control of the processing, sale, import and export of wild animals and trophies; provide for the implementation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora, the Convention on Wetlands of International Importance especially as Waterfowl Habitat, the Convention on Biological Diversity, the Lusaka Agreement on Cooperative Enforcement Operations Directed at Illegal Trade in Wild Fauna and Flora and other international instruments to which Zambia is party; repeal the Zambia Wildlife Act, 1998; and provide for matters connected with, or incidental to, the foregoing.

Relevance: The project site for the proposed project does not fall in any Game Management Area or designated National Park. However, the Act is relevant in that the area may be a habitat to bird species which may or may not be endangered.

Compliance thereof: The project will follow the requirements of this Act in order to conserve the animal and bird life within the vicinity of the farm block.

2.9 The Fisheries Act, No. 22 of 2011

The Act provides for the appointment of the Director of Fisheries and fisheries officers and provides for their powers and functions. It promotes sustainable development of fisheries and a precautionary approach in fisheries management, conservation, utilization and development. It establishes fisheries management areas and fisheries management committees and provides for the regulation of commercial fishing and aquaculture. It establishes the Fisheries and Aquaculture Development Fund. It has replaced the Fisheries Act of 1974. The implementing institution for this Act is the Ministry of Fisheries and Livestock. The Act regulates all fishing activities in Zambia undertaken in any kind of aquatic ecosystem. This includes lakes, rivers and streams. It also regulates activities that may interfere with fisheries.

Relevance: The project area has Musangashi and Saasa rivers which are tributaries of the Luombwa River. Management of the proposed rivers and dams if not properly handled may affect the fish species that may be found within the rivers mentioned.

Compliance thereof: Nansanga Farm block development will follow the guidelines in this Act to avoid the contamination of the rivers which may result in adverse impacts on aquatic species.

2.10 Employment Act No 3 of 2019

This Act provides conditions under which employees should work in Zambia. The Act covers both temporary and permanent employees. Generally, this Act stipulates employee protection and social security requirements. Major provisions include:

- i. Minimum contractual age;
- ii. Establishment of employment contracts;
- iii. Settlement of disputes arising from such contracts of employment;
- iv. The appointment of Labour Officers and other staff for the administration of the Act;
and
- v. Certain conditions of employment such as ordinary leave, sick leave, maternity, redundancy and welfare of employees.

Relevance: In order to achieve the objectives of the Nansanga Farm Block development, there will be employment of people during the construction and operation phases of the project.

Compliance thereof: The project will comply with this Act by ensuring that employers comply with the required age, establish contracts, conditions of service and settle disputes in accordance with this act. The relevance of this Act to the project will serve as guide to equal and formidable employment conditions.

2.11 Workers' Compensation Act No. 10 of 1999

This is a Social Security Act which has provisions for employee compensation in case of injury or death of an employee whilst at work. It is a requirement under this Act that all employers register their employees with the Workers Compensation Fund and make periodic subscriptions for compensation of their employees.

Relevance: During the construction and operation phases of the project, the employees may be exposed to OHS accidents which if no protective measures are put in place may lead to fatalities.

Compliance thereof: The project will ensure that employers comply with the provisions of this Act and remit subscriptions and reward compensation to its workers in accordance with this act.

2.12 The Water Resources Management Act of 2011

The Water Resources Management Act of 2011 regulates the use of surface and ground water for any of the following purposes; environmental, training and research, municipal, agriculture, industrial, hydro-electric, mining, navigation and any other activity that may be specified by

the water resources management board. Activities under these purposes may include but not limited to the following;

- i. Use of water for purposes specified under section sixty, other than for domestic purposes specified under section seventy of the Water Resource Management Act No. 21 of 2011.
- ii. Construct, acquire any water works, impound, supply or distribute water from any water or borehole to any other person;
- iii. De-water any mine, quarry or water works;
- iv. Drain any swamp, marsh, dambo, wetland, re-charge area or other land;
- v. Construct or acquire any water works for the purpose of draining into, conserving or utilizing, in any manner whatsoever, water from a water resource;
- vi. Construct water works necessary to restore the course of a water resource that has changed its course;
- vii. Harvest of any rainwater by means of a dam, weir or barrage that is on a water resource;
- viii. Conduct any operation that would interfere with the bank or course of a watercourse;
- ix. Sink, deepen or alter any borehole for any purpose in a water shortage area; or
- x. Carry any activity in relation to a water resource as may be prescribed.

Relevance: The Act is relevant developers of the Nansanga Farm Block will utilize underground and surface water resources, and the need to protect both surface and ground water from contamination.

Compliance thereof: The developers will extensively consult with the Water Resources Management Authority (WARMA) to make sure all the requirements are met for purposes of water permit and the protection of the water resource in the project area.

2.13 The Water Supply and Sanitation Act No. 28 of 1997

The Water Supply and Sanitation Act provides for the regulation and standards applied in the provision of public water and sanitation services. It also provides for permitting of water supply and sanitation service provision.

Relevance: local people and investors in the farm block will be supplied with potable water from boreholes and sanitation shall employ the use of septic tanks and soak way systems at a very minimal scale.

Compliance thereof: Water quality of the portable water will be monitored as required by the water supply and sanitation act to make sure quality water is supplied in the farm block.

2.14 Public Health Act Cap 295 of 1995

The Act provides for and regulates all matters connected with public health in the country under the local authority of each district as the enforcement agency.

Relevance: The proposed development will result in the generation of sewage and other waste which if not handled properly may contaminate ground water resulting in health problems for the people depending on ground water.

Compliance: The developer will ensure that sewage and other waste is contained and managed in a way that prevents contamination of water resources.

2.15 The Public Health (Notifiable Infectious Disease) (Declaration) Notice, 2020

The Act empowers a Council (Serenje Town Council) to prevent unhealthy activities at the project site. It provides for the prevention of disease and provision of drainage, latrine and disposal of sewerage and treatment systems.

Regulation 3: The ministry responsible for health may convert a suitable building to a hospital, observation camp or station for the purpose of placing a person suffering or suspected to be suffering from, or who has been in contact with a person suffering from COVID – 19.

Regulation 5 (2): Subject to sub - regulation (1) a person who intends to enter or leave an infected area may, before entering or leaving the infected area, be required to undergo the following:

1. *Medical examination.*
2. *Disinfection; or*
3. *Remain for a specified period in a hospital, an observation camp or station converted under regulation 3.*

Regulation 6: The body of a person who has died from COVID – 19 shall be disposed of in conformity with the directions of an authorized officer.

Regulation 7: An authorized officer may enter the premises to search for a case of COVID – 19 or to enquire whether there is or has been a case of COVID – 19.

Regulation 8: A person who becomes aware or has reason to suspect that another person has died or is suffering from COVID -19 shall immediately inform the nearest authorized officer in a local authority or public health facility.

Relevance: The activities to be undertaken will entail public interaction through workers and other visitors to the project area. This will require adequate public health facilities and conditions.

Compliance thereof: Nansanga Farm Block will ensure that activities such as sanitation, health and safety that border on public health at the farm block will be dealt with in accordance with this act.

2.16 Lands Act No. 20 of 1996 read as one with the Lands Amendment Act No 20 of 2015

The Act provides for the conversion of customary tenure into leasehold tenure; to establish a Land Development Fund and a Lands Tribunal; to repeal the Land (Conversion of Titles) Act; to repeal the Zambia (State Lands and Reserves) Orders, 1928 to 1964, the Zambia (Trust Land) Orders, 1947 to 1964, the Zambia (Gwembe District) Orders, 1959 to 1964, and the Western Province (Land and Miscellaneous Provisions) Act, 1970; and to provide for matters connected with or incidental to the foregoing.

Relevance: The proposed Nansanga Commodity Value Chain Transformation Project will be implemented on state leasehold and customary area held solely by the Project beneficiaries in Nansanga Farm Block.

Compliance: The land where the proposed project will be implemented is under state land and customary area. There is already documentation to prove ownership of the land. The developer has so far complied with this act, and it will strive to comply with any provisions under this act. Part of the land considered for this project is vested in private ownership and public ownership.

2.17 Local Government Act No. 2 of 2019

Enacted and implemented in 2010, the Act provides for the establishment of Councils or Districts, the functions of local authorities and the local government system. Some of these functions relate to pollution control and the protection of the environment in general.

Relevance: The proponent shall abide by the Bye Laws established by the Local Authorities in relation to land, management and pollution control and the protection of the environment in general.

Compliance there of: Acquisition of Local Authority permits and compliance with other environmental regulations shall be as stipulated therein.

2.18 The Noxious Weeds Act, Cap 231

The Noxious Weeds act gives provisions for the regulation of weeds declared noxious in an area or agricultural lands. The relevance of this act is that investors will not import, distribute, convey and or sale any noxious weed or any part thereof or of any seed with which the seed of any particular noxious weeds has become mixed with as provided in the act.

Relevance: The Act is relevant to avoid the introduction of noxious weeds in the agriculture area although the farm will not be involved in cropping activities whose core operation will involve the application of pesticides and fertilizers.

Compliance thereof: Nansanga Commodity Value Chain Transformation Project will remove any noxious weeds as identified and instructed by an authorizing officer acting legally and in accordance with this act.

2.19 The Plant, Pests and Diseases Act

The plant, pests and diseases Act cap 233 has provisions for eradication and prevention of spread of pests, control of importation of growing media, injurious organisms, invertebrates and plants, cured tobacco and miscellaneous.

Relevance: In the cropping operations at the farm, pest infestation may occur that may affect the diverse range of crops on the farm.

Compliance thereof: Nansanga commodity Value Chain Transformation Project take all necessary measures within the provisions of this act to eradicate and prevent the spread of pests within and outside the Project site. Importation of any growing media, injurious organisms, invertebrates and plants will be controlled in accordance with the provisions of this act.

2.20 Plant Variety and Seeds Act (Amended by Act 21 of 1995)

The Plant, Varieties and Seeds act gives provisions on administration, registration of seed importation and cleaning, seed certification, inspection of seeds, prescribed seeds, import and export of seed, offences related to seeds and miscellaneous issues regarding seeds.

Relevance: The objective of the project is to increase the cropping operations at the farms both for rain fed and irrigated crops. This will also entail increased purchase of seeds.

Compliance thereof: The Nansanga Commodity Value Chain Value Transformation Project will operate within the provisions of this Act to control the administration, registration, certification, and importation of seeds.

2.21 The Investment Act No. 11 of 2006

Investment Act provide a comprehensive legal framework for investment in Zambia; to repeal the Investment Act, 1991; and to provide for matters connected with or incidental to the foregoing

Relevance: Nansanga Farm Block is the long-term investment in agriculture sector by the developer.

Compliance: Nansanga Commodity Value Chain Transformation Project will ensure that the development of Nansanga Farm Block and all activities throughout the life cycle of the project meet the terms and conditions of investment stipulated in the Act.

2.22 The Agriculture (Fertilizer and Feed) (Amendment) Act No. 32 of 2010

The Agriculture Act provide for the regulation and control of the manufacture, processing, importation and sale of agricultural fertilizers and farm feed; to provide for minimum standards of effectiveness and purity of such fertilizers and feed; and to provide for matters incidental to or connected with the foregoing.

Relevance: Nansanga Commodity value Chain Transformation Project will involve the registered Agro-service providers of approved and authorised seeds and fertilizers to set-up agro-shops and depots in Nansanga Farm Block.

Compliance: The developer (Ministry of Agriculture) will ensure that all the project activities are in compliance with the provisions of this Act.

2.23 National Council for Construction Act No. 10 of 2020

This Act provide for the promotion, development and regulation of the construction industry so as to promote economic growth and competitiveness and create sustainable employment; continue the existence of the National Council for Construction and provide for its functions; enhance contractor capacity development and technical compliance in the construction industry; collaborate with professional bodies engaged in activities in the construction industry; continue the existence of the Construction School and rename it as the National Construction School; provide for a complaints and appeals procedure; repeal the National Council for Construction Act, 2003; and provide for matters connected with, or incidental to, the foregoing.

Relevance: There will be construction works taking place in Nansanga Farm Block which should be done in accordance with the regulations set by the National Council for Construction.

Compliance: All contractors engaged to work on the project in construction will be registered with the National Council for Construction, all construction material to be used on site will conform to the Standards Act and foreign firms to be engaged will be registered with the Council.

2.24 The Energy Regulation Act No. 12 of 2019

This Act provides for the licensing of enterprises in the energy sector. The sections of this Act relevant to the proposed project are part II section 4 which provides for functions of the Energy Regulation Board (ERB) to: issue licences and investigate and monitor operations of businesses in the energy sector; regulate and review charges and tariffs in the energy sector; stipulate conditions for an energy facility or installation and formulate measures to minimise the environmental impact of activities carried out in the energy sector.

Relevance: The project will require the use of fuel and other energy sources which are subject to the provisions of this Act.

Compliance: Handling of fuel required during project implementation on-site will be done in line with the Act, and the service providers will be engaged.

2.25 The Solid Waste Regulation and Management Act No. 20 of 2018

This Act to provide for the sustainable regulation and management of solid waste; general and self-service solid waste services; the incorporation of solid waste management companies and define their statutory functions; the licensing and functions of solid waste service providers, operators and self-service solid waste providers and provide for their functions; the regulation, operation, maintenance and construction of landfills and other disposal facilities; the setting and approval of tariffs for management of solid waste and provision of solid waste services; and matters connected with, or incidental to, the foregoing.

Relevance: The proposed project will involve the generation of various kinds of waste during all phases.

Compliance: Bins or bunkers will be introduced camp site which will be used to collect waste and these will be collected by a licensed garbage collector at regular intervals. The waste being collected will be disposed of on dumping sites that have been approved by ZEMA and Serenje Council.

2.26 The Zambia Development Agency (Amendment) Act, 2011 read as one with the Zambia Development Agency Act, 2006

The act provides a legal framework for investment in Zambia and recognizes the role of other agencies, including those responsible for environmental protection, in authorizing specific projects. In considering an application from an investor for a license, permit or certificate of registration, the Act stipulates that the Board shall have regard to the impact the proposed investment is likely to have on the environment and, where necessary, the measures proposed to deal with an adverse environmental consequence in accordance with the Environmental Protection and Pollution Control Act (Section 69d). It is worth noting that, the Zambia Development Agency Act, 2006 was amended on 30th December 2021 to provide foreign and local investors who invest not less than \$500, 000 or the equivalent in convertible currency, in a priority sector, incentives as specified by or under the Customs and Excise Act or Income Tax Act.

Relevance: The provision of the need to register all investment plans with the ZDA, and the recognition of the need to protect the environment in the execution of investment activities.

Compliance: Registration of the company with the ZDA, and the development of an EIS for the proposed activities.

2.27 Standards (Amendment) Act No. 4 of 2017

This Act to continue the existence of the Zambia Bureau of Standards and re-define its powers and functions; provide for standardization and quality assurance of products and services through the setting of national standards and provision of conformity assessment services for products and services; repeal the Standards Act, 1994; and provide for matters connected with, or incidental to, the foregoing.

Relevance: The development will require that commodities be transported to the construction site. Different kinds of raw materials are required for this development.

Compliance: All raw materials and pipe works procurement, and all designs and layouts will be in compliance with the Zambia Bureau of Standards.

2.28 Roads and Road Traffic Act No. 2 of 2011

The Roads and Traffic Control Act, provides for the control of traffic, and for the regulation of drivers. The sections of this Act relevant to the proposed project are section 14 (2) which provides that building owners shall provide service roads to give access to the buildings; Section 110 which provides for the need for all drivers to have driving licenses; section 198

which provides for the conviction of a person driving under the influence of drink and drugs and section 201 which provides that no person shall use or permit to be used a vehicle in dangerous conditions.

Relevance: Nansanga Farm Block will have a considerable amount of traffic flowing into and out of the Farm Block. Different type of Machinery and vehicles will have to be driven and operated on site and drivers of these should be in possession of valid driver's licenses. If drivers are under the influence of drink/drugs, there are likely to be accidents on site and convictions which will result in lost time and unnecessary costs to the project.

Compliance: All signage, detours and directions to control traffic movement and ensure a safe environment will be put in place. The drivers and machinery operators will have valid driver's licenses and the developer will ensure that any workers on site under the influence of alcohol/drugs are prohibited from working at the proposed project site to comply with the provisions of the Act. The proponent will also ensure that machinery to be used on site is regularly checked for oil leaks and only used when in proper working conditions.

2.29 The Gender Equity and Equality Act No 22 of 2015

The enactment of the Gender Equity and Equality Act, No. 22 of 2015, strengthen the legal framework for the elimination of all forms of discrimination against women and girls; empowers women to participate fully in public and private affairs of the country. In addition, Zambia has established Gender Based Violence Fast Track Courts to increase access to justice for GBV victims and ensure timely disposal of cases.

Relevance: It is relevant because the project will require stiff measures on gender based violence, sex exploitation, equal employment and fair treatment in the farm block.

Compliance thereof: Nansanga Commodity Value Chain Transformation Project will support women in horticulture production in under irrigation.

2.30 The Biosafety Act, No. 10 of 2007

This Act to regulate the research, development, application, import, export, transit, contained use, release or placing on the market of any genetically modified organism (GMOs) whether intended for use as a pharmaceutical, food, feed or processing, or a product of a genetically modified organism; ensure that any activity involving the use of any genetically modified organism or a product of a genetically modified organism prevents any socio-economic impact or harm to human and animal health, or any damage to the environment, and provide for matters connected with or incidental to the foregoing.

Relevance: It is relevant because the project will require stiff measures on bio-safety to control diseases in the farm block.

Compliance thereof: all operations in the farm block will be as provided by the bio-security Act.

2.31 International Conventions

Zambia is a signatory to a number of international conventions. Conventions of significance to the proposed project are briefly described below:

2.31.1 Ramsar Convention

The general objective of the Ramsar Convention is to curtail the loss of wetlands and to promote wise use of all wetlands. The convention addresses one of the most important issues in Southern Africa, namely the conservation of water supplies and use of the natural and the human environments in an intergenerational equitable manner.

Relevance: Nansanga Farm block is not part of the Ramsar site, and there are no wetland which can be affected by the implementation of Nansanga Commodity Value Chain Transformation Project.

Compliance thereof: The project will promote sustainable and adhere to the Ramsar Convention.

2.31.2 African Convention on the Conservation of Nature and Natural Resources (Algiers, 1968), (Maputo, 2003)

The objective of the convention is to encourage individual and joint actions for the conservation, utilization and development of soil, water, flora and fauna for the present and future welfare of mankind. This must be done from an economic, nutritional, scientific, educational, cultural and aesthetic point of view.

Relevance: Natural heritage sites are bound to be found in different locations including some undiscovered ones that might be found during construction of various projects such as this one.

Compliance thereof: Once any cultural heritages are found during construction or operation of the facilities at the farm, the guidelines on conservation of heritage sites will be adhered to.

2.31.3 Kyoto Protocol to the United Nations Framework Convention on Climate

Change:

The aim is to further reduce greenhouse gases by enhancing the national programs of developed countries aimed at this goal and by establishing percentage reduction targets for the developed countries.

Relevance: Zambia is party to the international agreement that promote sustainable development and protection of the environment through reduction in carbon emissions.

Compliance thereof: The contractor will ensure that equipment used and enterprises promoted reduces contributions of greenhouse gases. No open air burning of wood fuel will be undertaken during the construction of the facilities and development of the farms.

2.31.4 Convention on Biological Diversity (CBD)

The major aim of the CBD is to effect international cooperation in the conservation of biological diversity and to promote sustainable use of living natural resources worldwide. It also aims at bringing about sharing of the benefits arising from utilization of natural resources.

Relevance: The developer is required to be compliant with the provisions of the Convention on Biological Diversity as they are incorporated into domesticated documentation.

Compliance thereof: Biological resources of significant conservation value that will be identified during project implementation will be conserved and protected.

2.31.5 Basel Convention on the Control of Trans-Boundary Movements of Hazardous Wastes and their Disposal:

The objective is to control import and export of hazardous wastes. It also aims at ensuring that any transboundary movement and disposal of hazardous waste, when allowed, is strictly controlled and takes place in an environmentally sound and responsible manner.

Relevance: Zambia ratified the Basel Convention and is mandated in line with the Basel Convention and the EMA No. 12 of 2011 to ensure that hazardous waste movements in and out of the country and the disposal thereof are effectively controlled to ensure protection of human health and the environment.

Compliance thereof: Any Waste that might be hazardous in nature produced on site will be handled as per ZEMA guidelines. No hazardous waste Transboundary transportation will therefore be undertaken from the facility.

2.32 The AfDB Policies and Legal Frameworks

This section provides gaps between Zambia and AfDB in the framework which would be relevant to adequate implementation of the ESMP. It provides a comparison of Zambia's policy/ legal framework and the AfDB requirements to assure that what is in place would meet AfDB's requirements in regard to socio-environmental assessment procedure from project identification, disclosure, public consultation, reporting and supervision.

2.32.1 Environmental Requirements

The main safeguard policies, which are applicable to the transformation of Nansanga Farm Block project are: (i) African Development Bank Group's Policy on the Environment, 2004. (ii) Policy and Guidelines on Cooperation with Civil Society Organizations 1999; (ii) Environmental and Social Assessment Procedures for Public Sector Operations; (iii) The Gender Policy, 2001; (iv) Involuntary Resettlement Policy, 2003, (v) African Development Bank Group Policy on the Disclosure of Information, 2005.

2.32.2 AfDB Policy on the Environment, 2004

The environment policy framework is anchored in the concept of sustainable development. This concept has evolved significantly since it was first defined in 1987 by the Brundtland Commission as "*development that meets the needs of the present without compromising the needs of the future*". Although the principles of sustainability have been globally accepted for decades, their translation into specific environmental management objectives has been fraught with practical and theoretical problems. But, growing evidence of rapid deterioration of the ecological capital and diminishing assimilative capacities of the ecosystems, coupled with the global scale of environmental problems, have now forced policy-makers to rethink their development strategies and to accept that the environment and the economy are interdependent. Sustainable development is now widely recognized as the preferred development paradigm. Basically, the policy stresses the anticipatory nature of sustainable development rather than the reactive responses so predominant in development related decisions. This policy is relevant to the project in so far as the proposed road project is expected to stimulate and support local, national and regional socio-economic development.

2.32.3 AfDB Policy on Involuntary Resettlement, 2003

The primary goal of the involuntary resettlement policy is to ensure that when people must be displaced, they are treated equitably, and that they share in the benefits of the project that involves their resettlement. The objectives of the policy are to ensure that the disruption of the livelihood of people in the project's area is minimized, ensure that the displaced persons receive resettlement assistance so as to improve their living standards, provide explicit guidance to Bank staff and to borrowers, and set up a mechanism for monitoring the performance of the resettlement programs. Most importantly, the resettlement plan (RP) should be prepared and

based on a development approach that addresses issues of the livelihood and living standards of the displaced person as well as compensation for loss of assets, using a participatory approach at all stages of project design and implementation. Compensation at the full replacement cost for loss of lands and other assets should be paid prior to projects implementation with the view to improve the former living standards, income earning capacity and production levels of the affected population. The improvement of these living standards should also apply to host communities. In addition, the needs of disadvantaged groups (landless, female headed households, children, elderly, minority ethnic, religious and linguistic groups, etc.) must be at the centre of the development approach.

2.32.4 AfDB's Gender Policy, 2001

The Gender Policy seeks to provide, among other things, a requisite framework for action, which will ensure equal access to women and men to all Bank resources and opportunities. It elaborates the key concepts and approaches that underpin gender and development issues. It summarizes the evolution in perspectives and practices designed to integrate gender/women into the development process that have taken place in the last thirty years. Under the first approach, which is commonly referred to as Women in Development (WID), women as well as their concerns are seen as largely excluded from the development mainstream and their integration into development through stand-alone initiatives is advocated. With experience, it was realized that the exclusive focus on women ignored the political, economic and social relations that men and women are engaged in, and which shape their lives, livelihood strategies, prospects and well-being. Such an approach was insufficient in the African context, in which roles and status assigned to men and women were, and still are, largely culturally determined. The second approach identified as Gender and Development (GAD) is not centered on women, but on gender and the social, political and economic relations as well as the structures and processes that create, reinforce and sustain gender inequality. An example where gender equity can be reflected during implementation of the proposed project is in proportion of women in the construction workforce hired.

2.32.5 AfDB's Policy on Disclosure of Information, 2005

In December, 1997, the Board of Directors approved a policy for Public Disclosure of Information which established the procedures and the types of information for disclosure in the absence of compelling reasons for confidentiality. The Bank Group's Policy on Disclosure of

Information became effective in 1998. The policy was based on the principle that the Bank Group should be open and transparent in its operations. The main lessons from the implementation of the 1997 policy is that many institutions, civil groups and individuals have come to understand, appreciate and get involved in the work of the Bank Group. There has also been increased demand for disclosure of Bank Group documents and information on its activities.

2.32.6 AfDB's Policy and Guidelines on Cooperation with Civil Society Organizations 1999

Civil society organizations (CSOs) extend beyond NGOs to encompass people's organizations, trade unions, human rights bodies, religious groups, community-based organizations, policy advocacy bodies, associations of business and professional people. The African Development Bank has recognized the importance of such organizations in achieving sustainable development. In its 1999 Vision statement and elsewhere, the Bank has clearly stated its commitment to participatory practices and constructive engagement with civil society as responsible and promising ways forward. The Bank, in pursuing its development goals and objectives, will draw on the knowledge, contacts, experience, and delivery capacity of individual CSOs and networks. Where they possess necessary skills and experience, CSOs may be involved as volunteers or as contracted agents. Effective CSO participation, starting in the 'up-stream' stages is expected throughout the project cycle. The Bank puts people at the centre of development. Hence in all operations the Bank pays a close attention to projects that may result in the displacement and resettlement of people, particularly when they are the disadvantaged group such as elderly and children, female headed households, the poorest and the marginalized communities.

2.33 AfDB Operational Safeguard Instruments

2.33.1 AfDB Operational Safeguard 1 (OS1): – Environmental and Social Assessment

AfDB has developed Operational Safeguard 1 (OS1) that sets out the Bank's overarching requirements for borrowers or clients to identify, assess, and manage the potential environmental and social risks and impacts of a project, including climate change issues. The operational and safeguard 1 further captures need to assess issues of gender, vulnerability and disability by demanding the following:

- i. In assessing the potential impacts of Bank operations on affected communities, the borrower or client shall make use of adequate and qualified expertise to identify people

and groups that may be directly, indirectly and/or disproportionately affected or marginalized by the project because of their recognized vulnerable status.

- ii. Where groups are identified as vulnerable, the borrower or client shall implement appropriate differentiated measures so that unavoidable adverse impacts do not fall disproportionately on these vulnerable groups, and so that they are not disadvantaged in sharing development benefits and opportunities (such as roads, schools, healthcare facilities etc.).
- iii. Emphasizing the need to assess gender issues in the context of vulnerability.
- iv. Finally, OS 1 states that groups that may be considered vulnerable may include social or cultural groups recognized as Indigenous Peoples. The Bank seeks to promote the

Safeguarding of Indigenous Peoples' lands, natural assets and other cultural heritage by its member countries and to provide special protection for projects that may involve their resettlement. OS1, further, states that the borrower or client shall be responsible for ensuring that the siting, design, construction and operation of projects should avoid significant damage to cultural heritage (both physical and intangible). Cultural heritage likely to be affected by the project shall be identified and qualified, and experienced experts shall assess the project's potential impacts on this cultural heritage. Regarding cultural heritage, OS1 stipulates that the project shall not remove any physical cultural heritage unless the following conditions are met:

- i. No technically or financially feasible alternatives to removal are available;
- ii. The overall benefits of the project substantially outweigh the anticipated cultural heritage loss from removal;
- iii. Any removal is conducted in accordance with relevant provisions of national and/or local laws, regulations, protected area management plans and national obligations under international laws;
- iv. Any disturbance or removal is not done until appropriate consultation with local communities has been carried out, taking full account of traditions, beliefs and cultural norms;
- v. Any removal employs internationally accepted best available techniques.

2.33.2 Operational safeguard 2 (OS2): Involuntary resettlement: land acquisition, population displacement and compensation

This OS2 relates to involuntary resettlement of people by way of land acquisition, population displacement and compensation. It seeks to ensure that when people are displaced, they are treated fairly, equitably, and in a socially and culturally sensitive manner; that they receive compensation and resettlement assistance so that their standards of living, income-earning capacity, production levels and overall means of livelihood are improved; and that they share in the benefits of the project that involves their resettlement.

In line with the framework in the involuntary resettlement policy, this OS covers economic, social and cultural impacts associated with Bank-financed projects involving involuntary loss of land, involuntary loss of other assets, or restrictions on land use and on access to local natural resources that result in relocation or loss of shelter by the people residing in the project area of influence, loss of assets (including loss of structures and assets of cultural, spiritual, and other social importance) or restriction of access to assets, including national parks and protected areas or natural resources and loss of income sources or means of livelihood as a result of the project, whether or not the people affected are required to move.

This OS2 will not be triggered by the implementation of the project because Nansanga Farm Block is a planned farm block, where all the properties are on title deeds. In addition to that, the local people are also traditionally protected.

2.33.3 AfDB Operational Safeguard (OS3): Biodiversity and Ecosystem Services.

OS3 requires borrowers or clients to identify and implement measures to conserve and sustainably use natural habitats and their biodiversity, and observe, implement, and respond to requirements for the conservation and sustainable management of priority ecosystem services. Ecosystem services are treated under a separate heading (see “Ecosystem Services Assessment” below) in recognition of the fact that they are defined as the benefits that people, including businesses and development activities more generally, derive from ecosystems. The thicket also provides environmental benefits such as soil erosion control since the canopy reduces raindrop impact and the roots firmly hold the soil. As such, the action triggers OS3 of the Integrated Safeguard Systems of the African Development Bank.

2.33.4 AfDB Operational Safeguard (OS4): Pollution Prevention and Control, Greenhouse Gases, Hazardous Materials and Resource Efficiency

This operational safeguard sets out the main requirements for pollution prevention and control and resource efficiency and will be applied to management of pesticides and waste management. The PIU will avoid or minimize the potential for community exposure to hazardous materials and substances that may be released by the project. Where there is a potential for the public (including workers and their families) to be exposed to hazards, particularly those that may be life-threatening, the PIU will exercise special care to avoid or minimize their exposure by modifying, substituting, or eliminating the condition or material causing the potential hazards. Where hazardous materials are part of existing project infrastructure or components, the PIU will exercise due care during construction and implementation of the project, including decommissioning, to avoid exposure to the community. A PEST Management Plan (PMP) has been included in this document to minimize and reduce the potential of pollution to the environment that can trigger OS4.

2.33.5 AfDB Operational Safeguard (OS5): Labor Conditions, Health and Safety

OS5 refers to a body of international labor standards derived principally from a set of International Labor Organization (ILO) and UN Conventions. The OS focuses on requirements stemming from these international standards relating to human resource policies and procedures; working conditions and terms of employment; worker's organisations; non-discrimination and equal opportunity; retrenchment; grievance and redress mechanisms; child labor; forced labor; third party workers; and supply chain workers. Nansanga Commodity Value Chain Transformation project will provide opportunity for direct and indirect employment of the local people and other people from different places of the country. The project will trigger OS 5. The PIU and the Trust will support initiatives promoting community and public health, safety and security and aiming to reduce the spread of communicable and non-communicable diseases and disorders, such as HIV/AIDS, Rabbits, Tuberculosis and Malaria, where an increased incidence of the above is linked to project or other activities supported by the Bank. The project will collaborate with Ministry of Health and other stakeholders (such as NGOs, CSOs) and build upon existing measures to implement public programmes and policies, including disease monitoring plans, that will raise the public's awareness and understanding of communicable and preventable diseases and will effectively counter their spread. As part of the ESMP monitoring program, the PIU and experts from Health will monitor any incidence of such diseases.

3.0 Background

3.1 Location

The proposed Nansanga Commodity Value Chain Transformation Project will be located in Nansanga Farm Block in Chief Muchinda's area in Serenje District of Central Province of the Republic of Zambia (Figure 5-1). The proposed project with a total area of 3,500 hectares approximate, will be a diversified crop production, namely, maize, soya beans and cassava within the farm block in Serenje districts. The project area lies within the bounds of Latitudes 12° 30" and 13° 15" South and Longitudes 29° 50' and 30° 15" East. It is situated approximate 80 kilometres to the Western part of Serenje District. And it is about 371 kilometres from Lusaka, the capital city of Zambia. The project can be accessed through the Mulilima road passing through Luombwa Farm Block, when travelling from Mkushi, along the Great North Road, 30 kilometres before Serenje, Turn off at Mulilima road T-Junction. The Mulilima road is approximate 90 kilometres from the Great North Road to the project site in Nansanga Farm Block. Mapepala road can also be used from the Serenje business Centre via Kasanka Farm Block and Serenje Properties limited. The Mapepala road is approximately 70 kilometres to the project site in Nansanga Farm Block crossing Munte River. The shortest access route is the Serenje Post office to Kapumbu Resettlement Scheme. The road is approximate 50 kilometres to the project site in Nansanga Farm Block. The road passes through Munte and Saasa Farm Block.

Nansanga Commodity Value Chain Transformation Project will be implemented within Nansanga Farm block as indicated in the figure 1. 350 smallholder farmers will be selected within the proposed area to produce maize, soyabeans and cassava. The accumulative total hectares for the 350 beneficiarries will be 3,500. The vegetation clearing will be restricted to the 10 hectares for each selected farmer, and it will be done in patches across the farm block.

Table 2: Shows location with four (4) corner points coordinates of proposed area

Point ID.	Northing (N), Zone, 36L (WGS84)	Eastings (E), Zone, 36L, (WGS84)
A	12° 46' 29.1"	29° 53' 9.7"
B	12° 46' 42.4"	30° 12' 38.2"
C	12° 59' 11.6"	30° 12' 29.9"
D	12° 59' 11.6"	30° 12' 29.9"

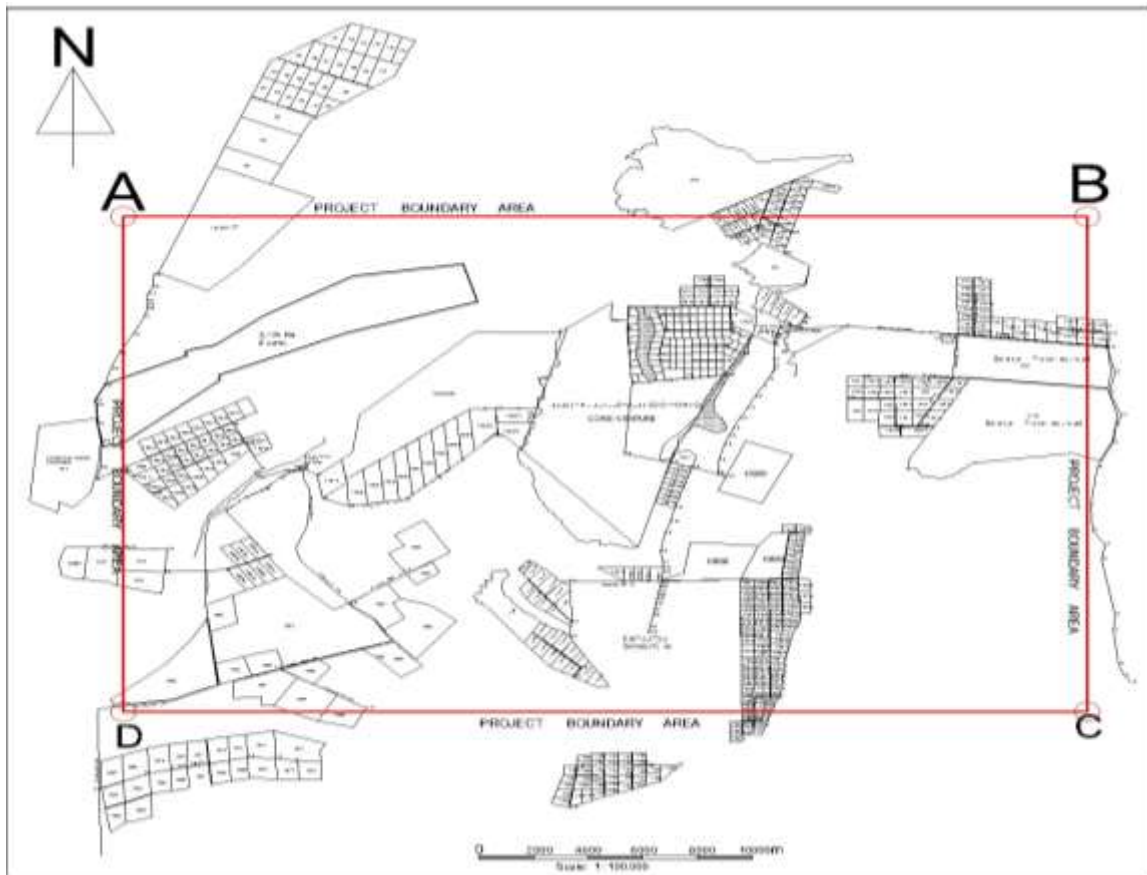


Figure 1: Showing the Location of Nansanga Farm Block

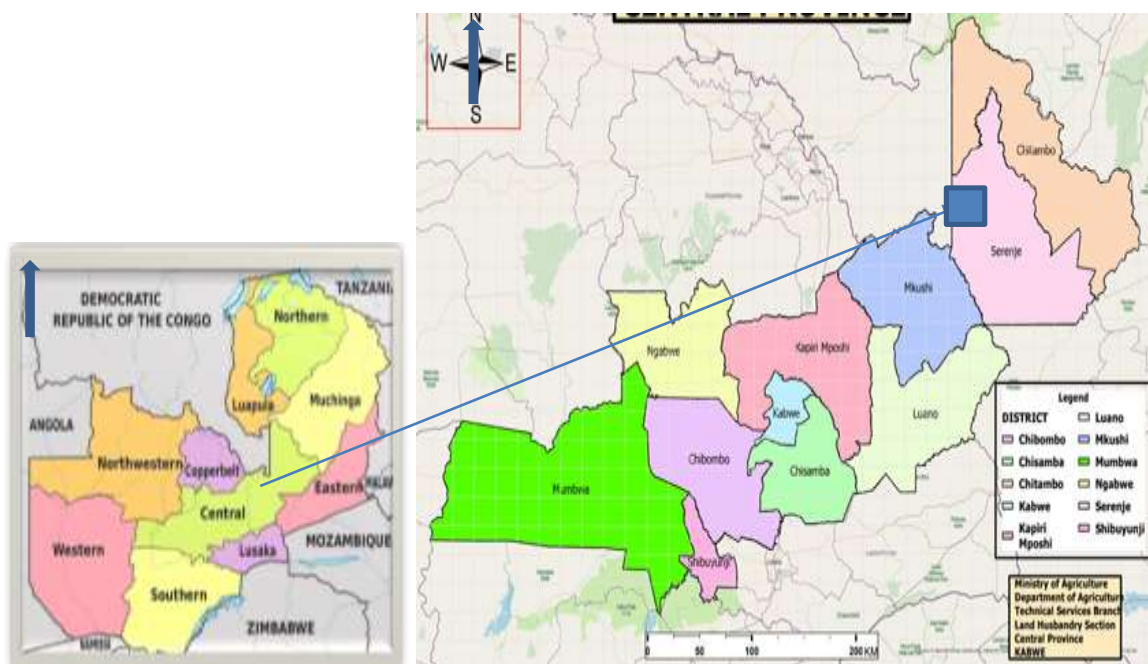


Figure 2: Showing of Map of Zambia and Central Province

3.2 Nature of the Project

3.3 Raw Material

- i. **Human Resource (Staff)** - The project will require both skilled and non-skilled labour. The project will have qualified staffs at the project implementation unit, and also at project level. Non-skilled labour will mainly be sourced from the local communities. Local people, especially women and youth will be given priority. The number of labour force will be determined at every phase of the project implementation.
- ii. **Cement**- Cement is easily available in Serenje district, and packed in 50kg bags and may be sourced from approved manufacturing companies in Zambia. Cement will be used in construction of the office blocks, upgrading of school and rural health post, irrigation canal, and any other works which will require civil works.
- iii. **Laterite/Gravel** – The laterite/gravel will be sourced from existing and any borrow pits that will be identified by the Contractor. The exact borrow pits to be used have not yet been identified though the projects approach is to establish borrow pits areas at an average frequency of 5kms along Serenje Boma – Kabeta road.
- iv. **Fuels/Oils** – Opening up of the agriculture arable land and rehabilitation of the existing road will require fuels/oils for the earth moving equipment and light vehicles in the project area. A contractor or service provider will be engaged to provide mechanization in the farm block. The fuels/oils to be used will be sourced from Total, Mt Meru, Lake Petroleum and Puma filling stations in Serenje district.
- v. **Water** – Water for construction, dust suppressing, and road compaction will be abstracted from Musangashi and Saasa Dam, Luombwa and Munte River with Nansanga Farm Block. For domestic purposes will be sourced from the boreholes. A water abstraction permit from Water Resources Management Authority (WARMA) will be obtained before commencing the works.
- vi. **Energy** – Electricity supply will be sourced from ZESCO which already has some service lines in Musangashi and Kabundi areas.

- vii. **Fertilizers**-Fertilizers for crop production are available as basal dressing (D-Compound) and Top dressing (Urea). Fertilizers will be sourced from reputable and approved manufacturing companies in Zambia, such as Nitrogen Chemicals of Zambia, Export Trading Group and the United Chemicals of Zambia.
- viii. **Seeds**-Seeds for maize and soyabeans will be sourced from reputable and approved seed producers such as Seedco, Panner, Afriseed, Corteva, and Syngenta. All seeds will be subjected to test by Zambia Bureau of Standards and Seed Control and Cerifocation Institute. IITA would multiply and distribute improved cassava varieties to farmers in the farm block.
- ix. **Agro-Chemicals**- Pesticides, Herbicides, Fungicides and insecticides are all available on the Zambian Market. The chemicals will be sourced from reputable and approved manufacturing companies.

Other Project Requirements

- i. **Agro-Mechanization Campsite** - The Service provider or Contractor (s) will establish campsites at the service centre within the farm block. The camp site which will be permanent during the project duration will be expected to comprise offices and living quarters for the Supervising Engineer and the Contractor. The campsite will also have a mechanical workshop, equipment yard and storeroom. The main campsite will be subjected to an environmental assessment and approval before their establishment.
Four (4) corner point coordinates for camp site are shown below.

Table 3: Four (4) Coordinates for Agro-Mechanization Campsite

Point ID	Northing (N), Zone 36L WGS 84	Eastings (E), Zone 36L WGS 84
A	12°50' 27.5"	30° 4' 0.45"
B	12°50' 27.5"	30° 4' 27.4"
C	12°50' 41.9"	30° 4' 27.4"
D	12°50' 44.3"	30° 4' 3.7"

- ii. **Road Rehabilitation Campsite** - The Contractor (s) will establish main campsite at the service centre within the farm block. The camp site which will be permanent during the project duration will be expected to comprise offices and living quarters for the Road Supervising Engineer, Site Environmental officer and the Contractor. The

campsite will also have a mechanical workshop, equipment yard and storeroom. The main campsite will be subjected to an environmental assessment and approval before their establishment. Satellite campsites will be established along the road. Four (4) corner point coordinates for camp site are shown below.

Table 4: Coordinates for Road Rehabilitation Campsite

Point ID	Northing (N), Zone 36L WGS 84	Eastings (E), Zone 36L WGS 84
A	12°54' 57.7"	29°56' 48.8"
B	12°54' 57.9"	29°57' 4.9"
C	12°55' 11.7"	29°57' 4.8"
D	12°55' 11.57"	29° 56' 48.7"

- iii. **Dam Rehabilitation and Canal Construction Campsite** - The Contractor (s) will establish main campsites at Musangashi Service Centre within the farm block. The camp site which will be permanent during the project duration will be expected to comprise offices and living quarters for the Supervising Water Engineer, Site Environmental Officer and the Contractor. The campsite will also have a mechanical workshop, equipment yard and storeroom. The main campsite will be subjected to an environmental assessment and approval before their establishment. Four (4) corner point coordinates for camp site are shown below.

Table 5: Four (4) Coordinates for Dam rehabilitation Campsite

Point ID	Northing(N), Zone 36L WGS 84	Eastings (E), Zone 36L WGS 84
A	12°53'15.4"	29°56'.10"
B	12°53' 15.2"	29°56' 23.6"
C	12°53' 29.3"	29°56' 22.3"
D	12°53' 28.4"	29° 56' 6.7"

- iv. **Transport requirements** – The Contractors for road and dam rehabilitation will utilize tipper trucks to transport gravel from borrow pits. The tipper trucks will also be utilized to transport cement and other materials from the campsites to the construction sites. Some of the materials such as fuel, oils, cement, etc will be transported to site (campsites) by the engaged service providers.
- v. **Waste management** – A waste management plan will be put in place by the Contractor (s) and agro-Mechanization service provider. The solid waste that will be generated will

be disposed at designated dumpsites that will be made available by the approval of Serenje Town Council in the farm block. Service Providers will be engaged to be disposing of solid waste at regular intervals. Other Registered Service providers will be engaged to transport and dispose of hazardous waste such as used oil, scraps from service parts and used tyres.

3.4 Project Components

The project shall focus to unlock production, productivity and value addition to promote export-oriented agriculture production for maize, soybeans and cassava. The project has two main components. These includes: Crop Production & Productivity Support and Institutional Support and Business Development for the Nansanga Farm Block Management.

3.5 Component 1: Crop Production & Productivity Support

3.5.1 Sub-Component 1.1: Sustainable Crop Production and Productivity

- i. **3,500 Hectares** - The project would engage a service provide to clear vegetation, levelling, discing and ploughing of the 3,500 hectares in the farm block. 350 farmers will benefit from the 3,500 hectares proposed by the project. On average, the selected 350 beneficiaries will have approximate 10 hectares in extent to be cleared.

The project will engage a service provider to provide mechanization support to 350 beneficiaries (Men, Women and Youth with title deeds and customary/traditional land consents). 40% of Local women and youth with customary/traditional consents from the traditional leadership will also benefit from the project to grow maize, soya beans and cassava. The crop production will be done by the farmers (beneficiaries). The project will provide input support loans planting of maize, soyabeans and cassava and provide market linkages of produce.

- ii. **100 Hectares Irrigation** - The project would also support 400 local community farmers (Including women and Youth) with customary/Traditional land consents from the traditional leadership to grow high value and nutritious vegetables in Musangashi Area. In addition, consultation with regulatory authorities such as Zambia Bureau of Standards, Zambia Agriculture Research Institute, Seed Control and Certification Institute and Consumer Protection commission in order to ensure that only certified seed and fertilizer is supplied to the farmers.

3.5.2 Sub-Component 1.2: Capacity Building for Extension and Nutrition Advisory

- iii. **350 farmers-** 350 farmers will be trained in Good Agriculture Practices (GAP) and Climate Smart Agriculture (CSA) technologies.
- iv. **400 Farmers -** Local community farmers (including women and youth) will be trained in irrigation packages, water management and agronomy for high value and nutritious vegetables in the Musangashi area within the farm block.

3.6 Beneficiary Selection Criteria

The selection criteria will fall under two categories and each beneficiary will be required meet the following;

Category 1 beneficiaries (Rain fed);

- i) Be farmer engaged in agricultural production.
- ii) Be a Zambian with Green National Registration Card.
- iii) Must own land in the farm block either titled or customary/traditional tenure with consent from the Chief.
- iv) 40% of beneficiaries will be women and youth.
- v) Ready to commit to the conditions of the project for input start up support.
- vi) Should be able to account for the start up support given by the project and correctly channel the inputs to crop production only as per project guidelines.
- vii) Only one beneficiary per Household.
- viii) Not be a beneficiary of Food security Pack (FSP), Farm Input Support Program (FISP). Beneficiary should not benefit from two subsidy programs at the same time.

Category 2 beneficiaries (Irrigated crop)

- i) Be farmer engaged in agricultural production.
- ii) Be a Zambian with Green National Registration Card.
- iii) Must own land in the farm block either titled or customary/traditional tenure with consent from the Chief.
- iv) 40% of beneficiaries will be women and youth.
- v) Ready to commit to the conditions of the project for input start up support.
- vi) Should be able to account for the start up support given by the project and correctly channel the inputs to crop production only as per project guidelines.
- vii) Only one beneficiary irrigated plot per Household.
- viii) Located near the irrigation facility/infrastructure.

- ix) Not be a beneficiary of Food security Pack (FSP), Farm Input Support Program (FISP). Beneficiary should not benefit from two subsidy programs at the same time. Failure to follow the guidelines will result in disqualification and blacklisting from the project

3.7 Sub-Component 1.3: Climate Resilient Agricultural Infrastructure Development

- i. **Rehabilitation of Musangashi Dam** - The project would support rehabilitation of Musangashi dam, along Musangashi Stream. The dam is operational, and currently, the Zambia Correction Service farm are abstracting the water for the dam reservoir. The local community is using the water for domestic, fishing and recreation (Swimming).
- ii. **Construction of 1 kilometer climate resilient irrigation canal** - The project would support the construction of the irrigation canal to irrigate 100ha to support 400 local community farmers to grow high value and nutritious vegetables. The water for the canal will be abstracted from the rehabilitated Musangashi dam. The Trust as operator of the canal will apply for the water abstraction permit from the Water Resources Management Authority (WARMA) before operation.
- iii. **Construction of 80 kilometres gravel road** - The project would support rehabilitation of climate resilient all weather condition existing gravel road from Serenje Boma to Kabeta School in Nansanga Farm Block to ease transportation of goods and services in the farm block. The proposed road is already existing standard gravel road connecting Kabeta, Kabundi, Kapumbu and Serenje Business Centre. The rehabilitation works will involve grading, levelling, compaction, embankment construction and drainage system. Displacement of local community people, demolition of structures and vegetation clearing will not take place during road construction as the road is already operational, and has enough road reserve provision as per Road Development Agency road standard.
- iv. **Sitting, Drilling and equipping of Solar Powered 10 Boreholes** - The project would support the local community with demand driven multi-purpose commercial solar powered 10 boreholes in the project area. Other works, will include installation of water tanks, piping systems and other ancillaries and fittings. The local community people will use water from the boreholes for domestic, and other economic uses. This is one of the adaptation measures to the impact of climate change.

- v. **Construction of Modern Office Blocks** - The project would support the construction of modern office blocks for the Project Implementation Unit/District Agricultural Coordinator, Block Extension Supervisor and the Nansanga Farm Block Trust administration Block in the Nansanga Farm block.
- vi. **Construction of Three Bedroomed Houses** - The Project would support the construction of 5 low-cost houses in Nansanga Farm Block. The houses will have a complete water supply system with a borehole, elevated tanks and with flushable toilets. Sewage treatment plant will be constructed for the treatment and management of the sewage.
- vii. **Upgrading of Primary Schools** - In order to ensure improved social conditions for local communities and farm investors, the project would rehabilitate two existing schools at Mutale and Ntenga Primary Schools. The proposed primary schools have inadequate classrooms and housing for staff. The project will construct 1 x 3 classroom block at Mutale and Ntenga Primary School. Further, 4 low cost houses for the teachers will be constructed. 2 low cost houses at each school.
- viii. **Upgrading of Rural Health Post-** The project would support the rehabilitation of Kabundi and Kapumbu Health Posts in the farm block. This will improve social conditions for local communities and the investors in the farm block. The two rural health posts have a patient catchment of over 5,000 people within and surrounding the farm block.

3.8 Component 2: Institutional Support and Business Development for the Nansanga Farm Block Management.

- i. **Nansanga Farm Block Trust-** The project would support the establishment of Nansanga Farm Block Trust in order to ensure sustainable and efficient management of the farm block public infrastructure as well as attracting investors, the project will establish a legal basis and structure for the Nansanga Farm Block by end of Year 1. This shall be a key undertaking for government to ensure efficient management of the farm block.

- ii. **Stakeholders Forum-** The project would support establishment of a Nansanga Farm Block Stakeholders Forum and a one stop information centre for farm block investors within the Trust offices.
- iii. **Farmer School Fields and Cassava Seed Multiplication -** The project would support the Department of Agriculture, Zambia Agriculture Research Institute and IITA to establish cassava multiplication seed fields and Farmers school fields for demonstration of Good Agriculture Practices and Climate Smart Agriculture technologies.

3.9 Sub-Component 2.2 Agri-Business and Market Advisory Support Services

- i. **Agribusiness Service Centres -** The project would facilitate establishment of 3 Agribusiness Service Centers where private sector investors and service providers (such as seed, fertilizer, agrochemical, mechanization, warehousing, agro-processors, financial institutions, etc) would be allocated plots of land to set up offices. The land for establishment of agribusiness service centres is available in the planned service centres in the Nansanga Farm Block.
- ii. **Training in Agribusiness and Marketing-**The project would train local agro-dealers as primary or last mile agents of bigger agribusiness companies. The project would also promote outgrower linkages between commercial operators and outgrower farmers by providing training and linkages. It would also provide training of farmers & agro-dealers in finance and insurance services. The Trust would establish a digital data management system for value chain operations in the farm block. It would train extension workers, SMEs and leader farmers in quality control. In order to improve financial viability and credit worthiness of farm investors and SMEs, the Trust would facilitate them to obtain title deeds.

3.10 Project Activity Phases

The following table 3 summarises the project activities.

Table 6: Summaries of Project Activities phases

SN	Project Phase	Project Activities
1	Pre-feasibility site investigation	Identification, Interviews, Selection and recruitment of the (beneficiaries) farmers (350 Farmers, with title deeds and Traditional Consents). Land Demarcation and Surveying for the 350 Farmers

		selected. (Each farmer will have on average 10 Hectares cleared to make accumulative 3,500 Hectares).
		Detailed Soil analysis Survey
		Road Survey and Pegging
		Detailed Surveying and design of the rehabilitation of Musangashi Dam
		Detailed design of the irrigation canal
2	Site mobilization	Establishment of Agricultural Mechanization service Centre
		Mobilization of earth moving equipment and Construction plant
		Clearing and levelling of 3,500 hectares for field crops for 350 Farmers
3	Construction Phase	Rehabilitation of 80 Km road from Serenje Boma to Kabeta School
		Construction of 1Km Irrigation Canal Irrigation System
		Rehabilitation of Musangashi dam
		Construction of Office blocks for PIU, Trust and DACO
		Construction of 3 bedroomed houses and Offices
4	Operation Phase	Establishment of the Farm Block Trust
		Operation and maintenance of the crop fields and irrigation canal

3.11 Equipment and machinery

Carrying out the above-listed activities requires various types of equipment and machinery. Whereas some equipment can be used in a number or all the above activities, some are specialized and are only able to carry out one activity. Some of the equipment and machinery expected on site include the following as summarized below:-

- i. Bulldozers.
- ii. Backhoes.
- iii. Chainsaws and axes.
- iv. Water Bowsers.
- v. Compactors.
- vi. Front-end loaders.
- vii. Graders.
- viii. Hydraulic excavators.
- ix. Dump trucks.
- x. Cranes.
- xi. Tractors

- xii. Boom sprayers
- xiii. Planters (Maize, Cassava and Soya bean)
- xiv. Ploughs
- xv. Tillers, weeders and Discs
- xvi. Combine Harvesters
- xvii. Cassava Peelers and Chipping/grating machines

3.12 Construction phase

The construction phase will involve the following activities:

- i. Land clearing for the preparation of the field crops will include Vegetation clearing, tilling, burning, levelling of anthills, removal of rocks, roots, stumps and tree logs
- ii. Land preparation activities will include ripping, discing with tractor
- iii. Land levelling with grader and other earth moving equipment
- iv. Borehole sitting and drilling
- v. Construction of the houses and offices
- vi. Rehabilitation of Musangashi dam
- vii. Construction of the irrigation canal
- viii. Construction of the bulking and storage sheds

The project will engage a service provider to carry out land clearing and preparation. It is anticipated that during site preparation phase, between 500 to 900 people will be directly employed to ensure smooth implementation of the project. Vegetation clearing will involve mechanical, and sometimes manual, where possible. Earth moving equipment such as bulldozers, graders, excavators, front End Loader, Water bowsers and chainsaws will be used. Vegetation clearing for the 3,500 hectares will be prepared to the required level for field crop planting.

3.13 Operation Phase

During operation stage, various machinery will be used for land clearing and preparation of the 3,500 hectares of field crops. These includes: - bulldozers, graders, excavators, front End Loader, Tractors, rippers, plough discs, combine harvesters, Boom sprayers, fertilizer spreaders and planters. The project will create more than 700 permanent job opportunities within the farm block. Furthermore, it is expected that more employment will be generated in other sectors related to agriculture such as transport and agro-dealers. Local marketing companies such as COMACO will be engaged to maximize market linkages of the agriculture produce. Other activities during operation phase are as follows:-

- i. Land preparation for the following planting season after harvesting
- ii. Boom spraying of agriculture chemicals such as fertilizers, herbicides, fungicides and insecticides
- iii. Harvesting and storage of maize and soya beans
- iv. Transportation of cassava tubers and chips to Chitambo Milling Plant
- v. Management of waste generation
- vi. Operation and maintenance of the irrigation canal and Musangashi dam

3.14 Climate Smart Agriculture and Good Agriculture Practice Technologies

Climate smart agriculture Good Agriculture Practice technologies will be adopted in the farm block to ensure the conservation of soils and water. Runoff and erosion will be reduced using tillage and ripping techniques. Other techniques that will be adopted are crop rotations, agroforestry, mulching, residual crop cover and planting nitrogen fixing crops. It is anticipated that 750 farmers will be trained on climate smart agriculture technologies in the farm block.

3.15 Harvesting and Storage

Crop harvesting is an important phase for any farming business venture. In order to minimize harvest losses, crops such as soyabeans, need proper timely harvesting management. The project will train smallholder farmers on crop harvesting management. The farmers will carry out harvesting on time at its optimal recommended moisture content of 13% to 15% in order to avoid harvest losses. The project will employ a qualified operator for the combine harvester to avoid crop losses. The local people within the community will be employed in crop harvesting operations will be trained in best crop harvesting management technologies for maize, soya beans and cassava. The project will construct storage warehouses and bulking centers in Nansanga Farm Block, which will be well ventilated and fumigated before storage.

3.16 Solid Waste Sewage Disposal Facilities

Sewage disposal and solid waste facilities will be constructed on site to handle waste generated from domestic and farming activities. Sewage will be discharged into small sewage treatment plant. The proposed sewerage system will comprise screening, primary settling, aeration, secondary settling, filtration and disinfection.

3.17 Common Pesticides, herbicides and Fungicides used in Nansanga Farm Block

A number of agro-chemicals are available on the Zambia market and specifically within the Serenje District. There is a potential that some of pesticides are not supposed to be procured or

used as they may either be classified **Ia**: Extremely hazardous and **Ib**: Highly Hazardous, phased out or restricted according to the WHO listing. Since the potential subproject activities relating to use of agro-chemical shall only be known during operation phase.

3.18 Common crops grown in Nansanga Farm Block

In order to understand the usage of different type of chemicals during the operation stage of the project in Nansanga Farm Block, a detailed value chain assessment was carried out during as indicated the table below.

Table 7: Shows the Crops grown in Nansanga Farm Block

S/N	Commodity	Land Utilized (Hectares)	Volume (Metric Tons)
1	Green pepper	5	60
2	Macademia	220	25
3	Groundnuts	8	5.5
4	Maize	190.75	601
5	Soya beans	354.5	891
6	Tobbaco	7.5	5.8
7	Tomato	5	70
8	Water melon	4	10
9	Wheat	100	400
10	Millet	1	0.2
11	Mixed beans	1	0.1
12	Onion	5	70
13	Popcorns	2	4.6
14	Potatoes	5	40
15	Seed maize	50	420
16	Sorghum	3	1
17	Cassava	35	15

3.18.1 Pests and crop Diseases

During the baseline survey on the value chain assesment in Nansanga Farm Block, it was observed that the common crop diseases affected the 2022/2023 farming season was termites, aphids, soybean rust, fall army worms etc.

Table 8: Pests/crop diseases and enhancement measures

Pests/ crop Diseases	Enhancement measures
Termites in fields of green Maize	Farmers to be trained on the application of phorate or termadine by drenching the chemicals in the soil as a control measure.
Soybean rust in soyabean	Farmers to be trained on the application of fungicides such as azoxystrobin, boscalid, Chlorothalonil etc,
Cassava mosaic virus in cassava	Farmers to be trained on the use of sanitation and plant resistance. Sanitation means cuttings from healthy plants.
Aphids in most horticultural crops	Farmers to be trained on the application of pesticides such as cypermethrine to control the pest
Early Blights, late blight and Botrytis in Tomato	Farmers to be trained on the application of pesticides such as ox-chloride and Dithern M-45 as preventive
Diamond Back Moth in Cabbage	Farmers to be trained on the application of the pesticides such as Malathion or Cypermethrine
Fruit flies in citrus fruits	Farmers to be trained on the application of pesticides such as Nimbecidine and Phoskil
Scales in Mango, Tangerines lemon and Orange trees	Farmers to be trained on the application of pesticides such as Neem oil based pesticides.
Red spider mite in Tomato	Farmers to be trained on the application of acaricide such as Tiktok or Abamectine
Tuta Absoluta	Farmers were advised to spray with Belt, Tuta guard and/or Nimbecidine.
Fall Army Worms	Farmers to be trained on the application of Biological pesticides eg Looperkill, Niconeem and/or Nimbecidine

3.19 Common Pesticides Used for Selected Food Value Chains

Table 9: Common Pesticides, Herbicides and Fungicides for selected crops

Insecticides								
Group #	Chemical Group	Item #	Insecticide Name	Trade Name	WHO Classification	Crops	Main insects Controlled	Official Use status
1	Avermectin	1	Abamectin	Dynamec	IV	Tomato, Cotton Cassava	Red Spider Mite,	
2	Carbamate	2	Carbaryl,	Carbaryl, Sevin Carbax,	II	Tomato, Rice, Pearl Millet, Soybean	Tomato moth, Green Stink Bug, spotted stem borer, African Pink Stem Borer, Epilachna beetle, Bollworm, Spotted stem borer, Cutworm, Epilachna beetle, Armoured Cricket	
		3	Carbofuran	Furadan	Ib, II	Cowpeas, Carrots	Black Beetle, sorghum Stem Fly, Sweet Potato weevils, nematodes	Banned or restricted in other countries

3		4	Ethiophencarb	Ethiophencarb	II	Cabbage	Aphids	
		5	Methomyl,	Methomex 90SP	Ib	Pearl Millet, sorghum,	Bollworm	
		6	Pirimicarb	Primor	II	Cotton, Cabbage, Rape, Okra, Pumpkin	Sucking, Aphids, Turnip Mosaic Virus,	
	Cyclodiene organochlorine	7	Endosulphan	Endosulfan, Thiodan, Thiokill	II	Cotton, Rice, Millet, Peas, Soybean, Maize	Bollworms, Sucking, Spotted stem borer, African Pink Stem Borer, Bollworm, Spotted stem borer, Pod moth, Epilachna beetle, Cutworm,	Banned for in all countries
		8	Lindane	Gamma BHC	II	Soybeans	Aphids	

Insecticide									
Group #	Chemical Group	Item #	Insecticide Name	Trade Name	WHO Classification	Crops		Main insects Controlled	Official Use status
		16		Demeton-S- Methyl	Metasystox	Ib	Rice	Aphids	Believed to be obsolete or discontinued for use
		17		Diazonon	Diazinon	II	Cowpea	Coreid Bug	
		18		Dichlorvos,	Vapona 50EC	Ib	Tomatoes Tilapia fish	Tomato moth, parasites	Banned or restricted in other countries
		19		Dicofol,	Dicofol	III	Tomatoes Mushroom	Red Spider Mite, mites	
		20		Dimethoate	Rogor, Nugor	II	Cotton, Soybeans	Sucking, Aphids	
		21		Fenitrothion	Shumba	II	Cowpeas	Cored Bug	
		22		Fenthion	Lebaycid 50EC	II	Cabbage Pumpkin	Leaf Minor, Melon Fly, Bean Fly	Believed to be obsolete or discontinued for use

						Cowpeas		
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Herbicides								
Group #	Chemical Group	Item #	Chemical Name	Trade Name	WHO Classification	Crops	Main Weeds Controlled	Official Use status
12	N-trihalomethylthio	14	Captan	Captan	Unlikely to present acute hazard in normal use	beans Maize	Mango Anthracnose,	Active Use
13	Triazine	15	Anilazine	Anilazine	II	Tobacco Cassava	Alternaria	Active Use

14	Chloronit rile	16	Chlorothalon il	Bravo 500, Encor Daconil	III	Cabbage Rape Tomato Onion Okra Carrot	Downy Mildew, Leaf Spot and Head browning of Cabbage, Late Blight, Purple Blotch, Powdery Mildew, Carrot leaf bright,	Active Use
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Fungicides								
Group #	Chemical Group	Item #	Fungicide Name	Trade Name	WHO Classification	Crops	Main insects Controlled	Official Use status
1	2,6-dinitroaniline	1	Flumetralin	Prime	Unlikely to present acute hazard in normal use	Tomato	Late blight	Active Use
2	Acylalanine	2	Metalaxyl	Ridomil	III	Cabbage	Downy Mildew	

3	Alkylenebis(dithiocarbamate)	3	Mancozeb,	Dithane M-45,	III	Tomato, Pumpkin, Carrot, Cabbage, Onion	Late blight, Anthracnose, Carrot leaf bright, Black rot, Purple Blotch, Mildews, Anthracnose	Evaluated by EPA as being carcinogenic
4	Azole	4	Difenoconazole,	Score250EC	III	Tomato	Late blight	

3.20 Chemical Storage

Agriculture chemicals, namely pesticides, herbicides, fungicides, insecticides and fertilizers will be stored in a well-ventilated warehouses. The project will engage certified agro dealers to set up storage facilities in the farm block. Agriculture chemicals play important role in the farming system in order to increase yield, and to enable the smallholder farmers to manage bigger portion of land with less labour. The following will be done for proper storage of agricultural chemicals:

- i. Storage facilities will be built to keep pesticides and fertilizers secure and isolated from the surrounding environment. These storage facilities will be located downslope away from the boreholes, wells and streams.
- ii. Herbicides, insecticides, fungicides and fertilizers will be segregated and their respective labels kept during storage to prevent cross-contamination and minimize the potential for misapplication.
- iii. All agricultural chemicals (pesticides and fertilizers) will be kept out of the way of activities that might rip open a bag or puncture a liquid storage container.
- iv. All chemicals will be maintained in their original well labelled containers, securely closed and regular inspections will be carried out for splits, tears, breaks, or leaks.
- v. Apart from handling chemicals, employees will also be trained on the BMPs of storing agricultural chemicals

3.21 Chemical Application

The fertilizers to be used will be mainly basal and top-dressing fertilizers. The nutrient content in these fertilizers is nitrogen, phosphorus, and potassium. Soil analysis and advisory capacity will be established to ensure precision farming and waste of chemical fertilizers. In Zambia these are applied as either D-compound for basal or urea for top dressing. The use of organic fertilizers and pesticides will be encouraged. There are different types of chemicals in the form of pesticides and herbicides will be utilized at various stages of growth of the crops. Specific pesticides will be used for pest control on each crop. The control of weeds in the field will be done using herbicides with crop-specific application rates and times. Each herbicide and pesticide will be applied in their right concentrations using boom sprayers. No aerial application of chemicals will be conducted.

3.22 Concept of Pest Management Plan

A pest management plan is a system that has been put in place to utilize all suitable environmentally friendly techniques and methods in a manner that controls the pest population without causing economic losses to the farmers. Pests refer to any biological agent that competes with and interferes with the growth of crops. Pests compete with crops for the available nutrients, sunlight, water, space and may cause undue harm and damage to the crops where the particular pest subsists and feeds on the plants. In addition, the pests may be carriers of diseases which may affect crop productivity. Pests if not managed have a potential to directly harm the crops and may pave the way for secondary infestations for diseases and other pests.

Modern sustainable agriculture requires that a pest management plan is put in place because a farmer's effort may go to waste if such a plan is not in place. Pests can affect food security by causing significant losses to farmers and the nation at large. Outbreaks of pests such as locusts can cause huge crop losses to crops and pastures and this can threaten the livelihood of farmers.

3.23 Pest Management Plan for Nansanga Farm Block

The project anticipates to establish market linkages between smallholder farmers and the agro-dealers in the supplying of pesticides and agro-chemicals to use in the production of maize, soya beans and cassava. The potential increase in productivity for the smallholder farmers under the Nansanga Commodity Value Chain Transformation Project has a potential risk to lead to an increase in use of pesticides and other agrochemicals. The increase in use of pesticides and agrochemicals has a potential to cause undue harm on both the physical and socioeconomic environment. Therefore, there is a need to put in place a Pest Management Plan that takes into account environmental and social risks within the whole pest management lifecycle from procurement, storage, usage and disposal. This is in compliance with the Zambia Environmental Management Act, Regulations on Pest Management and the AfDB OS 1, Pest Management, which supports the adoption of environmentally friendly sound management of pesticides. The requirement for sound management of chemicals is emphasized by Zambia being a signatory to the Stockholm Convention on Sound Management of Chemicals and the Environmental Management Act that provides for the Pesticides and Toxic Substance Regulations.

3.24 Purpose of a Pest Management Plan

The purpose of this PMP is to provide guidance on the sound management of pesticides in terms of their usage, storage and disposal for producer organization and smallholder farmers under the project. The PMP aims to contribute to improved management of pesticides, personal safety and protection of the environment against undue harm on the physical, biological and socioeconomic environment.

3.25 Objectives of a Pest Management Plan

This PMP has been prepared in compliance with the project's Environmental and Social Management Framework (ESMF) that has since triggered the AfDB operational Safeguard OS1 on environmental management. In addition, the pest management plan is in compliance with the Environmental Management Act (No.12 of 2011), Environmental Management (Licensing) Regulations of 2013, Statutory Instrument No.112 of 2013, Pesticides and Toxic Substances Regulations and the Plant Pest and Diseases Regulations Act, Cap 231 of the Laws of Zambia. The overall objective of this PMP is to promote sound use of pesticides amongst the project beneficiaries.

The specific objectives of a pest management plan are as follows:

- i. Promote the use of environmentally friendly practices such as hygienic, cultural, biological or natural control mechanisms;
- ii. Effectively monitor pesticide use and pest issues amongst agro-dealers and smallholder farmers under the Nansanga Commodity Value Chain Transformation project.
- iii. Provide an implementation in the event that serious pest management issues are encountered during the implementation of the project;
- iv. To manage pests by not only killing them but by preventing feeding and multiplication
- v. To use ecofriendly methods, which will maintain quality of environment
- vi. To make maximum use of natural mortality factors, apply control measures only when needed;
- vii. Identify technologies that reduce reliance on synthetic pesticides that lead to a significant decrease in the application of pesticides;
- viii. To reduce environmental and public health risk to both farmers and consumers;
- ix. Ensure that project beneficiaries comply with the Zambia Environmental Management and the Pesticides and Toxic Substances Regulation;

- x. Ensure compliance with AfDB Operation Safeguard OS 1

3.26 Pest Management Monitoring Plan

The monitoring and implementation of the Pest Management Plan will be provided by the project and Environmental and Social Safeguard unit. This shall be done through periodic site visits to agro-chemical dealers and smallholder farmers funded by the project. The monitoring will verify the effectiveness of the proposed mitigations measures provided for the PMP. Where modifications are required in terms of the mitigation measures, these will be documented. The frequency of monitoring will be done on a quarterly basis and shall be ongoing through the lifecycle of the project.

During the implementation phase of the PMP, the monitoring will focus on the following environmental indicators, water, soil, air, flora and fauna. Table 6: Summarizes the Pest Management Monitoring Plan.

Table 9: Pest Management Monitoring Plan

Component	Monitoring element	Indicator	Frequency	Responsibility
Water	Groundwater contamination Surface water contamination	<p>Physical parameters</p> <p>PH, Conductivity, Total Dissolved Solid(TDS) Total Suspended Solids (TSS)</p> <p>Chemical parameters</p> <p>Chemical Oxygen Demand (COD)</p> <p>Bacteriological parameters</p> <p>Total Coliforms(TC) Faecal Coliform(FC)</p>	Quarterly	<ul style="list-style-type: none"> • PIU

Soil	State of pollution of the site Pesticide storage	Typology Quantity of discharge (solid and liquid)	annually	PIU ZARI
Flora and Fauna	Evolution of fauna and micro fauna State of the flora of animals and Plant diversity	Presence of toxic residues in plants and crops Levels of destruction of no target (animals, aquatic fauna and vegetation)	annually	PIU
Human environment	Hygiene and health Pollution and nuisances Protection and security during operations	Type of pesticides used Quality of pesticides used Number of incidences Number of intoxication Waste management(resid ues and packaging)	annually	PIU

3.27 Products and By-Products

The main products are indicated in the table 5-5 below. These by-products may include pollutants such as residual fertilizers, pesticides, fungicides, fuels, oils, solid waste and herbicides, and others such as particulate matter, dust, noise, husks and crop stalks. .

Table 10: Summaries of the By-Products in Nansanga Farm Block

SN	Project Activities	Product and By-Products
01	Cropping Operations from 3,500 Hectares (350 Farmers)	Good quality Soyabeans, Maize and Cassava
02	Constructing of the Irrigation canal for Horticulture operation	High value and Nutrition vegetables, namely: rape, spinach, tomatoes, onion, cabbage, potatoes, carrots, chinese cabbage, orange maize etc

03	Rehabilitation of existing 80km road network	Climate resilient Standard Gravel road connecting Serenje Business Centre and Nansanga Farm Block
04	Rehabilitation of existing Musangashi dam	Increasing the dam embankment by 1m will increase the reservoir volume from the current 0.576million m ³ to 1.027million m ³ . This implies that water availability for irrigation will be sufficient.
05	Siting, drilling and equipping of the solar boreholes.	10 solar powered multipurpose boreholes with elevated water tanks will be installed in the project area
06	Construction of low cost houses for Agriculture Officers and Trust	Five Houses will be built, completely with water system. Three low cost houses for Agricultural Officers and Two Houses for the Trust Staff.
07	Rehabilitation of schools and Rural Health Centres	Two primary schools and Rural Health Centres will be rehabilitated and expanded with additional blocks and low cost staff houses
08	Construction of PIU and DACO, and Farm Block Trust offices	Project Implementation Unit and District Agricultural Coordinator, and Farm Block Trust Office Blocks in Serenje District and the Farm Block.
09	Establishment of the Agri-Mechanization service centre	Agri-Mechanization Service Centre will be set up at one of the service centres in Nansanga Farm Block

3.28 Project Schedule and Life Span

The project is scheduled to start in June, 2024, subject to the Decision Letter from ZEMA. The project completion date is December, 2028. It will run for five years.

3.29 Phases in Construction

3.29.1 Crop Land Preparation

This phase involves vegetation clearing, removing of trees, logs, anthill and levelling of the land for the selected beneficiaries. The vegetation clearing will target 3,500 hectares for 350 farmers. This includes Farmers with title deeds and customary/traditional consent letter from the traditional leadership. It is planned that the selected beneficiaries will each have 10 hectares to be cleared by

the project. This implies that, the total land to be cleared is 3,500 hectares across the farm block. Nansanga Farm Block has a total of 150,000 hectares, and it is the largest farm block in Zambia.

3.29.2 Rehabilitation of the Gravel road

From the road condition survey conducted, it was noted that the conditions of the road vary, from one stage to another, therefore, the road would have to undergo different activities of work during construction, which will have different levels of impact on the environment. The ESIA team assessed what it would require to rehabilitate 80km of the existing road to an acceptable road safety, speed and environmentally friendly. The phases involves clearing of the tall grasses, clearing the culverts, detailed surveying and pegging the levels. The team proposed the following engineering design shown on the figure below.

Figure 4: Show Typical Cross Section of the standard Gravel road.

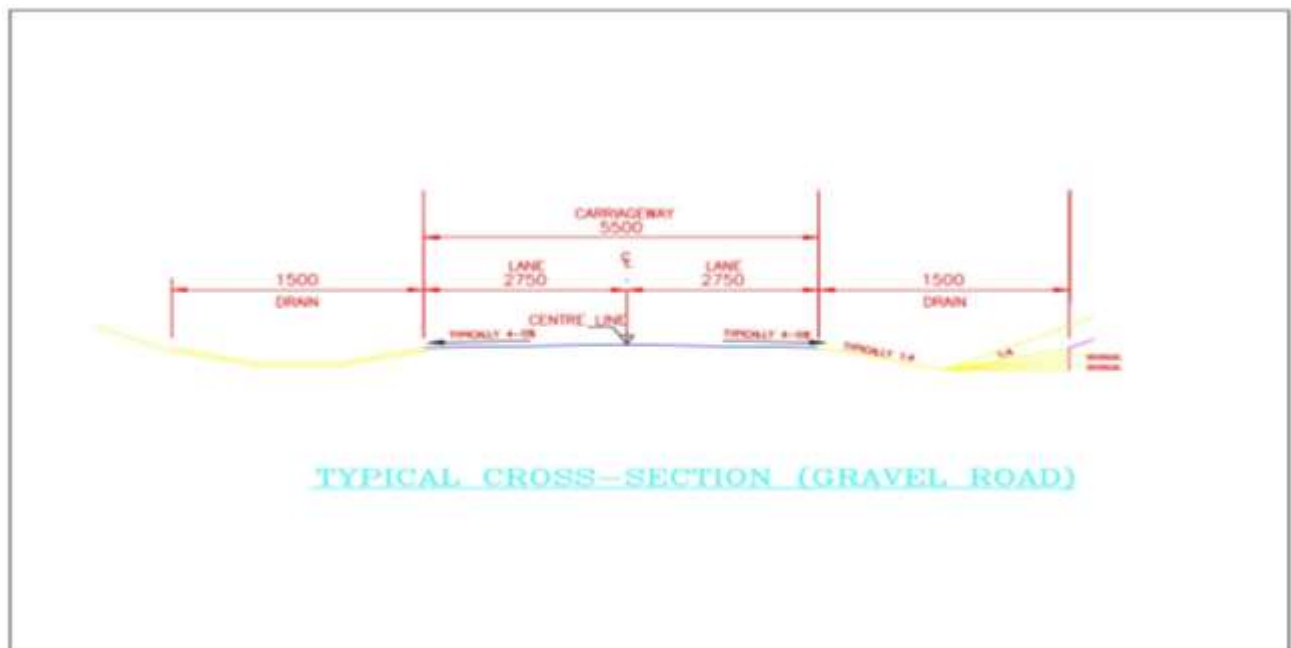




Figure 5 Proposed road for rehabilitation at Kabeta Trading Centre in Nansanga

3.29.3 Construction of Irrigation Canal

This phase involves detailed engineering survey to establish the centre line and the levels of the canal, vegetation clearing, removing of trees, logs, anthill, excavation of canal trenches, concrete works and plastering. The canal width will be 0.5m and 1000m long. The canal will service about 400 beneficiaries within and surrounding areas of Musangashi dam. A 50metres buffer zone from the dam reservoir will be established and protected, and agriculture activities will not be allowed in order to conserve the aquatic life and for restoration of the dam catchment area. The dam will be stocked with fish.

3.29.4 Construction of Houses and Office blocks

This phase involves vegetation clearing, removing of logs, shrubs, grasses, removal of humus top soils, grading the site, levelling. Other works includes excavation of foundation strip, removal of excess soils, concrete works, aggregates mixing etc. The construction of the houses for the agricultural extension officers, school and RHC and Trust staff. In addition, PIU and DACO office block will be constructed during this phase. A detailed design of the building will be done by the architectural expert under the Ministry of Infrastructure and Housing Development.

3.29.5 Site Preparation Phase

Nansanga Farm Block is already operational, and preparation phase will involve the following activities.

- i. Consultations with the relevant regulatory institutions such as ZEMA, WARMA and the District Council, hence preparation of this ESIA documents
- ii. Site Mobilization (importation and transportation of machinery and equipment to the project site).

3.30 Construction Phase

This stage will comprise construction of road network, rehabilitation of the dam, the construction of the irrigation canal, houses, offices, storage sheds and drilling of boreholes on the site. The major activities to be done will involve the following:

- i. Land Clearing and vegetation removal
- ii. Preparation of mortar and concrete
- iii. Excavation of the irrigation canal
- iv. Grading, levelling and compacting of the access road
- v. Installation of water storage tanks
- vi. Siting, drilling and equipping of the boreholes.
- vii. Excavation and backfilling on the dam wall

3.30.1 Operation Phase

During this stage, all construction works will have been completed and the main activities of production will commence. The activities during this phase will include the following:

- i. Preparation of the land for the next planting season/cycle after harvesting.
- ii. Planting of maize, soya beans and cassava
- iii. Operation and maintenance of the irrigation systems.
- iv. Boom spraying and application of agriculture chemicals (fertilizers, herbicides, fungicides, and insecticides).
- v. Timely harvesting and storage of crops to avoid losses and damages
- vi. Transportation of agriculture produce and inputs to the market and production sites
- vii. Repair and maintenance of equipment
- viii. Management of waste generated from the farming activities

3.31 Waste from the Preparation/Construction phase

The following waste is expected to be generated during the preparation and construction phases

- i. Biomass (tree logs, branches, leaves etc.) from land clearing activities.
- ii. Rubble and dust resulting from site clearing operations (trenching, excavations, movement of vehicles and cut and fill activities) for land preparation
- iii. Rubble resulting from excavation activities and laying of foundations.
- iv. Sanitary waste generated by the construction workforce
- v. Solid waste resulting from discarded packaging materials (e.g. empty cement bags, carton boxes, plastic packs, and empty paint containers), leftover food stuff and food waste from workers' canteen, etc.
- vi. Fuels/oils spillages during servicing of the machinery

3.32 Waste from the Operation phase

The following waste is expected to be generated during the operation phase;

- i. Biomass from crop harvest losses
- ii. Waste from agriculture chemicals (e.g. chemical containers and empty fertilizer sacks) which may have hazardous properties
- iii. Waste oils from the machinery
- iv. Hygiene and biological waste (Sewage effluent and grey water)
- v. Storm water runoff from roofed or built areas
- vi. Contaminated runoff from agriculture crop fields

The waste management system for the proposed project will be aimed at identifying the preferred options for waste management and/or disposal methods based on environmental principles, including necessary infrastructure. The likely associated infrastructure includes facilities for treatment or disposal of both liquid and solid waste.

3.33 Assessment of Musangashi Dam

Musangashi Dam is located in Musangashi Ward of Serenje Central Constituency in Chief Muchinda's area. The dam was constructed by China Gansu across Musangashi Stream a tributary of Luombwa River which drains into the Luapula River. The site is located at S12.88690°, E029.93007°, at an elevation of 1239m. A visual inspection of the site shows the over-grown vegetation on the embankment consisting of grass and shrubs which reveal a lack of maintenance

of the structure. The reinforced concrete lined spillway base, located on the right side of the embankment, is generally in good condition and is being used as crossing point on Musangashi River by motor vehicles, motor cycles and people.

The embankment appears to be in good condition with the crest undulating in parts. The downstream toe is extremely water-logged. The reservoir appears to have a lot of water and there is a pump station located up stream belonging to Zambia Correctional Services. The floating pump station has five (5) pumps each capable of pumping 585m³/hr out of which only two (2) pumps are currently operating.



Figure 6: Embankment overgrown with grass and shrubs



Figure 7: Concrete lined spillway still intact

Zambia Correctional Services has approximately 1, 600 hectares, and currently 4 centre pivots are operating covering approximate 320 hectares. The plan is to have a total of nine (9) centre pivots running by July, 2023. By April 2023, a total of six (6) centre pivots will be operational. The major crops grown are Soya beans, Wheat and White Maize. Currently, a 50 hectares of rain fed maize has been planted, and the plan is to increase from 300 to 400 hectares. The farm pumps water from the 2 pumps at Musangashi dam into a reservoir 120x120x3m (43, 200m³) which takes about 20hrs to fill. The water is able to feed 2 centre pivots for 48hrs (2days). In addition to that, Correctional Services has acquired another farm approximately 1, 600 hectares, which is located 4 kilometres from Musangashi dam and, the plan is to use water from Musangashi dam for the irrigated agriculture production.



Figure 8: Floating Pump Station for Zambia Correctional Services at Musangashi Dam

3.34 Rehabilitation of Musangashi Dam Survey

The site was surveyed using a differential GPS. Extents of the surveys is shown below. The site is such that it is slightly higher on the right side of the embankment where the spillway is located. Hence, the focus of the profile survey was concentrated on the left side along the center line of the existing embankment. From the survey, it was established that the dam embankment is 4.3m high, crest width is 4.4m with a wall length of 196m. The service spillway is 28m wide located on the right side of the embankment, the free board is 1.5m. The catchment area is 332Km². The Existing dam height can be increased by 1m by shifting the existing dam axis by 5m downstream, the embankment length increases by 80m. The conveyance system (furrow) has not yet been constructed in this area. This poses a challenge for small scale farmers to abstract water by gravity for irrigated farming as the reservoir lies in a low area.

The region receives the mean annual rainfall (MAR) ranging between 1000mm to 1200mm. Using 1100mm, assuming mean annual runoff of 10% of the mean annual rainfall, the catchment yield (Y) in an average year is given as:

$$Y \text{ (m}^3\text{)} = R_r \times A \times 1000 \text{ [FAO Manual on Small Dam]}$$

Where: R_r = Annual runoff for the catchment in mm.

A = Catchment area in Km².

Therefore, the catchment yield for Musangashi Dam is 36.52million m³.

The estimated current reservoir volume for Musangashi Dam is estimated as follows:

$$Q = (H' \times A')/3 \text{ [FAO Manual on Small Dam]}$$

Where: H' = Depth of water at full supply level at the deepest point in m.

A' = Area of reservoir at full supply level in m², 3 = is a factor.

Therefore, the estimated reservoir capacity is 0.576million m³, reservoir area of 617, 483.12m².

Increasing the dam embankment by 1m will increase the reservoir volume to 1.027million m³, reservoir area of 810, 915.51m². The volume of earth required is estimated as follows:

$$V (m^3) = 0.216HL (2C + HS)$$

Where: H = Crest height (FSL + Freeboard) in m

L = Length of the dam wall at crest height including spillway. C = Crest width in m.

S = Combined slope value e.g., upstream slope 1:3, downstream slope 1:2; S = 5. Additional earth volume = total earth volume after height increase – volume of earth before height increase.

Therefore, Earth Volume= 11, 153.6 – 5, 516.0 m³ = 5, 637.4m³.

Figure 8: Longitudinal Profile for Musangashi Dam

From Pos: 29.9259925403, -11.8887635291 To Pos: 29.9326155825, -12.8887635291

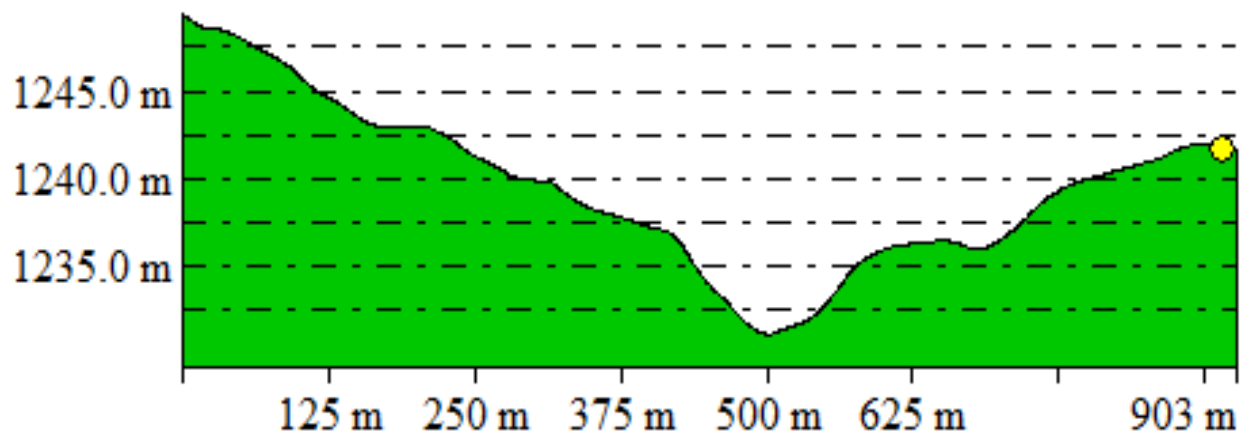


Figure 9: Contours after 1m intervals increase (blue and Red) at Musangashi Dam:

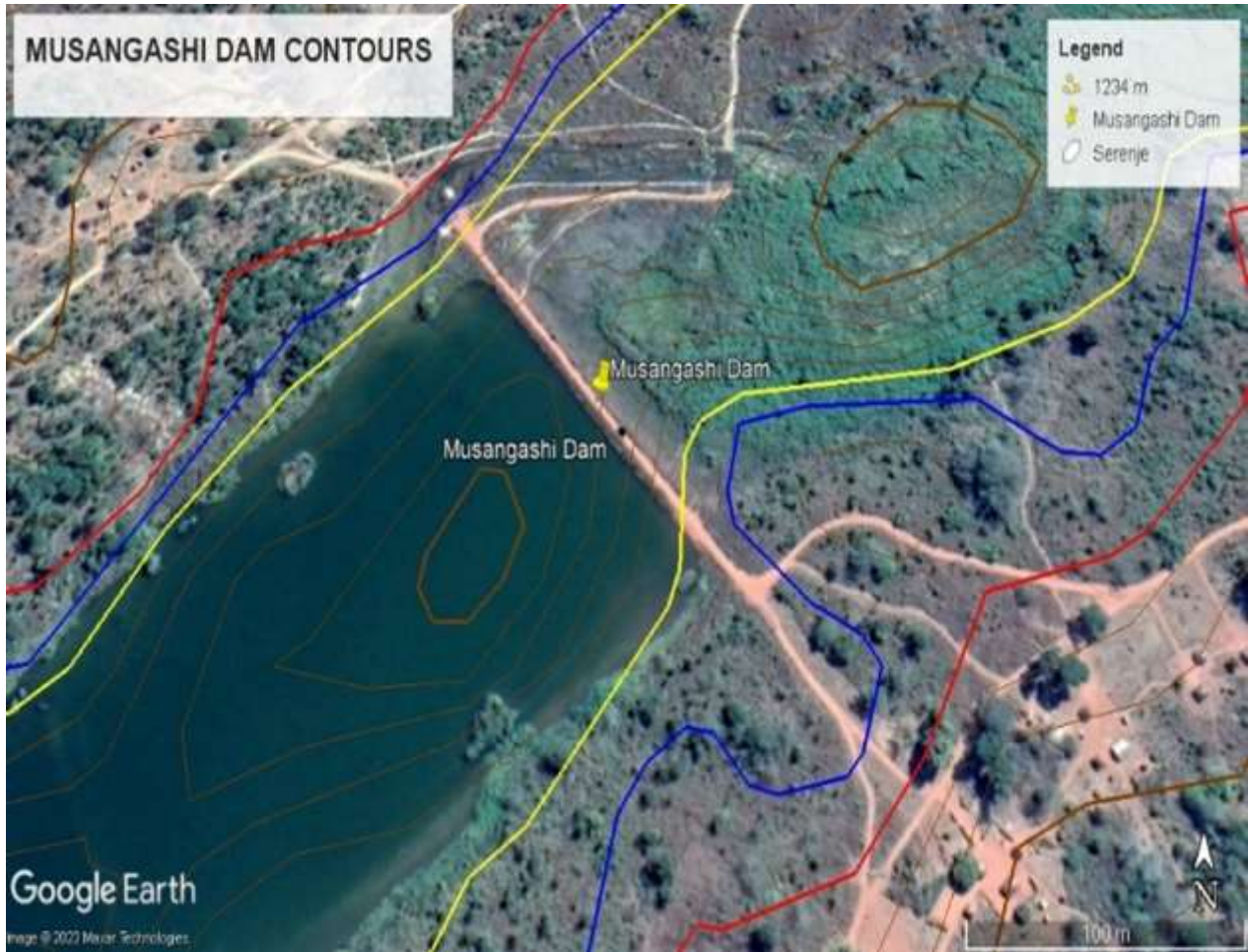
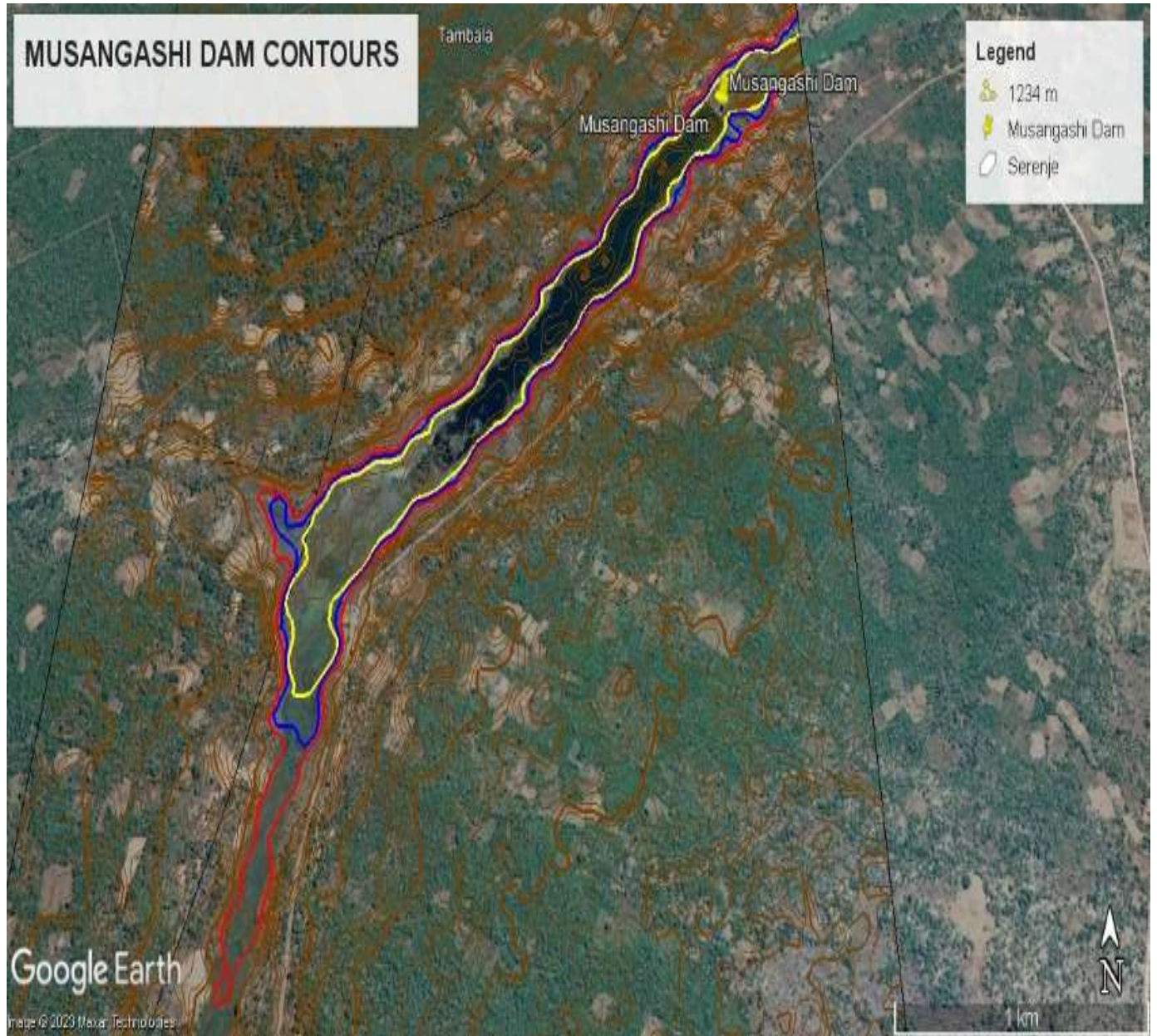


Figure 10: Resultant Reservoir area increases for 1m in height at Musangashi Dam



3.35 Project Alternatives

3.35.1 Location

There were two possible locations identified for the implementation of the project. These are Manyonyo Irrigation Scheme (Nega Nega Sugar Plantation) in Mazabuka, Southern Province, and Nansanga Farm Block in Serenje, Central Province. Nansanga Farm Block was assessed to be appropriate for the crop production of maize, soya beans and cassava. The marketing for soya beans and maize is readily available by the Food Reserve Agency and COMACO. Cassava tubers and dried chips will be supplied to Chitambo Cassava Milling Plant for starch and meal production in Chitambo districts. Nansanga Farm Block lies in region three of agro ecological zones which receives rainfall between 1000mm to 1200mm per year, this makes the site suitable for cash crop production.

3.35.2 Technology Alternatives

The agriculture technology and process system such as seed variety, fertilizers, herbicides, pesticides and machinery to be used will be those commonly used in other commercial farm production in Zambia. Climate smart agriculture technologies (crop rotation, Mulching, ripping etc) will be promoted for sustainability and conserving of the soils and water. Good Agriculture Practices will be adopted as adaptation measure from the impact of climate change.

3.35.3 Agriculture Type Alternatives

There are two options considered. Namely: - Rain-fed and Irrigation by Canal. Rainfed option involves planting crops during the rainy season around October to November every year. The project area receives an average annual rainfall of about 800mm to 1000mm. The rain season starts from October to March the following year. This implies that any crop planted must be raised within the rainfall period. The project intends to construct an irrigation canal for irrigation of high value and nutritious horticulture crops such as tomatoes, onions, rape, carrots, cabbages, etc. It is anticipated that more than 400 smallholder farmers will benefit from the irrigation system once operational. The irrigation canal will promote production of crops throughout the year.

3.35.4 Water Management Alternative

Surface water for irrigation will be abstracted from Musangashi dam once rehabilitated. The ground water in the farm block is potentially not suitable due to high content of iron and particle matters. Therefore, the water management will be regulated by Water Resource Management Act.

3.35.5 The Do-Nothing Alternatives

These alternatives implies that Nansanga Farm Block would remain without any project interventions which will leave the farm block under-developed with continued low crop production and poor road network. On the basis of these, the Do-Nothing Option was dropped from further consideration as it is not within the Republic of Zambia aspirations as enshrined in the 8th National Development Plan (2022 -2026), Zambia National Agricultural Policy (2012-2030) and Farm Block Development Programme, 2002.

3.35.6 Design Standard Alternative

The cropping operation and pattern will be carried out according to the Good Agriculture Practices and Climate Smart Technologies as it is enshrined in the agriculture extension manual and Zambia National Agricultural Policy (2012-2030). The Rehabilitation of roads will be based on Road Design Standards – Geometric Design of Rural Roads (Ed. Dec. 1994) issued by Roads Department Agency (RDA), Zambia. The rehabilitation of the Musangashi dam will be based on the Water Act and also the recommendation from the Water Resources Management Authority. The Building will be designed and construction regulations under the Town and Country Planning Act. All drawings approvals consent will be obtained from the Serenje Town Council and the Central Province Planning Authority.

3.35.7 Raw Material Alternatives

The raw material option that were considered include sourcing materials in Serenje Town or other places. Materials such as gravel, laterite and stone aggregates which are available in Serenje District. Other raw materials, such as cement, fertilizers, seeds and agro-chemicals will be sourced from other places.

3.35.8 Project Analysis Alternatives

According to land audit report (2023) for Nansanga Farm Block, it was concluded that only 14% of the 363 farms are active but with low production of crops and road network has greatly deteriorated in the farm block. In view of this, the Ministry of Finance and National Planning and Ministry of Agriculture is seeking for funding from African Development Bank for the Nansanga Commodity Value Chain Transformation Project to increase crop production and rehabilitation of the road. The government plan is to make Nansanga Farm Block as a model to other farm blocks.

3.35.9 Site Alternative

The alternative site considered the Nansanga Farm Block in Serenje district, and Manyonyo Sugarcane Plantation in Mazabuka district. Nansanga Farm Block was selected for assessment because of the locality, availability of land, accessibility, and good climate condition for Soyabeans, Maize and Cassava production, while Manyonyo Sugarcane Plantation was not assessed because of its sugarcane based mono-cropping production system, and therefore, the site was not selected.

3.36.0 Power Supply Alternative

The alternative power supply source will be hydro power source connected through the existing Zambia Electricity Supply system and Solar System. The solar system will power the commercial boreholes drilled by the project.

3.36.1 Agriculture Type Alternative

There are two alternatives considered for the project; namely, Rain-fed crop production and irrigated horticulture type. Tree plantations (pine, eucalyptus, macadamia and fruits) will also be promoted.

3.36.2 Farming method Alternative

Climate Smart Agriculture technologies alternative will be promoted in Nansanga Farm Block, such as tillage, mulching, crop rotation etc. The bank's Technologies for African Agriculture Transformation (TAAT) has a compendium of proven Good Agriculture Practices and commodity technologies that will be deployed.

3.36.3 Water Supply Alternative

Water will be sourced from the existing Musangashi and Saasa dam reservoirs and from existing boreholes.

3.36.4 Sewage Management Alternative

There are no sanitation services in Nansanga Farm Block. Therefore, sewage management will be managed through small sewage treatment Plant.

3.36.5 Fuel Storage Alternative

The project will engage the Fuel service provider to set up underground double fuel tank layer at one of the service centres in the farm block, upon the approval of the project brief. Currently, Zambia Correction service and Serenje Properties Limited have fuel surface tank for their operations.

3.36.6 Irrigation Method Alternative

The project will support surface irrigation system through the irrigation canal to the proposed 100 hectares in Musangashi area. Other methods available in the farm block are centre Pivot (Sprinklers) and drip irrigation system.

3.36.7 Chemical Storage Alternative

The project will engage agro-dealers to set up agro-shops in the farm block. The agro-chemicals will be stored in a well-ventilated storerooms to be constructed by the agro-dealers.

3.36.8 Criterion of beneficiaries Alternative

This alternative caters for 350 medium scale farm beneficiaries (10-40ha), who have state leasehold land. Another 400 smallholder communal farmer under traditional/Customary consent to qualify for selection for rainfed and irrigated crop production of maize, soyabeans, and cassava. Other 400 beneficiaries with customary consent will be selected for horticulture production crops such as tomatoes, rape, onions, cabbages etc.

4.0 Environmental and Social Baseline Situation

The environmental and social baseline conditions presented in this chapter are for the Nansanga Commodity Value Chain Transformation Project from Nansanga Farm Block in Serenje districts. The data is presented under three sub-headings namely physical, biological and socio-economic environments

4.1 Physical environment

4.1.1 Climatic Conditions

Nansanga Farm Block, like the rest of Serenje District, climatic conditions are typical with three distinct seasons: the warm wet season (rainy season), stretching from November through to April; cool dry cold season from May to July with the mean temperatures varying between 13°C and 22°C. Minimum temperatures in the cold season at times drop below the 12°C, especially between June and July. The hot dry season is experienced during the months of August to October with temperatures ranging from 15°C to 35°C. Warm winter days are accompanied by cold nights.

4.1.2 Rainfall

According to Meteorological report (2022), Nansanga Farm Block falls in agroecological zone two (2). The proposed area receives an average annual rainfall of between 800mm to 1200mm, which are influenced by Southward migration of the Inter-tropical Convergence Zone, and characterized by thunderstorms which are occasionally severe, with excessive lighting and sometimes hail.

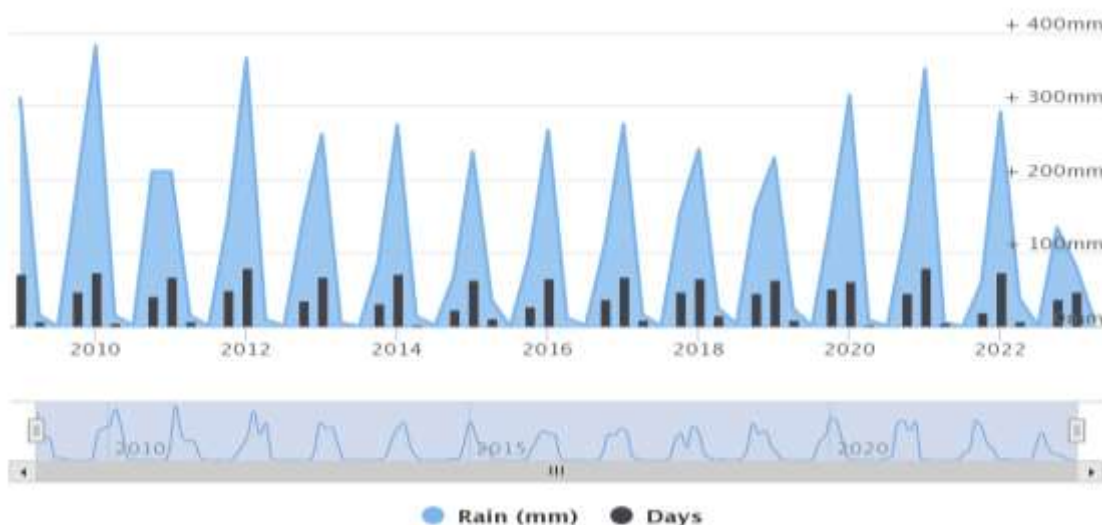


Figure 11: Shows Rainfall Trend in Serenje District (Meteorological data, 2022)

4.1.3 Temperature

The temperatures in Nansanga Farm Block like any other similar places in Serenje district experience similar temperatures. On average temperature ranges between 10°C to 31°C respectively. October is the hottest month with maximum temperature reaching as high as 31°C (Figure 6). The lowest temperatures of about 10°C are recorded in the month of July.

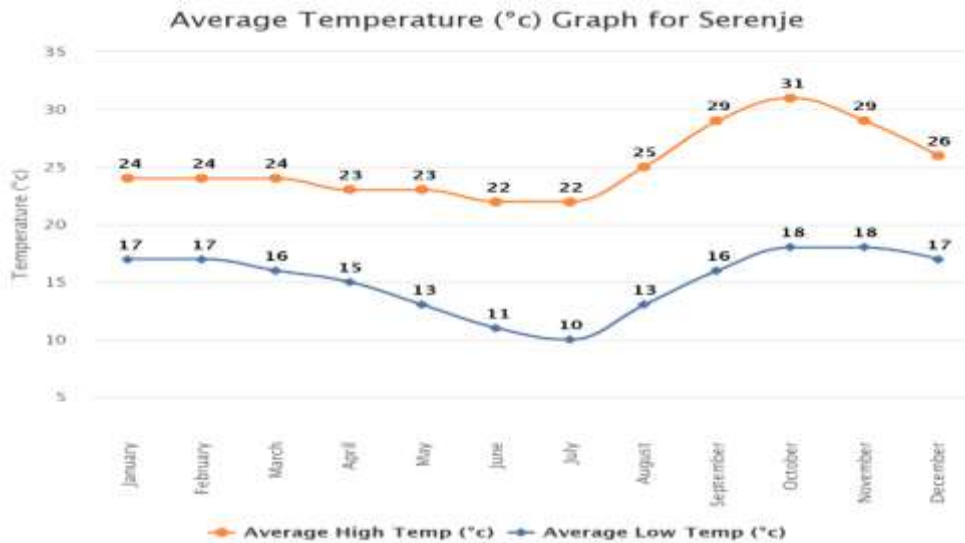


Figure 12: Average Temperature in Serenje District (MET, 2022)

4.1.4 Humidity

According to the studies available at Serenje Meteorological Station, the average humidity in Nansanga Farm Block varies from year to year. Serenje experiences some seasonal variation in the perceived humidity. The muggier period of the year lasts for 4.3 months, from December 1 to April 10, during which time the comfort level is muggy, oppressive, or miserable at least 6% of the time. The month with the muggiest days in Serenje is January, with 6.1 days that are muggy or worse.

4.1.5 Wind Speed

According to Meteorological report (2022), the predominant average hourly wind direction in Serenje is from the east throughout the year, while the average wind speeds range from 1.4m/s in summer months to 0.8m/s in winter periods. Nansanga Farm Block is a remote community setting with no industrial emissions currently.

4.2 Noise Level

The noise level was measured using a sound level meter. The device was calibrated before each measurement with an internal calibration and three records were taken per site, for three weeks using specific mathematical dependencies to designate the noise values at the project site. The assessment was conducted at Serenje Property limited, Zambia Correctional Service, Mutale area and Kapumbu area. The only potential sources of noise recorded are Serenje Property limited and Zambia Correction Services due to the moving of machinery, generally, the impact is insignificant. The noise level in Nansanga farm Block is very low.

Table 11: Shows Noise Level in Nansanga Farm Block

Location	Mean (dB)	Minimum (dB)	Maximum(dB)	Noise Source	Coordinates System
Serenje Property Limited	39.2	37.8	46.8	Machinery	-12°51' 22.6"N 30°12 ' 18.10" E
Mutale area	33.4	24.8	42.1	Human noise, Bird sounds	-12°49'27.12" N 30°6'18.42" E
Kapumbu Area	45.9	37.8	53.9	Human noise, Bird sounds	-12°57'5.8" N 30°3'38.32" E
Zambia Correctional Service Farm	42.3	48.3	56.4	Machinery	-12°57'26.15" N 29°56' 7.89" E

4.3 Air Quality

The portable hand held dust particle device was calibrated, locally tested and used for the air quality assessment. The readings were recorded at Serenje property limited, Mapepala, Kabundi and Correctional service farms. From the reading, it was observed that the the ambient dust collected falls within the Zambian standards range of 7.5 tonnes/km² over 30 days. The air quality is very good because the farm block is not yet developed, though land preparation and construction of access road network will impact on the air quality and may change the current status. **Table 11:**

Shows air Quality in Nansanga Farm Block

Location	Days	Tonnes/Km ² /30 days	Coordinates System
Serenje Property Limited	28	0.567	-12°51' 22.6"N, 30°12 ' 18.10" E
Mutale area	26	0.128	-12°49'27.12" N, 30°6'18.42" E
Kapumbu Area	26	0.148	-12°57'5.8" N, 30°3'38.32" E
Zambia Correctional	28	0.471	-12°57'26.15" N, 29°56' 7.89" E

All the four sites air quality assessment was below the limit. The impact will be minimal and manageable mainly during construction phases. The air quality in Nansanga Farm Block is quite good, though the implementation of the project will impact on this aspect and may change the current status. The impact will be low and mainly during land preparation and construction phases.

4.4 Hydrology and Drainage System

The Nansanga Farming Block’s drainage System is supported by the Luangwa (Central) Watershed, which runs from the South to the North of the District. This watershed is the source of the main rivers namely the Luombwa, Munte and the Kasanka. There are also sub-catchment areas within and outside the farm block which are of significant importance to the farm block, these are: the Musangashi, Luombwa, Musola. Mulembo Local Forests, which form sources of perennial streams, which flow into the main drainage system.

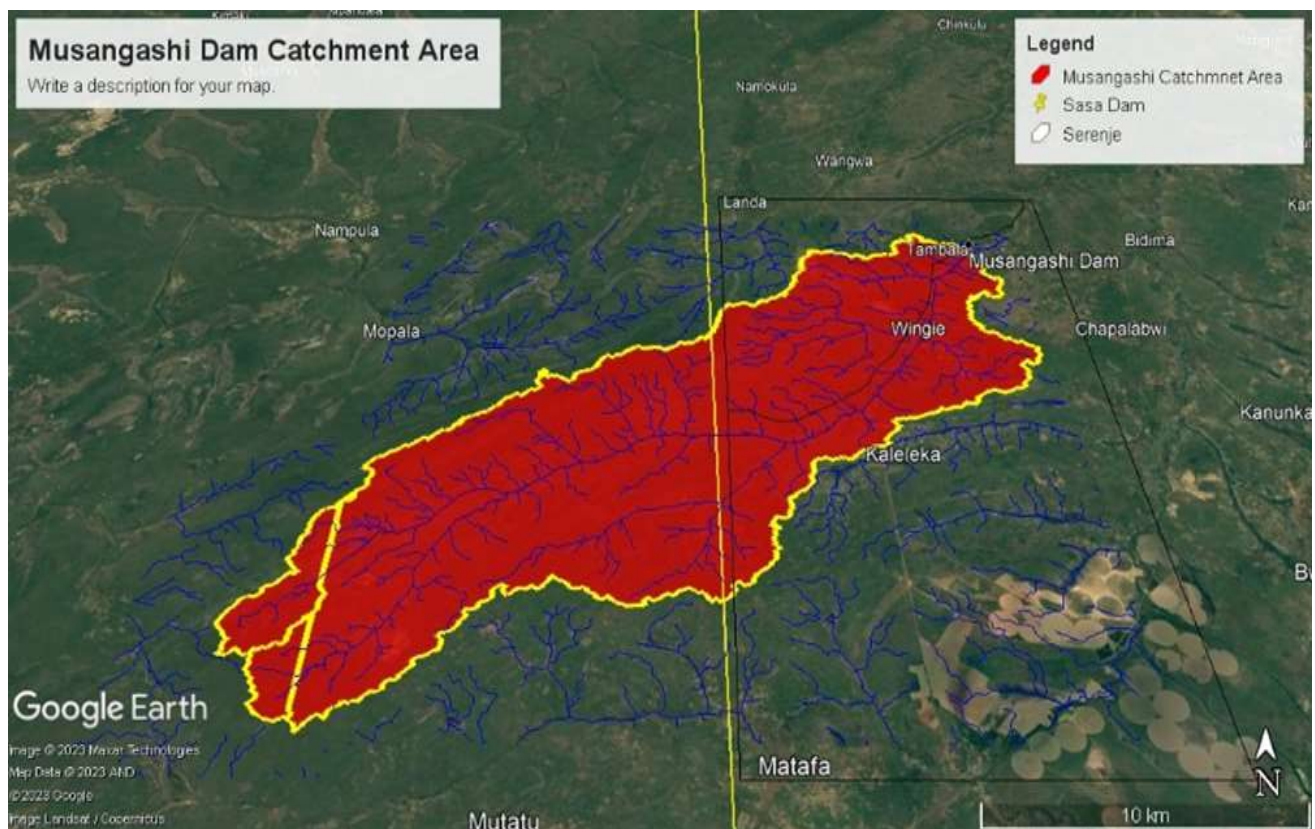


Figure 13: Shows Musangashi Dam Catchment Area (Baseline survey, 2023)

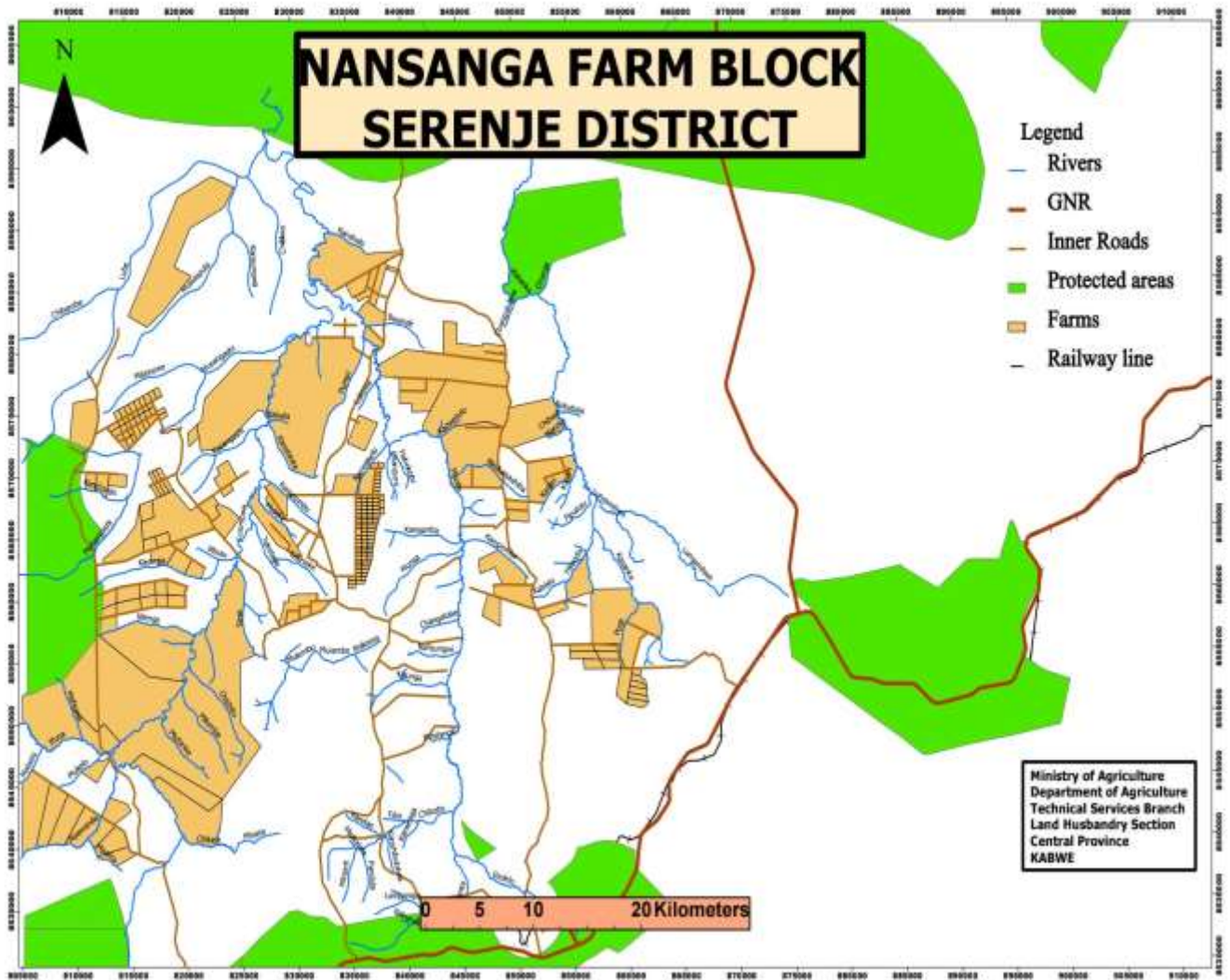


Figure 14: Shows Rivers and Streams drainage system

4.5 Zambia Hydrological Catchment

Nansanga Farm Block, its hydrological catchment is Luangwa Catchment. According to WARMA report, (2023), The Luangwa River Catchment (LRC) is approximately 145,690.33 Km² within Zambian territory and it lies between latitudes 9°30” North and 15°40” South, and between longitudes 28°00” West and 33°45” East. The Luangwa River has its sources at an Elevation of over 2100 at Mafinga Hills and ends at an elevation of less than 370 at Feira. This represents the largest drop in elevation of any river in Zambia. The river also has extensive flood plains in some parts that have alluvial aquifers that act as key groundwater sources for the rural population in Eastern Parts of Zambia. The Catchment forms the International Boundaries with Malawi to the East, DR Congo to the North-West and Mozambique and Zimbabwe to the South. Among the

features that defines its extents are watersheds namely the Muchinga Escarpment to the North, the Lake Malawi to the East, and Kafue to the west, Congo in the North-West and Lower Zambezi in the South.

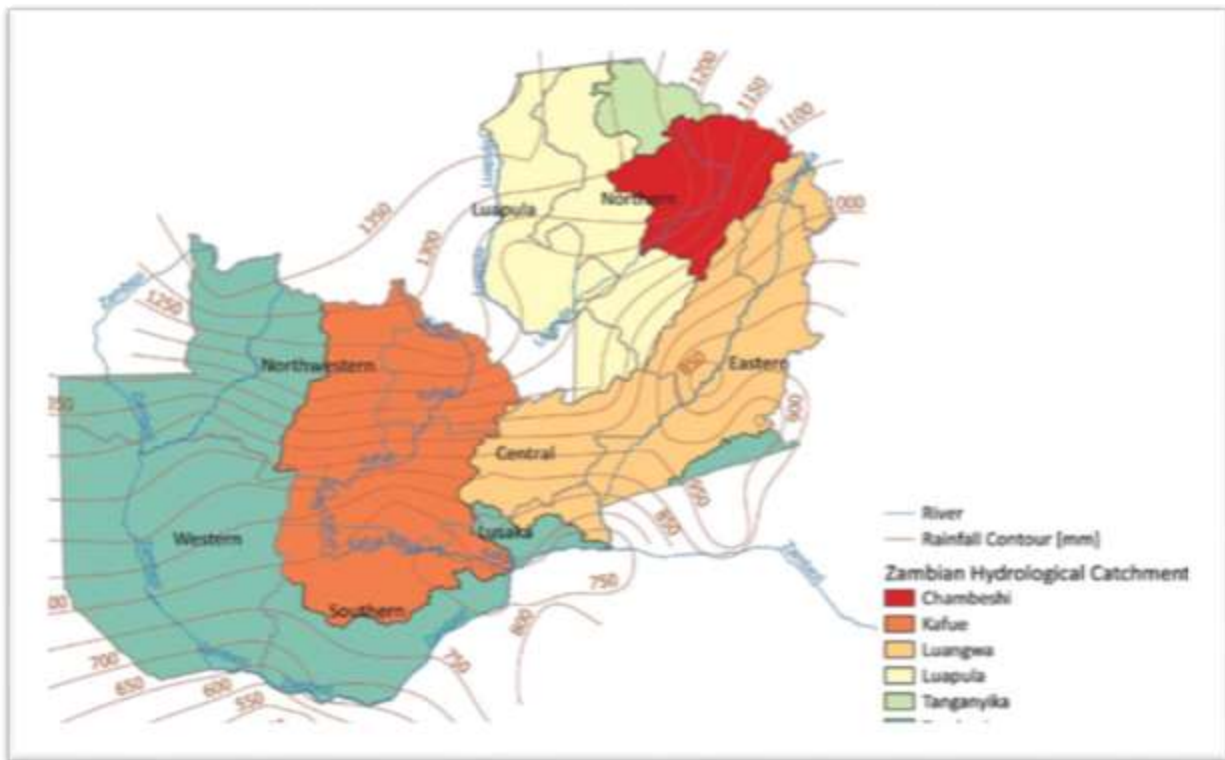


Figure 15: Shows the Zambia Hydrological Catchment (WARMA Report, 2019)

4.7 Topography

Serenje District lies at an altitude of 1120m above sea level. The Muchinga escarpment dominates the landscape on the southeast while the rest of the district is composed of scattered hills and a soft undulating valley in the southern part. The project area is composed of ridges, plains, pans and undulating surfaces.

4.8 Soils

The interpretation of the soil analysis is according to general norms and site/crop specific. An extraction Method 9080 (Cations – NH₄OAc) was used to determine the cation-exchange capacity of soils. The results indicate that the physical soil texture comprised of sandy loamy soils for all the surface samples collected on the four hectares labelled as CP8E, CP8W, CP9E and CP9W. The soil organic carbon levels are adequate for the three hectares labelled as CP8E, CP8W and CP9E, but CP9W the organic carbon level is deficiency. The critical deficiency limit is

approximate 0.8%. Further, the analytical elements total test indicate that Zinc is deficiency with the range from 0.5mg/kg to 0.8mg/kg across the field. Manganese deficiency is within the range of 7.5mg/kg to 17.5mg/kg, Copper deficiency is also in range of 0.3mg/kg to 1.1mg/kg and the Nickel deficiency was found to be 0.01mg/kg in all the four hectares.

Soil iron content was found to be adequate within the range of 17.8mg/kg to 22.1mg/kg. Therefore, the results indicated in the table 4, indicates that soil texture is responsive to correct amount of fertilizer, coupled with good agriculture practices. With correct fertilizer management and good agriculture practices, all the three crops proposed in the project will be able to give good yield.

Table 12: Shows Soil Analysis in Nansanga Farm Block

Routine	Soil Analysis			
Sample Number	CP8 E -12°56'50.22" 29°57'11.89"	CP8 W -12°56'50.26" 29°57'15.20"	CP9 E -12°56'53.47" 29°57'11.85"	CP9 W -23°56'53.51" 29°57'15.16"
Crop	Soybeans, Maize, Cassava	Soybeans, Maize, Cassava	Soybeans, Maize, Cassava	Soybeans, Maize, Cassava
Hectares	1.0	1.0	1.0	1.0
Sample depth	Top-Soil	Top-Soil	Top-Soil	Top-Soil
Bulk Density (kg·m ⁻³)	1097.2	1114.69	1142.79	1299.65
pH (KCl)	4.5	4.7	4.1	4.1
S (mg·kg ⁻¹)	9	9	11	13
P (Bray I) (mg·kg ⁻¹)	9	2	24	8
P (Olsen) (mg·kg ⁻¹)	-	-	-	-
K (mg·kg ⁻¹)	107	98	154	103
K(% of ECEC)	10	9	16	24
Ca (mg·kg ⁻¹)	354	363	306	111
Ca(% of ECEC)	64	66	62	50
Mg (mg·kg ⁻¹)	85	79	63	33
Mg(% of ECEC)	25	24	21	24
Na (mg·kg ⁻¹)	10	10	4	7

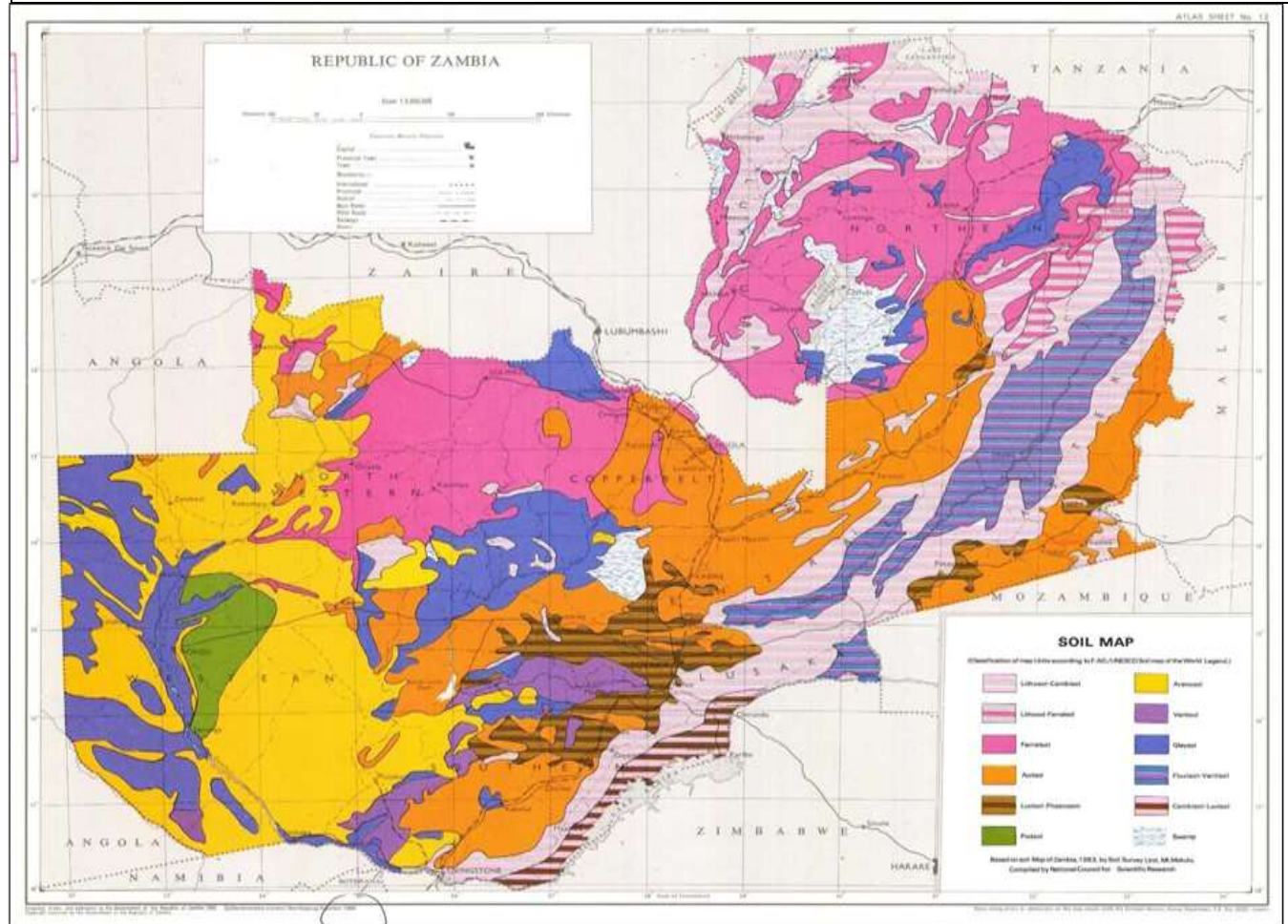
Na(% of ECEC)	2	2	1	3
ECEC (cmolc·kg ⁻¹)	2.8	2.8	2.5	1.1
Ca / Mg	2.5	2.8	3.0	2.1
Mg/K	2.5	2.6	1.3	1.0
(Ca + Mg) / K	9	10	5	3

The interpretation of this analysis is according to general norms and site/crop specific interpretation is advised.

This laboratory is ISO/IEC 17025:2005 accredited by SANAS (Test laboratory No T0466) for the quantification of Ca, Mg, Na and K in soil.

Extraction Methods
Cations – NH₄OAc

P - Bray I \ Olsen(pH >= 7.3)



Source: GRZ (1986)

Figure 16: Show Soil Map of Zambia

4.9 Geology

The geology of Nansanga Farm Block is described as Kibaran and Karroo system. The Kibaran has a basement complex of the pre-Katanga formations that were affected by the Kibaran orogeny and includes Granites, Gneisses, Migmatites, Metasediments, Phylites, Cataclasites, Amphibolites and Metavolcanics. The basement complex consists of highly deformed gneiss, schists and migmatites caused by erosion and rifting systems. The basement complex is overlain by undeformed Precambrian to lower Paleozoic sediment known as the Plateau Series.

4.10 Surface and Underground Water Quality

The borehole (W1470, -12°49'6.46") and Surface Water at Musangashi Dam (W1471,-12°53' 12.84", 29° 55' 48.25") at an elevation of 1239m was analysed at the **National Food and Drug Laboratory at the University Teaching Hospital** under the Ministry of Health. The water quality results shows that PH level is within the recommended ZABS/WHO standards. The iron content of 4.8 ppm for the borehole (W1470) is higher than the recommended 0.3 ppm by ZABS/WHO. Iron removal filters should be installed on the outlet suction pipe in order to reduce the iron content level. Other options are Aeration and chemical oxidation. Other elements are within the recommended standards by ZABS/WHO. Refer to results chart below.

Table 134: Water quality test results in Nansanga Farm Block

PHYSICAL AND CHEMICAL EXAMINATIONS DONE

PARAMETER	W1470	W1471	ZABS/WHO
Appearance	Clear	Clear	Clear
Odour	Inoffensive	Inoffensive	Inoffensive
pH	6.83	6.95	6.5 - 8.5
Total Dissolved Solids (TDS) mg/l	63	12	800
Conductivity (us)	122	26	1500
Turbidity (NTU)	2.04	0.04	0-5
Calcium Hardness (mg/l)	96.19	60.12	100
Total Hardness (mg/l)	78	52	500
Chlorides, Cl ₂ (mg/l)	33.49	24.49	250
Copper (cu) ppm	0	0	1
Nitrates ppm	0.5	0.4	10
Iron (Fe) ppm	4.8	0.6	0.3
Cobalt (co) ppm	0		0.5

REMARKS: The results of the analysis are as stated.


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PUBLIC ANALYST

4.11 Description of the Biodiversity Environment

Biodiversity is defined as all the different kinds of life you'll find in one area the variety of animals, plants, fungi, and even microorganisms like bacteria that make up our natural world. Each of these species and organisms work together in ecosystems, like an intricate web, to maintain balance and support life, and health environment.

4.11.1 Ecosystem Services

Ecosystem services are the benefits provided to humans through the transformations of resources (or environmental assets, including land, water, vegetation and atmosphere) into a flow of essential goods and services e.g. clean air, water, and food. These services are:-

- i. **Provisioning services:** - (mostly food and fibre commodities) along with the supporting services that need to be replaced in order for these services to continue to flow.
- ii. **Regulating services-** where some of these services, e.g. pest regulation, seed dispersal, disease regulation and erosion regulation. Other services, such as climate control, as carbon sequestration.
- iii. **Supporting services-** Support services to soil and biodiversity conservation. Others, such as water for environmental flows, are part of the services.
- iv. **Cultural services-** include knowledge of country and place, which is important to Indigenous people. Another example is nature based tourism that has significant economic value.

4.11.2 Flora Assessment

Following the provisions of law as outlined in the Environmental Management Act 2011 and Forest Act, 2015, on promoting the conservation of natural resources and biological diversities, the floral assessment was implemented to collect, compile and disseminate information on forest resources existing in any area and advise on areas requiring tree afforestation and reforestation and protection of flora threatened or in danger of extinction. The focus of this forest assessment was:

- i. To verify and determine the estimated vegetation area to be adversely affected by project.
- ii. Assessing and quantifying the adversely affected wood volume by the project.
- iii. To identify the botanical attributes of the assessment area.
- iv. To compile lists of species observed in Nansanga Farm Block.
- v. To describe the extent and type of native vegetation present
- vi. To determine the presence or absence of threatened species

4.11.3 Forest Assessment Methodology

To obtain the aforementioned key objectives of the forest resources assessment, data collection was biased towards a descriptive study in which the team conducted a feasible forest resource verification and traversing activity within Nansanga Farm Block area. Observations and face-to-face interviews were the two data collection tools.

The inventory was conducted using circular sample plots of diameter 20m established along a single traverse line. The following parameters of interest were assessed;

- i. **Tree Stocking Density:** - determining the existing number of tree species in a particular sampled plot of 20metres diameter. This was attained through physical counting of individual living tree species according to maturity levels, tree diameter and bore height within the sample plot area picked. Tree species composition was expressed in terms of frequency of occurrence, the most frequent species indicated as common and the least frequency as rare. The number of stems per hectare was used as a measure of stand density.
- ii. **Diameter at Breast Height (DBH):-** This is the thickness or width of any tree trunk or stem of a living standing tree. The DBH was determined by physically measuring the tree diameter at a tree height of 1.3m from the ground using a measuring tape instrument. The average DBH of trees was ranging from 3cm to 50cm. This was done as part of determining the growth rate of different tree species
- iii. **Tree Height/Bore Height:** - This is the description of individual tree species according to height from the ground to crown of the tree. This simply shows the height (tallness) of trees and was measured in meters. The average tree height was ranging between 3 - 21 meters and measurement was done using Tolley pole instrument.
- iv. **Presence of Regeneration:** This is the available secondary regrowth of living small vegetation or trees that have regenerated from human activity disturbance and are below 3cm diameter within the 10m diameter of the sample plot area. Regeneration stock was physically counted by hand.
- v. **Tree species:** This is the description of tree species according to botanical/scientific nomenclature to distinguish individual tree species according to characteristics. Tree identification was done in local language and scientifically using tree parts such as barks, leaves and fruits and by use of Literature such as Know Your Trees Book by Storrs(1995).
- vi. **Sample plots:** This is an area representing vegetation cover and existence of bio-diversity in a particular area within the project site and was marked by use of a Geographical

Positioning System (GPS) instrument. Coordinates were marked along project site boundary line and within the internal area whose sample plots were measured at 20meters diameter for mature trees and 10 meters diameter for the regeneration stock.

4.12 Field Observations/Findings

4.12.1 Vegetation Type

Nansanga Farm Block (NFB) is predominated by Miombo woodland type of vegetation which was physically counted, identified and recorded according to individual tree species. MTENR (2010) notes that, Miombo woodland is a two-storeyed woodland with an open or partially closed canopy of semi-evergreen trees 15 – 21m high characterized by species of *Brachystegia*, *Isoberlinia*, and *Julbernadia* and *Pericopsis angolensis* as frequent associates. The forest floor is covered by a more or less dense grass cover. Relic patches of evergreen thicket may or may not be present. Miombo woodland has also spread from the plateau onto the adjacent hills and down the escarpments, and also occurs as a relic in the major river valleys. Over 65% of the forests are secondary regeneration with active growth potential.



Figure 17: Miombo Woodland in Nansanga Farm Block

During field forest survey assessment and Stakeholder consultation with the Forestry Extension Officer and the local people different species are found/existing in the farm block due to favorable climatic conditions. There are 29 dominant indigenous tree species available in Nansanga farm block.

Table 14: Shows different Tree Species

S/N	Botanical Nomenclature	Local Name	IUCN Red List Conservation Status
1.	<i>Azelia quenzensis</i>	Mupapa	Least Concern
2.	<i>Albizia antunesiana</i>	Musasa	Least Concern
3.	<i>Brachystegia boemii</i> (Miombo)	Ngansa	Least Concern
4.	<i>Brachystegia longifolia</i> (Miombo)	Musamba	Least Concern
5.	<i>Brachystegia spiciformis</i> (Miombo)	Muputu	Least Concern
6.	<i>Brachystegia floribunda</i> (Miombo)	Mubombo	Least Concern
7.	<i>Combretum molle</i>	Mulama	Least Concern
8.	<i>Diplorynchus condylocarpon</i>	Mwenge	Least Concern
9.	<i>Erythloeum africanum</i>	Kaimbi	Least Concern
10.	<i>Faurea saligna</i>	Saninga	Least Concern
11.	<i>Isoberlina angolensis</i>	Mutobo	Least Concern
12.	<i>Julbernardia paniculata</i>	Mutondo	Least Concern
13.	<i>Monotesi africanus</i>	Chimpampa	Least Concern
14.	<i>Ochna pulchra</i>	Kabanga	Least Concern
15.	<i>Parinari curatelifolia</i>	Mupundu	Least Concern
16.	<i>Pericopsis angolensis</i>	Mubanga	Least Concern
17.	<i>Pterocarpus angolensis</i>	Mukwa	Least Concern
18.	<i>Protea gauged</i>	Musoso	Least Concern
19.	<i>Syzigium guinesse</i>	Mufinsa	Least Concern
20.	<i>Swartzia madagariensis</i>	Ndale	Least Concern
21.	<i>Piliostigma thonningi</i>	Musekese	Least Concern
22.	<i>Ficus species</i> (Fig Tree)	Mukunyu	Least Concern
23.	<i>Strychnos cocculoides</i>	Kasongole	Least Concern
24.	<i>Uapaka kirkiana</i>	Musuku	Least Concern
25.	<i>Anisophylea boemii</i>	Imfungo	Least Concern
26.	<i>Strychnos pungens</i>	Mutotelakubili	Least Concern
27.	<i>Azanza garckeana</i>	Mukole	Least Concern
28.	<i>Vangueriopsis lanciflora</i>	Mungolomya	Least Concern

4.13 Biodiversity

During the field survey and consultation with key informants such as the Forestry extension Officers and the local community people, a variety of existing biological diversities and fauna were observed and recorded in the Nansanga Farm Block. These fauna include: Algae, Monkeys, Bees, Beetles, Birds, Chameleon, Frogs, Snakes, Snails, Wild-Mushroom, Wild-Mice, and many others. Some of the flora and fauna living organisms will be disturbed and lost during project implementation activity in Nansanga Farm Block. The table below shows the scientific name, common name and rating according to International Union for Conservation of Nature.

Table 15: Shows Fauna groups common in Nansanga Farm Block

Mammals			IUCN Red List
	Scientific Name	Common Name	Conservation Status
1	<i>Cercopithecus pygerythrus</i>	Vervet monkeys	Least Concern
2	<i>Lepus victoriae</i>	Hare	Least Concern
3	<i>Paraxerus cepapi</i>	Bush squirrel	Least Concern
Reptiles			
	Scientific Name	Common Name	
1	<i>Bitis arietans</i>	Puff Adder	Least Concern
2	<i>Chamaeleo dilepis</i>	Common Flap-Necked Chameleon	Least Concern
3	<i>Gerrhosaurus nigrolineatus</i>	Black-Lined Plated Lizard	Least Concern
4	<i>Kinixys spekii</i>	Tortoise	Least Concern
5	<i>Python sebae natalensis</i>	African Python	Least Concern
Amphibians (Aquatic)			
	Scientific Name	Common Name	Least Concern
1	<i>Phrynobatrachus natalensis</i>	Puddle Frog	Least Concern
2	<i>Ptychadena oxyrhynchus</i>	Ridged Frog	Least Concern
3	<i>Xenopus laevis pertersii</i>	Clawed Frog	Least Concern
Fish (Aquatic)			
	Scientific Name	Local language	
1	<i>Tilapia sparmanii</i>	Katanga	Least Concern

2	Tilapia rendalli	Impende/ mpende	Least Concern
3	Oreochromis macrochir	Ikamba	Least Concern
4	Pseudocrenibrus philander	Infindu	Least Concern
5	Clarias ngamensis	Mulonge	Least Concern
6	Brycinus species	Imisenga	Least Concern
7	Serranochromis species	Imbilya	Least Concern
Birds			
	Scientific Name	Common Name	
1	Gallinula chloropus	Common Moorhen	Least Concern
2	Kaupifalco monogrammicus	Lizard Buzzard	Least Concern
3	Milvus migrans	Black (Yellow-billed) Kite	Least Concern
4	Oriolus larvatus	Eastern Black-headed Oriole	Least Concern
5	Parus griseiventris	Miombo Grey Tit	Least Concern
6	Pycnonotus barbatus	Common Bulbul	Least Concern
7	Streptopelia semitorquata	Red-eyed Dove	Least Concern

Pictures from different Fauna in Nansanga Farm Blok



Wild Mushroom



Snails



Tilapia rendalli



Serranochromis species



Clarias ngamensis



Cercopithecus pygerythrus



Gallinula chloropus



Parus griseiventris



Python sebae natalensis



Ptychadena oxyrhynchus

4.14 Description of the Social Economic Environment

4.14.1 Methodology for Socio-Economic Assessment

Socio-economic baseline data was collected by using primary sources of data from the field surveys as well as secondary data sources through various literatures.

4.14.1.1 Primary data

The ESIA study team visited targeted farms for data collection on socio, economic and land utilization and farm development. Some local people in Nansanga Farm Block were engaged to provide information for farms that had no homesteads and farming activities. All Schools and clinics were visited to obtain important information relevant for planning. Targeted infrastructure (dams, bridges and roads) were assessed through visual assessments. For roads, information was also obtained from road users. Mining sites were visited to obtain important information about mining activities. Prior to conducting socio-economic survey assessment in Nansanga, the study team went round in Nansanga farm block to inform the traditional leadership (advisers to the chief) about the survey. The team visited the headmen (Chilolos) because Muchinda Chieftdom has had no Chief since 2010 when the last Chief died.

4.14.1.2 Secondary data

The secondary data sources are:-

- i. Printed maps for Nansanga farm block
- ii. Latest Sentinel 2 images for Nansanga (October 2021 and April 2022).

- iii. Google sheets for data entry.
- iv. Ministry of Agriculture Farm Block development database.
- v. Ministry of Agriculture farm block development reports.

4.15 National Profile

Zambia is a landlocked country, and it is located between latitudes 8° and 18° south and longitudes 22° and 34° east. The country covers a total area of 752,612 square kilometres. Zambia is surrounded by Malawi, Zimbabwe, Angola, Namibia, Tanzania, Democratic of Congo, Botswana and Mozambique. Zambia has administrative ten provinces, these includes: - Central, Lusaka, Copperbelt, Luapula, Eastern, Southern, North Western, Western, Muchinga and Northern. According to the Zambia Statistic Agency national census report (2022), indicates that the total population was estimated at 19.6 million people in 2022. The male population was 9,603,056 and the female population was 10,007,713. Zambia has 116 districts, 156 constituencies and 1,430 wards. Lusaka is a capital city of Zambia. According to the living condition monitoring survey (2006: 2010), the results indicates that majority of Zambians have continued to live in poverty. The proportion of the population falling below the poverty line reduced from 62.8% in 2006 to 0.5% in 2010. Further, the proportion of extremely poor marginally declined from 42.7% to 42.3%.

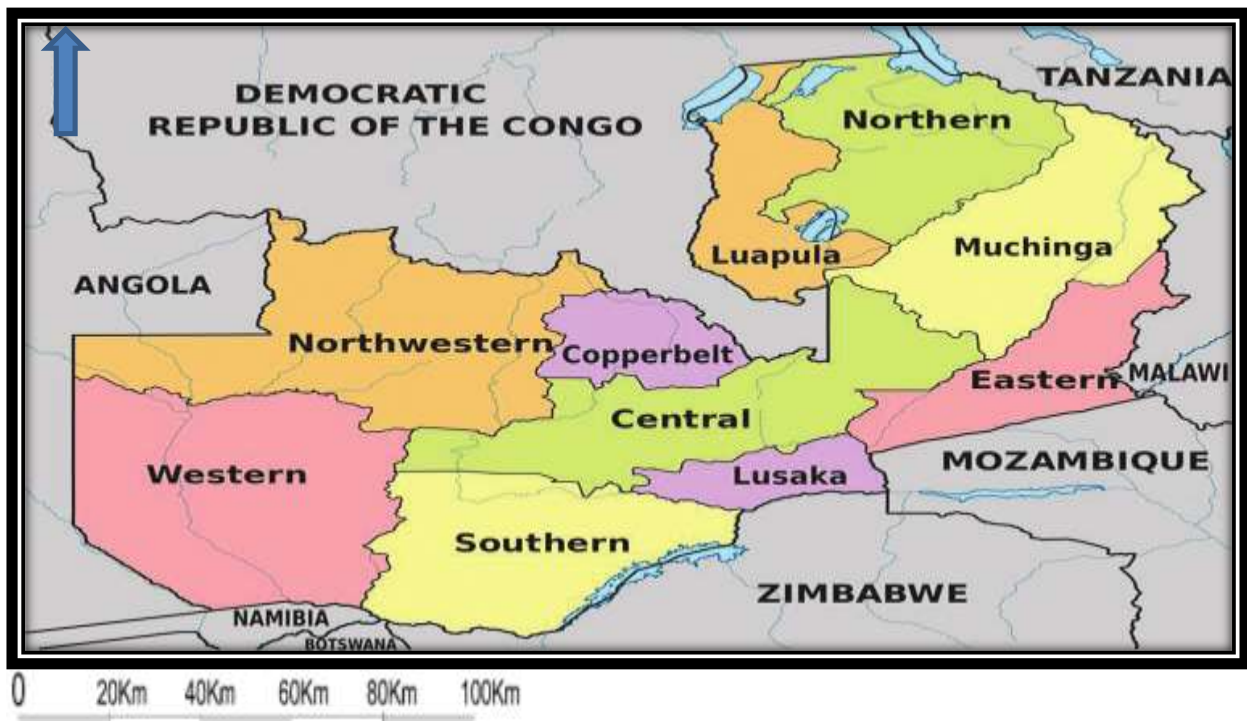


Figure 18: Shows Map of Zambia (Zambia report, 2022)

4.16 Mineral Resources

The main mineral resources and precious stones available in Zambia includes: Copper, Manganese, Lead, Uranium, Emerald, Zinc, Gold and Diamond. Others are Sugilite, Iron, Coal, Sand, Quartz etc. Copperbelt, North-Western, Central, Muchinga, Luapula and Northern Province have major mining activities.

4.17 National Parks and Game Reserves

The national parks and game management reserves consist of more than 30% of Zambia's total area of 752,612 square kilometres reserved for wildlife. There are 20 national parks and 34 game management areas in the country. South Luangwa, Kafue and Lower Zambezi rank among the finest national parks in the world. Others are Kasanka, Luambe, Lukusuzi Liuwa Plain, West Lunga, Sioma Ngwezi, and Nyika Plateau have substantial wildlife but are still relatively undeveloped in terms of infrastructure. Mosi-oa-Tunya, near Victoria Falls in Southern Province, is regarded as a zoological park as it has a well-managed population of antelope, elephants, giraffe and rhino but does not have any predators.

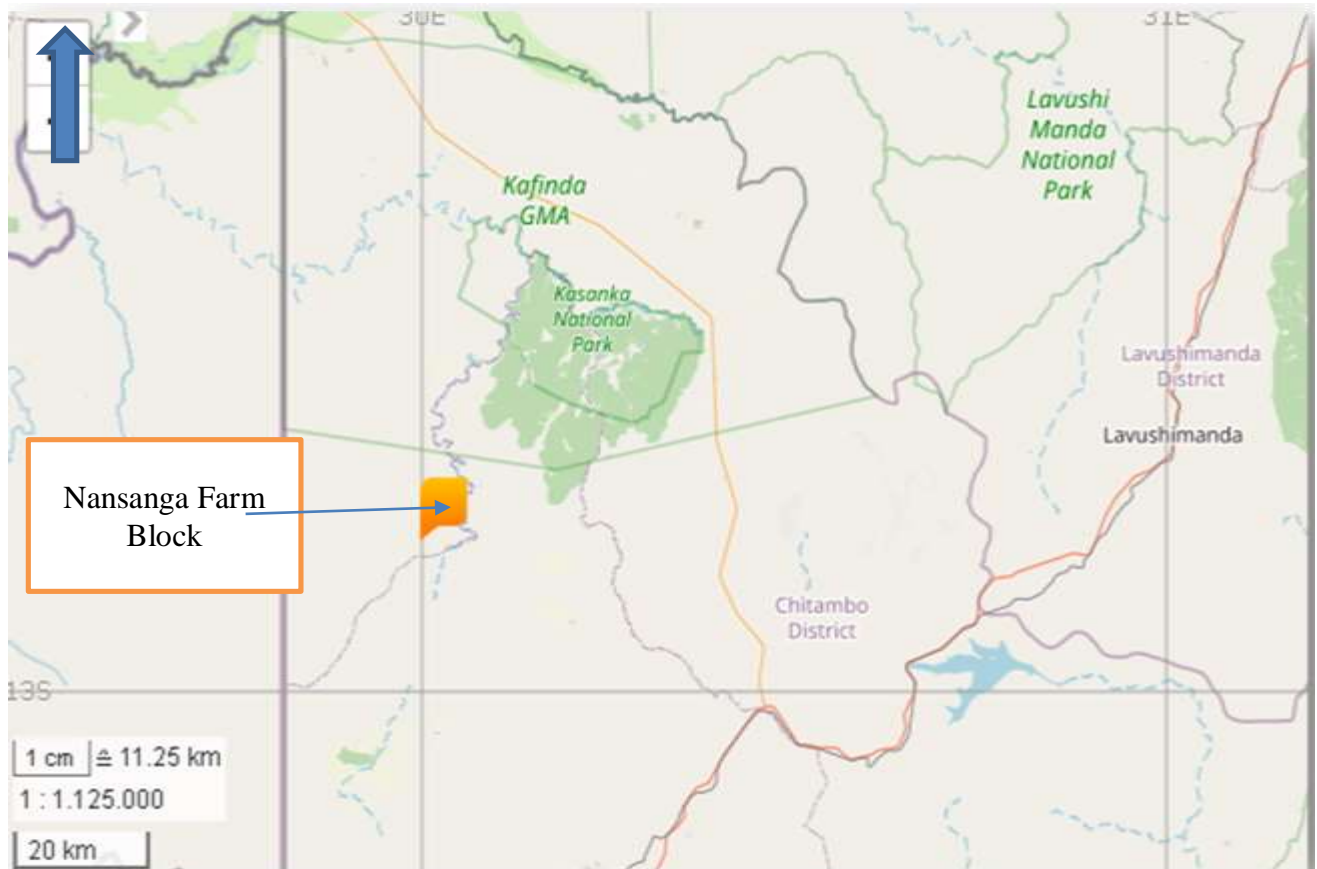


Figure 19: Map show National Park and Gama Management

4.18 Provincial Profile

Central province lies between latitudes 12° and 16° South of the equator and between longitude 25° and 31° east of the Greenwich. The province has eleven (11) districts, which are Chibombo, Chisamba, Chitambo, Kabwe, Kapiri Mposhi, Luano, Mkushi, Mumbwa, Ngabwe, Serenje and Shibuyunji. The total area for the province is 92,640 square kilometres. According to the Zambia Statistic Agency national census report (2022), indicates that the total population was estimated at 2.25 million people in 2022. The male population was 1,114,979 and the female population was 1,137,504. The distribution of the population in the province is concentrated on the plateau along the line of rail from Chisamba to Kapiri Mposhi and the TAZARA corridor, which borders with the Luano valley to the east. Areas with sparse population are the Luano valley and the areas around the Lukanga swamps. The population growth rate for the province is 2.8% per annum. Kabwe is the Provincial administrative center for Central Province.

4.19 Serenje District Profile

Serenje district lies between latitudes 13° and 23 °South of the equator and between longitude 30° and 23° east of the Greenwich. Serenje is one of the oldest Districts in Zambia having earned its District status in 1939. It is a District endowed with fertile land, good rainfall and abundant water bodies alongside cheap labor from the local community. It is the home of the Lala people whose primary language is Cilala.

Serenje District is constituted by six Chiefdoms which are Chisomo, Serenje, Kabamba, Mailo, Chibale and Muchinda. The inhabitants of the District mainly engage in agriculture which is the main source of income for most of the local people. The district has a total population of about 158,192 and covers an area of about 11,455 km². The district has 21 ward and two constituencies namely Serenje Central and Muchinga. Serenje district has four agriculture farm blocks, namely Nansanga, Kasanka, Luombwa and Munte. It has also two agriculture settlement schemes. These includes Kapumbu and Chiboboma.

4.20 Nansanga Farm Block Profile

Nansanga Farm Block consist of part of Lupiya (11,537 people), Kashishi (6,837 people), Musangashi (4,185 people) and Muchinda (22,727 people) wards in Muchinga and Serenje Constituencies.

The farm block total area is approximate 150,000 hectares, consisting of state land and customary/traditional land. It has 363 planned farms, which are allocated to (males - 257, Females – 49 and unallocated – 52) and 7 service centres. A total population of 1,750 (males – 1,080, and females – 670) is concentrated along Serenje - Mapepala Road, with dense population in Mukomansala, Mapepala, Shindaila and Nabowa Villages. Other major settlements are Mutale, Kapumbu, Kabundi, Kabeta, Ntenge, Musangashi and Masunga. The rest of the area is very sparsely populated.

Nansanga Commodity Value Chain Transformation Project will be implemented in Nansanga Farm Block targeting 350 smallholder farmers, both with title deeds and customary/traditional consent letters. The crop to be produced by the project beneficiaries (350) are soybeans, maize and cassava. Other targets are the 400 local community people under irrigation system around Musangashi area.

4.21 Land Tenure and Administration

Land tenure in Nansanga Farm Block, like any part of the country, is vested in the powers of the President on behalf of the Zambian people. Access to land is on lease tenure basis as governed by the Land Act. There are basically two types of land tenure systems in Zambia namely; State land and traditional land. About 70% of land in Zambia is held by traditional leaders who have powers to issue it for use by their subjects. No title deeds are issued for land under customary tenure system because this type of land is basically under communal ownership and as such property rights and security is dependent on the traditional leader's goodwill. The advantage of this system compared to leasehold is that everyone belonging to a particular chiefdom has shared ownership rights and cannot be declared landless. User rights on a given piece of land are thus passed on through inheritance or as a gift from the chief or his representative's headmen/women. There are several ways in which local community can access land. Access to land is based on the important traditional principle that all residents of the village are entitled to land for their personal or household use. This means that as far as virgin land is concerned any member of the related community can select a field for growing crops within the village territory.

State leasehold is a type of land where any individuals, investors or company can gain access of the land through land act conversion procedures. A land applicant identifies land in any part of Zambia, through the traditional leadership. A consent is granted for conversion of the land from

customary to state land through the respective local council. The advantage of this types is that it protects the land from grabbing and encroachment and also the lease title can be used as a security for mortgage, loans and other goods which requires a collateral. In the similar manner, the government through the Ministry of Agriculture applied for the land through his royal highness late chief Muchinda in 2002 for the establishment of a farm block. A consent was given and the planning of Nansanga farm Block concept was developed.

Nansanga Farm Block is a well-planned farm block consisting of 363 farms. All the planned farms are on title deeds with 99 years lease tenure, implies that it is a state land. The farms were allocated to the successful applicants between 2009 and 2010. The administration of the farm block is under the Ministry of Agriculture. Within the farm block, about 40% of the land was unplanned and reserved for local community people under customary/traditional area. Customary area within Nansanga Farm Block is administered by his royal highness chief Muchinda, through the headmen and headwomen. Nansanga Farm Block has more than 1,200 community people.

The chief is represented by the village headmen/women at the village community level and exercise jurisdiction over land in case of conflict or disputes. In order to empower people with right, Government of Zambia enacted the lands Act No. 29 of 1995 to recognize the title of individuals holding land under customary tenure. Further, the Act provides for the conversion of tenure of such holding from traditional to leasehold tenure. And this has changed the dynamics of the land tenure system.

4.22 Land Use

The major land use in Nansanga Farm Block is agriculture. There are two commercial farmers in the fame block, namely; Zambia Correctional Service farm and Serenje Properties limited a private entity. Major crops grown are seed maize, white maize, wheat, soyabeans and macadam nuts for commercial export market.

The smallholder farmers and the local people in the farm block are practicing subsistence farming. The farmers are cultivating using oxen driven rippers and hoes. The crops grown in Nansanga Farm Block by small scale farmers are white maize, groundnuts, soyabeans, mixed beans, cassava and tobacco. Apart from agriculture, the project area is also a source of catepillars and mushrooms.

4.23 Economic Activities

4.23.1 Agriculture

Primary data on maize, wheat, soyabeans, macademia nuts, tobacco, cassava, millet and groundnuts were captured during the field ESIA data capturing. Others crops included seed maize, tobacco, onion, potatoes, green pepper, tomato, watermelon, mixed beans, sorghum and popcorn. Macademia nuts, wheat, soya beans and seed maize are grown by Serenje Properties limited on commercial production. The correctional service farm grows Maize, wheat and Soya beans on commercial level. In terms of marketing, there's no formalized market in Nansanga Farm Block. As a result, all the agricultural produce is sold to nearby Food Reserve Agency, Serenje, Chitambo, Mkushi and other towns from other Provinces. On the other hand, macadamia being produced by Serenje Properties is being sold in South Africa where there is ready market, an opportunity that can be exploited as an out grower program with Serenje Properties being the aggregator of the crop. During the mapping exercise, it was also established that smallholder farmers were not conducting market surveys before crop production. However, farmers were looking for market after they had produced the commodities.

Table 17: Shows the Current Crop Trend for 2022/2023 in Nansanga Farm Block.

S/N	Commodity	Land Utilized (Hectares)	Volume (Metric Tons)	Remarks
1	Green pepper	5	60	Smallholder Farmers
2	Macademia	220	25	Commercial farmers
3	Groundnuts	8	5.5	Smallholder Farmers
4	Maize	190.75	601	Commercial farmers/Smallholders
5	Soya beans	354.5	891	Commercial farmers/ Smallholders
6	Tobacco	7.5	5.8	Smallholder Farmers
7	Tomato	5	70	Smallholder Farmers
8	Water melon	4	10	Smallholder Farmers
9	Wheat	100	400	Smallholder Farmers
10	Millet	1	0.2	Smallholder Farmers

11	Mixed beans	1	0.1	Smallholder Farmers
12	Onion	5	70	Smallholder Farmers
13	Popcorns	2	4.6	Smallholder Farmers
14	Potatoes	5	40	Smallholder Farmers
15	Seed maize	50	420	Commercial farmers
16	Sorghum	3	1	Smallholder Farmers
17	Cassava	35	15	Smallholder Farmers

From the table 7 above, soya beans, maize and seed maize recorded the highest, the values includes the commercial production by Serenje Properties limited and Correctional Service farms. Maize is a predominant crop grown by all the smallholder farmers in Nansanga farm Block. For the 2022/2023 farming season, Seed maize, Wheat and Macadamia nuts are grown by Serenje Properties. Smallholder farmers mainly grow maize, sorghum, onion, mixed beans, and millet for home consumption. Tobacco is a contract crop grown by few farmers on behalf of Alliance One in Nansanga Farm Block. Cassava crop is also produced by some smallholder farmers, and there is huge opportunity for cassava in form of chips and raw tubers in the production of starch, meal and feed a market to be provided by Chitambo Cassava Milling Plant in Chitambo district, once the milling plant is commissioned in the second quarter of 2023. Furthermore, there is projected high demand in future in view of its use in the fuel commingling process. The ethanol as one of the base feedstock in the fuel commingling is extracted from Cassava as a raw material and is also (ethanol) used as a base feedstock in the production of sanitizers.

From the field report, land utilized and production volume per food value chain in Nansanga Farm Block has 17 food value chains with a total hectares of less than 1,000 hectares underutilization and total production volume of less than 3000 metric tons. Out of the total production volume, maize accounted for about 600 metric tons, while soya beans accounted for about 900 metric tons. On the other hand, Serenje Properties produces about 400 metric tons of wheat. Majority of farmers are small to medium scale whose production volumes are quite low.

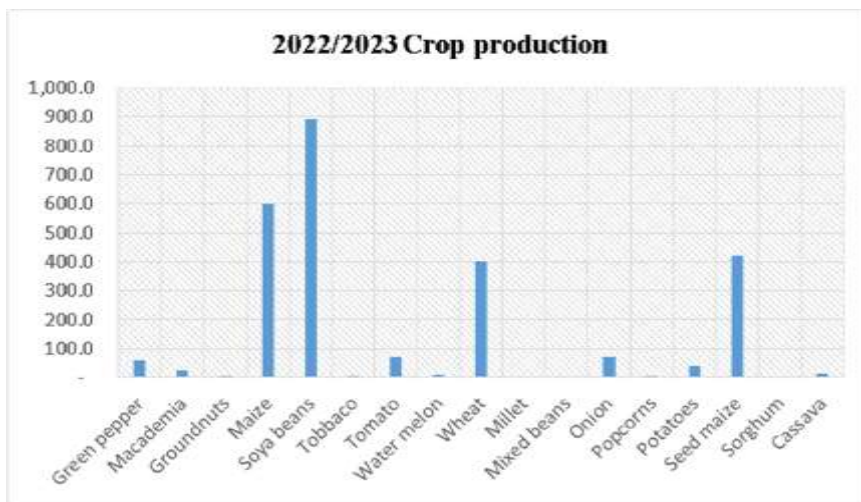


Figure 20: Crop Production baseline survey, 2023.

4.23.2 Market Availability

The major markets players are:-

- i. White maize - Food Reserve Agency
- ii. Soya beans - Food Reserve Agency, COMACO and other buyers
- iii. Cassava - Chitambo Milling Plant, Zambia Breweries/Agents and other Buyers

There are a number of agriculture produce players and stakeholders such as government and farmers association. The major buyer for the white maize and soya beans is the Food Reserve Agency (FRA). COMACO, also buys maize and soya beans. Surplus crop produce are exported to Namibia, Zimbabwe, Democratic of Congo and Botswana.

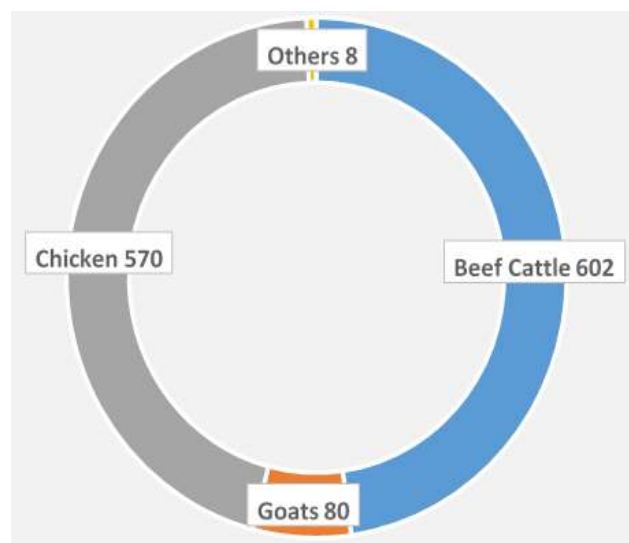


Figure 21: Food Reserve Agency Depot in the Project area

4.23.3 Livestock Activity

According to field findings of the ESIA study, beef cattle (602) is the largest number of livestock reared in Nansanga Farm Block. Serenje properties has the largest number (520) representing 86.7 % of the total population. The other farms are F10871 (40), Lot 24217 (12), F10900 (10) F10862 (9) and F10873 (9). A total 570 Chickens (broilers and local) were being reared at 13 different farms under medium commercial and smallholdings. Farm 10871 had the largest number of chickens (300) representing 52.6 % of the total chickens reared. 80 goats are being reared by medium commercial and small-holder farmers from 5 different farms. Other types of livestock (8) reared in the planned farms include turkeys and Guinea fowls. Figure 9-4: Shows the summary of livestock production.

Figure 22: Shows the summary of livestock production in Nansanga Farm Block



4.23.4 Mining Activity

According to the Nansanga Farm Block land audit report (2023), there are 18 mining licenses for Manganese ore in Nansanga Farm Block. 90% of mining activities are conducted in the traditional land, and concentrated in Kabundi, Saasa and Kapumbu areas. Only 10% affects smallholding farms in Nansanga Farm Block. Currently, the mining activities in the farm block has reduced, and mine reclamation (rehabilitation) procedures in Kabundi area is in progress. Major reclamation procedures are burying of mining sites, management of topsoil, revegetation,

managing wastes dumps, removal of access roads, removal of construction sites and heavy metals. The table below shows the active lincenses on the traditional/customary land and title deed land in Nansanga Farm block.

Table 16: Mining Lincese in the Farm Block

Sn	Lincense No	License Holder	Status/Comment
1	28466-HQ-LEL	Gold Tree Investment Limited (100%)	Active Lincense
2	15071-HQ-LML	Zamgem International Limited (100%)	Active Lincense
3	21073-HQ-LEL	Pentagon Resource Limited	Active Lincense
4	29199-HQ-SEL	African Digital Company Limited	Active Lincense
5	23117-HQ-LEL	Zamgem International Limited (100%)	Active Lincense
6	25033-HQ-LEL	Dayu Mining Limited	Active Lincense
7	25585-HQ-SML	Kabundi Resources Limited	Active Lincense
8	21491-HQ-SML	Kampoko Resources Limited	Active Lincense
9	29536-HQ-LEL	Liuwa Mineral Limited	Active Lincense
10	29222-HQ-SEL	Zomsampa Holding Limited	Active Lincense
11	23001-HQ-LEL	Linkstone Investment Limited	Active Lincense
12	30043-HQ-AMR	Whiteson S Daka	Active Lincense
13	23765-HQ-LEL	Kemose Mining Limited	Active Lincense
14	24638-HQ-LEL	Kampoko Resources Limited	Active Lincense
15	26670- HQ-LEL	Zambian United Mining Corporation Limited	Active Lincense
16	29536- HQ-LEL	Minatas Resources Limited	Active Lincense
17	29618-HQ-AMR	Kenneth Katobo (100%)	Active Lincense
18	28038-HQ-SEL	Chibalala Agro Enterprises Limited	Active Lincense

There are 36 smallholding farms, this represents 10% of the total farms in the fram block affected by the Mining activities. The Ministry of Agriculture will engage the Ministry of Mine and Mineral Development on the issuance of mining license in the farm blocks. It is proposed that issuance of mining licenses and mining activity should be stopped and land reclamation procedures be implemented by the mining companies.

The implementation of Nansanga Commodity Value Chain Transformation Project will not be affected by the mining activity, as the project will be implemented on title deeds land and

traditional/customary land not affected by mining activity as 90% of the total farms are free from mining activities in Nansanga Farm Block.

4.23.5 Livelihoods Activities and Alternatives

According to value chain assessment report for Nansanga Farm Block (2023), the livelihood of the people in the Nansanga Farming Block largely depend on agriculture activities. The major crops grown are soya beans, Cassava, tobacco and mixed beans. Other crops grown in medium to small quantities include groundnuts, beans, sorghum, finger millet, sweet potatoes and maize. Livestock though being a source of livelihood is only practiced on a small-scale. Caterpillar, Masuku, honey and mushroom collection is another off-farm income generating activities the people depend on for livelihood. From the baseline information assessment report indicates that most households visited and interviewed are already pursuing diversification livelihood strategies, such as bee keeping and horticulture production because of the availability of market in Serenje district, and also as adaptation measure to the impact of climate change. 90 % of the population in Nansanga Farm Block depends on rain-fed agriculture for its subsistence. White Maize, mixed beans, cassava and tobacco still dominates the crop production.

4.26 Income Level

According to value chain assessment survey for Nansanga Farm Block (2023) and also the baseline survey indicated that 85% of the households in the project area earn different income at different season of the year. During harvesting period, most households earn as much as K1000 average per month from the sales of the farm produce such as maize, tobacco and soya beans. This trend reduces during the rainy season, as most farmers' concentrates with cultivation of the field, and the income reduces to K250 per month from the sales of caterpillars and wild mushrooms. The main sources of income are: (a) Sales from Crops (Maize, Mixed beans, Tobacco, Cassava etc) (b) Sales from caterpillars and wild mushroom (c) income paid as salaries from commercial farmers and (d) income paid as gift from relatives in town.

4.27 Poverty level

Nansanga Farm Block like any other undeveloped rural area in Zambia, is plagued with high levels of poverty, food insecurity and malnutrition caused by low farm productivity and weak market integration of smallholder rural farmers. The situation is exacerbated by rising threats from climate

change. Between 2006 and 2020, the GDP growth rate declined from 13.2% to - 4.8 % (IMF, 2020). Agricultural share of GDP shrunk from 13.2 % to 2.7% (GRZ, 2021).

Majority of the households in the farm block fall within “poor category” (55%) and, approximate 70% of these poor households have income far below the poverty datum line. From the survey assessment conducted, it revealed that majority of households (65%) have between 6-12 members. For the Nansanga Farm Block, the household headship, the female headed households are more likely to be below the poverty line due to inequalities and traditional perception on female headed household. From the land audit assessment report for Nansanga Farm Block, the results indicate that only 13% of the respondent were female headed households own the titled land, as compared from the male household headed.

4.28 Gender Equity and Equality

Nansanga Farm Block like any other part of Zambia, experience evident gender inequality with women taking on many livelihood activities at the households’ levels. During the baseline survey, it was noted that women plays important role in agriculture activities, trading on the local market, domestic works, fetching of water from the boreholes and rivers, and also fire wood. Men, mostly spend time drinking alcohol as early as 08:00hrs. This was noted at Kapumbu, Kabeta and Kabundi market within the farm block. During community stakeholder consultation meeting in the farm block, it was noted that the women have few employment opportunities especially working in commercial agriculture, construction and mining works compared to men.

In order to reduce the gender inequality and scale up women empowerment, the Republic of Zambia has revised the National Gender Policy (2014) to ensure the attainment of gender equality in the development processes by redressing the existing gender imbalances. The policy is supported by the Gender Equity and Equality act No. 22 of 2015. In view of this, the Ministry of Agriculture are mainstreaming gender into its policies, plans and activities. Therefore, Nansanga Commodity Value Chain Transformation Project proposes to ensure that, 40% of the beneficiaries of the project will be the female headed household, this implies that 1,400 hectares will be selected from women on state leasehold and customary consent in the farm block. In order to enhance participation of women in other activities in the farm block, for those women who would be employed during construction and operation phases, the contractor or service provider will put in

place support facilities to enhance their participation such as separate toilets for male and female workers, observe the 120 calendar maternity leave and 5 days for paternity leave, kitchen and shelter for kids.

4.29 Historical and Archaeological Sites

National Heritage Conservation Commission Act No. 13 of 1994, states that the functions and powers of the commission is to provide for the conservation of ancient, cultural and natural heritage, relics and other objects of aesthetic, historical, pre-historical, archaeological or scientific interest; and to provide for the regulation of archaeological excavations and export of relics; and to provide for matters connected with or incidental to the foregoing. Therefore, Nansanga Farm Block has no site preserved and conserved by the commission.

Historical sites are more than 100 kilometers from the farm block, and these are Nsalu caves, the Kundalila falls, the Sancha rock in Serenje, and the David Livingstone memorial site in Chitambo district.

During ESIA community stakeholder consultation, it was also confirmed from the local people consulted that the project area has no historical and archaeological site. The only prominent sites are traditional burial sites, which are well-planned and preserved by the local community. Burial sites are well respected resting place for the beloved ones. Nansanga Commodity Value Chain Transformation Project will not interfere with burial sites, and any beneficiaries selected, the land will be assessed according to Land Act and Agriculture Policy. Only land suitable for agriculture production will be supported by the project.

4.30 Prevalent Diseases

HIV/AIDS assessment indicates that people living with HIV/AIDS, current stand at 8,042, out of a population of 158,192 in Serenje District, with a positivity rate of 4.40%. Vulnerability to HIV/AIDS and STIs has continued to threaten lives and overall well-being of the population in Nansanga Farm Block. As part of government intervention, people are receiving antiretroviral drugs from Serenje district hospital. Though, it is anticipated that the development of Nansanga Farm Block will increase the positivity rate due to the influx of people from different parts of the country looking for employment and other opportunities in agro-marketing services. HIV/AIDS will be minimized through dissemination of HIV/AIDS information, awareness of the dangers of

the disease to the people in the community and encouraging adherence to the ARV drug treatment. Local rural clinics will act as information centers, and also distribution of condoms for sex active age groups.

Other diseases noted from Kabundi, Kapumbu and Zambia Correction Health Post indicate that Malaria, Diarrhea, Bilharzia, Respiratory Tract Infections (RTI) and Skin Rashes are the common diseases in the project sites. Malaria vectors are widespread in the project sites especially during the rainy season, and the high prevalence of malaria can also be attributed to lack of treated mosquito nets. Diarrhea and Bilharzia is attributed to the contaminated water from wells and streams, as people rarely chlorinate their drinking water and water from boreholes is not accessible to most households. A critical consequence of the disease burden has been the presence of relatively high morbidity and mortality among children and women.

4.31 Social services and amenities

Ministry of General Education’s mandate is to formulate and implement education and science policies, set and enforce standards and regulations, license, supervise and provide education and skills development, as well as promote science, technology and innovation. At district level, the general education is managed under District Education Board Secretary (DEBS). The board is responsible for basic education in the district (Grades 1-9).

Serenje district has a total of 190 learning institutions broken down as shown in the following table. High schools include Serenje Boys, Mukando, Ibolelo, Serenje Technical, Chibale High School and Muchinda Boarding School (Under Construction). At tertiary level, the district has two colleges namely, Malcom Moffat Teachers’ College and Serenje School of Nursing.

Table 17: Learning Institution in Serenje District

S/N	Type	Number	Comment
1	Early Childhood Care, Development Education	4	All new school constructed have early childhood care.
2	Middle basic	63	New classrooms are constructed under Constituency Development Fund
3	Upper basic	33	Additional classroom blocks constructed
4	High School	3	Muchinda Boarding school is under construction

5	Community school	84	Many school are closing due to operation challenges
6	College of education	1	The college is operation
7	Serenje School of Nursing	1	The nursing school is operation

During ESIA baseline assessment survey, there are five Primary schools (Grade 1-9) in Nansanga Farm Block, namely; Mutale, Kampumbu, Muchinda, Kabeta and Ntenge, with a total, pupil population of 1,942. Muchinda Boarding school is under construction, once completed it will be the only boarding school in Nansanga Farm Block.

Table 18: Learning Institution in Nansanga Farm Block

SN	Facility	Pupil Population	Comments
1	Mutale Primary	300 pupils (F-160, M-140)	5 classrooms
2	Kampumbu Primary	230 pupils (F-110, M-120)	4 classrooms
3	Muchinda Primary	652 pupils(F-250, M-302)	5 classrooms
4	Muchinda High School	0	Still under construction
5	Kabeta Primary	260 pupils (F-112, M-148)	4 classrooms
6	Ntenge Primary	180 pupils (F-76, M-104)	2 classrooms
7	Masunga Primary	320 pupils (F-120, M-200)	3 classrooms

4.32 Health Facilities

The Ministry of Health mandate is to provide effective quality healthcare services close to the family as possible. This ensures equity of access to health service delivery. At district level, the District Health Board manages administrative hospitals, clinics and health posts. In Serenje, the district has one Central Hospital. Other health facilities include two Hospital Affiliated Health Centers (HAHC's), 15 rural health centres and 9 health posts. Theatre facilities are available at Serenje Central Hospital. During field assessment survey, it was noted that Nansanga Farm Block has four rural health posts; Kampumbu, Kabundi, Zambia Correction Service and Masunga.

Table 19: Health Institution in Nansanga Farm Block

SN	Name of facility	Patient Population	Comment

1	Kampumbu Rural Health Post	3,000 patients	Constructed in 2020 by ZCCM.
2	Kabundi Rural Health Centre	10,419 patients	2 admission wards, maternity wing, admission wards
3	Zambia Correctional Services	5,860 patients	New rural post constructed by Correction services.
4	Masunga Rural Health Post	2,600	1 admission, Maternity wing

4.33 Villages/Settlements on Customary land

The village/settlement patterns in Nansanga Farm Block are dotted along Serenje - Mapepala road, Mutale Primary School, and stretch up to Kampumbu, Masunga and Kabeta Primary School. Others, are dotted along around Munte, Luombwa, Saasa and Musangashi River catchment area.



Figure 23: Brick House for Mr. Peter in the farm Block

4.24 Community and Stakeholder Consultations

4.24.1 Introduction and importance of stakeholder engagement

Awareness and information dissemination about a new project during the ESIA study is important for people to know and understand the developments, particularly when these developments affect their land and their needs. It is a fact that the local communities have a thorough knowledge and understanding of their natural, physical, cultural and social environments.

4.24.2 Purpose and Objectives

The objective of consultations was to disseminate information, identify and address legislative, community and environmental concerns and seek information on appropriate mitigation measures for project negative impacts. The objective of stakeholder consultations with key stakeholders, regulators and local community was to acquire and disseminate information, identify and address legislative, community and environmental concerns and to offer appropriate mitigation options for all identified negative impacts. The following were the specific objectives of consultation process to:

- i Inform the people about the proposed project/development.
- ii Establish areas of co-operation and development with the stakeholders.
- iii Getting feedback from the stakeholders
- iv Build ownership and enhance social acceptability of the project by stakeholders.
- v Evaluate alternatives and seek solutions.
- vi Explore how to resolve and avoid conflicts.

4.24.3 Stakeholder Identification: Primary and Secondary Stakeholders

Consultations with primary stakeholder were also held with beneficiaries in Nansanga Farm Block during ESIA study. These meetings were also used to get wider public input from both primary and secondary stakeholders. The meetings were conducted at Lupiya, Kabeta, Masunga, Kampumbu, Mutale and Kabundi areas.

A total of 14 local communities meetings with a total attendance of 1174 (484 females and 684 males) were engaged in the Farm Block. The table below summarizes the communities that were visited and the dates the communities were engaged.

Table 20: Summary of Community engagement:

SN	Target Community	Attendance			Date
		M	F	Total	
1	Lungamana	46	33	79	21.01.2023
2	Kampumbu	55	28	83	21.01.2023
3	Ntenge	29	20	49	22.01.2023
4	Mutale	54	33	87	22.01.2023
5	Kabeta	102	38	140	23.01.2023
6	Copperbelt forest community	15	23	38	23.01.2023
7	Kabundi	78	68	146	24.01.2023
8	Masunga	18	06	24	24.01.2023
9	Chinfunde	34	21	55	25.01.2023
10	Core Venture	38	34	72	25.01.2023
11	Lupiya	121	82	203	26.01.2023
12	Bwande	29	26	55	26.01.2023
13	Nkulumashiba	37	12	49	27.01.2023
14	Mukomansala	70	61	131	27.01.2023
	Total	726	485	1211	



Figure 29: Local people during Stakeholder engagement at Nansanga Farm Block

Consultations with secondary stakeholders involved public consultations in the first quarter of 2023, with National, Provincial and District officials in the project district at Serenje, while 14 community stakeholder meetings were held with beneficiaries in Nansanga Farm Block. The key stakeholders consulted during the ESIA study includes: Permanent Secretary, His Royal Highness Chief Kabamba, Senior Chief Advisors, District Commissioner, Council Chairperson and District Administrative Officer (DAO), officers responsible for lands, road development, traditional affairs, community development, forestry, health, education, gender, labour, civil society, non-government organization, infrastructures, Serenje Town Council, Commercial farmers, COMACO, Chitambo Milling Plant and Water development officers among others.

Some other key stakeholders consulted included; ZEMA, ITTA, JICA, WARMA, IAPRI, COMACO, Chitambo Milling Plant, Serenje Properties, Zambia Correction Services, Mwachipapa farms, Kabeta, Masunga, Mutale and Kapumbu Schools.



Figure 24: His Royal Highness Chief Kabamba, Permanent Secretary and Government Officials during Stakeholder Consultation in meeting in Serenje (February, 2023):

4.24.4 Stakeholder Analysis

Stakeholder analysis is the process of collecting information about any person that will be impacted by (or can impact) the project. Conducting a stakeholder analysis will enable you to identify all your stakeholders as well as their needs and expectations.

4.24.5 Engagement strategies

Stakeholder engagement strategies differed for community members, government officials and other institutions. Invitation letters for an EIA scoping meeting were sent to secondary stakeholders, sharing the terms of reference with regulatory agencies and potential stakeholders.

The regulators identified are the Ministry of Green Economy and Environment, Zambia Environmental Management Agency, Ministry of Land and Natural Resources, Water Resources Management Authority and Zambia Research Institute. The regulators were informed of the proposed project through letters as well as visit to their offices and direct discussion to ensure that all issues of concern are adequately addressed for the project.

The primary stakeholders were identified as local people, farmers with the title leasehold in the farm block and other farm block residents and community leaders. These were consulted through community meetings, focus group discussions and key informant interviews. Socio-economic surveys involved local community consultations and field interviews within and surrounding Nansanga Farm Block. Traditional and church leaders, and host communities were consulted widely. Field baseline survey activities were conducted from March, 2023 to May, 2023. More consultation meetings will continue during project implementation. Refer to the attached minutes of some of those meetings are summarized in Appendices 3.

4.24.6 Feedback Mechanisms from ESIA Consultations

Most of the respondents in Nansanga Farm Block have a positive outlook towards the project. The women and youth, are looking forward for employment opportunities during the project implementation. The findings and observations revealed that the wider population of stakeholders consulted are largely in favour and accepting of the project. The key issues raised are listed in the table below and proposed resolutions.

Table 21: Public Consultation Key Issues raised

S/N	Concern raised during consultations meeting	How to Address the concerns during project implementation
1	Kampumbu Community lobbied for drilling of boreholes.	The project will site, drill and equip 10 demand driven solar powered boreholes. Kampumbu Community is also targeted to benefit.
02	The inadequate classroom blocks and teachers houses at Mutale and Ntenga Primary School has contributed to early marriages and teenage pregnancies.	The project intend to rehabilitate schools and rural clinic in the farm block.
03	The entire farm block communities complained about the poor road infrastructure which has been exacerbated by the mining activities in the areas.	The project intend to rehabilitate Serenje Boma to Kabeta school, covering a total distance of 80kilometres. The Ministry of Agriculture will engage the Ministry of Mines on the mining activities.
04	Some farm owners have not developed their farms and this has led to encroachments local people	The Ministry of Agriculture completed the land audit. All farms owners advised to start developing the farms.
05	The communities appealed that whenever there are job opportunities within the farm block, the locals need to be prioritized.	The project intends to employ more than 600 local people during construction and operation phases. More than 400 local farmers will benefit direct from the project.
06	Soya beans recorded low yield due to the brown rust experienced in 2022/2023 rain season.	The project intervention on the brown rust disease, will be on the use of pesticides, with pesticides management plan in place. Refer to the section 2, on pest management
07	What will be criterion on the selection of beneficiaries for the project?	The project will use the existing structures with the Ministry of Agriculture at project level to identify, interview and select the beneficiaries. The target beneficiaries are 750 people including state

		leasehold and customary area. 40% beneficiaries will be allocated for women and youth.
08	Are the communities going to pay for the Mechanization services?	The project will engage a private agri-mechanisation service provider for land clearing and field preparation. The project will pay for the initial vegetation clearing.
09	Are communities going to be given free inputs?	The project will provide start-up inputs (Fertilizer, Seed and Chemicals) for the first farming season for the 10 hectares, for the 350 beneficiaries. The total accumulative hectares is 3,500 hectares.
10	The communities are experiencing high level of skin rashes and malaria during the rainy season	The project will prioritize with health of the local people by upgrading Kabundi and Kampumbu rural posts to rural health centres.
11	Communities are worried with early pregnancies among school going girls.	The project will continue to carry out awareness and dissemination of information on code of conduct for all employees. Topics on Gender Based Violence will be among the toolbox talks
12	There is fear over HIV/AIDS and sexually transmitted diseases.	An HIV/AIDs program will be put in EMSP and rural clinic program
13	Improved Working conditions of the employees during construction and operation	The Ministry of Labour will be enforced on the project. The Labour Officers based in the Serenje district.
14	Fear of water contamination due to washing plants constructed on the banks of the river.	The project will monitor water quality for surface water and boreholes in the project area.
15	Involvement of Members of the DDCC in the monitoring and backstopping of project activities	The project will allow DDCC members on project site. DDCC members have been consulted widely during the consultation meetings.

16	What will happens to the land been occupied by local people in the Farm Block.	No displacement of people will be allowed by the project. This project is for the people both on state leasehold and customary consent. The project intend to empower the people with land with vegetation clearing and start-up loans in order to increase production. The implementers of the project at project level are the people who beneficiaries.
17	Communities fear of increase cases of civil and criminal cases because influx of people.	The project employ as many people as possible from among the local community members to minimize the influx of people
18	How is Musangashi Catchment areas going to be protected from deforestation which can lead to dam siltation?	The project will create a buffer zone of 50 metres from the dam reservoir as provided by WARMA. Vegetation clearing will be extremely minimal near the dam.

4.24.7 Capacity Building

The project will be supported by government agricultural extension staff to provide training to farmers, SMEs and communities. The Trust will organize all investors and mobilise services for them. The project will rehabilitate two schools for provision of education. Employers will impart skills in their employees.

4.24.8 Cultural Sensitivity

Cultural sensitisation will be promoted among new immigrants. As much as possible, local people will be employed and encouraged to embrace new immigrants.

4.24.9 Conflict Resolution

A conflict resolution mechanism and a grievance redress mechanism (GRM) will be developed based on local structures

4.25 Roles and Responsibilities

The borrower is the Ministry of Finance and National Planning (MFNP) while the Executing Agency is the Ministry of Agriculture (MoA) through the Department of Policy and Planning. An initial assessment of the capacity of the Executing Agency to implement the project found that it does not have adequate internal capacity to implement the various aspects of the project due mainly to human resources constraints. Based on institutional assessment, the main mitigation measures include: (i) establish a Project Coordination Unit (PCU) by competitively recruiting staff under DACO's office at Serenje to support EA in day-to-day management of the project. These include a Project Coordinator, Project Accountant, Procurement Officer, Monitoring and Evaluation Officer, Environmental and Social Safeguards Officer (ii) develop capacity of PCU in project management, M&E, financial management, procurement and E&S compliance (iii) provide guidelines, supervision, and monitoring of the project and allocate resources for monitoring and supervision activities (iv) establish an independent management entity for the Nansanga Farm Block. The primary role of the public sector will be to provide regulatory and supervisory services in their areas of competence.

The Nansanga Farm Block Management Trust (NFBMT) will be established, as an independent private body, to help ensure efficient management of the project and Farm Block in the short, medium and long term, for sustainability. The project is about commercial agriculture and so private sector efficiency, competitiveness and profitability are of utmost importance. The Trust will take charge of the day-to-day operation of the farm block, coordinating activities particularly to ensure the attraction and retention of private sector participation. The Nansanga Farm Block Management Trust will receive strategic direction from the board of Directors. The Board of Directors for the NFBMT shall have a Chairperson, Vice chairperson, who will be elected at the General meeting of the board. The Farm Block General Manager will be the Secretary of the Board of Directors. The composition of the Board of Directors of the Trust will include a 7 member team as follows:

- i. 3 Farmers in the Farm Block (commercial, Medium and smallholder)
- ii. 2 Representatives from Input Suppliers in the Farmer Block
- iii. 1 Ministry of Agriculture as Ex Officio
- iv. 1 Representative Agro Processors.

The Management of the NFBMT will comprise of three professional recruited from the labour force to management the Trust as a Private entity. The three will comprise of

- i. The general manager
- ii. The finance and administration manager; and
- iii. The operations manager.

The primary roles and responsibilities of the Trust are:

- i. Provide overall oversight and strategic vision in the Nansanga Farm Block
- ii. Facilitate Market linkages between the producers and processors.
- iii. Facilitate and coordinate water use permits for the members with WARMA
- iv. Act as agent for WARMA permit fees collection and transmission
- v. Coordinate and ensure compliance on environmental management in collaboration with ZEMA
- vi. Mobilise resources for the operations of the trust.
- vii. Network with relevant government institutions to ensure sustainable crop and livestock production
- viii. Oversee all farm block assets and ensure these are well maintained.
- ix. Manage a revolving fund for the farmers in the farm block for operations and start up inputs;
- x. Establish and manage a mechanisation center for farmers to hire;
- xi. Provide investment opportunities and information for investors. Therefore, there is need to come up with a detailed status of the Nansanga Farm Block articulating among others land in use and available for investment and suitable investments

The management of the trust will work in collaboration with Government staff including extension, research, irrigation and agribusiness experts.

4.26 Timelines and Milestones: Monitoring and Evaluation

The PIU M&E expert will prepare progress reports based on outputs and outcomes outlined in the Results based Framework and the Monitoring Plan. He/She will prepare Annual Work Plans and Budgets, baseline report, mid-term evaluation and completion report to assess progress towards targets; resource commitments and disbursements, compliance with legal conditions and commitments of the social and environmental requirements; financial management, procurement,

and lessons learnt and proposed adjustments to achieve results. Table 19 below presents the project implementation and monitoring schedule.

Table 22: Shows time frame, project milestone and monitoring process

Time-Frame	Milestones	Monitoring Process (Feedback Loop)
Year 1	Baseline Survey and Design Preparations	MoA, Province, District, PCU, Trust and Farmer
Years 1 to 5	Project Implementation	Farmers, Trust, Districts, Province, PCU and MoA
Years 1 to 5	Quarterly Progress, Financial, Procurement and E&S Audit Reports	PCU, Trust and External Audit Firm (Annually).
Year 3	Mid-Term Review	Farm Block communities, Trust, district, provinces and Bank Mission Team
Year 5	Beneficiary Impact Assessment	Farm Block beneficiaries, Trust and team.
Year 5	Project Completion Review	Communities, Trust, district, province and Team.

5.0 Potential Environmental and Social Impacts

This chapter presents the environmental and social impacts expected from the proposed Nansanga Commodity Value Chain Transformation Project. The impacts were assessed from the land use changes likely to be caused by the project activities on baseline environmental conditions.

5.1 Assessment of Biophysical Environment

The assessment considered the major components of the project and how it would impact upon the environment component (land, soil, ecosystem etc.). Impacts were assessed based on the significance and likelihood following the information gathered during the scoping process, the baseline information survey for the project area and its surrounding communities, and as well as desktop for the available literatures and reports. The impacts are explained according to the phases of the project implementation. These include: Site Preparation, Construction, Operation and decommissioning phases.

5.2 Impact on soil erosion

Soil erosion will be caused by stripping of topsoil during preparation and development of the camp sites. There will be four camp sites proposed within the project area. Soil erosion and siltation during the rainy season is expected to increase, particularly after clearing the site. Furthermore, the use of heavy equipment such as front-end loaders, bulldozers, and other construction vehicles can compact and change the texture of the soil. This has the potential to leave the soil prone to erosion. The impact of loss of agricultural land is insignificant as only the selected 350 beneficiaries will have their 10 hectares each cleared and prepared for crop production opposed to clear off 3,500 hectares stretch. Further, the impact on loss of produce is likely to be insignificant as people in the project area are farmers.

5.2.1 Mitigation and Remediation Measures

- i. Restricting the clearance of land to the footprints of the project site to avoid over clearing of vegetation and topsoil layer to avoid future soil erosion;
- ii. Stockpiling topsoil stripped from the cleared areas at designated places and can be then used to rehabilitate areas of bare soils that may be created after construction works have been completed;

- iii. Good agriculture practices measures such as contour ploughing, cover cropping, terracing and planting windbreaks.

5.3 Impact on soil Contamination

Soil contamination can arise during the construction phase through spillages of fuels and oils at the site, improper waste disposal of materials such as used oil filters, waste oil containers including packaging and agricultural practices such as pesticides, herbicides, and fertilizers used in farming can contribute to soil contamination.

5.3.1 Mitigation and Remediation Measures

- i. Adopting an emergency response procedure consisting of cleaning up soils immediately where oil spills and fuel leaks have been identified.
- ii. All leaking vehicles, equipment and tanks are taken back to the workshop as soon as a leak has been found.
- iii. Combination of remediation measures and techniques will be adopted and implemented, including implementing soil remediation such as bioremediation, soil vapor extraction to reduce or eliminate contaminants. Containment measures will include creating physical barriers to prevent the spread of contaminants. Land use planning by implementing appropriate land use practices and zoning to prevent contamination will be done. Above all, active community involvement will be solicited.
- iv. Fuels and lubricants will be stored in double layer tanks and in appropriate spill containment to avoid soil contamination;
- v. Routine inspection of all the mobile tanks and pipes on vehicles and equipment to ensure all spillages of engine oils and lubricants are cleaned;
- vi. Dispose of waste generated at the project site during construction at designated and ZEMA approved industrial and domestic waste dump sites.

5.4 Loss of Vegetation

The loss of vegetation is confined to the selected beneficiaries. The project target to clear vegetation for the 350 people, implies that each beneficiaries will have 10 hectares cleared on his or her field for crop production. The accumulative hectares is 3,500 hectares. The ecological value of the woodlands, more especially on the Musangashi riverine ecosystem cannot be ignored in that such vegetation stands contain several niches for diversity of animal and other aquatic species.

Removal of vegetation implies there is possibility of increased soil erosion, habit loss, increased surface temperature, water quality, altered nutrient recycle and increased flooding. However, only vegetation and biodiversity within the footprint of the proposed project will be affected which is less than 3% of the farm block landmass. Therefore, the loss of biodiversity of small insects is a negative impact. Loss of vegetation in this phase is caused by activities related to clearing of sites for agriculture activity, rehabilitation of the road and dam.

5.4.1 Mitigation and Remediation Measures

- i. The project and Trust will encourage and compel all farm developers to physically demarcate field boundaries between areas to clear and areas to maintain in order to reduce the risk of accidental land clearing by the heavy machine operators; Educational campaigns by MoA, MGEE, Trust and ZEMA will be undertaken to sensitize farmers about forest bands and the need to reduce soil erosion.
- ii. The project will encourage and compel all farm developers to only clear vegetation where agriculture activities will take place. No unnecessary land and biodiversity disturbance will be done;
- iii. Trees waste (wood) from clearing will be given to nearby villages as this is the raw material for their various construction works and fuelwood.

5.5 Impact on Surface and Ground Water Quality and Quantity

During the construction phase, possible impacts include increased water demand on Musangashi dam will increase as there will be more water to be tapped for both domestic and irrigation activities. Water quantity will be reduced due to losses through evaporation from both the dam reservoir and concrete canal. Siltation of the dam may also reduce water quantity, calling for mitigation measures related to regular dam maintenance, technological interventions to help minimize water loss. During the construction phase, possible impacts on water quality due to pollution of surface and ground water are likely to occur as a result of seepage/leakage of fuels and oils from the storage area at the camp, during servicing of vehicles or equipment and due to leakages from construction equipment. Run-off water during irrigation may transfer hazardous chemicals into the Musangashi River and its tributaries which is the final exit point for all run-off water in the area. There will also be an increase in the possible groundwater contamination. Contamination of surface water in nearby river and streams caused by runoff from the project site.

During the operation phase, the risk of pollution is expected to be low. Impact sources on water quality during this phase are mostly from vehicle spills of oils, agricultural residual chemicals especially from heavy vehicles such as Tractors and combine harvesters. During the rainy season a heavy rainfall event can trigger the runoff around the project site, which may eventually find its way into nearby Musangashi dam and Luombwa River and its tributaries thereby affecting the surface water quality. Leaking vehicles and equipment left unchecked over a long period of time may be more susceptible to contaminate surface soils and possibly surface water and groundwater. Only relatively small volumes of contaminants are likely to be released but the effect would be negative. The level of significance on water quantity and quality is low to moderate and allocation of resources for mitigative gradual restoration, emergency erosion control, stakeholder engagement and policy review, education awareness, research and monitoring and collaborative planning are included in the ESMP.

5.5.1 Mitigation and Remediation Measures

The following specific mitigation measures will be put in place;

- i. The developers will control surface water run-off during operation phase to avoid surface runoff from site;
- ii. The developer will plan and implement proper irrigation schedules to reduce on both evaporation and surface runoff and irrigation to be done on cooler hours of the day (night sometimes).
- iii. Strict monitoring of water levels to be observed in order to sustain water resources for all users.
- iv. Ground water monitoring using piezometers will be done to avoid waterlogging.
- v. Routine inspection of all the mobile tanks and pipes on vehicles and equipment to ensure all oil spillages are cleaned and avoided so that surface water and groundwater is not contaminated.
- vi. Fuels and lubricants will be stored in double layer tanks located in appropriate spill containment to avoid surface water and groundwater contamination;
- vii. Waste generated at the project site during operations will be disposed of at designated industrial and domestic waste dump sites to avoid surface water and ground water contamination.
- viii. Checking structures will be constructed in severe cases to reduce any wear and tear.

- ix. Lining and regular maintenance of the 1km canal is planned. Community involvement through the irrigation farmer groups will be responsible for the maintenance and the Budget is included in the ESMP

5.6 Air quality deterioration

During construction phase, vegetation clearing amounts of soil will be excavated and transported. The heavy machinery used for vegetation clearing, construction of the road and dam will generate dust, which can be dispersed by the wind affecting a zone of up to 100m around the excavation. Emissions to the air in form of exhaust fumes and dust from vehicles and machines cause nuisance to the closest surroundings. Dust raised from gravel access roads by haulage trucks during transportation of materials will also pollute the air of the immediate local environment. Air quality will be negatively impacted by dust mainly during the clearing and preparation of land. Particulates, as well as methane, carbon dioxide or other potentially lethal gases may create these conditions but are unlikely to exist in a Greenfield construction site. Although heavy equipment will be extensively used during the construction phase, the cumulative emissions from exhaust and particulate emissions are not anticipated to be significant. The Contractor will be assigned through contract to implement mitigation measures. During the operational phase, vehicle movement is expected to reduce while excavation will be also be minimal. The generation of dust and dispersal by the wind as well as exhaust fumes and dust from vehicles and machines will only affect households closest to the road. The cumulative emissions from exhaust and particulate emissions are therefore not anticipated to be significant. The cost of these will be met through the ESMP budget. Selective clearance opting for selective clearance methods that minimize vegetation removal, preserving natural habitats and reducing the need for extensive machinery and vegetation buffer will be practiced during operational phase.

5.6.1 Mitigation during Construction Phase

- i Regular watering of active construction areas and roads to reduce dust emissions is recommended.
- ii Protective facemasks should be required for heavy plant operators and those working in confined spaces.

- iii Other personal protective equipment (PPE) should be mandatory for the handling of toxic chemicals, welding, high voltage electricity areas, and building sites and similar.
- iv Monitor amount of dust generated to ensure that it conforms to the set standards and does not go above 50mg/Nm³. Dust will be monitored by the Environmental and social safeguards and ZEMA. The budget is provided in the ESMP

5.7 Noise pollution

During construction phase heavy machinery will be used for the vegetation clearing and excavation of soil. The machines are noisy and will cause a certain degree of nuisance to the surrounding environment. The noise levels of machines and vehicles vary widely and depend on the type of noise generated and level of activity. The noise level will however be localized, of short duration of 8hours per days. Noise impacts from excavators, bulldozers, heavy earth moving, grading, or land levelling and other steel fabrication equipment will create localized, short duration impact noise nuisance around storage shed erection areas and other building sites. Noise impacts may affect construction labour and operators but is unlikely to extend to workers and populations outside a 100m to 200m radius around the immediate construction areas. Noise levels during construction are likely to be localized and insignificant. The noise levels and impact during the operational phase will minimal and insignificant.

5.7.1 Mitigation during Construction Phase

- i Restricted Working Hours: working hours will be limited to day time to avoid disturbance in the night;
- ii PPE will be provided for ear protective equipment to employees operating mobile equipment generating significant noise with noise levels of 85dBA and above;
- iii Regular maintenance of equipment to include the checking and replacement, if necessary, of intake and exhaust silencers.
- iv Continuous monitoring of noise to detect any changes of noise levels in haul truck and equipment for easy detection of any abnormal noise levels so as to implement mitigation

5.8 Impacts on Solid and Hazardous Waste during Construction

The expected type of waste to be generated at site are construction waste such as plastics, cement bags, rock waste, cleared vegetation, plastic containers and demolition rubble, etc. Domestic waste would generally consist of waste comprising paper, plastic, bottles, tins, vegetable matter and food waste. During the construction stage, solid wood waste is expected resulting from land clearance, levelling and soil waste from excavation. Another type of waste will be generated from the human activity involving workers on site.

5.8.1 Mitigation during Construction Phase

- i All other solid waste will be stored in appropriate solid waste bins separated into Domestic Waste, Industrial Waste and Hazardous Waste. The waste will be managed in accordance with EMA no. 12 of 2011 (Stored and once the quantities are sufficient, will be transported to the Licensed waste disposal site).
- ii Separation of the waste will be prioritized as well. Biodegradable materials will be recycled as manure.

5.9 Socio-economic Impacts

5.9.1 Impact on Land Use

The land use for Nansanga Farm Block is characterized with agriculture activities, no settlement or people will be displaced during construction phase and during the project implementation. Therefore, there are no anticipated impacts on land use during the operation phase as well as the road and dam will have been fully rehabilitated and operational following its current alignment. The law gazetted the land as a farm block does not trigger any new land uses and therefore risk is low. All facilities being developed are in line with the planned land use. Any encroachers will be addressed in the strategic assessment. The rating is low on resettlement and land use impacts and mitigation measures will address incident management and monitoring.

5.10.0 Impact on mining activity

During the land clearing and preparation, the expected waste are tree logs, shrubs, access soils, rocks etc. The waste will be removed and disposed off on the designated dumping sites within the farm block as per approved by the local authority. No waste will be dumped on the mining

sites. During the rehabilitation of the existing road, detours and road diversions will be provide to avoid any disruption on the traffic from the mining areas.

5.10.1 Mitigation during Construction Phase

- i. All wastes will be disposed off at the designated dumping site as per approved by local authority.
- ii. Road detours and diversions with clear signage will be provided during the rehabilitation of the existing road.
- iii. Dust suppression will be done by watering on the road works

5.11 Impacts on Archaeology and Cultural Heritage

During the construction phase of the Project. The potential negative impacts could be damage to archaeological findings that may be exposed or unearthed during vegetation clearing, road and dam rehabilitation works. If any found and excavated. It will be reported immediately to the commission and other related government authorities. During operation phases, there are no anticipated impacts.

5.12 Impacts on Traffic and Road Safety

During the construction phase, the project will likely result in an increase in construction related traffic in the Nansanga farm Block delivering different types of materials. The increase in traffic is likely to result in increased traffic congestion and decreased road safety. Increase in traffic and decrease in road safety may potentially cause traffic-related injuries and fatalities among members of the public including construction workers. Traffic management plan involving temporary traffic control such as signage, barriers and lane diversions to guide drivers safely through construction areas is likely to occur on certain sites. Speed limiting is also likely to be required on some stretches and sites such as populated areas to ensure pedestrian safety. Public awareness campaigns on traffic will be mounted. Required resources relate to plan development, traffic control devices, labor costs, personel monitoring and tracking the plan, equipment relating to signage and temporary barriers, costs relating to communication and outreach, training of construction worker shall be inserted under works contract.

During operation phase the crop production would have been started and the rehabilitation of road and dam to its new design standards would have been completed. It is anticipated that there will be reduced road fatalities as compared during construction phase.

5.12.1 Mitigation and Remediation Measures

- i. Appropriate road signs will be put on and along constructions sites.
- ii. Road Development Agency to ensure the signs are according to the standards.

5.13.0 Impact on Occupational Health and Safety of Workers

The potential causes of accidents/incidents in farming activities in the farm block are likely to be largely vehicle-related accidents, injuries from small sharp tools, intoxication from agrochemicals and machinery related incidents. Other risks include insect and snake bites, fire hazards from machineries, infrastructures or wildfires, and health issues such as those related to malaria and dehydration. Possible risks are classified according to the following: Machinery hazards (risks associated with operating heavy machinery and equipment such as tractors and harvesters, leading to injuries like cuts or entanglement), chemical exposure to pesticides, herbicides and fertilizers that may pose health risks, manual handling of heavy loads, repetitive tasks or awkward postures causing muscular or skeletal disorders and biological hazards including viruses, bacteria or allergens from plants, animals or agricultural products leading to infectious diseases and zoonotic diseases, as well as snake bites/animal attacks. Other hazards are heat stress, noise exposure, respiratory hazards, electrical hazards and biomechanical hazards.

5.13.1 Mitigation and Remediation Measures

The developer and the contractor will clearly outline an emergency response and effective risk management strategy which involves implementing safety protocols requirements:

- i First steps, including who to call, how to call, and when to call;
- ii Identifying who will be responsible for implementing the emergency procedures in the team when on site along the site during preparation and operational phases;
- iii Employing proper H&S Officer to identify and resolve any health & safety risks;
- iv Training of first-aid supervisors;
- v Defining all communication systems to be used (i.e. two-way radio, cell phone);
- vi Required notification (e.g. Health and Safety inspector, District Emergency Personnel);
- vii In all serious emergencies the following response Procedures must be implemented;
- viii Putting appropriate road and safety signs on and along project sites:
- ix Providing training
- x Supply and use of PPE
- xi Regularly assessing and addressing potential hazards to ensure the well-being of workers

xii Developing and implementing an OSH plan.

In case of accidents

- i. Call on a member of the team trained in First Aid;
- ii. Apply first-aid at the scene i.e. stop victim from bleeding, put in victim in rest position;
- iii. After stabilizing patients; and
- iv. Ensure safety
- v. Mobilise emergency services
- vi. Isolate the area
- vii. Report to authorities
- viii. Document the scene
- ix. Evacuate victim to the nearest health centre.
- x. Provide medical attention
- xi. Document witness statements
- xii. Notify Management and the Bank
- xiii. Incident Investigation- (root cause analysis always required by the Bank
- xiv. Review and updated procedures
- xv. Mitigation resources will be allocated in the ESMP.

5.14 Impacts on Population

During the construction phase, the population density in Nansanga Farm Block will change due to the demand of employment opportunities and market linkages. This implies that people from other areas will come and be engaged as casual workers, hence increasing the existing population. The male population, especially, will show an upward trend. During operation phase, some of the migrants that come in search for job opportunities, may settle within the farm block, which will increase on the number of settlements. The impact will be insignificant as the tradition leaders will be engaged to integrate newcomers in the villages. This influx in population may result in increased pressure on local resources and access to social services such as health, school facilities, water, housing, energy and sanitation. It may also increase traffic congestion. The influx of people from outside will also increase cultural diversity and pose both positive and negative influences on local culture and tensions. Managing increased cultural diversity will require cultural sensitivity training, tolerance, inclusive policies, improved communication channels, cultural competence

programs, leadership commitment, celebrating diversity, conflict resolution training, flexibility in practices and improved feedback mechanisms. The cost of these mitigation measures will be included in community mobilization, sensitization and training programmes under the project. The cost will also be included in the ESMP.

5.15 Impacts on Public Health

5.15.1 Occupational Healthy and Safety:

Communicable diseases may be transmitted during the construction phase through interaction between construction workers and the local community. Such diseases may include acute respiratory infections and tuberculosis (TB), HIV/AIDS, Hepatitis B and C, and other sexually transmitted infections and Malaria. There is a risk that the workforce employed during the construction period of the Project could impact the local communities' health status.

5.16 Community Health and Safety:

Groups vulnerable to health impacts would include young children, the elderly, the socio-economically deprived, and groups with chronic health conditions. The project in collaboration with Ministry of Health will put up measures to address any other future pandemics/epidemics that may arise during the lifespan of the project. These are high risk and specific mitigation measures required include sensitization of local leaders and local people on the dangers of social impropriety, need to seek medical attention, preventive sexual behavior and improved capacity for treatment through the medical facilities.

During operation phase, communicable diseases may appear or increase in incidence owing to the influx of migrants to the area as well as injuries and exposure to pesticides, herbicides and fertilizers, including viruses, bacteria or allergens from plants, animals or agricultural products leading to infectious diseases and zoonotic diseases. Increased mosquito activity resulting from farm operations and construction actions may also have harmful effects on populations adapting to the new environment. These are moderate risks and specific mitigation measures required include sensitization and training of farm producers, farm workers agrodealers and local people on these hazards and the need to seek first-aid and medical attention, and improved capacity for treatment through the medical facilities. These will be integrated in the extension training activities.

5.17 Impacts on the Local Economy

During construction phase, the execution of the project will require employment of different professionals and non-skilled casual workers at different stages. Firstly, there will be creation of job opportunities to the service providers, and the Project Implementation Unit. It is estimated that the project will employ close to 600-900 workers in the various project activities which will translate to household earnings and support to the families. The construction phase will generate contracts for the purchase of materials and other goods and services from Serenje District while many of these contracts will be for specialist goods and services, there is likely to be some potential for procurement from businesses at the local and provincial levels, which will be significant for the local economy. The Bank's requirement for sustainable procurement to generate direct and indirect jobs disaggregated by gender will be applied and monitored. Procurement will also ensure supplier diversity that promotes inclusivity percentage procurement spending on diverse suppliers (women owned, minority owned, etc). Fair labor practices and compliance with fair labor standards including adherence to international labor conventions will be promoted. As much as possible, local sourcing and percentage of materials sourced sustainably or ethically. Supply chain transparency will be ensured through supply chains including visibility into suppliers and their practices. Measurement and monitoring of social benefits generated by procurement activities such as job creation or community development will be ensured. As much as possible, renewable energy usage will be promoted. Compliance with sustainability standards such as ISO 14001, fair trade, etc will be promoted among business entities.

During operation phase, there could be a significant improvement in the local economy, for example due to local procurement of supplies and services by the construction camp. New agribusiness centre operators and agro-dealers, the Farm Block Management Trust and other value chain players will generate employment opportunities. However, there could also be an increase in the price of local goods, which could make life more difficult for those vulnerable sectors of society that are unlikely to benefit from the construction phase and are already economically strained.

5.18 Impact due to improved Socio-Economy

5.18.1 Economic multiplier effects at the national level:

To sustain operations and further embark on future expansion developments, more inputs such as seed, chemicals, fertilizer, equipment and associated services such as finance and insurance are required. These will have to be out-sourced from other firms and consequently provide increased opportunities for job creation. This social impact through sustainable investment will have an economic multiplier effect once successful and result in more income for government through various taxes.

5.19 Employment, skills transfer and human resource capacity development:

Implementation of this project will involve the use of both skilled, semi-skilled and unskilled labour from the construction phase up to the operational phase. The project will involve the use of agronomists, agriculture engineers, technicians, drivers, and machine operators. Provision of employment shall contribute to raising the socio-economic well-being of the people and thereby their livelihoods. The target skills identified are agronomy, agribusiness and technical skills, targeting the main sources and recipient groups as youth and women. The current skills among these groups are low and capacity will be built in these areas through project training based on curricular and training materials and resources to be developed after training needs assessments. The selected training methods will be experiential, participatory and field schools. Extension staff and agribusiness service providers such as agro-input suppliers will also provide hands-on farmer trainings, mentoring and coaching as well as on-site workshops and sessions.

5.20 Provincial and district impacts:

Sustained crop production and marketing will have positive socio-economic impacts in Serenje District and the Central Province as a whole in the area of improved employment opportunities and increased income in the form of taxes for local authorities. Consequently, this will result in improved availability and access to social services. At district level, local people benefit from improved opportunities at COMACO and Chitambo Cassava Milling Plant for outgrower market linkages in various agricultural-related jobs making them more employable. The bulking and aggregation centres will provide opportunities for value adding and market access to markets far and beyond the district of Serenje.

5.21 Improved quality of livelihoods:

During project implementation, it is possible that unfair exclusion of certain individuals or groups from the benefits of the program and the impact may reinforce inequalities and may lead to social and economic marginalization. Selection bias, discrimination and prejudice against some community members may undermine the fairness of the program, erode trust and could lead to legal or ethical challenges. The perceived or actual favoritism in beneficiary selection may create tensions, disputes, conflicts and discontentment within community. Lack of community engagement during the selection process could lead to diminished sense of ownership and potential resistance or lack of cooperation from the community. The deployment of subsidies may create dependency on aid or benefits without promoting self-sufficiency, undermining the long-term sustainability of the program and perpetuating cycles of dependency. To mitigate these negative impacts, it shall be crucial to ensure transparency and accountability by introducing transparent and self-targeting selection criteria coupled with commitment to equity and ethical conduct to help address these challenges and foster positive outcomes. However, during the implementation of the project, there will be enhanced quality of livelihoods for those who will be employed and the 350 farmers whose farms will be planted, 400 irrigators who will receive irrigation plots and over 20 agro-dealers who will be supported. People who will directly or indirectly be employed will earn incomes which they can use to buy food, clothes and school requisites for their children, and pay for medical services. This will lead to improved quality of life to the beneficiaries. The impact will be significant and of long-term mode.

5.22 Support to agricultural development:

Nansanga Commodity Value Chain Transformation Project will be implemented in an area considered to be food basket in Zambia and will contribute to expansion of agricultural development in the area. The project will build capacity of local farmers, SMEs and agrodealers to good agriculture practices and climate smart agriculture and prepare them for integration in agri value chains, contributing to export production and earnings as well as agriculture gross domestic product.

5.23 Impacts on Grievances arising from land:

Grievances are likely to arise especially from the communities where the project will be implemented. These grievances may relate to land allocation and encroachment, beneficiaries

selection, inputs distribution, farms to be cleared, siting for construction of water infrastructure and social related issues. Grievances are bound to surface at different stages of the project cycle. Some grievances may arise during the project design and planning stage, while others may come up during the project implementation process. A Grievance Redress Mechanism (GRM) will be developed to help address most of these Grievances.

5.24 Anticipated Positive Environmental Impacts:

The following are some of the positive environmental impacts to be generated by the project:

- i. Sustainable agriculture technology and good agriculture practices to be promoted will contribute to preservation of biodiversity due to use of appropriate land management practices and having permanent fields and sedentary farming systems which will reduce/eradicate shifting cultivation (chitemene) system of production currently being employed by locals;
- ii. Sustainable land management practices will contribute to combat and mitigate climate change through good agriculture practice involving preservation strips of woodland in all areas that are not meant for development;
- iii. Good agriculture practices and climate smart agriculture technology will impact positively on soil structure and water conservation through minimum tillage and strict nutrient management and use of an efficient and effective irrigation systems.

5.25 Evaluation of Environmental and Social Impacts

This section presents the environmental and social impacts expected from the proposed project. The impacts were assessed from the changes likely to be brought about by the project activities on baseline environmental conditions. The significance of the environmental impact arithmetic product of the ratings for likelihood and consequence of the environmental impact shown.

5.26 Impact Assessment Criteria

Evaluation and prediction of environmental and social impacts are considered against the baseline information (its value and its sensitivity). The assessment of each of the proposed components during site preparation, construction, operation and decommissioning stages was adhered to. The impact assessment criteria will conform with the ZEMA key principles such as:-

- i Nature and magnitude of the intended activity and the existence of similar projects at the site or similar sites.

- ii Extent of the impact of the proposed project.
- iii Location of the project and nature of the surrounding environment and nearby farming clusters.

The ESIA study methodology has been used in combination with ZEMA requirements. The following factors below are considered in classifying each potential impact generated by the project as indicated in Table 18 below:-

Table 23: Shows the Evaluation of Impacts

Category	Terminology	Definition
Scope of Impact		
Frequency (Occurrence of activity producing the impact, that is continuous, intermittent or a single even or less than once per year)	Frequent Infrequent Rare	Uninterrupted or on a daily basis Once or more per day Single event/less than once per year
Likelihood (Probability of the impact Occurrences (0%, 50%, 100%))	Certain Likely Unlikely No impact	Impact possibility estimated to be 100% Impact possibility estimated as between 50% and 99% Impact possibility estimated as <50% Zero estimated possibility of impact
Extent (Spatial extent of the impact (e.g within 2km radius, outside the project))	Local Provincial Regional National International	Within 2km of the Project site Outside the Project site but <20 km away Outside the Project site but <200 km away Within Zambia Outside Zambia
Duration (extent in time of the impact. Short term impact, medium term impact and long term impact)	Short Medium Long	Less than the life of Project The life of project Greater than the life of Project

<p>Magnitude (Defined in relation to the limit criterion specified by ZEMA or international regulators).</p>	<p>Very low Low Medium High Very High</p>	<p>Defined in relation to the limit criterion where available, e.g.:</p> <ul style="list-style-type: none"> • Very low: Parameter <10% limit criterion • Low: Parameter 10 to <50% limit criterion • Medium: Parameter 50-100% limit criterion • High: Parameter 100-200% limit criterion • Very High: Parameter >200% limit criterion. <p>Or, for qualitative assessments:</p> <ul style="list-style-type: none"> • Very low: No degradation/adverse alteration to resource/receptor • Low: Minor degradation/adverse alteration to resource/receptor • Medium: Moderate degradation/adverse alteration to resource/receptor • High: Significant degradation/adverse alteration to resource/receptor • Very High: Permanent degradation/adverse alteration to resource/receptor.
<p>Type of Impact (Positive or Negative effect, direct or indirect action)</p>		
<p>Effect</p>	<p>Positive Negative</p>	<p>Beneficial Impact Adverse Impact</p>
<p>Action</p>	<p>Direct Indirect</p>	<p>Impact caused solely by activities within scope of Project Impact which does not result directly from activities within the scope of Project, but which has connection with the Project's presence.</p>
<p>Potential Significance (a combination of all factors described to determine the type and significance of potential impact prior to mitigation. This is defined as low, medium or high)</p>		

Significance	Low	Any low magnitude impact, or medium impact that is unlikely to occur or is of short duration.
	Medium	Any medium magnitude impact that is certain or likely to occur and of medium or long duration. Also, any high magnitude impact that is unlikely to occur, of short duration, or local in extent.
	High	Any high magnitude impact that is certain or likely to occur, of medium or long duration, and regional in extent.

5.27 Methodology of Impact Evaluation

5.27.1 Impacts Evaluation Procedure

The significance of the identified impacts was determined by combining the perceived frequency of occurrence of the source of impact; the duration of the impact; the severity of the impact; the spatial extent of the impact; and the sensitivity of the area being impacted upon. This procedure was developed by South African Mining Industry, and it is modified to suit the Zambian conditions in respect of descriptions below.

Table 24: Evaluation Matrix Model

CONSEQUENCE		LIKELIHOOD	
Geographic Extent of Impact	Rating	Frequency of Impact	Rating
Site	1	Rare	1
Local Area	2	Unlikely	2
Regional	3	Occasional	3
National	4	Likely	4
International	5	Almost certain	5
Impact Duration	Rating	Receptor Sensitivity	Rating
Construction Phase	1	Negligible (No change)	1
Operational Phase	2	Low (Detectable but minor change)	2

Decommissioning Phase	3	Medium (Detectable change – non-fundamental)	3
All Project Phases	4	High (Detectable change – fundamental temporary)	4
Post-Closure Phase	5	Very high (detectable change – permanent change)	5

- i Duration of the Impact: Which defines whether the impact is temporal or permanent;
- ii Spatial extent of the impact: Which defines the area to be affected by the impact;
- iii Severity of the Impact: Which is the severity/beneficial or simply the state or extent of the badness of the impact. It takes into consideration among other things, sensitivity of the area being impacted upon; and
- iv The likelihood of occurrence: Which looks at the probability of the impact occurring and frequency of occurrence where it occurs.

Table 25: Ranking of evaluation criteria matrix:

CONSEQUENCE (Magnitude x Geographic Extent x Duration of impact)															
LIKELIHOOD (Frequency of activity X Frequency of impact Sensitivity	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30
	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45
	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75
	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90
	7	14	21	28	35	42	49	56	63	70	77	84	91	98	105
	8	16	24	32	40	48	56	64	72	80	88	96	104	112	120
	9	18	27	36	45	54	63	72	81	90	99	108	117	126	135
	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
	11	21	31	41	51	61	71	81	91	101	111	121	131	141	151
	12	22	32	42	52	62	72	82	92	102	112	122	132	142	152
	13	23	33	43	53	63	73	83	93	103	113	123	133	143	153
	14	24	34	44	54	64	74	84	94	104	114	124	134	144	154
	15	25	35	45	55	65	75	85	95	105	115	125	135	145	155

Table 26: Determination of Overall Significance

Insignificant	1-24	Acceptable positive and negative impacts subject to periodic passive monitoring measures. Should have no significant influence on the proposed development project.
Minor	25-50	Acceptable positive and negative impacts subject to regular passive monitoring measures. Positive impacts should weigh towards a decision to continue.
Moderate	52-75	Acceptable positive and negative impacts subject to regular active monitoring measures. Positive impacts should weigh towards a decision to continue, should be enhanced in final design.
Major	77-120	Unacceptable negative impacts which require constant active monitoring, and measures to be put in place to reduce exposure. Negative impact should weigh towards a decision to terminate proposal, or mitigation should be performed to reduce significance to at least a moderate significance rating. Positive impact should weigh towards a decision to continue, should be enhanced in final design.
Significant	126-155	Unacceptable level of risk exposure which requires immediate corrective action to be taken. If mitigation cannot be implemented effectively for negative impacts, proposal should be terminated. Positive impact should weigh towards a decision to continue, should be enhanced in final design.

5.27.2 Summary -Ranking of identified Impacts

Table 27: Ranking of identified Impacts

Impact Type or Activity	Consequence				Likelihood			Rank Score (Likelihood X Consequence)	Significance of Impact	Comment
	Magnitude	Spatial Extent	Duration	Total Score	Probability	Frequency	Total Score			
Impact on Employment and skills transfer	5	3	3	11	3	5	8	88	Major positive	Implementation of this project will involve the use of both skilled, semi-skilled and unskilled labour from the construction phase up to the operational phase
Impact on the Economy at national level	3	3	3	9	4	5	9	81	Major positive	The crop production of soyabeans, maize and cassava will have an economic multiplier effect once successful and result in more income for

										government through various taxes
Migration of people will create pressure on resources such as health.	1	2	2	5	1	5	5	25	Minor Positive	Priority of unskilled employment will be given to the local people in the community. Only skilled employment will be sourced
Impacts on Public Health	3	1	2	6	1	5	6	36	Minor Positive	Expected increase of people (general workers and customers buyers of Produce) by number more than 600 approximately, which will place a demand on accommodation, health services, water and sanitation, waste disposal and HIV/AIDS.

Noise level due to increased road traffic on the main road	3	2	3	8	2	5	7	56	Negative	Operations will be restricted to day time only during construction phase.
Impact on Air Quality	3	4	2	9	4	3	7	63	Moderate Positive	Dust suppressing by daily watering. Regular servicing of machinery to reduce emissions
Impact on vegetation	3	1	3	7	1	5	6	42	Minor Positive	Habitats have been degraded from past activities since this is a zoned and planned agricultural farm block area. The project will aim at protecting and revitalizing what is left, to aid its recovery.

Occupational Health and Safety	3	3	2	8	4	4	8	64	Moderate Positive	Employees will be trained in construction site safety procedures through before engaging workers. All workers will be provided with full PPE. First AID medical kit will be provided at the site
Grievances arising from land dispute and beneficiaries selection	3	3	2	8	2	4	6	46	Minor Positive	The project will establish GRM mechanism on resolving land disputes
Land and Soil contamination	2	1	3	6	3	4	7	42	Minor Positive	Storage of potential pollutants such as fuel, oil and chemicals stored on original packs Mechanical prevention of Soil erosion

Impacts on Surface Water and underground water (Stream, dams, rivers, boreholes)	4	3	2	9	4	2	6	54	Moderate Positive	Fuel/oils spillage will be cleared All servicing of vehicles and machinery will be done in designated workshop. No agriculture activities within the buffer zone of the riverine. Minimum 50 metres
Impacts on Solid and Hazardous Waste	3	2	2	7	4	3	7	49	Minor Positive	Biodegradable and Non-Biodegradable Waste will be Disposed at designated place. Contractors and service provider to provide Flushable toilets

Impact on Biodiversity	4	3	1	8	3	3	6	48	Minor Positive	Unselective killing of animals, birds, insects, snakes, lizards will not be allowed in the project area Only vegetation on selected beneficiaries will be cleared.
Impact on Aquatic Biodiversity	3	3	1	7	2	3	5	35	Minor Negative	No agriculture activities will be along the riverine. 50 metres buffer zone will be created to protect the aquatic fauna such as fish, bird, worms, etc
Impact on Mining Activity	2	2	3	7	1	3	4	28	Minor Negative	No mining activities in the farm block Land reclamation procedures such as removal of excess soils waste, burying the pits, revegetation.

6 Environmental and Social Management and Monitoring Plan

6.1 Environmental and Social Management Plan (ESMP)

As per provisions that required that an Environmental and Social Management Plan (ESMP) is prepared for all Category 1 and 2 projects financed by the Bank, we have prepared this ESMP with the purpose of defining mitigation/enhancement, monitoring, consultative and institutional strengthening measures to be undertaken during project implementation and operations. This ESMP shall be incorporated in the loan documents to sign between the Borrower and the Bank. The ESMP format is based on the standard template provided at <https://www.fao.org/3/cc7511en/cc7511en.pdf> and is flexible enough to ensure the integration of project specific mitigating, enhancing and monitoring requirements. The ESMP format permits adjustments and revisions to reflect new developments and findings along project implementation and operations.

This ESMP presented in Table 12-1, represents Government's commitment to address and manage the potential negative and positive impacts associated with the project, and defines the standards and guidelines to be achieved in terms of environmental legislation, policy and standards. It involves the protection, conservation and sustainable use of the various elements or components of the environment. It provides all the details of project activities, impacts, mitigation measures, time schedules, costs, responsibilities and commitments proposed to minimize environmental impacts of activities, including; monitoring and evaluation and environmental audits during implementation and decommissioning phases of the project.

This ESMP is an output of the ESIA and provides the framework or checklist for project monitoring and evaluation/audit. Mitigation measures provided in this section are aimed at making changes in any of the following ways: project materials, raw materials, project sites to mention but a few. The main objectives of this ESMP are to:

- i. Ensure the project is compliant with applicable national environmental and social legal requirements;
- ii. Identify the required mitigation measures that are needed in order to reduce negative impacts and enhance positive ones;

- iii. Ensure that all mitigation measures and recommendations identified during the environmental impact assessment are incorporated into documents that are referenced and expanded if necessary during the various phases of the project;
- iv. Outline the mitigating/enhancing, monitoring, consultative and institutional measures required to prevent, minimize, mitigate or compensate for adverse environmental and social impacts and/or to enhance project related beneficial impacts;
- v. Address human resource requirements to ensure implementation of the ESMP is possible.

To achieve the above, this ESMP shall enable the project sponsor to ensure that:

- i. During project planning and design, all mitigation measures identified in the ESIA are incorporated into the planning and design of the project.
- ii. During construction all constraints, restrictions and actions required to minimize construction related impacts are incorporated in the contracts and implemented.
- iii. During operation, detailed operating procedures are developed so that all constraints, restrictions and actions required to minimize impacts caused by commissioning and operation are developed, implemented and monitored for all aspects of the project.
- iv. During the life of the project, continue to enhance positive impacts and ensure mitigation for negative impacts. An important component of this monitoring, evaluation and communication of findings, and adherence to the principle of continued improvement.
- v. During decommissioning, detailed procedures are developed to ensure that the project area is rehabilitated to an acceptable and previously agreed-to level.
- vi. The ESMP is an umbrella plan that describes the management of environmental, health and safety (EH&S) matters and that will be complemented and augmented by a number of sub plans as described in this report.

6.2 Implementation of Environmental and Social Measures

The Project Implementing Unit shall be responsible for the implementation of all environmental and social mitigation measures identified and described in the ESIA and ESMP. These measures are grouped into two main categories as follows, for which responsibilities will be organized differently:

- i. **Measures directly related to construction and the site:** implementation of most if not all of these measures will be integrated into the civil works contract and attributed directly

to the Contractor. The Contractor will have to make sure, if the case arises, that his sub-contractors will also comply with them. In these cases, The Environmental and Social Safeguards Officer under the PIU will be responsible for the control and monitoring of the Contractor's performance in this regard.

- ii. **Measures not related to any works allocated to contractors:** Here, the PIU will be directly responsible for the supervision of all works and to ensure that the ESMP is followed.

6.3 Summary of Main Impacts and Mitigation Measures

In this ESIA Report, environmental risks and impacts likely to emanate from project related activities have been described. The are impacts, with their importance, are summarized and listed together with the required or proposed mitigation measures, where such measures seem necessary for minimizing the impact as far as possible or reducing the risk to an acceptable level. The mitigation measures for impacts with 'medium' to 'high' significance have been summarized in Table 10-1

6.4 Overall Impact Evaluation

In our opinion, the conclusion of the ESIA report is that most impacts are rather small and easily mitigated, if mitigation is required at all. There is no impact of the category "strong negative, mitigation not possible", which would have to be considered as a no-go for the project.

6.5 Environmental and Social Monitoring Plan

Monitoring of all the environmental protection measures described in the ESMP has to be carried out in the way outlined. The aims of monitoring are as follows:-

- i. To check on compliance with the conditions set forth and ZEMA compliance standards to be achieved.
- ii. To inform the relevant authorities on observed cases of non-compliance;
- iii. To propose corrective measures for such cases;
- iv. To check on the success of these measures.

6.6 Environmental Auditing Plan

The PIU shall carry out E&S audits of its implemented activities and the entire operation of the project on yearly basis in order to ensure compliance with the relevant regulatory requirements.

Also, audits will be done whenever the Zambia Environmental Management Agency makes a demand for them. The Environmental audits will be necessary in order to assess whether the project is having a detrimental effect on the environment. The following benefits will be derived from the environmental auditing process.

- i. Identification of environmental risk which may cause the following:
- ii. Causing environmental harm.
- iii. Non-compliance with statutory requirements.
- iv. Poor operating procedures.
- v. Site contamination.
- vi. Improper disposal of wastes.
- vii. Avoidance of financial loss such as operating restrictions, site clean-up, negative publicity, third party damage and compensation claims.
- viii. Avoidance of legal sanctions such as fines or jail for Directors, managers, staff, ensure compliance with environmental laws, avoid civil liability, increase in staff awareness, policies and guidelines in place, training programs implemented, staff feedback to communication, extension to suppliers and distributors.
- ix. Identify potential cost savings are waste minimization, reuse of materials, energy conservation.
- x. Improve dealings with regulatory agencies, media representatives, community groups, insurance companies, financial institutions, employees and environmental groups.
- xi. Establish a history of environmentally responsible operations through environmental incident reports, environmental monitoring and recording and reporting to the affected parties

Table 28: Environmental and Social Management Plan

Impact	Mitigation/Enhancement Measure	Objectives	Frequency of Monitoring	Time-Frame	Performance Indicator	Responsible Person	Cost (US\$)
Impact on local economy improved							
Increased employment opportunities	Unskilled labour force will be given to local people .	To ensure that the local community benefits from the project	Quarterly	Throughout operation	Number of locals employed	PIU E&S Officer Labour Officer	10,000
Procurement of raw material	Construction materials, fuels/oils, cement and food will be procured from Serenje district	To empower local business entrepreneurs in Serenje district	Monthly	During construction and operation phases	Number of Suppliers empowered in Serenje district	PIU E&S Officer PIU Procurement Officer	5,000
Impact due to water contamination							
Water quality (Surface and underground water)	Hazardous waste, oils spillage, fuels leaks, herbicides, pesticides and fertilizers should be well kept in original containers in project area	To maintain safe and clean water for domestic and commercial use	Monthly	Construction phase and operation phase	Number of Water quality test	PIU E&S Officer Contractor	20,000

Soil pollution	Contaminated soil shall be removed/treated immediately	To maintain and promote healthy environment	Quarterly	Operation Phase	Number of Soil test	PIU E&S officer Contractor	10,000
Noise Pollution	Vegetation clearing, road construction and rehabilitation of the dam will done during day times only. Use of mufflers, silencers, and screens to minimize noise from construction activities;	To maintain peacefully sleep for the workers and people in the community. To protect ear drums from damage due to high noise level	Daily	Construction Operation	Number of Noise level test	PIU E&S officer Contractor ZEMA	10,000
Soil erosion	Protect slopes from erosion, where bare slopes are exposed as a consequence of the works limit the period of exposure to water or wind erosion and provide temporary or the designed slope	To maintain and protect soil healthy	Quarterly	Operation	Number of technologies used to protect the soil through good agriculture practices	PIU E&S officer Project beneficiaries	5,000
Impact on Biodiversity							

Loss of Terrestrial habitat	Do not clear vegetation outside the selected field of the beneficiaries. Preservation of identified, rare, endangered, threatened or endemic species or their habitats to be persevered	To protect and preserve the life of terrestrial habitat such as animals, snakes, insect, rats etc.	Quarterly	Construction Operation	Number monitoring of remote sensing carried	PIU E&S Officer Contractor	15,000
Loss of Vegetation	Retardation of vegetation growth due to dust and chemicals	Dust control by water suppression	To suppress dust particles	Construction Operation	Daily	PIU E&S Officer Contractor	5,000
Loss of aquatic habitat	Do not carry out agriculture activities along riverine 50 metres buffer zone will be maintained at the Musangashi dam reservoir. No cutting of trees within the radius of 50 metres	To prevent any contamination of surface water with pesticides, fertilizers, herbicides etc To protect and preserve aquatic life	Quarterly	Construction operation	Number of surface water test (COD, BOD, PH)	PIU E&S Officer WARMA	20,000
Impact on socio-economic							

Impacts on workers' health	<p>Providing safe ventilation for storage of volatile chemicals.</p> <p>Restricting and controlling access to areas containing hazardous substances.</p> <p>Using refrigerants and fire extinguishing agents in accordance with the Montreal Protocol'</p> <p>Provide PPE to all workers</p>	To maintain and protect health of the workers	Daily	Construction operation		PIU E&S Officer	25,000
Injuries to pedestrians, increased road traffic accidents	All motorists will be encouraged to move within the speed limit. Adequate signage will be installed along the roads within the project area Entry into the project area will be restricted to workers and suppliers/contractors only	To reduce and minimize injuries to people and animals	weekly	Construction operation	Number of injuries/accidents recorded	PIU E&S Officer Traffic Police Officers	10,000

Work accidents, occupational diseases (skin irritation, noise, etc)	Develop occupational health and safety procedures such as wearing of protective equipment, proper handling of hazardous substances, etc. All workers have to use the relevant protective equipment (helmet, gloves, goggles, work boots, masks, ear plugs, etc.), provided free of charge.	To reduce and minimize work accidents	Daily	Construction Operation	Number of accidents recorded	PIU E&S Officer Contractor Police Officer Clinical Officer	15,000
Grievances arising from land dispute and beneficiaries selection and working condition	Grievance Redress Mechanism to be establish, which should traditional conflict resolution. Introduce grievance redress mechanism register	To reduce grievance and conflicts before escalating to high level	Daily	Construction operation	Number of grievances received and registered.	PIU E&S Officer Contractor Community liaising Officer	30,000

Migration of people will create pressure on resources such as health and school	Existing classrooms will be rehabilitated to meet the demand Existing rural health post will be upgraded	To improve social amenities and service delivery	Yearly	Construction operation	Number of schools upgraded Number of rural health post upgraded	PIU E&S Officer District Education Board	5,000
HIV/AIDS, STIs and other communicable diseases	Encourage VCT service (testing, pre-test, and post-test counselling). Awareness on the risks of communicable diseases Focus on behavior change for workforce, local people etc	To reduce infection rates	Weekly	Construction Operation	Number of HIV/AIDS test	PIU E&S Officer District Health Officer Clinical Officer	15,000
Grand-Total for EMSP (U.S. Dollar							195,000

6.7 Description of the ESMP

The Environmental and Social Management Plan (ESMP) provides an overall approach for managing and monitoring environment and social issues during construction and operation. It describes the institutional framework and resource allocations required to implement the environmental and social management and monitoring plans for the Project. The implementation of the project will be guided by the African Development Bank environmental and Social Safeguards system as indicated below.

6.8 African Development Bank Environmental and Social Safeguards

The African Development Bank Group have formulated an Integrated Safeguards System as a cornerstone for its strategy to promote growth that is socially inclusive and environmentally sustainable. Safeguards are a tool for identifying risk, reducing development costs and improving project sustainability. These are meant to ensure project benefits to affected communities and help preserve the environment. The Integrated Safeguards System enables the Bank to be better equipped to address emerging environmental and social development challenges. It also promotes environmental and social best practices and encourages transparency and accountability, thus upholding the voices of people affected by Bank-funded operations.

6.8.1 The Bank has adopted a series of five Operational Safeguards:

Operational Safeguard 1: Environmental and social assessment – This overarching safeguard governs the process of determining a project’s environmental and social category and the resulting environmental and social assessment requirements.

Operational Safeguard 2: Involuntary resettlement land acquisition, population displacement and compensation – This safeguard consolidates the policy commitments and requirements set out in the Bank’s policy on involuntary resettlement and incorporates several refinements designed to improve the operational effectiveness of those requirements.

Operational Safeguard 3: Biodiversity and ecosystem services – This safeguard aims to conserve biological diversity and promote the sustainable use of natural resources. It also translates the commitments in the Bank’s policy on integrated water resources management into operational requirements.

Operational Safeguard 4: Pollution prevention and control, hazardous materials and resource efficiency – This safeguard covers the range of key impacts of pollution, waste, and hazardous materials for which there are agreed international conventions, as well as comprehensive industry-specific and regional standards, including greenhouse gas accounting, that other multilateral development banks follow.

Operational Safeguard 5: Labour conditions, health and safety – This safeguard establishes the Bank’s requirements for its borrowers or clients concerning workers’ conditions, rights and protection from abuse or exploitation. It also ensures greater harmonization with most other multilateral development banks

In general, Operational Safeguard 1 sets out the Bank’s overarching requirements for borrowers or clients to identify, assess, and manage the potential environmental and social risks and impacts of a project, including climate change issues. Operational safeguards 2-5 support the implementation of OS1 and set out specific requirements relating to different environmental and social issues, including gender and vulnerability issues that are triggered if the assessment process reveals that the project may present certain risks.

6.9 Grievance Redress Mechanism Structure

It is anticipated that the most people to be affected in the project area are poor and un-educated; therefore, the grievance procedures will be simple, accessible, flexible, just, fair and capable of being administered properly with minimum delay. In this regard, the grievance redress mechanisms shall make provisions for the following: -Sub-district (Ward/Village Council), District/Local Government structures including laid down Committees, Provincial and National levels. It is expected that E & S officer in collaboration with the office of Project Coordinators will sensitize the affected persons and communities on mechanisms which incorporates four integrated approaches namely the Ward/Area Development Committee, District Development Coordinating Committee (DDCC), Provincial Development Coordinating Committee (PDCC) and the National Project Steering Committee.

6.9.1 Receiving and Recording Grievances

- i. Receiving and recording of grievances will be done by the Farm Block Trust secretary. As part of the GRM, the grievances from the stakeholder or their

- representatives may be communicated verbally (in person or over a telephonic conversation) or in written form to the person responsible for handling grievances at every level of the GRM structure
- ii. GRM committee secretary will record each grievances directly into the Grievance Redress Form

6.9.2 Maintaining a Grievance Register

- i. District GRM secretary to receive and register the grievance. The Project Coordinator’s office will maintain the grievance register.
- ii. When reporting a concern or grievance, it is important that the complainant provides enough information that will enable thorough investigation.
- iii. Concerns and grievances must be raised without malice and biasness

6.9.3 Acknowledgment of Grievance

- i. Acknowledgement of receipt of the concern and grievance will be communicated within stipulated timeframes for handling of complaints, through convenient means of communications such as written letter, phone calls, verbal and email.
- ii. An investigation will be conducted as speedily as possible and the outcomes / action plan communicated to the complainant within the shortest possible time.
- iii. In case the grievance is assessed to be out of the scope of the GRM, a communication towards the same shall be made to the grievant, and an alternative mode of redress shall be suggested.
- iv. The reasons for any delays in feedback will be notified to the complainant

6.9.4 Grievance and Investigation Procedure

- i. At the community project level, the ward GRM committee will carry out field visit and investigate the complaint or grievances together with the offices of the Project Coordinator and District Agricultural Coordinator.
- ii. After investigation, the office of the Project Coordinator in consultation with the District Agricultural Coordinator will provide feedback to the complainant, and an agenda is set to resolve the grievance.

- iii. If the matter is not resolved, the office of the Project Coordinator refers to the E & S Officer at PIU for further investigation.

6.9.5 Site Inspection and Resolution

- i. Investigation and verifying and resolving the grievances received, site inspection may not be required in all the cases. Depending upon the sensitivity of the issue, requirement of a site inspection will be identified by the E&S officer.

6.9.6 Resolution and Closure at National Level

- i. During the resolution and closure of the complaints or grievances, the person affected by the project/complainant will be involved in reaching a resolution.
- ii. The resolution shall be communicated to the grievant within 7 working days of completing any site investigation and closure of the case.
- iii. In case the grievance remains unsettled, E&S officer will forward the case to the Project Coordinator, who will identify an adequate resolution or provide an alternative resolution to the grievance in consultation with the District Agricultural Coordinator.

6.10 Environmental, Health and Safety Management System (EHSMS)

The Environmental, Health and Safety Management System helps to ensure adequate emergency preparedness and sound implementation of environmental, health and safety measures of any project and the development of Nansanga Farm is not an exemption. In view of this, it is necessary that the EHSMS for the farm block be developed.

The project implementation unit will utilize expert personnel and the Environment, Health and Safety Management System (EHSMS) to safeguard the environment, health and safety of its employees and the public. Using these tools, the potential health and safety hazards (risks) has been identified and assessed. Further, substantial planning, organization, and procedures for the operations of the facility is developed.

Prior to project commissioning, all relevant personnel are required to undertake an extensive training program to ensure safe operating practices. The training program and subsequent regular

refresher programs involve issues covering Safety; Emergency Procedures and Environmental Management Systems.

It is and will always be the responsibility of management to provide the following basic information:

- i. Description of all potential hazards/ risks associated with the project;
- ii. Health and Safety implications of all hazards;
- iii. Description of management techniques including inspections, maintenance follow-up, reports and personnel protective equipment (PPE);
- iv. Outline of emergency response procedures including organizational structure of key trained personnel to act as emergency responders, action steps for entering and working within zone of hazards, evacuation procedures, protective gear requirements, decontamination procedures, lines of communication, emergency call centres' telephone numbers, map of nearest medical centres' routes, etc.

6.11 Emergency Response Plan

Emergency may be defined as a sudden event causing or has the potential to cause serious human injury and /or environmental degradation of large magnitude. The best "cure" for an emergency is "prevention". Considering the nature of the proposed project, the probable emergency situation can be:

- i. Diesel tanks failure (leaks)
- ii. Natural calamity such as heavy rain, flooding, etc.
- iii. Bomb threat or any sabotage / terrorist activity
- iv. Any other incident involving all or large parts of the premises and its workers.

Emergency Response Management is provided by a small team of senior project managers (the "Control Committee") who in turn direct all response activities through the Emergency Response Unit, security, communications, public relations, safety and environmental affairs and material procurement section. Each of these sections will have specific responsibilities to perform in the event of an emergency. The main objective of this plan is to establish the general guidelines for the actions to be taken in the event of an emergency such as fire explosion at diesel storage

tanks; explosion, accidents, disasters and sabotage. It is aimed at minimizing their effects and consequences in order to protect:

- i. The lives of own or third-party personnel present in the project area;
- ii. The lives of the occupants of the Project;
- iii. The lives of the nearby residents and communities coming into the direct influence of the project area;
- iv. The lives of the ecological systems located in the surroundings of the Project.

6.12 Risk Situations

Due to the characteristics of the Project, the risks that could arise are the following:

- i. Risk of fuel storage tanks failure
- ii. Risk of explosion/fire at fuel tanks storage area
- iii. Risk of employee's injury especially during site preparation and construction
- iv. Natural calamities such as floods or droughts

The chances of occurrence of these risks has been reduced or avoided through proper planning and in house emergency response and management system.

6.12.1 Internal Risks

Risks arising from operational conditions or human error that could result in personal accidents or spills, such as:

- i. Occupational accidents (serious or fatal), due to non-compliance to occupational health and safety guidelines, failure to comply with operating rules and procedures, negligence of the personnel, falls, internal traffic accidents (drop zone and parking lot), bad use of equipment and personal protection items, etc.
- ii. Environmental Contamination due to improper storage and disposal of solid waste, contamination of water, etc.

6.12.2 Personnel Transportation Risks

All personnel of this project must be instructed that in the event of accidents while the personnel / worker is being transported to/ from the site, using own or third-party transportation must immediately notify the Environment, Health and Safety (EHS) department so that it may be able to provide the necessary assistance for the injured, and proceed to issue notices not only to the health care centers but also to external support institutions (Serenje District Disaster Management Centre, Police, Fire Fighters, etc.).

Considering the nature of the proposed project, these risks are higher during site preparation and construction activities relative to the operational phase.

6.13 Risk management

The management of contingencies shall be based on:

- i. Early detection of emergencies
- ii. Warning of local communities and employees on the risks associated with the project activities
- iii. Training of employees in safety matters and emergency preparedness
- iv. Confinement of emergency / affected area.
- v. Application of the adequate response procedure. Follow-up and monitoring.

6.14 Evacuation Plan

Alarm signal(s) are used to begin evacuation if required. The possible alarm systems that can be utilized include:

- i. Horns/Sirens
- ii. Verbal (i.e. shouting, paging)

6.15 Emergency Contacts

- i. Health and Safety Section on site
- ii. Phone No
- iii. Fire/Police/Ambulance
- iv. Phone No
- v. Serenje District Disaster Management Centre
- vi. Phone No

6.16 Emergency Procedures

6.16.1 Emergency Coordinator Responsibilities:

- i. Whenever there is an imminent or actual emergency situation, the emergency coordinator (or a designee when the emergency coordinator is off duty) shall:
- ii. Identify the character, exact source, amount, and extent of hazard.
- iii. Assess possible hazards to workers and the public that may result from the hazard.
- iv. Activate internal facility alarms or communications systems, where applicable, to notify all facility personnel.
- v. Notify appropriate local authorities.
- vi. Notify the State Office of Emergency Services.
- vii. Monitor for the possible sources or causes of the risk/hazard.

Take all reasonable measures necessary to ensure that the risk can not materialize or do not recur, or spread to other hazardous materials at the facility.

- i. Before facilities at the site are back to normal status and operations are resumed in areas of the facility affected by the incident, the emergency coordinator shall:
- ii. Provide for proper storage and disposal of recovered waste, or any other material that has been destroyed or results from the incident at the facility.
- iii. Ensure that all emergency equipment is cleaned, fit for its intended use, and available for use.

6.16.2 Post-Incident Reporting

The time, date, and details of incident that requires implementation of this plan shall be noted in the facility's operating record. Within 15 days of any accident or emergency incident which triggers implementation of this plan, a written Emergency Incident Report, including, but not limited to a description including the facility's response to the incident, must be prepared. The report shall include:

- i. Name, address, and telephone number of the facility's owner / operator;
- ii. Name, address, and telephone number of the facility;
- iii. Damage occurred to life and property;

- iv. Name and quantity of material(s) involved;
- v. The extent of injuries, if any;
- vi. An assessment of actual or potential hazards to human health or the built environment, where this is applicable;
- vii. Estimated quantity and disposition of recovered material that resulted from the incident;
- viii. Probable cause (s) of the incident;
- ix. Remedial measures taken to prevent reoccurring in response to the incident;

Administrative or system controls designed to prevent such incidents in the future.

6.16.3 Emergency Equipment

The Health and Safety Regulations require that emergency equipment at the facility be listed. An appropriate emergency equipment inventory table needs to be developed in order to meet the requirements.

6.16.4 Training

Personnel are trained in the following:

- i. Internal alarm / notification system
- ii. Evacuation Management System
- iii. Re-entry procedures & assembly point locations
- iv. Emergency incident reporting System
- v. External emergency response organization System
- vi. Location(s) and contents of emergency

6.16.5 Emergency Response Training

Appropriate training must be imparted to the relevant staff that enables them to respond during the emergency situation. Emergency contact list and related information like the location of the emergency equipment must be kept handy.

6.16.6 Response levels

Two levels of response must be contemplated:

- i. With Internal Personals

- ii. With External Agencies, such as Serenje District Disaster Management Centre, Police, Ambulance services etc.

6.16.7 Response Strategy

In an event of emergency occurrence, the response plan has been undertaken as per the following sequence:

6.16.7.1 First Level: Notification

- i. Internal Communication, wireless communication systems has been established.
- ii. External Communication
- iii. Local Authorities have been advised by telephone.
- iv. In the case of serious or fatal accidents, police are notified.
- v. The relatives of the injured person are informed, as soon as they are evacuated to a hospital.
- vi. To the extent possible, the press will be notified after the accident has been investigated through the personnel appointed / designated by Management.
- vii. In the case of an accident that has affected the facilities; the insurance company will be notified in coordination with the administration and finance management.

6.16.8 Second Level: Initial Assistance/Rescue

A joint evaluation report will consist of the status of the event, and the conditions of the affected site that warrant a safe development of rescue actions, first aid and transportation of the injured to a medical unit. Strategies will be adopted to determine own material and human resources to be required, the deployment of the resources to the emergency location, as well as the estimated response time. Trained emergency teams must be prepared to act as required, and a reserve team must be available. All personnel who are not essential to fight the emergency must be evacuated to a safe place where there must be communication equipment available to count the number and condition of the personnel.

6.16.9 Third Level: Response operations

Response Operations refer to:

- i. Isolation, confinement and containment of the incident affected area Medical assistance and evacuation of injured personnel and occupants.
- ii. Evacuation of all personnel and occupants if their lives are in danger (in an event of a disaster)
- iii. Application of a monitoring program and a mitigation plan.

6.16.10 Fourth Level: Evaluation of the plan and damages

Once response operations have been concluded, the development and results of the plan must be evaluated in order to issue recommendations that allow correcting deficiencies for the purpose of improving response operations. These recommendations will then form part of revisions and subsequent annual approval of the Contingency and Risk Prevention Manual. A record of damages will be prepared as part of the final emergency report. The resources used, lost and recovered will be detailed in the said register.

7.0 Decommissioning and Closure Plan

Decommissioning is the last phase of the project. At this point, the project will have served its purpose. The planning for closure and decommissioning of an agricultural project is complicated and rare unlike planning for a facility such as a mine, factory or storage facility that has finite resource. For this reason, the decommissioning and closure plan for the integrated agricultural project for Nansanga Farm Block will concentrate on the Mechanical Workshop, Fuel Storage Areas and Chemical Storage Sheds at the service centres.

7.1 Objectives of the Decommissioning and Closure Plan

The rehabilitation and closure objectives for the aforementioned project components will include:

- i. Compliance with relevant Zambian environmental legislation relating to closure.
- ii. Identification of potential post closure uses of the land occupied by the project infrastructure in consultation with the surrounding landowners and land users (to be done during the operational phase).

Rehabilitation of disturbed land to a state that is suitable for its agreed post closure uses (which are likely to include wilderness, grazing or subsistence farming); Rehabilitation of disturbed land to a state that:

- i. ensures that the area is physically stable and minimizes safety hazards
- ii. Minimizes the opportunities for soil erosion to occur;
- iii. Facilitates compliance with applicable environmental quality objectives (air quality and water quality guidelines)
- iv. Reduces visual impact of the disturbed land;
- v. Provides a self-sustaining solution with a minimum of post closure management.

7.2 Closure Activities and Commitments

7.2.1 Consultative Meetings

Since the agricultural project infrastructure is not likely to have high risk residue impacts, there is need to engage various stakeholders to determine the nature of activities or specific commitments regarding closure. These stakeholders will include but not limited to:

- i. Zambia Environmental Management Agency
- ii. Community leaders, churches and other local organizations

- iii. Ministry of Land and Natural Resources
- iv. Local community members
- v. Interested and affected party's national wide

7.2.2 Post Closure Land and Infrastructure use

The use to which the farm land and infrastructure will be committed after closure will be determined by: the consultative meetings with the above listed stake holders; legal requirements/provisions and; the state of infrastructure at that time.

7.2.3 The No-demolition option

If the infrastructure will be in good or usable condition, it is most likely that no demolitions will be done. Instead, it will be committed to other uses that will be deemed beneficial to the local community and the nation at large. This may include options such as converting the administration offices and housing units into local administration offices, community/government schools (secondary, primary or even nursery) other government offices or sale to would be future private users. The exact use will be determined at consultation stage.

7.2.4 The demolition option

If the decided course of action is demolition, the following principles will apply

- i. After demolition all subsurface concrete will be removed to a depth of at least 500mm
- ii. Rubber will be used to fill voids on site and the excess will be disposed of following an arrangement agreeable with ZEMA

Backfill and re-contouring the land disturbed by the initial project site preparations, construction and closure demolition operations to the greatest extent possible so that it is stable with gentle slopes suitable for the long term land use commitment such as agricultural use, forested area or any other use agreed upon during consultative meetings

- i. Characterization and stockpiling of the topsoil for use in reclamation;
- ii. Employ local resources (domestic waste and animal manure) in soil amendment methods;
- iii. Use, to the greatest extent at least 60 % of local plant species (as determined during flora studies of this ESIA) or species that have proved to be adapted to the local environmental conditions for revegetation;
- iv. Avoid to the greatest extent possible, introduction of noxious weeds into the reclamation area;

- v. Remove all facilities and equipment from the site which are not required by the proposed closure/decommissioning plan;
- vi. Remove or control residual hazards from various facilities e.g. the chemical storage facilities.
- vii. Monitor and manage rehabilitated areas until the vegetation is self-sustaining and all other reclamation objectives are achieved as projected.

7.2.5 Decommissioning and Closure Cost Estimates

The precise estimation of how much it will take to decommission and close the facilities on site will be determined at the time of closure. In case the option of demolition is favored, an independent team will be engaged to determine the total cost of demolition of concrete, steel, rubber, and other structures on site. The cost of making the land suitable for an agreed upon land use will also be determined. After issuance of the closure certificate, the land will be handed back to the government. Table 23: Gives estimates of the decommissioning and closure costs for main facilities on site.

Table 29: Summary of Decommissioning and Closure Cost Estimates:

Activity/Aspect	Description	Estimated quantities	Unit Cost (US\$)	Total (US\$)
Mechanical Workshop – Earth Moving Machine				
Demolition	Demolition and removal of sub structure concrete to a depth of 500mm	100 tons	100	10,000
Final Rehabilitation	Levelling or re-sloping of the area to fit the general land profile	12000m ²	5	60,000
Final Rehabilitation	Levelling or re-sloping of the area to fit the general land profile	100m ²	300	30,000
	Spreading of top soil to a depth of 300mm	100m ²	50	5,000
Facility: General and Chemical Storage Shed				
Final Rehabilitation	Levelling or re-sloping of the area to fit the general land profile	500m ²	10	5,000
	Spreading of top soil to a depth of 300mm	500m ²	30	15,000
Administration				
Post closure monitoring	2 inspection/year for 5 years	10 inspections	1000	10,000
Preparation of final closure plan	Final closure plan after consultative meetings and agreed upon post closure land use	1	1200	1200
Total				136,200

8.0 Conclusion

The ESIA study team completed the identification, evaluation and mitigating measures of the concerns and impacts of the Nansanga Commodity Value Chain Transformation Project to be implemented in Nansanga Farm Block.

From the ESIA consultations, studies and findings, it is evident that the Nansanga Commodity Value Chain Transformation Project to be executed by Ministry of Agriculture is environmentally, socially and economically viable and generally beneficial to the area. The project will result in overall economic growth and development as a result of the improvement in the availability of employment opportunities for the locals and improved food production from the soya beans, maize and cassava production.

The study shows that the project has minimal negative impacts and most of these will occur within the project area (Nansanga Farm Block). However, the positive impacts are many and they are felt within the project area and beyond. The flora and fauna impacts are associated with the habitat loss and fragmentation as a result of vegetation clearing. Implementation of the mitigation measures proposed in the ESMP of this report will reduce the predicated impacts to minor in most cases.

For the threatened species of conservation significance, impacts to aquatic macrophyte, freshwater fish and aquatic fauna species of conservation significance are highly unlikely to occur as a result of the Project and no detectable or measurable impacts to the aquatic ecology of Ramsar, as Nansanga Farm Block is not part of the listed Ramsar wetlands.

In our opinion, it has been proven that the positive impacts of the project are more sustainable and outweigh those of the negative impacts. Based on the level of details and depth of the ESIA study, it is the view of ESIA study team that all foreseen environmental and Socio-economic impacts have been fully addressed within the limits of the current state of knowledge and reasonable practice. Hence, the Nansanga Commodity Value Chain Transformation Project can continue taking into considerations commitment made in the ESMP.

9.0 DECLARATION OF AUTHENTICITY

The information provided is unbiased and accurate Environmental and Social Impact Assessment (ESIA) for the proposed Nansanga Commodity Value Chain Transformation project in Nansanga Farm Block, Serenje District in Central Province to be executed by the Ministry of Agriculture. This document is presented to the Zambia Environmental Management Authority (ZEMA) for approval.

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Appendix 1: Stakeholders in Nansanga Farm Block

Table 30: Primary Stakeholders in the area

STAKEHOLDER	CONTRIBUTION	EXPECTATIONS	REMARKS
Chief	<ul style="list-style-type: none"> ○ Traditional leadership ○ Land allocation ○ Conflict resolution ○ Lobby for development 	<ul style="list-style-type: none"> ○ Maintenance of Traditional status ○ Play a role in land distribution ○ Receive some royalties ○ Security of tenure of his currently subjects. 	Change in land status from customary to state land may affect those expectations
Village Headmen/Women	<ul style="list-style-type: none"> ○ Traditional leadership ○ Land allocation ○ Conflict resolution ○ Lobby for development ○ Advice to the Chief 	<ul style="list-style-type: none"> ○ Maintenance of their status ○ Security of land tenure for villages under them. ○ Social responsibility from Investors that enhances local economic and cultural Development 	Pears of erosion of traditional values and loss of authority.
Local Communities	<ul style="list-style-type: none"> ○ Cultural heritage ○ Homage to traditional leader ○ Constitution Village system ○ Development activities in the area. 	<ul style="list-style-type: none"> ○ Increased employment opportunities ○ Pressured land tenure ○ Social responsibility from investors ○ Free access to Resources ○ Increased development 	Their fears were <ul style="list-style-type: none"> ○ Limited Access to Natural Resources due to change in land status. ○ Erosion of cultural values ○ Increase in communicable disease i.e. HIV/AIDS

		<ul style="list-style-type: none"> ○ Development of outgrower schemes ○ People's Rights to be respected <p>Improvement of social services</p>	<ul style="list-style-type: none"> ○ Disruption of families' clan units.
Community Resource Board – Kafinda	Natural Resource Protection and utilization especially Kafinda Game Management Area.	<ul style="list-style-type: none"> ○ Increased capacity to manage the area ○ Increased income from resource utilization ○ Development of GMA Conservation Plan 	<p>Fear included</p> <ul style="list-style-type: none"> ○ Increased human population will result in increase in poaching activities ○ Demarcation of plot in GMA will destroy habitats and change its status
Members of Parliament and Local Councilors	<ul style="list-style-type: none"> ○ Represent Local People in council and Parliament ○ Lobby for Development ○ Political Mobilization 	<ul style="list-style-type: none"> ○ Represent local people in Council and Parliament ○ Lobby for development ○ Political mobilization 	<ul style="list-style-type: none"> ○ Foreign influence on local politics ○ Loss of local voice in decision making <p>uncertainties</p>

Table 31: Secondary stakeholders in the area

STAKEHOLDER	CONTRIBUTION	EXPECTATIONS	REMARKS
Investors	<ul style="list-style-type: none"> ○ Employment creation ○ Market opportunities ○ Capital investment 	<ul style="list-style-type: none"> ○ Improvement of infrastructure ○ Cooperation from local people ○ Cooperation from government and local authority ○ Good market ○ Security 	<ul style="list-style-type: none"> ○ Drivers of agricultural development in the farm block ○ Serenje Properties Limited have created employment to 300 local people
Traders	<ul style="list-style-type: none"> ○ Goods and services ○ Employment ○ Market for local goods 	<ul style="list-style-type: none"> ○ Improved transport services ○ Security and cooperation with the local people 	<ul style="list-style-type: none"> ○ Provides readily available market and coordination of the produce ○ Food Reserve Agency has set up depots for agricultural produce
Tourist	<ul style="list-style-type: none"> ○ Market Opportunities 	<ul style="list-style-type: none"> ○ Readily available market 	<ul style="list-style-type: none"> ○ Tourist are potential investors. ○ Disseminate information
Employees	<ul style="list-style-type: none"> ○ Provides services 	<ul style="list-style-type: none"> ○ Improved social services ○ Good employment conditions 	<ul style="list-style-type: none"> ○ Provides labour services

Table 32: Institutional stakeholders in the area

Forestry Department	<ul style="list-style-type: none"> ○ Protection of watersheds ○ Establishment of VNRMCs ○ Forest Extension Services ○ Capacity building in forest based income generating activities ○ Management of protected forests ○ General welfare of the environment 	<ul style="list-style-type: none"> ○ Good land use planning in the Farm Block ○ Compliance with government legislation by all stakeholders ○ Orderly settlement ○ Sustainable utilization of forest resource 	<ul style="list-style-type: none"> ○ Encroachment of protected areas due to some spillover effect ○ Destruction of watersheds
Home Affairs (Police)	<ul style="list-style-type: none"> ○ Provision of security ○ Capacity building in community policing ○ Conflict resolution 	<ul style="list-style-type: none"> ○ Farmer participation in formation of neighborhood watches ○ Provision of community Police Posts ○ Compliance with national Laws 	Increase in crime rate in the area
Immigration	Regulation of immigration and emigration issues of citizenship work permits	Compliance with Immigration Laws	<ul style="list-style-type: none"> ○ Increase in unregistered immigrants working without proper work document.
Lands Department	<ul style="list-style-type: none"> ○ Land appropriation in State Lands ○ Issuance of Title Deeds ○ Ground Rates and Rent 	<ul style="list-style-type: none"> ○ Collaboration in land use issues with other sectors ○ Compliance with leasehold land regulations 	<ul style="list-style-type: none"> ○ High demand for plots

Water Affairs	<ul style="list-style-type: none"> ○ Hydrological Survey ○ Approval of dam siting ○ Regulation of water consumption ○ Monitoring of water quality ○ Sustainable management of water resources ○ Capacity building for local water sanitation 	<ul style="list-style-type: none"> ○ Sustainable use of water ○ Compliance with water regulations 	Fears include deterioration of water quality and quantity due to unsustainable use.
Serenje District Council	<ul style="list-style-type: none"> ○ Infrastructure development ○ Social services delivery ○ Revenue collection through levies ○ Processing of applications for land, business, etc ○ Preparation of development plans and coordinating implementation of plans 	○	<ul style="list-style-type: none"> ○ Inability of people to honour levies and rate payments ○ Inadequate cooperation with investors
Ministry of Health	Health service delivery	<ul style="list-style-type: none"> ○ Support from new investors in providing private health service facilities ○ Improved and increased health facilities 	<ul style="list-style-type: none"> ○ Increase in communicable diseases ○ Increased workload for staff in the 9 Centres due to increase in population

Zambia Electricity Supply Corporation(ZESCO)	<ul style="list-style-type: none"> ○ Provide employment ○ Rural electrification 	○	Fears: vandalism of power lines or transformers
Roads Department Agency	Road and bridge construction	○ Resources and logistics for road and bridge maintenance	Inadequate resources for road maintenance
Community Development	<ul style="list-style-type: none"> ○ Community mobilization ○ Community development through literacy programmes and clubs 	<ul style="list-style-type: none"> ○ Raising of literacy standards especially for women ○ Improved living standards of the people 	<ul style="list-style-type: none"> ○ Mushrooming of churches ○ Conflicts among different church members

Appendix 2: Terms of Reference (TORs) for the Environmental Impact Assessment (EIA) For the development of Nansanga Commodity Value Chain Transformation Project

INTRODUCTION

These Terms of Reference (TORs) are for the execution of the Environmental Impact Assessment (EIA) for the development of the Nansanga Farm Block in Serenje District. The EIA team members shall use the TORs as guidelines to execute their tasks. However the scope of work shall not necessarily be limited to the TORs as the experts are at liberty to identify, include and work on other issues of importance should they emerge in the course of work. The EIA team shall be grouped into three, according to the key areas of focus; socio-cultural, infrastructure development and ecological.

BACKGROUND

Zambia is afflicted with high levels of poverty, food insecurity and malnutrition caused by low farm productivity and weak market integration of smallholder rural farmers. The situation is exacerbated by rising threats from climate change. Between 2006 and 2020, the GDP growth rate declined from 13.2% to - 4.8 % (IMF, 2020). The agricultural share of GDP shrunk from 13.2 % to 2.7% (GRZ, 2021). Allocated budget to the sector reduced to less than 6 % in 2020. Debt servicing obligations took up 38.5 % of the national budget (IAPRI¹, 2020; World Bank, 2020; GRZ, 2021). Support from Cooperating Partners has also declined to less than 10% of the national budget. Socio-economic indicators have been deteriorating and the proportion of people facing income poverty in rural areas stood at 77% in 2015².

The poverty levels are too high for a country ranked as a low-income country (LIC). People ranked as very poor were higher among female-headed households at 50.1% compared to male households at 37.9% (CSO, 2015). At least 50% of the districts suffered from food insecurity³ in 2019/2020. Under-5 stunting rate was more than 35% in 2018 (ZDHS 2018), below the average for lower LICs.⁴ The agricultural sector has been recording low productivity with the yield of staple maize below 2.0mt/ha compared to 10mt/ha potential with the use of hybrid seeds and

¹ Indaba Agricultural Policy Research Institute

² National Development Plan, 2017 - 2021

³ The United Nations Office, Lusaka, 2020

external inputs. Zambia cultivates less than 14% of its 45 million hectares of arable land and irrigates less than 155,912 hectares (5.7%) of its irrigable land.⁵ Zambia is spending valuable foreign exchange on importing foods that it can easily produce and export, with a huge potential in the farm blocks and settlement schemes.

The Zambian Government has through the Eighth National Development Plan (8NDP - 2022-2026), reiterated the desire to develop farm blocks, resettlement schemes and processing hubs or zones. These strategic assets present great opportunities to unlock farm productivity, value addition and increased exports by providing the critical public goods and an enabling environment for private sector investments in the agricultural sector.

Transformation of the agriculture sector remains one of the most strategic options for the achievement of the country's medium to long-term objective of macroeconomic stability, growth, poverty reduction and diversified economic development. The Government's development agenda is articulated in the National Vision 2030 and the Eighth National Development Plan (7NDP: 2017-2021). The National Vision 2030 sets the long-term goal which reflects the understanding, aspirations and determination of the people to be a "*prosperous middle-income country by 2030*". The agriculture sector and the farm block development programme in particular is one of the priority areas of focus that will contribute to the attainment of the country's development aspirations.

Zambia has reserved about 2 million hectares of land under farm blocks and settlement schemes scattered throughout the country. These are blocks of land carefully selected based on their high agricultural potential. Transformation of production, processing and marketing in farm blocks and settlement schemes remains a key strategy for commercial agriculture for domestic and regional markets. The Farm Block concept comprises a core venture, large, medium, and small-scale farms operating under an out-grower arrangement and agri-processing facilities. The GRZ has piloted the farm block concept at Nansanga and Luena Farm Blocks which are both at advanced stages of development, though not fully operationalized. The Government has supported settlement schemes as a tool for agrarian reform. However, these settlement schemes remain largely undeveloped because of lack of supportive infrastructure such as feeder access roads, electricity, water for irrigation and domestic uses, communication facilities as well as supportive agribusiness services for marketing and processing of primary products.

⁵ Ibid

The Programme will adopt a phased approach by selecting high potential farm blocks and settlement schemes. Two sites at Nansanga and Nega Nega Irrigation Scheme have been selected largely based on both technical (production) and commercial (processing and marketing linkages) potential as ranked during ten feasibility studies. The programme will focus on (i) raising productivity by promoting access to improved technologies and (ii) promoting value addition and processing and integrating and aligning smallholder producers to commercial processors and industry through out-grower arrangements and, (iii) Integrating cross-cutting priorities including environment, social, gender mainstreaming, youth and women empowerment, and climate change. In March 2022, a team from the African Development Bank met with Government and agreed on the need to develop farm blocks and settlement schemes. It was further agreed that the support to this end will be through the Nansanga Commodity Value Chain Transformation Project with a financial commitment of USD22.5 million ADF 16 concessional resources to be implemented in 2023. The target sites for the programme would be: (i) Manyonyo Irrigation Scheme at Nega-Nega Settlement Scheme; and (ii) Nansanga Farm Block. Initially, the project will focus on opening-up selected sites within the two areas, supporting agriculture production, providing agri-business support services and building capacity for smallholder out grower schemes.

PROJECT DEVELOPMENT GOAL AND COMPONENTS

The overall objective is to contribute to poverty reduction, food and nutrition security of smallholder farm households in farm blocks and settlement schemes through the adoption of climate resilient technologies and provision of improved agricultural support services.

Implementation of the programme requires a mindset change by all stakeholders, primarily to promote farming as a business, and embracing the role of the private sector in the provision of agribusiness services. The Programme has three integrated components; (A) Climate Smart and Integrated Crop Plantation Schemes; (B) Agribusiness Support Services, and (C) Institutional Support and Programme Management. A detailed description of these three components follows below.

COMPONENT A: CLIMATE SMART AND INTEGRATED CROP PLANTATION SCHEMES

Farmers in the targeted farm block and settlement scheme will be supported to open up their land and increase crop and livestock production and productivity in an integrated manner.

Sub-Component A1: Crop Plantations: Under Phase 1, the Programme will help smallholder farmers to develop and plant 11,000 ha of land under rainfed crop plantations and 1,000 ha under irrigated land through irrigation development services. At Nega Nega settlement Scheme (Manyonyo) in Mazabuka, the project will complete the planting of 385 ha of Blocks A and C under sugarcane irrigation and establish 1,000 ha of rainfed soyabean crops. In Nansanga, the project will establish 3,500 ha of rainfed crops (cassava and soyabean) and 300ha of irrigated crops. The plantations will be individually owned by over 3,000 smallholder farmers who will be linked to established commercial operators as out-growers and private sector-managed agri-service centres that will provide mechanization, soil testing and analysis services and input provision services.

Sub-Component A2: Promote Productivity-Enhancing Climate Smart Technologies and Practices: Working closely with Consultative Group on International Agricultural Research institutions and private sector input suppliers, farmers will be supported with access to Technologies for African Agricultural Transformation climate-smart production technologies for each crop through demonstration sites, procuring and distributing Climate Smart Agriculture inputs, developing appropriate seed systems and disseminating proven Integrated Pest Management practices and building capacity in good agricultural practices for farmers and promoting climate-smart post-harvesting technologies. The program will help smallholder farmers to diversify into small livestock such as goats, sheep and poultry, utilizing maize and soyabeans into stockfeeds. These enterprises will be linked to established commercial operators as out-growers.

COMPONENT B: AGRI-BUSINESS SUPPORT SERVICES:

Through Agribusiness Service Centres, rented or owned by the private sector and public sector service providers, farmers will be able to access the following services: (i) Training in agribusiness, (ii) forge sustainable linkages and relationships between Private Sector, commercial operators and out-grower farmers, (iii) Commodity Storage and Bulking Facilities as Warehouse Receipt System (WRS), (iv) Agro-processing and value addition. A Revolving Fund Loan Scheme will be established to help the private sector and farmers access loans for farm establishment and crop establishment.

The programme will not focus on subsidies but the provision of start-up input loans through agribusiness support services. The Programme will also encourage or promote financial services such as Savings and Credit schemes among farmers and SMEs in the schemes, insurance products

for producers and SMEs, and Digital Agricultural Market Information System for all value chain players and crop and weather early warning services. The Programme will also support farmers to improve their credit worthiness.

COMPONENT C: INSTITUTIONAL SUPPORT AND PROGRAMME MANAGEMENT:

Local Institutions: This component will support (i) Development of innovative institutional management mechanisms for the farm blocks and settlement schemes, support to farm block and scheme management entities, primary cooperatives and farmer groups, (ii) build capacity of staff, women, girls, youth, nutrition, climate change and COVID-19, (iii) develop and operationalize an M&E/MIS, produce knowledge management products, Programme visibility and IEC (Information, Education and Communication).

Women and Youth Empowerment: In order to empower women and youth, the Programme will (i) deliberately target youth (45%) and women (40%) in all capacity building and agribusiness services activities; (ii) support nutrition education using the food-based approach and behavioral change; (iii) support infant feeding and appropriate child feeding practices. (iv) Train women and girls in preparation of infant foods using locally available foods; (v) Promote growth monitoring for under-five infants; (vi) Train women in nutrition within COVID-19 context. (vii) Provide inputs for backyard vegetable gardening and small livestock as supplements to commercial crops.

Programme Management and Coordination: In order to improve Programme management, the Programme will be managed at the decentralized district levels but will support (i) supervisory functions of Ministry HQ; (ii) operations of the Programme Steering Committee and the Technical Committee; (iii) knowledge products, M&E; (iv) Financial and Procurement audits; (v) E&S Audits and Environmental and Social Safeguards compliance; (vi) Procurement and Financial Management functions, (vii) production of Annual Work Plans and Budgets; (viii) Programme related operations at decentralised district and farm block levels; (ix) establishment of a Programme Coordination Unit (PCU) at each district level and central HQ; and (x) collaborative efforts with CGIAR institutions within TAAT framework.

The Nansanga Value Chain Transformation Project has been categorized under the Second Schedule of the Zambia Environmental Impact Assessment Regulations and is category 3 under the Bank's safeguards system. The categorization requires that a full Environmental and Social Impact Assessment (ESIA) study is completed and published before ADB approval and implementation. Further and in line with the ESIA, the project requires preparation of Pest

Management Plan (PMP). In this regard, the Ministry of Agriculture has mobilized resources to engage a team to undertake the ESIA and PMP preparation in the two areas and specifically targeting actual sites for the investments.

OBJECTIVE OF THE ASSIGNMENT

The objective of the assignment is threefold, namely, to:

- (i) Conduct an Environmental and Social Impact Assessment (ESIA) of the proposed Phase 1 Farm Block Transformation Project in Nansanga Farm Block, specifically covering the sites for the interventions (land to be cleared for crop production under rain fed and irrigation, locations for bulking and agro-processing facilities). The team will be required to produce an Environmental and Social Impact Assessment (ESIA) to serve as a basis for the issuance of an Environmental Permit by the Zambia Environmental Management Agency for the implementation of the proposed project;
- (ii) Prepare an integrated Pest Management Plan (PMP) for the project to promote the use of a combination of environmentally and socially friendly practices and reduce reliance on synthetic chemical pesticides and ensure that health, social and environmental hazards associated with pesticides are minimized under the Project.

The need for an ESIA and PMP is in line with national law that require that environmental concerns, land acquisition, restrictions on land use and involuntary resettlement are integrated into development interventions and as a way of preventing, minimizing, mitigating or compensating for adverse environmental and social impacts. The requirement for the EIA and the Environmental Impact Assessment process are enshrined in the Zambia Environmental Management Act of 2011 and EIA Regulations, Statutory Instrument No.28 of 1997 (SI 28, 1997), respectively.

The agricultural production, construction of facilities to support agri-business and other related operations is likely to have significant adverse and beneficial environmental and social impacts which need to be assessed so that appropriate measures are introduced in the project design and implementation. This will ensure compliance with the ZEMA Act, EIA regulations and other national laws, as well as compliance with the requirements of the integrated safeguards system (ISS) of the African Development Bank (AfDB).

SCOPE OF WORK/ASSIGNMENT

The Team shall conduct an Environmental and Social Impact Assessment (ESIA) in each scheme/farm block of implementation, including an Environmental and Social Management Plan (ESMP) required to satisfy Government and AfDB requirements as stated in section 2 of these TORs.

SCOPE

The Environmental Impact Assessment Regulations of 1997 identifies the key stages that will inform the scope of works for the assignment as follows:

Project screening: This is aimed at determining if the project falls in the Second Schedule of the regulations;

Scoping: to identify the potential impacts i.e. magnitude, extent, significance and special sensitivity of the impacts to allow for the key issues to be subsequently studied in detail during the main ESIA. Based on the scoping, the team will produce a report and develop detailed Terms of References for the main ESIA;

Baseline study: providing a detailed description of the existing environment including the biophysical and socio-economic activities of the population resident in the potentially affected area;

Impact Evaluation: prediction and evaluation of impacts and ranking them in order of importance on the basis of quantitative qualitative changes the project will bring about;

Public Participation in Environmental Impact Study: engagement with the communities which are likely to be affected by the project in order to seek their views for consideration in the development of mitigation measures;

Identification of Mitigation Measures: identification of measures for elimination (where possible), or reduction, of environmental impacts for various alternatives identified in the study;

Assessment or comparison of alternatives: all the alternatives on the basis of economic, socio-cultural and environmental gains and costs are assessed, ranked and recommendations made regarding the best alternatives; and

Submission of the report to ZEMA: once the developer makes a decision regarding the best alternatives, a draft Environmental Impact Statement is submitted to ZEMA for comments and thereafter the comments are incorporated in readiness for final submission for approval.

DETAILED TASKS

Description of the Proposed Project

In order to properly screen the project, a detailed description of the proposed project and its activities and specifications in the areas/districts concerned is required. The team for the ESIA will therefore have to liaise closely with the MoA in developing a detailed description of the activities and investments of the proposed project to support impact identification and assessment.

The description of the project will include:

- (i) Potential site locations including geographic coordinates;
- (ii) Distribution corridor and network, adjoining land uses, including any proposed future developments;
- (iii) Project components and specifications;
- (iv) Planned installations and production activities related to agribusinesses to be undertaken and schedule;
- (v) Description of construction materials, including quantities to be used and their sources;
- (vi) Description of work camp and other facilities to be provided on the site;
- (vii) Types and quantity of equipment required for the production and operations;
- (viii) Labour requirements for construction and operations
- (ix) Planned project operational activities;
- (x) Other relevant information on the project; and
- (xi) Project Alternatives.

The description will include maps, photographs and graphics at appropriate scales to illustrate the specific location of the various activities and investments of the project.

4.2.2 Policy, Legislative, Regulatory and Institutional Frameworks

The team will identify and discuss Government policies, regulations and standards or guidelines and institutional frameworks governing environmental and social impact assessment, environmental quality, natural resources management, occupational and public health and safety, labour influx, physical cultural resources, pest management and use of synthetic chemical pesticides, land acquisition, restrictions on land use, involuntary resettlement and livelihood restoration that are applicable to the execution of the proposed project.

The relevance of the various frameworks to the implementation of the proposed project should be clearly demonstrated. At the minimum, the analysis should cover the following:

Relevant Policies (including land appropriation, resettlement and compensation, pest management and use of synthetic chemical pesticides, Climate Change, environmental and Gender related policies);

- (i) Legislative and Regulatory Framework that includes;
- (ii) Lands Act;
- (iii) Zambia Environmental Management Act of 2011;
- (iv) Sector laws;
- (v) Plant Pests and Diseases Act;
- (vi) General and Sector Specific Environmental Quality Standards;
- (vii) AfDB Environmental and Social Operational Standards;
- (viii) International Laws and Conventions requirements; and
- (ix) Detailing how the policies and regulations listed above relate to the project.

According to ISS requirements of the Bank, the environmental and social institutional and regulatory framework shall be comprehensively analyzed, not focusing only on environmental and land laws but including pest management, social protection policies/strategies, and the project's sector relevant standards/norms related to Environmental and Social health and safety. The team shall make a thorough capacity assessment of the public entities in charge of the implementation of the environmental and social measures enforcement and oversight and the PIU, including how they are decentralized in the project implementation areas/Districts.

Description of Baseline Biophysical, Socio-Economic Environments, Settlements and Pest Management in the zone of influence for the project

The team will collect, evaluate, and present baseline data on the biophysical and socioeconomic characteristics of the project area of the direct, indirect and enlarged influence, including associated facilities in the area/district concerned and their respective ecological characteristics to aid impact identification and assessment.

This description will highlight the project site and the major environmental and social concerns of the project site and influence area, including the valued environment and social compounds baseline conditions and trends, including land cover and production sites maps. This should identify and highlight peculiar and sensitive baseline characteristics and conditions of

environmental and social interest particularly project area. The team will outline the scope and potential physical extent for collection of primary socio-economic data with reference to settlements to be impacted by the project. The proposed approach and methodology to data collection should be clearly described in the Team's proposal.

The baseline information will cover the physical and biological aspects of the environment as well as the socioeconomic and cultural characteristics. The Team will also compare the results or analysis of the baseline conditions of ambient air, noise, water, and soil with those of the National Environmental Quality Standards and the AfDB Environmental Health and Safety (EHS) general and sector specific (agricultural projects) standards/guidelines. The baseline conditions should be presented in graphical detail as much as possible and should include the areas highlighted below.

Analytical description of the natural environment: basic description and mapping of the various ecosystems of the project areas, plant resources, biodiversity, threatened and/or endemic species, and critical, sensitive and/or endangered, the network of protected areas, the soil profile, the depth of the water table and the quality of surface water and the water table, the threats and opportunities presented by the activities and investments envisaged in the areas on these ecosystems. This analysis will highlight sensitive resources (rare, threatened, endangered, valued or recoverable) with a view to a better subsequent appreciation of the significance of the negative impacts.

Analytical description of the social environment: basic demographic and socio-economic data, context of the project sector in the area, the distribution areas of ethnic groups on maps, analysis of the structure of community organizations including their social organization and local institutions, the roles of different social groups, economic systems, links with the local and regional economy, traditional systems of access to resources and land, health problems including AIDS.

Project sites land allocation and settlements: Land requirements for the project, profiles of people affected by resettlement including their vulnerability levels, and Impacts and indirect effects of temporary or permanent loss of land and source of livelihood.

Current approaches to pest management and issues in the use and management of synthetic chemical pesticides: Overview of target crops and associated pest problems, current approaches to pest management, practical experience in integrated management, use of pesticides in the country (volumes, types, approval, supervision, etc.), circumstances of use of pesticides and competence to handle products, assessment of risks to the environment, population health and the economy, control of the distribution and use of pesticides and ability to manage / dispose of obsolete pesticides and polluted packaging.

Mapping of the main actors concerned by the activities and investment of the project, the opportunities and risks, including those related to pest management and use of synthetic chemical pesticides, presented by the post-project context in the area. This analysis includes a special section devoted to vulnerable social groups or particularly those occupying or directly dependent on the sites identified for the planned developments. This component includes: (i) the precise identification of the ethnic groups concerned, with geographical location and estimate of their population; (ii) identification of the community structure, social links with the rest of society, and dependence on the natural resources of the area; (iii) land use as well as the traditional rights that these groups exercise over the natural resources in their lands.

4.2.4 Stakeholder Consultation

The Team will undertake extensive consultations with stakeholders during the ESIA process, these consultations will build on the earlier engagements and outcomes from the scoping phase. The Team will ensure that a wide range of stakeholders (including vulnerable groups like women, the elderly, children and persons with disabilities) are engaged to voice opinions, concerns and suggestions.

The Team will document details of consultations with all stakeholders and the approach for such will be described in the team's proposal. The outcomes of consultations with communities and other stakeholders will be presented in the Issues and Response Report which will be incorporated in the ESIA Report.

The team will ensure, with evidence in the ESIA report, that the stakeholders are given an opportunity to verify their contributions, issues or concerns during the assessment and to comment on the findings of the assessment, including proposed mitigation and enhancement measures.

Analysis of Alternatives to the Proposed Investments

This will involve comparative analysis of the options, alternatives or variants for achieving the objectives pursued by the project, and justifying the alternative or variant chosen. The Team will analyze alternatives to the proposed project including the “No Action” or “No Project” alternative in order to demonstrate environmental and social conditions without it. In addition to the “No Action” alternative, the analysis will consider alternative project design options and methods of execution as well as management systems including those addressing pest management. The analysis will demonstrate how the alternatives compare in terms of potential environmental and social impacts and the team will present the reasons for selecting the proposed option over the alternatives.

All the alternatives should also take into account Climate Change Mitigation and Adaptation issues and must be environmentally sustainable. Where alternatives are not considered the team should explain why there are no project, technology, location, management and resettlement alternatives.

Analysis of the Potential Impacts of the Proposed Investments

The Team will be required to present a detailed analysis of the potential impacts of the proposed Project on the biophysical and socio-economic environments. This analysis will build on the preliminary identification and assessment of impacts presented in the scoping report. The Team will identify, predict and evaluate environmental and social impacts, including those relating to settlements and pest management of proposed activities and investments using a range of impact identification and assessment methodologies and tools. With regard to pest management, key considerations will include the impact of pesticides on water bodies, impact of pesticides on aquatic fauna, public health concerns from water borne or water related diseases, Improper pesticide use and disposal of pesticide containers, Production and market losses from fruit fly attacks, mycotoxin poisoning from poor maize drying, Production losses and food security concerns from Armyworm and other crop pests and disease outbreaks, and Abuses in pesticide supply and sales, among others.

The Team will be expected to give due attention to the identification of impacts during the preparatory, construction, operational and decommissioning phases of the project in relation to the critical biophysical, socio-economic and cultural baseline conditions. Once the range of impacts has been identified, the nature, potential magnitude, extent and effect of each must be predicted.

The prediction of the impacts must draw on physical, biological, socio-economic and anthropological data and techniques and may include field investigations, mathematical models, physical models, socio-cultural models, economic models, experiments or expert judgments. Once the impacts have been analyzed, an evaluation of their significance i.e. whether major or moderate and whether they matter and whether something needs to be done to mitigate them) will be undertaken, will also be undertaken.

In this regard, the team will discuss how impacts will be identified, predicted and evaluated and their significance determined. The impacts will be defined in terms of direct impacts, indirect impacts, cumulative impacts and their nature, intensity, reversible/irreversible, spatial extent, duration, probability and magnitude. The analysis will also propose ways to deal with uncertainties. It is suggested that impact assessment tables/Matrices be used for presentation. The identification, prediction and evaluation of impacts will also consider human settlements, pest management, Climate Change and Gender related issues and concerns.

Formulation of Appropriate Impact Mitigation and Enhancement Measures

The Team will recommend measures to mitigate significant negative environmental and social impacts and to enhance the positive impacts. The mitigation measures will also address Climate Change and Gender related issues and concerns.

In developing the mitigation measures, the team would be required to explore the full hierarchy of avoidance, minimization, mitigation and compensation. The enumeration of the risks/impacts management measures will include:

- (a) the specific measures addressing each significant/moderate impact (physical activities including programs like reforestation, biological offset, proposed system and management unit, management criteria, etc.);
- (b) specific environmental health and safety provisions to include in works contracts including: (i) the General rules of Hygiene health and safety (HHS) on construction sites (ii) the STD - HIV awareness (iii) the management of the relationship between employees and the communities in the project area, with the emphasis on the protection of minors and other

vulnerable (iv) the consideration of gender equity and gender-based-violence (GBV) as well as sexual exploitation and abuse, whenever relevant (v) management of “chance finds”;

Development of an Environmental and Social Monitoring Plan

The team will develop a detailed Environmental and Social Monitoring Plan to guide the monitoring of the environmental and social impacts and the implementation of mitigation and enhancement measures during the construction, operational and decommissioning phases.

The team will outline the elements of the monitoring plan in the proposal. The Monitoring Plan should provide an indication of how proposed mitigation measures would be monitored to track performance, and the parameters must be defined including Climate Change and Gender related issues that must be monitored. The Monitoring Plan should include both text and two matrixes:

- (i) The environmental monitoring matrix using the following variables as headlines: Code, Parameter to monitor (pollutant, biology, landcover), Sampling methods/approach, Cost, Responsibility, Reporting, etc.; and
- (ii) The risks management matrix using the following variables as headlines: Code, Event, Risk Nature/Description, Risk level, Prevention measure, Preparedness/management action, Alert notification Officer, Cost, and Supervision.

Development of an Environmental and Social Management Plan (ESMP)

The Team will develop a cost estimate of Environmental and Social Management Plan (ESMP) to be used as a tool for the effective implementation of the impact mitigation and enhancement measures. The Team will outline the elements of the ESMP in the proposal and must include proposed mitigation and monitoring measures as well as institutional responsibilities and budgets for both the construction and operation phases of the project.

The ESMP should include: (i) the ESMP matrix using the template recommended by ZEMA; (ii) Enumeration of some key ESMP implementation indicators to monitor; (ii) Independent local empowered and accessible Grievance Redress Mechanism (GRM) at the project level, with cost of its implementation; (iii) Roles and responsibilities within the Project Implementation Unit, and institutional arrangement for an efficient implementation of the ESMP, with the cost of the

intervention of each actor targeted; (iv) Estimated overall budget (itemized matrix) for the implementation of all environmental and social measures including provisions for compensation (if applicable) and audits (annual environmental and social compliance audits of the project).

Preparation of Environmental and Social Impact Statement (ESIS)

The Team will prepare an ESIS at the end of the ESIA. The ESIS will be a compilation of the outcomes of activities undertaken during the ESIA. In preparing the ESIA, the Team will be guided by the Format developed by ZEMA. The ESIA will also be prepared to meet AfDB Environmental and Social Operational Safeguard requirements. Other information, data and reports to be included in the EIS, mainly as attachments, could be stakeholder consultation report, air quality report, correspondences, etc.

Incorporation of Pest and Pesticide Management Plan (PMP) in ESIA document

The team will propose relevant activities for integrated pest/vector management actors in project implementation and include it the ESIA document. Appropriate mitigation measures and implementation tools as well as monitoring indicators are therefore required to be instituted to contain any adverse occurrence. The key actors focused on the project implementation entity, local phytosanitary services or vector control, are expected to be involved in the implementation of the mitigation and management. The main headings under the action plan should include issue/pest and pesticide threat/ risk, mitigation measures, implementation tool, expected result, monitoring indicators and responsibility.

The plan will cost for it to be used as a tool for the effective implementation and monitoring of the impact mitigation and enhancement measures. The action plan should include the cost of Grievance Redress Mechanism and PMP in the ESMP

DURATION OF THE ASSIGNMENT

The assignment is expected to be completed within 4 months.

QUALIFICATION OF THE TEAM

The team must possess a minimum of a Master's degree in Environmental Engineering, Environmental Science, and Environmental Management or in a related discipline. The Team shall have a minimum of ten (10) years of relevant experience in ESIA in Zambia and the ISS's requirements of the AfDB. Further, the team must have experience in the preparation of ESIS, ESMP, Health and Safety Plan, Resettlement Action Plan and Pest Management Plan, including leading the conduct of ESIA of not less than 3 projects similar in scale and content to the proposed project.

The team may engage other specialists to support him/her in undertaking the assignment. The engagement and payment of the other specialists will be the responsibility of the Team and not MoA or AfDB.

In addition to that of the team, the CVs of the specialists should be included in the proposal. These may include a Social Development Specialist, an Environmental and Safeguard Specialist, Agricultural Economist, Gender Specialist among others with the relevant qualifications and experience.

Further, the support team will be necessary to help in the collection, processing and analysis of data and information, and in the realization of the public consultation.

EXPECTED REPORTING REQUIREMENTS AND SCHEDULE OF DELIVERABLES

The team is expected to liaise closely with the Client Technical Working Group assigned to support the conduct of the ESIA. All reports, documents, maps and drawings shall be submitted under official cover letter by the Team to the Permanent Secretary, MoA in a timely manner. The MoA will facilitate the submission of the reports to ZEMA and other relevant institutions for their review. The following reports shall be prepared and submitted by the team to MoA.

Inception Report

Two (2) hard copies and one (1) electronic copy of the Inception Report will be submitted by the team within two (2) weeks from the Commencement Date of the contract. The Inception Report will include a list of project documents the team has reviewed or would like to review, preliminary observations on the environmental and social baseline of the sites, including pest management and settlement issues, as well as other information relevant for the conduct of the ESIA.

Scoping Report

A Scoping Report based on the format or guidance from ZEMA, including capturing the pest management and settlement/resettlement elements of the assignment, will be prepared by the team. Ten (10) hard copies and one (1) electronic copy of the Scoping Report must be submitted to the Client within six (6) weeks from the Commencement Date of the contract for review and approval by ZEMA.

Draft Environmental and Social Impact Assessment (ESIA)

The team must submit the appropriate number of hard copies and one (1) electronic copies of the draft ESIA to MoA, within twelve (14) weeks from the Commencement Date of the contract for review. The draft ESIA Report must be informed by the requirements of the law and regulations and as guided by ZEMA and other authorities as well as the TORs. The ESIA Report must include all sections, information and data, with executive summary as required by the ISS's requirements of the Bank and ZEMA. The draft ESIA report shall be submitted to the Bank for prior-review.

Final Environmental and Social Impact Assessment (ESIA)

The main or ultimate deliverables of this assignment will be the final ESIA incorporating Pest Management Plan for the proposed Project integrating the comments of the MoA and the Bank on the draft versions. The Team must submit the final ESIA two (2) weeks after receipt of review comments from ZEMA. The team will submit the appropriate hard copies and one (1) electronic copy of the final ESIA, to MoA and these will be submitted to the Bank for approval.

DISCLOSURE

The MoA will facilitate the disclosure of the Scoping, ESIA Report, making copies available to ZEMA and advertising in two major national newspapers. The team will work with ZEMA to facilitate disclosure of the Scoping Report, at the local/community level. The MoA will allow the Bank to disclose the approved version of ESIA, on its internal website (ISTS).

9. CLIENTS INPUT

The MoA will provide the team with the following:

- Project documents that are of relevance to the ESIA and the technical design;
- Facilitating access to sites for the proposed project; and

- Technical support.

PROJECT COORDINATION

The Team will be reporting to the Permanent Secretary, Technical Services, Ministry of Agriculture. Lusaka, Mulungushi House.

7.0 REPORT

At the end of the assessment work the team will compile and submit copy of the EIA report to Ministry of Agriculture which will contain among others the following key information:

- Executive Summary
- Description of the project
- Description of the Environment of the study area
- Policy and Legal Framework
- Significant Environmental Impacts
- Mitigation Management Plan
- Stakeholder analysis
- List of references
- Appendices:

Appendix 3: National, Province and District Scooping Minutes



REPUBLIC OF ZAMBIA
MINISTRY OF AGRICULTURE
PROJECT SCOPING PLANNING MEETING MINUTES

**SCOPING MINUTES OF THE NATIONAL ENGAGEMENT MEETING - FOR THE
NANSANGA COMMODITY VALUE CHAIN TRANSFORMATION PROJECT –
ATHA LODGE, SERENJE DISTRICT, 9TH – 13TH JANUARY, 2023**

1.0 ATTENDANCE LIST

SN	Name	Position	Station/District	Ministry
1	Milner Mwanakampwe	Permanent Secretary	Kabwe	Central Province Provincial Administration
2	Paul Masuwa	District Commissioner	Serenje	Office of the President
3	Alex D. Chilala	Provincial Agricultural Coordinator	Kabwe	Ministry of Agriculture
4	Mwela Davison	ESIA Team Leader	Kabwe	Ministry of Green Economy and Environment Protection
5	Rasford Kalamatila	Chief Land Husbandry Officer	Lusaka	Ministry of Agriculture
6	Staivous Mulumba	Council Chairperson	Serenje	Ministry of Local Government
7	Julius Malipa	Principal Agricultural Officer	Kabwe	Ministry of Agriculture

8	Patrick Longwani	Provincial Agricultural Planner	Kabwe	Ministry of Agriculture
9	Katumwa Mutandi	District Agriculture Coordinator	Serenje	Ministry of Agriculture
10	Patrick Munthali	Senior Land Husbandry Officer	Kabwe	Ministry of Agriculture
11	Cheelo Mudenda	Senior Irrigation Engineer	Kabwe	Ministry of Agriculture
12	Kalumbwe Kapekele	Protocol officer	Kabwe	Provincial Administration
13	Jephurn Shemu	Senior Mechanical Engineer	Kabwe	Ministry of Agriculture
14	Gershom Sikazwe	Senior Business and Marketing Officer	Kabwe	Ministry of Agriculture
15	Donald Mwaba	Senior Agriculture Officer	Serenje	Ministry of Agriculture
16	Moses Nyati	Provincial Agricultural information Officer	Kabwe	Ministry of Agriculture
17	Clement Kachali	Agricultural Information Officer (Producer TV)	Kabwe	Ministry of Agriculture
18	Howard Kunda	Provincial Roads Engineer	Kabwe	Road Development Agency
19	Mathews Simfukwe	Provincial Water Engineer	Kabwe	Ministry of Water Development
20	Faison Phiri	Provincial Infrastructural Officer	Kabwe	Ministry of Infrastructure, Housing & Urban Dev.
21	Chomba Bwalya	Regional ZESCO Manager	Serenje	ZESCO
22	Kalima Vincent	Senior Land Officer	Kabwe	Ministry of Land
23	Jestone Kunda	SESO	Kabwe	Ministry of Education
24	Dr Chapa	District Health Officer	Serenje	Ministry of Health
25	Rodrick Mutambo	Provincial Accountant	Kabwe	Ministry of Agriculture

26	Annie Lungu	District Chiefs affairs Officer	Serenje	Ministry of Chiefs and Culture
27	Precious Mukamba	Director of Planning	Serenje	Ministry of Local Government
28	Kabamba	Hon. Acting Chief Muchinda	Serenje	Ministry of Chiefs and Culture
29	Gracious Moonga Monga	Gender Expert	Serenje	Ministry of Community Development
30	Prince Mweemba	Water Engineer	Serenje	Ministry of Water Development and Sanitation
31	Kachulu Msiska	Agronomist Expert	Kabwe	Extension Advisories
32	Chibuye Paul Lee	Forestry Expert	Serenje	Ministry of Green Economy and Environmental Protection

2.0 AGENDA

- i. National Anthem
- ii. Opening Prayer
- iii. Introduction of participants
- iv. Opening Remarks
- v. Official Opening of the meeting by Mr. Milner Mwanakampwe, Permanent Secretary
- vi. Presentations of the Nansanga Commodity Value Chain Transformation Project
- vii. Plenary discussion - Collection of views and concerns regarding the proposed program.
- viii. Closing Remarks by Mr. Paul Masuwa, District Commissioner
- ix. Closing National Anthem
- x. Closing Prayer

3.0 PROCEEDINGS

The meeting was called to order at 10:00hrs, by the District Agricultural Coordinator Mr. Katumwa Mutandi who was the moderator for the meeting. He welcomed the members in attendance and informed them of the agenda.

Mr. Katumwa Mutandi explained that the main purpose of the meeting was to collect views for the Environmental and Social Impact Assessment to be conducted in relation to the development of the Nansanga Commodity Value Chain Transformation Project in Nansanga Commodity Value Chain Transformation Project, Serenje District of Central Province. He further stated the objectives of the meeting as follows:-

- i. To ensure that stakeholders are informed about the proposed infrastructural development
- ii. To provide the stakeholders with an opportunity to review and comment on the report presentations on the proposed Nansanga Commodity Value Chain Transformation project.
- iii. To draw on the knowledge of local communities in order to assist with the identification of environmental and social issues and mitigation and enhancement measures; and
- iv. To comply with Zambia's legal requirements and align with international good practices.

These objectives were met and will continue to be met throughout the stakeholder consultation and disclosure process, which includes sharing relevant information at appropriate stages of project implementation.

He then invited the Provincial Agricultural Coordinator, Mr. Alex D. Chilala to give the brief remarks. Mr. Alex D. Chilala in his brief remarks stated that Farm blocks should be able to drive the agenda of agricultural development in the Country. He said the farm block model has been identified as one of the best tools that can actualize agriculture as the main and sustainable driver of the economy through diversification from mining. He observed that stakeholders in the Nansanga Commodity Value Chain Transformation Project should take advantage of the government's increased interest in ensuring that the farm blocks in the country are highly developed and fully operational to make sure that Nansanga Commodity Value Chain Transformation Project gets all the attention it deserves.

Mr Alex D. Chilala invited the Permanent Secretary for Central Province, Mr Milner Mwanakampwe for official opening of the stakeholder engagement meeting.

Mr. Milner Mwanakampwe officially opened the National, Provincial and District engagement meeting at 11:00 hrs. He stated that, it was indeed his pleasure to come and officiate at this first ever stakeholder engagement meeting for Nansanga Commodity Value Chain Transformation Project being held under his able leadership, the President of the Republic of Zambia, Mr. Hakainde Hichilema. This meeting is cognizant of the Eighth National Development Plan (8NDP) aspirations whose theme is “Social-Economic Transformation for Improved Livelihoods.” The plan is designed to unlock the country's immense prospects in all sectors of the economy for sustainable, holistic and inclusive national development with the aim of returning the country to the trajectory of its 2030 vision of becoming a prosperous middle-income nation. Government recognizes that to deliver inclusive and equitable development to the citizens requires concerted efforts and commitment of all stakeholders. Thus meetings like this one aimed at enhancing the agricultural sector remains one of the best-kept secrets in the strategic development goals toolbox. We are gathered here for this stakeholder engagement meeting of Nansanga Commodity Value Chain Transformation Project to address gaps and build consensus on how to further improve the delivery of this program. The Government of the Republic of Zambia has embarked on a farm block development programme, and Nansanga Farm Block in Central Province is one of the first farm blocks earmarked for development. The main thrust of government economic policy under poverty reduction is the development of the agricultural sector. The concept of farm blocks will rationalize the use of limited resources to develop the selected farm blocks. Basic infrastructures to be provided in the farm blocks will entice investors for government to meet its objectives.

The United Party for National Development (UPND) government is already discussing with some cooperating partners to secure both the technical and financial support for the development of Nansanga Farm Block which had been abandoned in the last ten years. The background work such as land audit in Nansanga Farm Block started last year and actual work will commence by the first quarter of this year.

In this year's budget, government has sourced 10 million dollars from the African Development Bank for the implementation of Nansanga Commodity Value Chain Transformation Project in Nansanga Farm Block. It is therefore preliminary works such as the environmental and social impact assessment, surveying of the electrical power line extension route, local community engagement, siting and drilling of boreholes which will be done in the first quarter of 2023. Government's plan is to modernize the farm block so that investors can be attracted to invest in

agricultural production but this plan cannot be achieved if we still have only 14% active farms in Nansanga Farm Block.

This stakeholder engagement meeting has indeed come at the right time in that government will get real-time feedback from all the stakeholders involved in the implementation of Nansanga Commodity Value Chain Transformation Project.

The Permanent Secretary further warned of stern action against all those who were standing in the way of government bringing about the development of Nansanga Commodity Value Chain Transformation Project. He said that the government wants to actualize its diversification agenda of making Agriculture the main stay of the economy by ensuring that the farm blocks in the country were fully developed and operational. He encourage the stakeholder members to be positive and open during the presentations and discussions before declaring the stakeholder engagement meeting officially open and wishing all participants fruitful deliberations while looking forward to the implementation of planned activities for the Nansanga Commodity Value Chain Transformation Project

4.0 ENVIRONMENTAL AND SOCIAL IMPACT ASSESMENT PRESENTATION

Mr. Davison Mwela gave a brief background on the proposed Nansanga Commodity Value Chain Transformation Project developments in Nansanga Farm Block. He explained that the project will support with vegetation clearing and land preparation of 3,500 hectares for the 400 smallholder, construction of 1km irrigation canal, rehabilitation of the existing Musangashi dam, rehabilitation of the existing Serenje Post Office to Kabeta road and Construction of low cost houses for extension officers and Trust staffs. The project further will rehabilitate schools and Rural Health Posts in Nansanga Farm Block.

Mr Mwela further stated, that the purpose of the meeting is to get comments and feedback from the stakeholders so that a detailed Terms of References for the ESIA study can be formulated. Mr. Mwela stated that the project will be financed by African Development Bank with a total cost of 10 million dollars. The project will benefit both smallholders with title deeds and traditional consents from the chief/headmen. It is anticipated that 750 smallholder farmers will benefit from the project. In terms of employment, the local people in Nansanga Farm Block will be given priority. The benefit from the project will be increased agriculture production of maize, soya beans and cassava. The project will also engage service providers for the agricultural machinery and agro dealers to set up point of service and sales within the farm block.

He went on to explain that the Environmental and Social Impact Assessment to be conducted for Nansanga Commodity Value Chain Transformation Project will mitigate any impacts arising from the implementation of the project. The Ministry of Agriculture is under obligation to develop plans to reduce perceived impacts of the program so as to sustainably use the Nansanga Farm Block's natural resources for the benefit of the future generation. He further explained some of the impacts relating to the program and the proposed mitigation measures. Some of the impacts on the environment discussed included cutting down of trees which may trigger more runoff resulting in massive erosion; siltation of streams and rivers. Some of the Socio-economic impacts highlighted would be reduced yields; less rainfall if mitigation measures such as introduction of a wide range of climate smart Agriculture and good agriculture practices are not introduced.

Finally, Mr. Mwela explained the benefits of the project and emphasized that the identified positive impacts of the project far outweigh the negative and, therefore, there is no reason why the project cannot be supported by all well-meaning stakeholders go ahead.

5.0 1D. Photographs: Stakeholders



Figure 25: Mr. Milner Mwanakapwe (PS) Central Province, His Royal Highness Chief Kabamba and other members during National, Provincial and District Stakeholder engagement meeting

6.0 Discussion, Questions and Responses

The stakeholders question and feedback session allowed all participants to freely deliberate and comment on the development of Nansanga Farm Block. The table below summarises the questions and feedbacks.

SN	Name	Questions/Comments	Responses
01	Chief Kabamba (Caretaker Muchinda)	What is government plan for the road from Serenje Post Office to Kabundi? What was the rationale behind for Road Development Agency to remove the Acrow bridge from Luombwa river in Nansanga Farm Block to Kansanka area?	Engineer Howard, responded that Road development Agency has inadequate funds for rehabilitation of FTC-to-Nansanga Farm Block road. The Acrow bridge was shifted because there was an emergency in Kasanka. A new Acrow bridge will be installed after the rains under force accounts budget.
02	Chief Kabamba (Caretaker Muchinda)	What is the role of Serenje Town Council on the rehabilitation of FTC to Kabundi	Council Chairperson, Hon, Staivous Mulumba responded that, out of 37 companies, only 4 companies contributed money for works and 3 companies machinery for rehabilitation of the road. Only 15 kilometres was done, which has also been destroyed by the rains. All companies will be consulted in 2023 for contributions.
03	Annie Lungu (C.A.O)	What monitoring plans do you have in place to make sure that mining pits near the school are buried?	The burying of mining pits near the school has commenced. We are hoping that all pits will be buried. The Ministry of Agriculture will continue to monitor the activity in collaboration with MoE
04	Petina Kabwenda (DESO – Serenje)	Since you are proposing to construct 1 x 3 classroom blocks in selected schools in	The project intends to construct 1 x 3 classrooms at Mutale Ntenge Primary

		Nansanga. What plan do you have for teachers' houses?	School, and also 2 Houses for teachers at both school.
05	Jestone Kunda (PESO – Central) Ministry of Education	In order to develop Nansanga Farm Block, let us consult all influential people, and use the positive sides of these people to develop the area.	The Ministry of Agriculture is consulting all stakeholders at national, provincial and district levels. These meeting will be extended to local communities within Nansanga Farm Block.
06	Mr. Paul Masuwa (District Commisioner)	What is the government position for the people planned to be removed from core Venture?	Mr Katumwa Mutandi (DACO), responded that Government, through Industrial Development Cooperation engaged the Office of Project Coordinator to plan, subdivide 106 smallholdings, where these people will be settled. All the works were completed and awaiting handover.
07	Boniface Makumba (Civil Society)	What is government plan for the Inactive farms in Nansanga Farm Block	The Ministry of Agriculture will engage Ministry of Land, through the Provincial Administration. The Central Province Permanent Secretary will guide for further actions.
08	Dr Chapa (DHO)	How will be the boreholes allocated.	The Ministry of agriculture will use community engagements
09	Staivous Mulumba Council Chairperson	He raised a concern with regards to the high number of farms in the farm block that where not developed. He also reiterated that all the farms that were not developed, government should repose and	The Ministry of Agriculture will engage Ministry of Land for detailed land assessment exercise.

		allocate private investors who were willing to come and invest	
10	Staivous Mulumba Council Chairperson	The Chairperson raised a very serious concern regarding some individuals who were busy fighting some of the investors in the farm block thereby impeding development. He said, these individuals are conniving with the locals not to accept any form of compensation from any investors who would want to displace them when trying to expand their farming territories	Mr. Milner Mwanakapwe (PS), warned that all people who are blocking government's developmental efforts will be brought to book. He advise the civil servant to stop having night meetings with these same people.
11	Faison Phiri (Provincial Maintenance Officer)	Why the Ministry of Infrastructure, Housing and Urban Development is missing on the Technical Working Group which has been proposed?	The Ministry of Agriculture recognizes this and invited the Provincial Maintenance Officer, this shows that the Ministry of Infrastructure, Housing and Urban Development is part of the Technical working group.

7.0 Persons in support of the project

At the end of the question and answer discussion Mr. Katumwa Mutandi sought clarity from the stakeholders on whether or not they were in agreement with the implementation of the proposed program. All the stakeholders welcomed the project stating that they had waited for this development for a long time. The stakeholders were advised to Vote for or against the proposed project. The results were as follows:

For the implementation of the program: 32

Against the implementation of the program: 0

8.0 Closing Remarks

Mr. Paul Masuwa, District Commissioner for Serenje District thanked the members of the meeting for attending. Requesting that if they had any further inquiries / views these could still be presented to Ministry of Agriculture and Technical Working group on the ESIA study, who would be ready to address them.

Meeting closed with the singing of national anthem at exactly 13:00 Hrs.

Chairperson: Katumwa Mutandi

Signature:



Secretary: Patrick Munthali

Signature:





Mr Milner Mwanakapwe (PS), Chief Kabamba, Director Physical Planning, Mr Paul Masiwa (DC), Stavious Mulumba (Council chairperson) listening to presentation



Stakeholder’s members listening to discussion

Appendix 4: Nansanga Farm Block Community Scoping Engagement Meetings Report.



**MINISTRY OF AGRICULTURE
PROJECT SCOPING PLANNING MEETING**

**SCOPING MINUTES OF THE COMMUNITY ENGAGEMENT MEETINGS
- FOR THE NANSANGA COMMODITY VALUE CHAIN TRANSFORMATION
PROJECT – 14 COMMUNITY CENTRES IN NANSANGA FARM BLOCK, HELD
FROM 21ST JANUARY, 2023 TO 27TH JANUARY, 2023**

1.0 ATTENDANCE LIST

SN	Name	Position	Ministry
01	Alex D. Chilala	Provincial Agriculture Coordinator	Ministry of Agriculture
01	Davison Mwela	Environmental Expert ESIA Team Leader	Ministry of Green Economy and Environmental Protection
02	Katumwa Mutandi	Nutrition Expert	Ministry of Agriculture
03	Paul Chibule Lee	Forestry Expert	Ministry of Green Economy and Environmental Protection
04	Precius Mukamba	Environmentalist	Ministry of Local Government
05	Prince Mwemba	Water Engineer	Ministry of Water Development
06	Jeff Chalwe	GIS Expert	Technical Services

07	Patrick Munthali	Hydrologist Expert	Technical Services
08	Kachulu Msiska	Agronomist Expert	Extension Advisories
09	Levison Tembo	Economist Expert	Policy and Planning Department
10	Moses Nyati	Information Expert	Zambia Agriculture Information Service
11	Donald Mwaba	Senior Agriculture Officer	Extension Services

2.0 AGENDA

- i. Opening Prayer
- ii. Introduction of participants
- iii. Opening Remarks
- iv. Official Opening of the meeting by District Agricultural Coordinator
- v. Presentations of the Nansanga Commodity Value Chain Transformation Project
- vi. Plenary discussion - Collection of views and concerns regarding the proposed program.
- vii. Closing Remarks
- viii. Closing Prayer

3.0 PROCEEDINGS

The meeting was called to order at 09:00hrs, by the District Agricultural Coordinator Mr. Katumwa Mutandi who was the moderator for the meeting. He welcomed the members in attendance and informed them of the agenda.

Mr. Katumwa Mutandi explained that the main purpose of the meeting was to collect views for the Environmental and Social Impact Assessment to be conducted in relation to the development of the Nansanga Commodity Value Chain Transformation Project in Nansanga Commodity Value Chain Transformation Project, Serenje District of Central Province. He further stated the objectives of the meeting as follows:-

- i. To ensure that stakeholders are informed about the proposed infrastructural development

- ii. To provide the stakeholders with an opportunity to review and comment on the report presentations on the proposed Nansanga Commodity Value Chain Transformation project.
 - iii. To draw on the knowledge of local communities in order to assist with the identification of environmental and social issues and mitigation and enhancement measures; and
 - iv. To comply with Zambia's legal requirements and align with international good practices.
- These objectives were met and will continue to be met throughout the stakeholder consultation and disclosure process, which includes sharing relevant information at appropriate stages of project implementation.

4.0 ENVIRONMENTAL AND SOCIAL IMPACT ASSESMENT PRESENTATION

Mr. Davison Mwela gave a brief background on the proposed Nansanga Commodity Value Chain Transformation Project developments in Luena farm block. He explained that the project will support with vegetation clearing and land preparation of 3,500 hectares for the 400 smallholder, construction of 1km irrigation canal, rehabilitation of the existing Musangashi dam, rehabilitation of the existing Serenje Post Office to Kabeta road and Construction of low cost houses for extension officers and Trust staffs. The project further will rehabilitate schools and Rural Health Posts in Nansanga Farm Block.

Mr Mwela further stated, that the purpose of the meeting is to get comments and feedback from the stakeholders so that a detailed Terms of References for the ESIA study can be formulated. Mr. Mwela stated that the project will be financed by African Development Bank with a total cost of 10 million dollars. The project will benefit both smallholders with title deeds and traditional consents from the chief/headmen. It is anticipated that 750 smallholder farmers will benefit from the project. In terms of employment, the local people in Nansanga Farm Block will be given priority. The benefit from the project will be increased agriculture production of maize, soya beans and cassava. The project will also engage service providers for the agricultural machinery and agro dealers to set up point of service and sales within the farm block. Some of the activities to be implemented are:-

- i. Opening of 3500 hectares of land for agricultural production targeting maize, cassava and soya beans.
- ii. Opening of access roads in the farm block and the benefits that accompany a good road network such as easy and efficient transportation of agricultural goods and services.

- iii. Awareness creation on siting of boreholes in the communities and benefits of health and clean water to the locals.
- iv. Development of Agri-Centers and bulking facilities.
- v. Job creation that will be associated with the above-mentioned activities.

5.0 SCHEDULE OF MEETINGS

A total of 14 scoping local communities meetings with a total attendance of 1174 (484 females and 684 males) were engaged and sensitized. The table below summarizes the communities that were visited and the dates the communities were engaged.

SN	TARGET COMMUNITY	ATTENDANCE			DATE
		M	F	Total	
1	Lungamana	46	33	79	21.01.2023
2	Kampumbu	55	28	83	21.01.2023
3	Ntenge	29	20	49	22.01.2023
4	Mutale	54	33	87	22.01.2023
5	Kabeta	102	38	140	23.01.2023
6	Copperbelt forest community	15	23	38	23.01.2023
7	Kabundi	78	68	146	24.01.2023
8	Masunga	18	06	24	24.01.2023
9	Chinfunde	34	21	55	25.01.2023
10	Core Venture	38	34	72	25.01.2023
11	Lupiya	121	82	203	26.01.2023
12	Bwande	29	26	55	26.01.2023
13	Nkulumashiba	37	12	49	27.01.2023
14	Mukomansala	70	61	131	27.01.2023
	Total	726	485	1211	

6.0 FEEDBACK FROM THE COMMUNITIES

The local people in Nansanga Farm Block provide the following feedbacks as shown in the table:

SN	Name	Questions/Comments	Responses
01	Paul Changwe	Are you going to drill boreholes in Kampumbu area because the area is mostly dry?	The project will drill and equip 10 commercial boreholes in Nansanga Farm Block, so even Kampumbu area will be catered for.
02	Petson Kunda	Any plan for the construction of schools in Lungamana (Kansenga area) and Mafwasa (Copperbelt forest area) as communities require schools as the nearest government schools are 15Km and 12.5km away respectively?	The project will construct 1 x 3 classroom blocks at Mutale Ntenge Primary school. The Ministry of Education will be consulted so that the two areas are taken into consideration
03	Mollen Kunda	Unfulfilled promises from government such as electricity extension to the farm block, improved road networks, construction and rehabilitation of the proposed 8 dams, construction of access roads, communication network towers etc. which have led to some people not to fully develop their farms?	The project will rehabilitate the existing roads, Musangashi dam and also construction of canal. And also the government has ready planned for electricity power extension from Pensulo to the Farm Block and the erecting of the mobile network towers in the Farm Block
04	Patson Chisenga	What are the plans for the communities in terms of job opportunities within the farm block?	The project will prioritize the local people for any unskilled work and also for skill transfers
05	David Mwape	Are you going to displace or evict the farmers from the land?	The project will not evict or displace anyone.

7.0 PERSONS IN SUPPORT OF THE PROJECT

At the end of the question and answer discussion Mr. Katumwa Mutandi sought clarity from the stakeholders on whether or not they were in agreement with the implementation of the proposed program. All the stakeholders welcomed the project stating that they had waited for this development for a long time. The stakeholders were advised to Vote for or against the proposed project. The results were as follows:

For the implementation of the program:	1160
Against the implementation of the program:	0
Not willing to raise hands	52

8.0 Closing Remarks

Mr. Alex D. Chilala, Provincial Agricultural Coordinator thanked the members for attending the meeting. Requesting that if they had any further inquiries / views these could still be presented to Ministry of Agriculture and Technical Working group on the ESIA study, who would be ready to address them.

Meeting closed with the singing of national anthem at exactly 13:00 Hrs.

Chairperson: Katumwa Mutandi

Signature:



Secretary: Patrick Munthali

Signature:



Field Photo File for Scoping Meetings



Photo 1: The STO addressing the community at Kampumbu school



Photo 2: The SAO addressing the community at Mutale school



Photo 3: The TO addressing the community at Lupiya



Photo 4: The DFO addressing the community at Chinfunde



Photo 7: The BEO-Lupiya introducing the team at Ntenge



Photo 8: The DFO interpreting PACOs address at Chinfunde

List of participants in Nansanga Farm Block

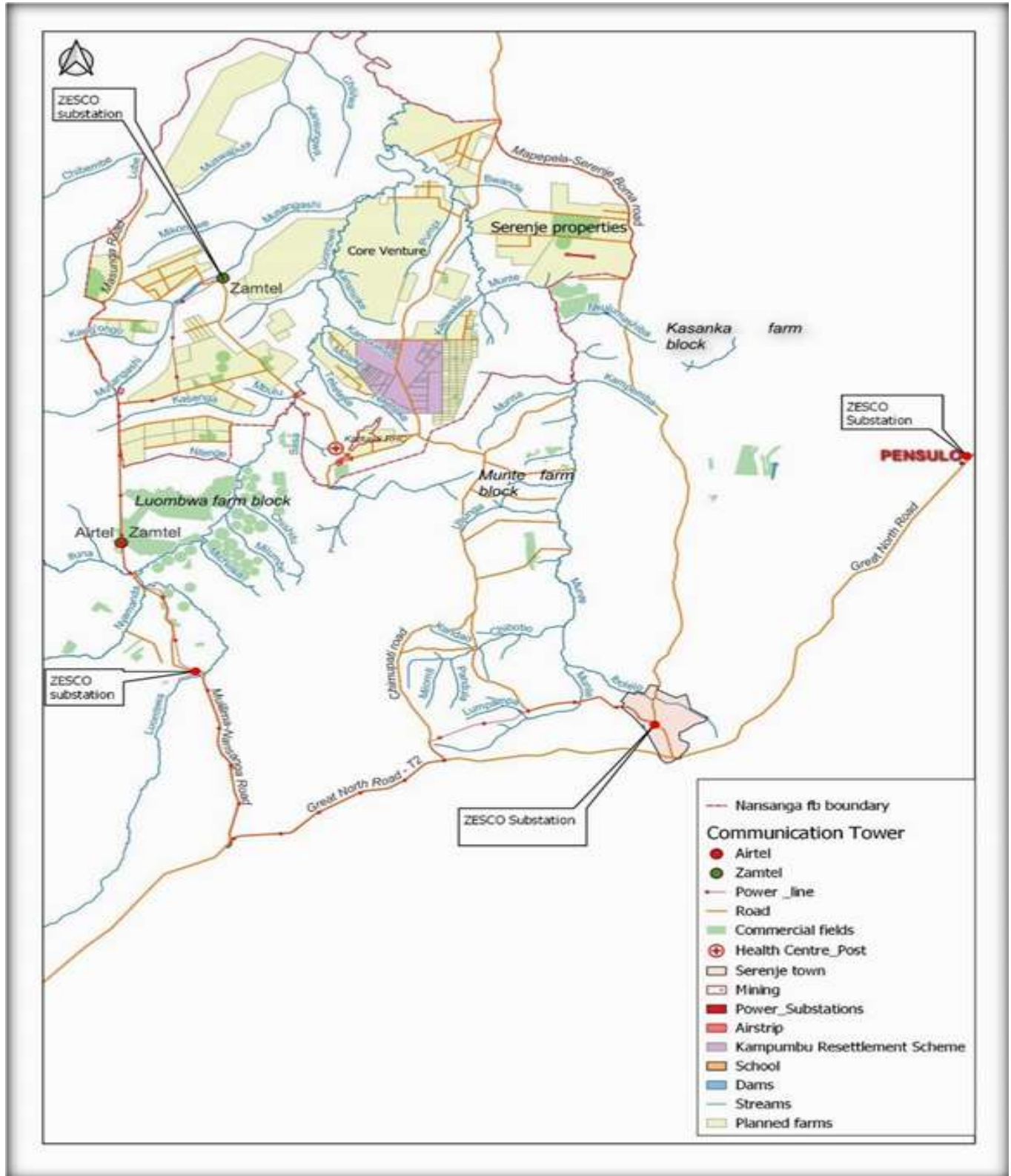
Lungamania

Nansanga Farm Block Community Sensitization Attendance List

Date: 21-01-2023

Sn	Name	Gender	NRC	Section/Village	Phone no.	Sign
1	Jackson C. Lufya	M	153370/12/1	CHISHIKE		Jackson
2	MALISON CHIPA	M	119662/12/1	CHISHIKE		MALISON
3	Charrel KUNDA	M	138091/12/1	CHISHIKE		Charrel
4	Solix NUKUSA	M		CHISHIKE		Solix
5	MUMISA GUMAL	M	169196/12/1	CHISHIKE		MUMISA
6	GLASFORD CHARDA	M		CHISHIKE		GLASFORD
7	moder mwape	M	243606/12/1	CHISHIKE		moder
8	DUMPOS KALONGA	M	192535/12/1			DUMPOS
9	ALICE BUNDA	M	276516/12/1	CHISHIKE		ALICE
10	JAMES CHLOISWA	M	726312/12/1	CHISHIKE		JAMES
11	PATRIC MUSONDA	M	202455/12/1	CHISHIKE		PATRIC
12	DUAL CHANGWE	M	207206/12/1	CHISHIKE		DUAL
13	CATHAR KANUNGA	M	143553/12/1	CHISHIKE		CATHAR
14	ROLD MWAPE	M	143034/12/1	CHISHIKE		ROLD
15	PETRO CHOLA	M		CHISHIKE		PETRO
16	SMANT KUNDA	M	245501/12/1	CHISHIKE		SMANT
17	PEISON KUNDA	M	175956/12/1	CHISHIKE		PEISON
18	MUSONDA NGOSA	M	174475/12/1	CHISHIKE		MUSONDA
19	Cherogule P. Kunda	M	198807/12/1	CHISHIKE		Cherogule
20	KELVEN KUNDA	M	224096/12/1	CHISHIKE		KELVEN
21	ROSTO MWAPE	M				ROSTO
22	SOACK M. KALONGA	M	206819/12/1	CHISHIKE		SOACK
23	CHIBUYE KALU	M		CHISHIKE	095460135	CHIBUYE
24	PATRIC CHUFYA	M		CHISHIKE		PATRIC
25	PATSON CHISENGA	M		CHISHIKE		PATSON
26	KEPSON CHISENGA	M		CHISHIKE		KEPSON
27	CRETO SIMUENZA	M	291923/12/1	CHISHIKE	0956859466	CRETO
28	STENATHY KUNDA	M		CHISHIKE		STENATHY
29	PASTOR BWALE	M		CHISHIKE		PASTOR
30	YVAN MUTUMIZO	M	177619/12/1	CHISHIKE	0950811232	YVAN
31	DAVID MWAPE	M	233504/12/1	CHISHIKE		DAVID
32						

Appendix 5: Impact Assessment Map of Nansanga Farming Block



Prepared by: Chrispin Moyo, Stanslaus Saka, Patrick Munthali, Cheelo H. Mudenda, Soft Tembo, Obster Lungu & Chambwa Mandandi

Appendix 6: Curriculum Vitae

Table 2: Curriculum Vitae for the Team

1.0 CURRICULUM VITAE

ESIA – ENVIRONMENTAL EXPERT (TEAM LEADER) – NANSANGA COMMODITY VALUE CHAIN TRANSFORMATION PROJECT

1.0 Personal Information

- i) Name: Davison Mwela
- ii) Address: C/O Provincial Forestry Office, P. O. Box 80441, Kabwe
- iii) Phone: 0977714523, 0963208573, 0955706940
- iv) email: davison_mwela@yahoo.com/davisonmwela@gmail.com
- v) Date of Birth: 24th December, 1964
- vi) Marital Status: Married
- vii) Religion: Christian
- viii) Nationality: Zambian
- ix) NRC#: 407159/11/1

2.0 Education

- i) 2018-2021: University of Zambia
- ii) 2006-2010: The Copperbelt University, Kitwe
- iii) 1994-1996: Zambia Forestry College, Kitwe
- iv) 1989-1990: Zambia Forestry College, Kitwe
- v) 1983-1987: Matero Boys Secondary School, Lusaka
- vi) 1974-1983: Chitanda Primary School, Lusaka

3.0 Qualifications

- i) 2021: Master of Science in Sustainable Land and Environmental Management
- ii) 2010: Bachelor of Science Degree in Agroforestry
- iii) 1996: Diploma in Forestry
- iv) 1991: Certificate in Forestry
- v) 1987: Grade XII School Certificate

4.0 Other Qualifications

- i) 7th May to 12th May 2018: Certificate of attendance in Training of Trainers in Entrepreneurship

- ii) 16th October to 25th October 2017: Certificate of attendance in GIS training
- iii) 2nd November 2015 to 11th November 2015: Certificate of Training of Trainers in Strengthening Forest Land Tenure Systems and Governance
- iv) 23rd November 2007: Certificate of Attendance in FUTURE SEARCH, Small Business Awareness Seminar
- v) 2005: GCE Ordinary Level Certificate
- vi) 21st June to 25th June 2005: Certificate of Attendance in Participatory Monitoring and Evaluation
- vii) 27th January to 31st January 2005: Certificate of Attendance in Mushroom Growing
- viii) 2nd September to 13th September 2002: Certificate of Attendance in Rural Sociology
- ix) 14th January to 18th January 2002: Certificate of Attendance in Monitoring and Evaluation for Enhanced Programme Management
- x) 13th October to 17th October 2001: Certificate of Attendance in Leadership Skills
- xi) 20th August to 24th August 2001: Certificate of Attendance in Facilitation of Community Based Projects
- xii) 14th August to 18th August 2001: Certificate in Basic Construction and Maintenance of Community Roads
- xiii) 6th December to 19th December 1997: Certificate of Attendance in Human Perspective in Natural Resources Management
- xiv) 1st June to 5th June 1993: Certificate of Attendance in Basic Course in Soil and Water Conservation and Agroforestry
- xv) 1992: GCE Ordinary Level Certificate

5.0 Publications

- i) Study on the Spatial Distribution of Edible Caterpillars in Serenje District of Central Zambia (BSc Thesis)
- ii) Assessing the impact of climate change on Forests Using Remote Sensing and GIS Techniques: A Case study of Kanona National Forest, Zambia (MSc Thesis)
- iii) Co-author: Trends in vegetation indices and the relationship with Land surface temperature

6.0 Work experience

- i) 2016 – Date: Working as Forestry Officer- Extension: Provincial Forestry Office, Kabwe

- ii) 2010-2016: Worked as Forest Research Officer: Forest Research Branch, Kitwe/FDHQ Lusaka
- iii) 1998-2010: worked as District Forestry Officer: District Forestry Office, Serenje
- iv) 1997-1998: worked as Plantation Manager: Chimtengo Forest Plantations, Sinda, Katete District
- v) 1991-1993: worked as District Forestry Extension Officer: District Forestry Office, Chama District

7.0 Other Responsibilities and Experience

- i) Provincial Focal Point Person: “Promoting Climate-Resilient, Community-Based Regeneration of Indigenous Forests in Zambia’s Central Province” Project, Serenje and Chitambo Districts
- ii) March 2015 to May 2018: LIFE Technical Trainer, PST, Peace Corps, Chipembi, Chisamba District
- iii) May 2015 to August 2015: Senior Technical Officer, Forestry, Environment and Wildlife Management, J A Consultancy, Lusaka
- iv) May 2013 to November 2013: Acting District Administrative Officer, Chitambo District
- v) December 2012 to May 2013: Programme Officer (Monitoring and Evaluation), National Tree Planting Programme, Forestry Headquarters, Lusaka
- vi) 2001 to 2005: Resource person: Community Based Natural Resources Management Programmes, Kasanka National Park, Serenje District
- vii) 2004 to 2005: Coordinator, Catchment and resource protection under Central Province Rural Water Supply and Sanitation Program, Serenje District.
- viii) 2004 to 2005: Supervisor, borehole drilling projects under Central Province Rural Water Supply and Sanitation Program, Serenje District.
- ix) 2001 to 2003: Facilitator: community-based development projects under ZAMSIF, Serenje District

8.0 Environmental Briefing and Environmental Social Impact Assessment completed

- 1) Consultancy in Forestry and Environmental Management
 - i) Environmental Project Briefs

- Environmental Project Brief for The Proposed Timber Harvesting and Processing Project in Kasikizi Open Forest Area of Nyimba District in The Eastern Province of Zambia
- Environmental Project Brief for The Proposed Timber Harvesting and Processing Project in Kasikizi Open Forest Area of Nyimba District in The Eastern Province of Zambia
- Environmental Project Brief for The Proposed Timber Harvesting and Processing Project in Kawato Open Forest Area of Nyimba District in The Eastern Province of Zambia
- Environmental Project Brief Report for The Proposed ZAWAR Projects for the Exploration of Au, Co, Cu, Mn, Ni, PGM, Ti for Licence 20007-Hq-Lpl
- Environmental Project Brief for a Timber Concession License in Kabembe Local Forest, Chief Muchindwe's area in Kawambwa District
- Environmental Project Brief for a Timber Concession Licence in Lundazi National Forest, Chief Kampombo's area, Chama District
- Environmental Project Brief for The Proposed Small Scale Sosi Red General Dealers Timber Concession Project in Chief Mboroma's Area, Luano District of Central Province
- The Environmental Project Brief Report For The Proposed Kaluano Mining Exploration of Cu,Co For Licence No.25586-Ho-Sel At Kayafukuma In Solwezi, North-Western Province.
- Environmental Project Brief Report for the Mining Project Activities at Kayafukuma in Solwezi, North-Western Province.

ii) Environmental Impact Assessment

- Environmental And Social Impacts Assessment on The Forests at Matalloy Farm in Mpongwe District-Copperbelt Province
- Environmental Impact Assessment on Manganese Processing for Southern Africa Ferrol Alloy Limited, Chitambo District- Central Province

- Environmental Impact Assessment in Nansanga Farm Block for the Ministry of Agriculture, Serenje-Central Province
- 2) Consultancy in Forest Management, Investments, Strategic and Business Planning
- i) Forest Resource Assessment
- Forest Inventory and Valuation Report of Compartments Impacted by Mining at Metalloy Farm Limited, Mpongwe
 - Forest Inventory Report for Norwest Quarries (Z) Ltd Chief Nyalugwe, Nyimba District
 - Forest inventory report for Natizu Enterprises, Chief Nyalugwe Nyimba District
 - Report On Forest Inventory carried in the Proposed Concession Area for SOSI Red General Dealers in Luano District Chief Mboroma's Area
- iii) Strategic and Business Plans
- Departmental Strategic Plans for Forestry Department, Central Province
 - Departmental Implementation Plan for Forestry Department- Contribution to the 8th National Development Plan
 - Strategic Plan and Company Profile for JA Consultancy
 - BUSINESS PLAN for Vegetable Production and Supplies for Muleya Fresh Farms
 - BUSINESS PLAN for Farm development for Pentecostal Assemblies of God Church Farm
 - BUSINESS PLAN for Farm development for Samson Kasele
 - Investment and strategic plan for Timber Production for SOZI Red General Dealers
 - Forest Operation and Regeneration Plan for SOSI Red General Dealers
- 3) Consultancy in Entrepreneurship

- Training in Timber production and saw milling for workers for SOSI Red General Dealers
 - Training in Beekeeping, Tree nursery establishment and Mushroom production for farmers under Plan International in Chiyengi and Chisamba Districts
 - Training manual in Mushroom Production for the Copperbelt University
- 4) Community Forest Management Activities
- Sensitization on Community Forest Management process and formation of community forest management groups as an exit strategy for “Promoting Climate-Resilient, Community-Based Regeneration of Indigenous Forests in Zambia’s Central Province” Project.
 - Training of trainers in Community Forest Management process

9.0 Skills and Competences

9.1 Skills

- Microsoft word
- Microsoft Excel
- Power Point
- R programming
- QGIS
- ArcGIS

9.2 Competences

- Report writing
- Project and Business proposals
- GIS and Remote Sensing
- Land Surveying and Mapping

10.0 General

10.1 Present membership

- i) Zambia Institute for Environmental Managers
- ii) Forestry and Environment Institute of Zambia

10.2 Past membership

- i) Member, Copperbelt University Natural Resources Conservation Society (CUNARES), Kitwe

- ii) Project Coordinator: HORIFA Charity Foundation, Serenje
- iii) Treasurer: Serenje Boma Basic School PTA, Serenje District
- iv) Committee Member: Chimtengo Basic School PTA, Sinda, Katete District
- v) Secretary: Chimtengo Health Neighbourhood Committee, Sinda, Katete District
- vi) Relief Food Distribution Secretary: Chama Disaster Preparedness and Development Group, Chama District

10.3 Sport

- i) Lawn tennis
- ii) Table tennis
- iii) Volley ball
- iv) Football
- v) Basket ball
- vi) Badminton

2.0 CURRICULUM VITAE

ESIA – HYDROLOGIST – NANSANGA VALUE CHAIN TRANSFORMATION PROJECT

<u>Personal Profile:</u>	
Name:	Munthali Patrick
Nationality	Zambian
Contact Details	0977347141
Phone	0977347141
Email	pmatibila@yahoo.com , patmunthali8@gmail.com
Mulungushi University 01/10/2017 - 08/24/2019	MASTER OF CLIMATE CHANGE AND SUSTAINABLE DEVELOPMENT
Mulungushi University 09/08/2009 - 06/04/2013	BACHELOR IN LAND AND WATER RESOURCES MANAGEMENT
Natural Resources Development College (NRDC). 01/12/2002 – 08/06/2004	DIPLOMA IN WATER ENGINEERING

Isoka High School 01/07/1995 – 22/11/1999	FULL O' LEVEL SCHOOL CERTIFICATE
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7.0 Language skills

Language	Reading	Speaking	Writing
English	1	1	1
Bemba	2	1	2
Chewa	2	3	2
Tumbuka	1	1	1

8.0 Membership of Professional bodies

Zambia Institute of Planners – Mzip/01/445 (Environmental Planner)
Zambia Network for Environmental Educators and Practitioners (ZANEPP)

9.0 Specialization

- Environment Engineering
- Sustainable Development
- Climate Change

10. Present Positions

Agricultural Productivity and Market Enhancement Project (APMEP)

as Environmental & Social Safeguards Specialist – (2019 to date)

Main duties are to:

- Provide technical expertise on key issues related to environmental and social impact assessment and on sustainability risks in the design, preparation, implementation and supervision operations taking into consideration best industry practices and standards;

- Manage and conduct environmental and social safeguard due diligence of new of activities
- Identify all key potential social and environmental impacts and risks of a project and ensure that their magnitude and significance are well understood;
- Design and incorporate into the safeguard plans and project effective and feasible measures to avoid, minimize, and mitigate the adverse environmental and social impacts, and draft relevant project processing documentation. Ensure that the client understands the applicable safeguard policies, guidelines and project-specific requirements, and has the necessary commitment and capacity to manage social and environmental impacts and/or risks adequately and supported by mechanisms that facilitate implementation;
- Supervise projects to ensure implementation of mitigation measures.
- Conduct consultations with stakeholders in accordance with relevant policies and guidelines;
- Provide internal and external clients with capacity building on ESG related topics by designing and piloting information sharing schemes;
- Report on and disseminate good practices and generated knowledge

Key Skills Obtained in:-

- i. AutoCAD Computer drawing aided software.
- ii. Arc VIEW GIS software
- iii. Google Earth Analysis
- iv. Environmental Mapper

11. Employment History

Station	Date from - Date to
Environmental and Social Safeguards Specialist Agricultural Productivity and Market Enhancement Project (APMEP, Kabulonga Office, Lusaka, Zambia.	12/07/2018 – To date 12/09/2019 - To date
Agriculture Specialist – Land Husbandry Unit	07/04/2016 – 12/07/2018

Department of Agriculture, Central Province	
Project Support Officer – NorthWestern Water Company Solwezi, NorthWestern Province	05/09/2005 – 16/10/2008
Assistant Environmentalist - DH Engineering Teams	21/03/2004 – 05/09/2005

• **Specific Experience from other Projects:**

- i. Preparation of the Strategic Environmental and Social Assessment (SESA) for APMEP projects, 2018.
- ii. Preparation of the Environmental Project Brief for Shikabeta Irrigation Scheme, Luombwa, Mulembo, Chiboboma and Muleya Kulima, 2018.
- iii. Preparation of Grievance Redress Mechanism (GRM) for various project in six districts of Zambia.
- iv. Promotion of Climate Smart Agriculture practices such as Ripping, Potholing, Basing, crop rotation and mulching in rural communities to enhance food production in Zambia, in collaboration with the Conservation Farming Unit
- v. Planning and Supervising of Cassava value chain Machinery installation in Chitambo District, Central Province.
- vi. Designing and Construction of permanent weirs in Central province jointly funded by Government of Zambia and Japan
- viii. Training of Extension Staff in Soil Management in Central Province
- ix. Planning and development of 29, 000 hectares of land into agriculture farming scheme in Central Province
- x. Supervision of Borehole sitting, drilling and installations in rural areas of Zambia
- xiii. Preparation of the Environmental impact assessment project brief for various clients, Kobil, Puma, and Engine under DH Engineering Teams.
- xiv. Water and wastewater laboratory results analysis and Interpretation for Various client
- xv. Waste management and technical disposal recommendations

3. CURRICULUM VITEA

**ESIA - ENVIRONMENTALIST – NANSANGA COMMODITY VALUE CHAIN
TRANSFORMATION PROJECT**

1.0.PERSONAL DETAILS

1.	Name	Chibuye Paul Lee
2.	Gender	Male
3.	Date of Birth	2 nd January, 1975
4.	Place of Birth	Livingstone
5.	Nationality	Zambian
6.	Marital Status	Married
7.	Religion	Christian
8.	Tribe	Lala

2.0.PROFESSIONAL QUALIFICATION

S/N	INSTITUTION	YEAR	QUALIFICATION
1.	University of Africa, P.O Box 35440, Lusaka	2020	BSc Sustainable Health and Environmental Studies
2.	Ridgeway Institute of Management, P.O Box 37372, Lusaka	2008	Diploma in Business Administration
3.	Zambia College of Agriculture, P.O Box 660053, Monze	1997	Certificate in General Agriculture
4	Linda Secondary School, P.O Box Livingstone	1994	Grade 12 Certificate

3.0.OTHER QUALIFICATIONS

S/N	INSTITUTION	YEAR	QUALIFICATION
1.	Zambia Wildlife Authority & The Nature Conservancy	2017	Certificate in Fire Management

2.	Forestry Department (Zambia) & GEF-UNDP	2017	Certificate in Fire Management
3.	Forestry Department (Zambia) & GEF-UNDP	2016	Certificate in Community Based Natural Resources Management
4.	Forestry Dept. (Zambia) & Food Agriculture Organization (FAO)	2014	Certificate in Zambia National Inventory (ILUA 2)
5.	Electoral Commission of Zambia	2011	Certificate of Service (Presiding Officer)

4.0.PERSONAL PROFILE (COMPETENCES OR ATTRIBUTES)

- Excellent interpersonal Communication skills (Both Verbal and written). Able to speak English, Bemba, Chinyanja, Lozi, Tonga, Lala, Lamba
- Good Adaptability (Flexible and easy to adapt to organizational structure and policy changes)
- Good Accountability approaches
- Literate in ICT and Geographical Positioning System(GPS) Usage
- Competent in Vehicle driving
- Excellent Tutoring/Capacity building skills
- Good Tact and Courtesy with others
- Good Dependability levels
- Good Management and Supervisory skills
- Good Team worker
- Highly innovative and Conflict Resolution Strategies
- Ability to Act and work independently with less daily direction from Supervisors
- Good Marketing Strategies

5.0.FIELDS OF INTEREST

- Establishment and management of Community Forest Management Groups
- Community Based Natural Resource Management Governance

- Capacity building in Community Projects, Sustainable Agro-forestry activities, Sustainable Energy sources, Beekeeping development, Agriculture, forestry and environmental management.
- Conflict resolution and management strategies
- Gender mainstreaming approaches
- Controlling, leading, managing, directing and coordinating of programmes
- Climate change mitigation strategizing and implementation
- Environmental protection, Landscaping, Waste management and Pollution control
- Environmental Impact Assessment, Environmental Project Briefs and Strategic Environmental Assessment implementation
- Public Health promotion and management
- Human Resource Management and Public Relations
- Occupational health and safety management in work places
- Seed collection and Analysis
- Soil collection and Analysis
- Sustainable Water resources management and utilization
- Fire and disease emergency preparedness, prevention and control
- Quality Assurance in Agro-forestry products

6.0.WORK EXPERIENCE

PERIOD	POSITION/RANK	ORGANIZATION	JOB PURPOSE
1999 – 2001	Senior Supervisor	AgriFlora (Z) Ltd, LUSAKA	Quality assurance management of crop produce meant for export
2002 – 2005	Extension Assistant	Forestry Department, P.O Box 96, SESHEKE	To ensure that forest resource protection and management is carried out in the district
2005 – 2011	Extension Assistant	Forestry Department, P.O Box 96, SESHEKE	To generate government revenue through the issuance of forest permits on forest products at Masese Forestry Station.

2011 – 2013	Technologist	Forestry Department, P.O Box 96, SESHEKE	To undertake forest extension programmes in the district in order to ensure effective management of forest resources.
2013 – 2017	District Forestry Officer	Forestry Department, P.O Box 60, ITEZHI TEZHI	Planning, implementing and coordinating forestry extension programmes in the district to ensure effective management and utilization of forest resources
2017 – To Date	District Forestry Officer	Forestry Department, P.O Box 29, SERENJE	Planning, implementing and coordinating forestry extension programmes in the district to ensure effective management and utilization of forest resources

4.0 CURRICULUM VITAE

ESIA – GIS EXPERT – NANSANGA COMMODITY VALUE CHAIN TRANSFORMATION PROJECT

PRECIOUS MUKAMBA

+260972135091

precious.mukamba@gmail.com

SERENJE, ZAMBIA

Date of Birth: 31st December, 1988

Gender: Female

Highly dynamics and innovative professional with experience in planning, and implementation of institutional programs and projects. Have a great understanding of public sector work systems with practical hands on experience in working with quassi-government institutions. Possess strong interpersonal skills to effectively communicate with peers and stakeholders to ensure effective implementation of work projects.

Professional Education and Academic Background

- **Master of Science in Spatial Planning:** University of Zambia- Lusaka (2020)
 - **Bachelor of Arts with Education:** University of Zambia –Lusaka (2010)
 - **General Certificate of Education:** Njase Girls Secondary School – Choma (2001)
-

Professional and Personal Continuous Development/Training

- Implementation of the Sustainable Development Goals (SDGS), implementation and monitoring. – United Nations Development Program /Ministry of Finance Lusaka. (2019)
 - Preparation of Local Area Plan (2018)
 - Climate change, Land use Management, Basic GIS, fire Management through community based regeneration of natural forests- UNDP (2017)
 - Change Management, Local Economic Development, Administration and good governance- GIZ/ Ministry of Local Government (2017)
 - Implementation of Devolution and Decentralization at sub district levels through GIZ / Ministry of Local Government (2016)
 - Activity based budget preparation and monitoring: GIZ/Ministry of Local Government. (2013)
-

Professional Work Experience

District Planning Officer - Serenje Town Council, Serenje (March, 2013 to Date)

Duties and Responsibilities

- **Planning:** Directing the planning division, in charge of socioeconomic, community, environmental, and physical planning, as well as serving as the committee's secretariat.

- **Policy Implementation:** Policy implementation, Secretariat and advisory to the Planning standing committee of the Council and Coordinate socio-economic planning in order to enhance implementation of District Development plans and programs
- **Marketing and Liaison:** Marketing the district to investors, through publications and brochures. Liaison officer between the local community and the investors through the office of the council secretary.
- **Performance Management:** Managing effectively the implementation of performance management system in order to improve and sustain performance. Managing the human, financial and material resources to enhance the operations of the department.
- **Monitoring and Evaluation:** Facilitated for the implementation and monitoring of the usage of the constituency Development funds and inspections of developments in the district to ensure compliance to the relevant laws and acts.

Field Inspector - Workers Compensation Fund Control Board, Lusaka

(February, 2010-2011)

Duties and Responsibilities

- Effectively registered businesses and monitored compliance with the requirement to pay the board money each quarter.
- Timely Collected of data of newly established and old companies that do not exist in the database.
- Made prudent calculation and determining how much should be remitted every financial year
- General calculation of compensation to be paid to the affected employees in case of injury or accident at the place of work.
- Provided customer care and coordination

Assistant Research Officer-Forum for African Women Educationalist in Zambia (FAWEZA).

(November, 2010)

Duties and Responsibilities

- Collection data in the various centers in the districts where FAWEZA has safe houses.
- Accurate Data analysis, Management and Report Writing
- Sensitization on girl child education enrollment and remaining in school and how to prevent unwanted pregnancies in selected centers of the country.

Extra Assignments, Projects and Position

- **A Member of the District Welfare Assistance Committee (DWAC):** - Provided technical assistance for budgetary management and social cash transfers to orphans & vulnerable children (OVCs).
- **District HIV/Aids Committee:** - Co-ordination and Implementation of HIV/AIDS related activities in the district with coordination from Ministry of health and National Aids Council.

Professional Achievements and Milestones

- Managed and Facilitated for the updating of the valuation roll for Serenje district council effectively.
- Led and facilitated the development of the strategic plan (2017 – 2021) for Serenje district council
- I wrote a document on the institution's behalf (Serenje District Council) in 2017 that helped the institution earn the Award of excellence in local government.
- Actively lobbied for and facilitated the investment process which increased the number of investors in Serenje district.

5. CURRICULUM VITAE

ESIA- AGRONOMIST EXPERT – NANSANGA VALUE CHAIN TRANSFORMATION PROJECT

Personal profile

Name: Kachulu Msiska

Date of Birth: 16th October, 1983

Languages: English (Official), Tumbuka, Bemba, Chewa, Lenje

Denomination: Christian

Marital Status: Married

Address: Ministry of Agriculture, Itezhi Tezhi District, P. O. Box 64

Cell: +26097-8-794087/+26096-8-318535/+26095-4-555594

Email: kachulumsiska@gmail.com

Career Objective

I seek a challenging career in an innovative and flexible organization that will allow me to use my excellent organizational, analytical, administrative and innovative skills to their fullest potential.

Summary of skills and abilities

- Highly motivated and qualified with almost 7 years' experience in rural development
- Ability to multi-task, prioritize and work well under pressure, with minimal or no supervision.
- Well vested in both written and verbal form of communication, strong planning and organizational skills.
- Accomplished in Microsoft Windows operating systems, Microsoft Office (Word, Excel and PowerPoint) and Internet.
- I've proven proficiency with communication tools like Skype and Lotus notes 8.5 and accounting tools like GEMS and Straight2bank.

- Well vested in LQAS and SPSS statistical packages

Academic Qualification

2021-2023	Master of Science in Agronomy, Mulungushi University
2012 to 2016	Master of Environment and Sustainable Development (ESD); The Copperbelt University
2004-2008/9	B. Agriculture Science; The University of Zambia
1997-2001	Secondary School Certificate; Kafue Boys Secondary
1991-1996	Primary School Certificate; Woodlands A Basic School

Other technical trainings

Year	Course	Provider	Length
2017	Hybrid Maize Comprehensive Technology for Developing Countries	Yuan Longpin High-Tech Agriculture Company, China	3 months
2014	Survey Design, Data Collection and Analysis Course	Indaba Agricultural Policy Research Institute	2 weeks
2012	Project Management for development professionals level 1-Certificate	APM Group	2 weeks
2011	Saving Group establishment and management-Certificate of completion	World Vision International Zambia	1 week
2011	Value Chain Program Design-Certificate of completion	Action for Enterprise	1 week
2011	Seed inspection Course-Certificate	Ministry of Agriculture and Livestock, Seed	2weeks

		Control and Certification Institute	
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Work experience

March 2010 to February, 2015:

Food Security Development Facilitator, World Vision Zambia, Keembe ADP.

The role involved;

- Coordinating and thoroughly implementing field activities and operations as outlined in the Food Security Project Design Document (PDD) in partnership with the relevant stakeholders.
- Timely writing and submitting Monthly Management reports, Semi Annual Report, Annual Progress Reports and Community Disaster Preparedness Plans (CDPP) for the Food Security Project to the Program Manager.
- Training farmers in post-harvest handling in an effort to reduce losses resulting from poor handling of farm produce
- Conducting regular field monitoring visits to provide technical support and extension services to the small scale farmers and record impact stories every month.
- Regularly liaise with the relevant government departments and other stakeholders to provide technical support for the effective implementation of project activities in the Project area.
- Conducting livelihood skills trainings in environmentally friendly farming practices like Agro forestry, Organic Farming and Conservation Farming.
- Training farmers in livestock production and disease management to reduce mortalities.
- Ensuring that the community through Disaster Satellite Committees have the necessary capacities to prevent and manage hazards like floods and disasters from escalating into disasters.

- Ensuring that community members especially women form community banks in form of saving groups where they make savings and get loans to support their families in times of need.
- Facilitating the development of a Goat Value Chain in the Area Development Program

Key Achievements;

- Facilitated the formation of 47 saving groups of which 35 as at December, 2014 had shared out K448, 496 in loan form. The total composition of these saving groups was (371F/85M). On average each group had a membership of 20.
- 80% of the Small scale farmers under the food security project against a total of 1, 875 had adopted most of the principles of conservation farming. This had resulted in increased production and productivity
- The number of small scale farmers on the production side of the goat value chain within the Area Development Program had increased from 350 in 2010 to 2809 by December 2014. The demand for goats had resulted in price increase from between K50 to K80 in 2010 to between K300 to K400 by December 2014.
- For the five years that I was at the helm of the Food Security Project in Keembe Area Development Program, the organisation always scooped the first prize at the Annual District Agriculture Shows.

June 2012-October 2012, 1st July, 2013 to Date

Acting Monitoring and Evaluation Officer, World Vision Zambia, Keembe ADP

This role involved;

- Assisting the ADP team to setup/implement/continuously improve the ADP's monitoring system by assisting the team to set annual/quarterly/monthly targets – after DIPs are approved
- Coordinating the process of developing ADP progress monthly, semi-annual and annual reports using the appropriate LEAP formats.

- Developing/adapting the appropriate data bases which were used to track the ADP's performance against annual/quarterly/monthly targets
- Training the program team and community volunteers on the usage of various monitoring tools.

Key achievements

- I successfully coordinated the process of evaluating the food security, literacy and nutrition levels in the program area after 3 years of implementation using Lot Quality Assurance Sampling design (a statistical package).
- Improved goat and crop monitoring tools so that they could be used to collect more information that would be used to inform programming

April 2011 to October, 2012:

Focal point person for Water and Sanitation Hygiene Education, World Vision Zambia, Keembe ADP

This role involved;

- To effectively coordinate and implement all WASHE activities in partnership with key stakeholders i.e. District Council, Ministry of Health and Beneficiaries.
- To implement Community Led total Sanitation (CLTS) sensitization meetings in all the WASHE project areas and construction of Boreholes and Sanplates
- Build strong partnership between the council and the community as a sustainability strategy of the project.
- Facilitate the training of community pump minders in borehole repair and maintenance

- Build community & partners capacity in prioritizing projects, project planning, implementation, monitoring and reporting processes for sustainability of the project interventions

Key Achievements

- After sensitizing the community members of 3 zones in Community Led total Sanitation (CLTS), over 80% had built toilets using locally available materials as at December, 2014.
- I facilitated the construction of five Boreholes and training of 10 community pump minders as a way of sustaining the program. The pump minders were equipped with knowledge, skills and tools that would enable them maintain the boreholes by repairing or servicing in case of any faulty.

October 2009 to Dec 2009

Farm Manager:

This role involved;

- Day to day running of the company farms and gardens and Overall supervision of farming activities
- Organise stakeholder meetings, workshops and trainings for out grower Farmers
- Provide technical support to outgrower farmers on the production of Soybeans, Sunflower, Groundnuts and Beans
- Monitoring and evaluating all the project components at the company Farms and out grower farms in collaboration with the Ministry of Agriculture
- Establishing strong linkages and partnerships among project Stakeholders (Out grower farmers, Ministry of Agriculture and Livestock and Buka Agro Products)
- Ensuring that the budget is spent according to the project operations.

6. CURRICULUM VITAE

ESIA- WATER ENGINEER – NANSANGA VALUE CHAIN TRANSFORMATION PROJECT

Prince Mweemba (BSc, MEIZ)

Serenje, Central Zambia

(+260) 970148121 | 957642765 | pmweemba94@gmail.com

EXPERIENCE

October 2022 to date: District Water Development Officer, Serenje District

Department Of Water Resources Development, Ministry Of Water Development and Sanitation

- To coordinate timely the development and review of Water Resources Development Policies in order to provide operational guidelines for effective implementation of programmes in the district
- To coordinate effectively the development of water infrastructures in order to harness water resources to facilitate support to all sectors of the economy in the District
- To coordinate timely research and development programmes in order to generate information for effective decision making in implementation of appropriate interventions
- To coordinate timely the monitoring and evaluation of programmes in order to assess their impact and facilitate identification of appropriate interventions
- To supervise effectively the human, financial and material resources in order to attain the objective of the Department in the District
- To coordinate effectively the development of international waters in order to support sustainable utilization and foster regional cooperation
- To coordinate timely the development and implementation of the Water Resources database in order to facilitate storage and retrieval of information

- To manage and coordinate effectively the design and implementation of contracts in order to ensure conformity with required standards and facilitate the effective execution of projects
- To manage effectively the development of departmental work plans and implementation of the Annual Performance Appraisal System

January 2021-October 2022 Internship

Mumbwa Town Council; Rural Water Supply & Sanitation section

- To undertake effective monitoring and supervision of Rural Water Supply & Sanitation works/projects in the District
- Borehole rehabilitation and maintenance
- Active participation in D-WASHE activities like CLTS and PHAST in the District □
Any other functions assigned to by the MTC Water Coordinator.

January 2019 to December 2020 Support Engineer

Geocorp Water Solutions, Lusaka

- Borehole development, construction, inspection and maintenance
- Project Management and site supervision
- Solar and electrical water pumps installation; submersibles and surface water pumps
- Planning and designing of Rural & Urban water supply and sanitation systems including irrigation systems designing

-
- Any other functions assigned to by the Projects Engineer/ MD

EDUCATION

1. University des Sciences et de la Technologie d'Oran Mohamed-Boudiaf _USTOMB, Algeria
2018

BSc Hydraulic (Water) Engineering

2. Chelstone Secondly School, Lusaka

2013

GCE School Certificate

3. University of California__e-Learning on Coursera

July 2018

Project Management Basics

4. The United Nation Education, Scientific and Cultural Organization (UNESCO) __E-Learning

May 2021

Ground Water Quality in Transboundary Aquifers

SKILLS

- Microsoft office proficiency
- GIS Proficiency
- Time Management, Project Management, Problem Solving
- Hands on personality

7.0 CURRICULUM VITAE

ESIA – Nutrition and Agro-Process Expert, Nansanga Commodity Value Chain Transformation Project.

Katumwa Mutandi

Phone +260977881708

E-mail mutandi76@yahoo.com

Katumwa.mutandi@agriculture.gov.zm

Personal Information

Marital status: Married

Nationality: Zambia

Place of Birth: Kalabo

Date of Birth: 16-08-1976

Summary of
qualifications

Year	School/Institution	Place
2008-2010	Ghent University	Ghent, Belgium

Master of Nutrition and Rural Development

Dissertation: “Analysis of consumer’s values and background attitudes in five European countries”.

Year	School/Institution	Place
1997-2004	University of Zambia	Lusaka, Zambia

Bachelor of Food Science and Technology.

Dissertation: “A comparative study of the methods used to determine the bioavailability of Soya bean protein”.

Year	School/Institution	Place
1991-1995	Kalabo secondary School	Kalabo

Grade 12 Certificate

Work experience

20/11/2013 To date

District Agricultural Coordinator, Serenje District.

Job Description:

- Ensure effective interpretation and implementation of agriculture policy in order to attain ministerial objectives.
- Undertakes effectively the utilization of human, financial and material resources in order to ensure sustainable capacity building and attainment of Ministerial objectives.
- Coordinates effectively collaboration with other institutions and stakeholders in order to highlight the core function and operation of the Ministry.

- Coordinates timely provision of technical and specialized services to farmers in the district in order to enhance the productivity.
- Ensure effectively the registration and training of cooperatives (societies, union) in order to facilitate their participation in agricultural development.
- Undertakes regularly the maintenance of an up to date information management system in order to facilitate easy storage and retrieval of information.
- Coordinates timely development of market linkages for agro and fish products in order to enhance trade in the district.
- Coordinates timely implementation of research protocols in crops, livestock and fisheries in order to generate technology appropriate for farmers.
- Coordinates timely the dissemination of research findings in order to provide information for informed decision making.
- Undertakes effectively the provision of extension services in order to impact knowledge and skills to farmers.
- Coordinates the timely preparation of budgets in order to facilitate the acquisition of financial resources.
- Develops effectively the department and individual work plans in order to facilitate monitoring and evaluation of performance.
- Carries out regularly monitoring and evaluation of Agricultural programmes and activities in the district in order to facilitate implementation of appropriate interventions.

Job: Senior Agricultural Officer**Job Description:**

- Ensures timely development and implementation of extension training programs in order to impart knowledge and skills to farmers
- Co-ordinates the timely preparations of farm budget plans for client farmers in order to promote improved farm management.
- Co-ordinates timely the development and implementation of food and nutrition in order to provide information to the farming community and the public.
- Co-ordinates timely M & E in advisory services in order to facilitate appropriate intervention measures.
- Co-ordinates effectively human resources in order to attain departmental objectives
- Co-ordinates regular research in agricultural extension in order to generate information
- Co-ordinates timely development of individual and departmental work plan in order to monitor and evaluate performance.

Others: Active contributor (working group participant) to the M & E document for the Ministry of Agriculture and Livestock which has been ready July, 2013.

Year	Place/Institution	Location
17/02/2008-17/07/08	Agricultural Support Program	Kabwe

Job: Acted as District Coordinator:

Job Description:

- To provide technical support primarily to CEOS/Facilitators within the camps, falling within Agriculture Support Program (ASP) through backstopping and also to other stakeholders within the ASP tri-partite partnership.
- To make sure that Programme activities are carried out in accordance with the ASP log frame and that Camp Committees are getting the needed guidance and support in preparing their work plans.
- To ensure that requisitions for resources to implement planned activities at camp level are made in a timely manner.
- To facilitate support to identified training needs for staff and stakeholders in the tri-partite partnership.
- To ensure that the monitoring and evaluation system works well and to analyze Programme activities and impact and ensure that the quality of field work is not compromised.
- To coordinate all the district based activities including linkages to local business and non-business support entities.
- To be the link between the district and team office in terms of day to day programmes implementation including backstopping and reporting.
- To assist the FTL with coordination of ASP activities and with the dissemination of learning experiences in the district to share with other facilitation teams and districts.
- To ensure proper resource utilization at district level.

Year	Place/Institution		
Location			
2006-01/01/201 Kabwe	Ministry	of	Agriculture

Job: Food and Nutrition Officer

Job Description:

- Undertake timely capacity building program in food and nutrition in order to enhance knowledge and skills to farmers (food processing preservation, storage and utilization).
- Conduct timely the development and implementation of food and nutrition programs order to improve household food security.
- Undertake timely monitoring and evaluation in food nutrition in order to facilitate interaction measures.
- Conduct effectively human resources in order to attain departmental objectives.
- Conduct regular research in food and nutrition in order to generate information.
- Co-ordinate timely the development of individual and departmental work plan in order to monitor and evaluate performance.
- Mainstreaming gender and HIV/AIDS issues.
- Promotion income-generating activities amongst women and youth groups.
- Promotion of appropriate and labour saving technologies e.g. use of treadle pumps in irrigation, conservation farming etc.

Research Undertaken
 Project Management & Coordination

2012-2013 2012-2013

“Drivers of deforestation, identification of threatened forests and Forest Co-Benefits other than Carbon from REDD+ Implementation in Zambia”.

***The paper has been published under FAO, 2014

2016-2022

Position: District Agricultural coordinator

Project: Agricultural Production and Market Enhancement Project (APMEP).

Role: Leading, coordinating, planning, budgeting and supervision of project activities in Chitambo district with support from province and head office.

Key milestones:

- Establishment of the Cassava Milling plant.
- Demonstrated, promoted and commercialised rice production in the district from 40 demonstrations in 2016/17 to a total 1892ha in 2021/22.
- Successfully commercialized fish farming among the piloted fish farmers some of whom have scaled up through financing from CEEC.
- Poultry pass on (village chickens) successfully implemented.

Funder: GRZ/Africa Development Bank (AfDB) with funding from Global Agriculture Food Security Program (GAFSP).

2022-2023

Working in same capacity as District Agricultural Coordinator, currently establishing cassava seed stock in preparation for plantation establishment under the APMEP in Serenje district.

2023-2024

Position: District Agricultural coordinator

Project: Nansanga Farm Block Development

Role: Leading, coordinating, planning, budgeting and supervision of project activities in Serenje district with support from province and head office.

Expected outputs:

- Access roads opened up
- Power pulled to the farm block from pensulo
- Dams rehabilitated or constructed
- Commercialization of atleast 1 value chain
- Possible establishment of an Industrial yard in the farm block ***

2017-2019 - Position: Team Leader

Funder: GRZ/World Bank

Role: Leading, coordinating, planning and budgeting for five (5) multidisciplinary teams of agriculture extension and research experts across the country in dissemination of technologies (Maize, rice, sorghum, food legumes x 2). Revised dissemination strategy was developed in which all 5 dissemination teams were put under the coordination of the team leader.

Key milestone: over a million farmers were reached through various dissemination channels/pathways.

2014-2018

Position: Principal Investigator

Sub-project Title: “Enhanced dissemination of food legumes based technologies for Increased production”

Project: Agricultural Productivity Program for Southern Africa (APPSA)

Funder: GRZ/World Bank

Languages Lozi, Nyanja, Lenje and English

Capabilities Ability to work with or without minimum supervision and to adapt to any work Situation. Capable of working odd hours and team player. Conversant with most computer software packages i.e. Ms-word, Ms-excel, Ms-editor, and SPSS. Conversant with GIS packages.

8.0 CURRICULUM VITAE

ESIA – Gender/Sociologist Expert – Nansanga Commodity Value Chain Transformation Project.

1.0 PERSONAL DETAILS

Name: Gracious Moonga Monga (Mrs)

Sex: Female

Date of Birth: 12th June 1969

Nationality: Zambian

2.0 EDUCATIONAL STUTAS

1991

Completed Grade 12 at Macha Girls Secondary School in Choma with a full school Certificate

3.0 PROFESSIONAL QUALIFICATIONS

2013 -2016: Bachelor Degree in Development studies with Emphasis in Community Development, Republic of Uganda at Bugema University.

2010 – 2008; - Diploma in Human resource Management and Development, UNZA, from 2008

2007 – Certificate in Human Resource Management Advanced Level, by UNZA, from July to December

2007 – Certificate in Human Resource Management Level 1, by University of Zambia (UNZA) from January to June

1994 - Certificate in Community Developmen, Monze Staff Training College, in Community Development field

4.0 OTHER RELEVANT TRAINING (S)

1998 -Trained in Civic Education which covered Local Government Community Participation, Human Rights, Conflict Management, Election Monitoring and Women in Leadership, by Zambia Reconstruction Organization (ZAMRO)

2001 - Trained in Training of Trainers in facilitation of Community Based Development, by Zambia Social Investment Fund (ZAMSIF)

2002- Trained in Microcredit District Facilitation, by Micro Projects Unit

2005- Trained in Entrepreneurship Skills Development by TEVETA, conducted by Small Enterprise Development Board (SEDEB)

2005-Trained in Peer Education, by Champ

4.0 WORK EXPERIENCE

1997-2003

- Worked in Kapiri-mposhi in the Ministry of Community Development and Social Services, as Assistant Community Development Officer; mobilized, organized, and trained women clubs in entrepreneurship Skills.
- Facilitated non formal Education and Skills training, to Adult Literacy classes.
- Facilitated mobilization, organization and identification of community projects also participated in both desk and field appraisals for projects in the district.

2004

- Worked in Mkushi District in the same capacity and in the same Ministry, in the Department of Community Development; organized and trained women and youth groups.
- Was involved in the delivery of District Water Sanitation and Health Education in Mkushi community

2005 - 2007

- Worked in the department of Social Welfare, in the acting capacity of District Officer and facilitated social support to the orphans and vulnerable children, the disable People, the aged, repatriated the stranded individuals to their destinations; and performed administrative functions.

2008 - 2010

- Worked in the department of Community Development in the acting Capacity of District Officer; performed Administrative functions
- Facilitated social development programmes in the district.
- Facilitated proposal writing for groups to access women empowerment funds
- Participated in Civic duties

2011

- Participated in the national General Elections, as Presiding Officer for Mulembo Polling Station

2011-2012

- Continued to operate in the department of Community Development, in the capacity of Assistant Community Development Officer

2019 – 2023

- District Community Development Officer, Serenje District Community Development department.
- Participated in various field activities both within the ministry of Community Development, Line ministries an Ngos concerning Facilitation, Community mobilization