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**TITLE: TERMS OF REFERENCE FOR THE PROPOSED
CONVERSION OF 2,164HA OF SUGAR CANE IRRIGATION
SYSTEM FROM FARROW TO SUB-SURFACE DRIP AT
KALEYA SUGAR PLANTATION IN MAZABUKA DISTRICT
OF SOUTHERN PROVINCE**

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Executive Summary

Project Background

These are Terms of Reference (TORs) for the proposed Conversion of sugar cane irrigation system from furrow to sub-surface drip. The proposed project will be located at the Kaleya Estate approximately 7 kilometres from Mazabuka Town, on the southern side along the Livingstone road. The proposal is to develop a sub-surface drip irrigation system. Currently the irrigation used is furrow. The proposed development will entail some sugar cane clearing, land preparation and the installation of sub-surface drip irrigation pipes.

KASCOL has water rights of 152,000 m³ per day. Zambia Sugar provides bulk water supply for irrigation pumped from Kafue River to the central reservoirs (Earth dams) before distribution to individual cane fields through a network of canals. For potable water supply, there is a dam near the proposed site and water will be pumped from this dam to distribution to the drip irrigation pipes.

Kaleya Smallholders Company Ltd (KASCOL) is one of the leading smallholder agricultural schemes in the Southern African region. Popularly known as KASCOL, it was established in 1980 after Zambia Sugar Plc expanded its milling capacity to meet domestic demand for sugar and to supply excess to the neighbouring countries. Zambia Sugar Plc could not expand its plantation due to limited land availability. Consequently the idea of an outgrower scheme emerged, and among its objectives was the enhancing of Zambian smallholder participation in the sugar cane industry and that of improving the condition of Zambian small-scale farmers. These objectives were achieved to a great extent with the establishment of KASCOL. This project came into existence with the support of the Zambian Government. KASCOL has since evolved from the initial 65 hectares planted in 1981 to the current crop area of 2,500 hectares, of which 1,074.5 hectares belong to the 160 smallholders at KASCO and the rest belong to KASCOL management.

Purpose and Objectives of the TOR

The Environmental Management Act (2011), read together with the Environmental Impact Assessment Regulations (1997), requires that developers of large projects that fall within the second schedule of the EIA regulations such as the proposed conversion of an irrigation system project develop “Terms of Reference (TORs)” which should be submitted to the Zambia Environmental Management Agency (ZEMA) for scrutiny and approval before a detailed study for a project is carried out.

These Terms of Reference (TORs) are therefore being developed on behalf of KASCOL the project proponent. The TORs are being developed to provide ZEMA with the details of what the various ESIA specialists will be investigating during the study of the development of the drip irrigation project in Mazabuka area. These TORs and the accompanying Scoping Report are meant to inform the authorities on the forthcoming ESIA, and specifically, to:

- Provide key information on the Project and the Project Proponent;
- Discuss how the ESIA will be developed including the ESIA methodology and tasks, the scope of the ESIA (geographically and temporally), and team members; and
- Present the environmental, socioeconomic or cultural heritage issues that are likely to be impacted and on which the ESIA will give emphasis.



Project Location

The Project site is located to the south-east of Mazabuka town approximately 7km from Mazabuka Central Business District (CBD).

Project description

The proposed project comprises the conversion of sugar cane irrigation system from farrow to sub-surface drip in the Kaleya cane fields in Mazabuka Districts of Southern Province. The Project site is located to the south of the plantation as shown on figure 3.1 site location of the proposed Project and figure 3.2 showing the general layout of the proposed site.

Particulars of the Project Proponent

The project developer is Kaleya Smallholders Company Ltd with its registered address at:

Address: Kaleya Smallholders Company Ltd (KASCOL)
Plot No. 235a/235A along Livingstone Road
P.O. Box 670371
Mazabuka, Zambia

KASCOL Contact person details:

Name: M. Mufana
Designation: Estate Manager
Phone number: +0978240240
Email Address: mmufana@kascol.co.zm

Regulatory framework

The study will be conducted in compliance with all relevant polices, legislation and institutional requirements. These will include the Environmental Management Act, the Environmental Impact Assessment Regulations, the Environmental Management (Licensing) Regulations, and other relevant regulatory requirements listed in this report. The study will also be conducted in compliance with the International Finance Corporation Performance Standards. The Institutional Framework will be provided by the Zambia Environmental Management Agency, the Ministry of Housing and Infrastructure Development and others listed in this report.

Project activities

Project activities will be conducted in the following phases:

- Site preparation and construction phase;
- Commissioning;
- Operational phase, and
- Decommissioning

Initial site preparation will entail removal of the existing vegetation, scarifying of topsoil and earthworks to establish the required levels. The project will be constructed on the sub-surface level requiring minimal basic earthworks, which will minimise the need for filling of areas with topsoil. Earthworks will for the most part involve the use of heavy machinery such as bulldozers and graders.



The subsurface drip irrigation system consists of four main components connected together with PVC pipe and fittings. These four components are

- a) Driplines,
- b) Valves,
- c) Filter,
- d) Flow meter.

The most important component is the filtration system. This is the largest and most noticeable component of the drip system. The filter's purpose is to protect drip emitters from plugging due to contaminants in the water. The drip emitters are manufactured in the dripline and are a valuable part of the drip system. The emitters are what allow the system to drip, applying small, precise amounts of water uniformly across an entire field. Valves are used to break a system into zones which are critical in the design process. The water meter has two very important purposes. The first is as a management tool giving growers the precise amount of water applied. The second purpose is as a diagnostic tool. Together with a pressure gauge, this is the only way to know what is going on in your field

Ancillary actions

Ancillary actions would involve cane clearing, the haulage and storage of materials, including fuels and lubricant oils, cement, lime, paints and concrete works, and plant and equipment maintenance operations including the disposal of used lubricants.

The mobilisation, demobilisation and maintenance of work areas would require bush clearing and land preparation, the provision of water supplies

The ESIA study shall be prepared for the construction, operation/maintenance and decommissioning phases of the project. The following issues will be particularly considered:

- The ESIA Study will focus on the identification and assessment of potential environmental, socioeconomic and cultural heritage impacts of the project, as well as of cumulative impacts with other infrastructure projects.
- The Consultant will put emphasis on assessing the positive and negative impacts on communities, e.g. socio-economic impacts, health impacts, etc. In principle, no physical resettlement is foreseen as a result of the project activities. If however such a need arises, the consultant will undertake a resettlement screening giving an estimate of the number of people being affected by the project and prepare a Resettlement Action Plan appropriate for the needs of the project.
- The Consultant will undertake the needed public consultations with affected stakeholders in the project area. The relevant procedure and the details of the stakeholder engagement and disclosure of information will be outlined in the Scoping Study.
- The responses of the public to the Scoping Study and the draft ESIA will be recorded and, if necessary, the documents will be modified and updated accordingly for the final version, thus ensuring that stakeholders' views regarding project design, implementation and monitoring are taken into account.



- The ESIA Study will be complemented by an Environmental and Social Management Plan (ESMP) containing mitigation and monitoring measures, needed training programs for stakeholders, describe institutional arrangements for implementing the ESMP, describe reporting needs, develop proposals for institutional strengthening if required and give the costs for implementing of the measures.

ESIA tasks

The environmental and social variables that will be considered during the assessment of the impacts of a drip irrigation project include:

- Air quality
- Noise
- Water quality and use
- Soils
- Biodiversity
- Landscape and visual impacts
- Cultural and archaeological heritage
- Land use and livelihood
- Socio-Economic Impacts
- Community Health and Safety
- Occupational Health and Safety
- Resources and waste
- Cumulative Impacts

The preparation of the ESIA will follow the stages presented below, as per Zambian regulations and international best practice.

1. **Screening:** to determine if the project requires an EPB or a detailed ESIA.
2. **Alternatives Assessment:** to identify the project alternative that are technically feasible and have the least environmental and social impacts.
3. **Scoping:** identifies and consults upon the key issues to be addressed in the ESIA.
4. **ESIA:** For the key issues identified in scoping, secondary data and field studies will be used (as necessary) to assess existing environmental and social conditions. The ESIA will assess predicted environmental and social changes as a result of the project and propose mitigation measures where necessary.
5. **Stakeholder Engagement and Consultation:** During the ESIA study, the team will provide relevant information and seek the views of interested parties so that these can be taken into account in the assessment and reflected in the proposals for mitigation. Once complete, the ESIA Report will be subject to public disclosure and consultation. Comments will be taken into account in revising the final ESIA Report.

ESIA Methodology

The ESIA Study will be informed by the district reports compiled by various government departments complemented by field surveys and assessments.



ESIA Schedule

The table below is the proposed ESIA schedule.

Deliverable	Indicative timing
Submission of the Scoping Study and TOR for ESIA	September 2021
ESIA Scoping and TOR approval	October 2020
Desktop studies, ESIA and Consultation site visits	September – October 2021
Submission of the Draft ESIA	October 2021
ESIA Disclosure and Stakeholder Engagement	October 2021
Submission of Final ESIA	October 2021

Specialist Studies

The information provided in this TOR and in the Scoping Report for the project has been based on desktop information available for the project area, feedback from stakeholders provided during the Scoping meetings and expert opinion of the project team.

The ESIA study will have specialist studies in the areas listed below:

- Air Quality Sampling Analysis
- Noise and Vibration Assessment
- Water Quality Analysis
- Biodiversity Assessment (Flora and Fauna Sampling and Analysis)
- Heritage Impact Assessment
- Socio-Economic Assessment
- Cumulative Impact Assessment

The ESIA team will comprise the following experts:

1. ESIA Specialist (Team leader)
2. Agronomist
3. Social economic Specialist
4. Health and Safety Specialist
5. Environmental specialist

The CV's of the proposed ESIA team are included in Appendix A.



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Abbreviations & Acronyms

Acronym	Description
AIDS	Acquired Immune Deficiency Syndrome
BSAP	Biodiversity Strategy Action Plan
CBD	Central Business District
CBD	Convention on Biological Diversity
CHS	Community Health Safety
CITES	Convention on International Trade and Endangered Species
CO ₂	Carbon Dioxide
CWSC	Chambeshi Water and Sewerage Company
ECZ	Environmental Council Of Zambia
EHS	Environmental Health and Safety
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EMA	Environmental Management Act
EPPCA	Environmental Protection and Pollution Control Act
EPRP	Emergency Preparedness and Response Plan
ESIA	Environmental and Social Impact Assessment
ESIS	Environmental and Social Impact Statement
ESMP	Environmental and Social Management Plan
ESMS	Environmental and Social Management Systems
FGDs	Focused Group Discussions
GDP	Gross Domestic Production
GIIP	Good International Industry Practice
GMO	Genetically Modified Organism
Ha	Hectare
HIV	Human Immune-deficiency Virus
IAP	Interested and Affected Persons
IDPs	Internally Displaced Persons
IFC	International Finance Corporation
ILO	International Labour Organization
KASCOL	National Pension Scheme Authority
NBSAP	National Biodiversity Strategy Action Plan
NCC	National Council for Construction
NCS	National Conservation Strategy
NEAP	National Environmental Action Plan
NEP	National Energy Policy
NGO	Non-Governmental Organization
NHCC	National Heritage Conservation Commission
NO _X	Nitrogen (mono-/di-, etc.) Oxide
NPS	National Pension Scheme
NPS	National Pension Scheme
NSDI	National Spatial Data Infrastructure
OHS	Occupational Health and Safety
PS	Performance Standards
R-NASF	Revised National HIV and Aids Strategic Framework



RTSA	Road, Transport and Safety Agency
TOR	Terms of Reference
UNFCCC	United Nations Framework Convention on Climate Change
ZEMA	Zambia Environmental Management Agency
ZESCO	Zambia Electrical Supply Corporation



1 INTRODUCTION

1.1 Project Background

Kaleya Smallholders Company Ltd (KASCOL) is one of the leading smallholder agricultural schemes in the Southern African region. Popularly known as KASCOL, it was established in 1980 after Zambia Sugar Plc expanded its milling capacity to meet domestic demand for sugar and to supply excess to the neighbouring countries. Zambia Sugar Plc could not expand its plantation due to limited land availability. Consequently the idea of an out grower scheme emerged, and among its objectives was the enhancing of Zambian smallholder participation in the sugar cane industry and that of improving the condition of Zambian small-scale farmers. These objectives were achieved to a great extent with the establishment of KASCOL. This project came into existence with the support of the Zambian Government. KASCOL has since evolved from the initial 65 hectares planted in 1981 to the current crop area of 2,500 hectares, of which 1,074.5 hectares belong to the 160 smallholders at KASCO and the rest belong to KASCOL management.

The proposed project is a Conversion of sugar cane irrigation system from farrow to sub-surface drip. The proposed project will be located at the Kaleya Estate approximately 7 kilometres from Mazabuka Town, on the southern side along the Livingstone road. The proposed development will entail some sugar cane clearing, land preparation and the installation of sub-surface drip irrigation pipes.

1.2 Purpose and Objectives of the TOR

The Environmental Management Act (2011), read together with the Environmental Impact Assessment Regulations (1997), requires that developers of large projects that fall within the second schedule of the EIA regulations such as the proposed drip irrigation project develop “Terms of Reference (TORs)” which should be submitted to the Zambia Environmental Management Agency (ZEMA) for scrutiny and approval before a detailed study for a project is carried out.

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- Present the environmental, socioeconomic or cultural heritage issues that are likely to be impacted and on which the ESIA will give emphasis.



1.3 Project location

The Project site is located to the south-east of Mazabuka town approximately 7km from Mazabuka CBD Central Business District (CBD) and can be accessed via the Mazabuka to Livingstone Kaleyia junction. The proposed project site location is shown in Figure 3.1 page 32.

1.4 Project description

Subsurface drip irrigation (SDI) is an irrigation system through buried plastic tubes containing embedded emitters located at regular spacing's. There are a wide variety of configurations and equipment used, however drip tubes are typically located 38" to 84" (134 to 213 cm) apart, and 6 to 10" (15 to 25 cm) below the soil surface.

Subsurface drip irrigation provides the ultimate in water use efficiency for open-field agriculture, often resulting in water savings of 25-50% compared to flood irrigation. The use of SDI offers many other advantages for crop production, including less nitrate leaching compared to surface irrigation, higher yields, a dry soil surface for improved weed control and crop health, the ability to apply water and nutrients to the most active part of the root zone, protection of drip lines from damage due to cultivation and other operations, and the ability to safely irrigate with wastewater while preventing human contact.

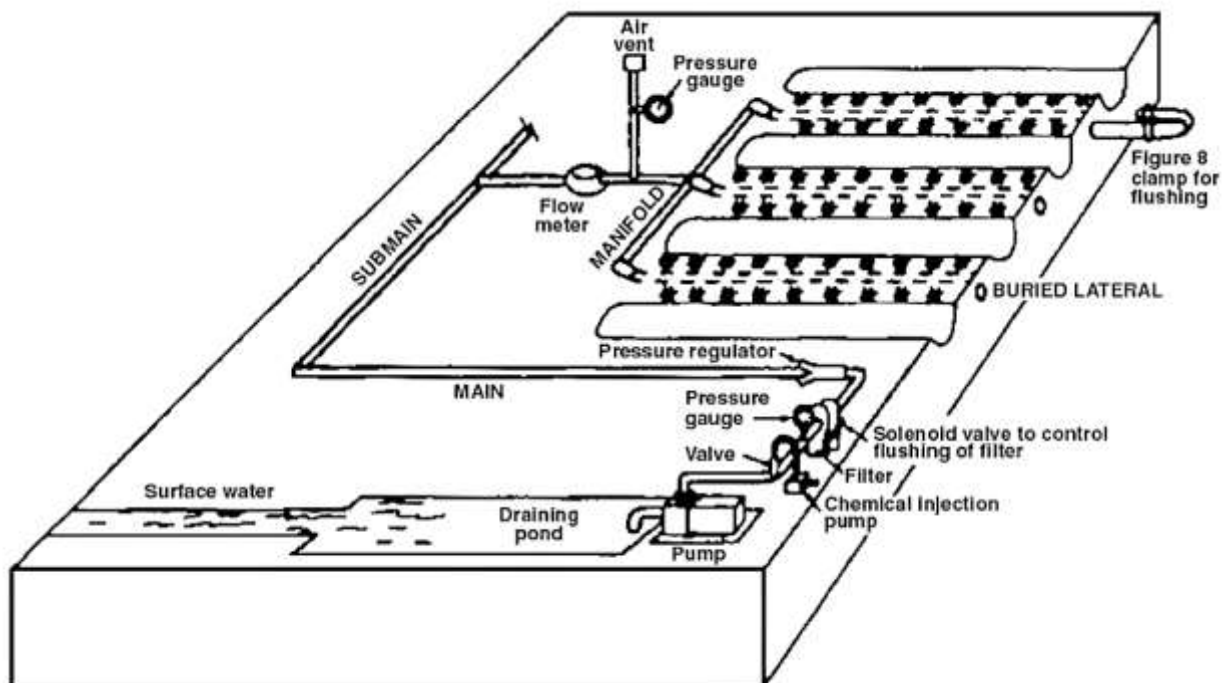


Figure 1.1 showing typical subsurface drip irrigation field layout



1.5 Key Project components

The Project key components include the following:

- e) Driplines
- f) Valves
- g) Filter
- h) Flow meter.

1.6 The Project team

1.6.1 The Project Proponent

The Project developer is Kaleya Smallholders Company Ltd (a statutory body) with its registered address at:

Address: Kaleya Smallholders Company Ltd (KASCOL)
Plot No. 235a/235A along Livingstone Road
P.O. Box 670371
Mazabuka, Zambia

KASCOL Contact person details:

Name: M. Mufana
Designation: Estate Manager
Phone number: 0978240240
Email Address: mmufana@kascol.co.zm

Table 1.1: Details of Directors

SHAREHOLDING IN KASCOL		
NAME	% SHAREHOLDING	NO OF SHARES
Development Bank of Zambia	25.00%	250,000
Mazabuka sugar cane growers trust	25.00%	250,000
Growers investment holdings limited	30.50%	305,000
Kaleya smallholders farmers trust	19.50%	195,000
Total	100.00%	1,000,000

SHAREHOLDERS REPRESENTATIVES

SHAREHOLDERS REPRESENTATIVES NAME	INSTITUTION	PHONE	EMAIL
Dr. Samuel Bwalya	Development Bank of Zambia	0971021036	smbwalyas@dbz.co.zm
Ms Hephzibah Beyani	Mazabuka Sugar Cane Growers Trust	0760633424	Hbeyani@zamsugar.zm
Mr. Muna Hantuba	Grower Investment Holdings Limited	0977770833	hantuba@aflife.co.zm
KAST Chairman	Kaleya Smallholders Trust	0979499602	kastchairman@kascol.co.



1.6.2 The ESIA Consultant

ESIA Consultant contact details	
Name of company	Earth Environmental Consultants
Contact	Lovemorre Muma
Address	106 Kantanta Street Nkana East, Kitwe Zambia
Telephone	+260 966904567
Email	Earth@zambia.co.zm

The Consultant was assigned with undertaking of the Feasibility Study, including the preparation and submission of the ESIA.



2 POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK IN ZAMBIA

2.1 Policy Framework

The National Conservation Strategy (NCS) is the forerunner to environmental legislation in Zambia. The NCS was adopted by the Government of Zambia in 1985 and led to the enactment of the Environmental Protection and Pollution Control Act in 1990 and provided for the establishment of the Environmental Council of Zambia (ECZ- now Zambia Environmental Management Agency) which became operational in 1991. The NCS provided guidance for the sustainable development of Zambia through the use and conservation of natural resources within a centrally planned and controlled economy. However in 1992, the National Environmental Action Plan process was established to update the NCS, to meet the demands of an economy undergoing liberalisation and to update technical information.

The following policies are relevant to the proposed drip irrigation project .

1. Zambia Vision 2030

The developmental vision of Zambia, to become a prosperous middle-income country by 2030, is elaborated in a document entitled Vision 2030. The Vision 2030 is founded on seven key basic principles. These principles are: (i) sustainable development; (ii) upholding democratic principles; (iii) respect for human rights; (iv) fostering family values; (v) a positive attitude to work; (vi) peaceful coexistence; and (vii) upholding good traditional values. The characteristics of the nation that Zambia is building can be described as follows:

- a. A common and shared destiny, united in diversity, equitably integrated and democratic in governance, promoting patriotism and ethnic integration;
- b. Devolved political systems and structures while retaining the roots and positive aspects of their own mould of social, cultural and moral values;
- c. A continuous path of ever refining, ever advancing and ever consolidating democratic dispensation and progressive adaptation from global best practices;
- d. Economically, socially and politically integrated within the sub-region, Africa and the rest of the world;
- e. Diversified and balanced and strong industrial sector, a modern agricultural sector and an efficient and productive services sector;
- f. Technologically proficient, fully able to adapt, innovate and invest using its human and natural resources;
- g. Strong and cohesive industrial linkages in the primary, secondary and tertiary sectors;
- h. Sustained high and increasing productivity levels with regard to every factor of production;
- i. Well developed and maintained socio-economic infrastructure;
- j. A robust and competitive transport and communications network that services the region;
- k. Strong entrepreneurial capabilities, self-reliant, outward looking and enterprising, where nationals take advantage of potential and available opportunities;
- l. Exemplary work ethics, honesty, high human and ethical values, quality consciousness and the quest for excellence;
- m. A macroeconomic environment conducive for growth;



- n. Development policies consistent with sustainable environment and natural resource management principles;
- o. Access for all to good quality basic human necessities such as shelter, titled land, health and education facilities and clothing;
- p. Diversified education curricula that are responsive to the knowledge, values, attitudes and practical skill needs of individuals and society at large;
- q. Regional centre of excellence in health and education;
- r. Decent work opportunities that ensure respect for fundamental human rights and principles;
- s. Opportunities for all citizens to become resourceful and prosperous nationals;
- t. Decentralised governance systems; and,
- u. Safe and secure social environment.

Relevance: *This project addresses the diversification and balanced and strong industrial sector, with modern agricultural sector and an efficient and productive services sector*

2. Seventh National Development Plan

The Seventh National development Plan is the vehicle that will deliver the broad objectives of Vision 2030 during the period 2017 -2021. The integrated approach recognizes the multi-faceted and interlinked nature of sustainable development which calls for interventions to be tackled simultaneously through a coordinated approach to implementing development programs. The key development outcomes envisioned by this plan include economic diversification and job creation; poverty and vulnerability reduction; reduced developmental inequalities; enhanced human development; and an enhanced governance environment for a diversified and inclusive economy.

Relevance: *This project reduces inequalities through providing employment creation for low-income groups.*

3. National Resettlement Policy - 2015

The policy aims to protect the resettlement land and provide for the welfare of persons resettled in order to achieve stability and sustained development and improved livelihoods. The policy has the following guiding principles:

- The Government shall ensure that guidelines and procedures regarding settler selection criteria are clearly spelt out.
- The size of the land allocated shall be commensurate to the ability of the settler to develop the land and/or be adequate to support an average family with basic subsistence food and reasonable surplus.
- Two (2) types of settlement patterns shall be promoted by the Government. The first is the dispersed type of settlement pattern where each settler has his own dwelling house and family on his farm. The second type is the concentrated settlement pattern where settlers' dwelling houses are clustered next to each other in communal /village setup.
- There is need to provide basic public services in resettlement schemes if settlers are to be attracted and encouraged to settle there.
- The Government will as much as practicable, encourage the use of the already existing ministries/institutions to carry out activities relevant to their respective mandates in the resettlement schemes. This also includes forging partnerships with all interested stakeholders including Cooperating Partners, the private sector and NGOs.



- Involuntary resettlement should be in line with the international human rights and humanitarian law as set out in the 1998 United Nations Guiding Principles on Internal Displacement, which are recognised as an important international framework for the protection of internally displaced persons.
- Humanitarian and development aid to Internally Displaced Persons (IDPs) and other vulnerable populations should not place them in greater danger or empower those responsible for the violence, exploitation or abuse suffered by IDPs. External aid should not produce inequalities or dependencies, nor should it exacerbate local tensions.
- Involuntary resettlement should be avoided where feasible. Where population displacement is unavoidable, it should be minimised by exploring all viable project options.
- People unavoidably displaced should be compensated and assisted, so that their economic and social future would be generally as favourable as it would have been in the absence of the project or better.

Involuntary resettlement should be conceived and executed as part of the project. The full cost of resettlement and compensation should be included in the presentation of project costs and benefits.

Relevance: *Any displacement that might be triggered by the project will be guided by this policy.*

4. Agricultural Policy

The aim of the Agriculture Policy is to facilitate and support the development of a sustainable and competitive agricultural sector that assures food security at national and household levels, and maximises the sector's contribution to Gross Domestic Product (GDP).

The policy has the following specific objectives:

- To ensure national and household food security through an all-year round production and post-harvest management of adequate supplies of basic foodstuffs at competitive costs;
- To contribute to sustainable industrial development by providing locally produced agro-based raw materials;
- To increase agricultural exports thereby enhancing the sector's contribution to the National Balance of Payments;
- To generate income and employment through increased agriculture production and productivity; and
- To ensure that the existing agricultural resource base is maintained and improved upon.

Relevance: *Impacts of the project on any agricultural areas will be governed by this policy.*

5. National Energy Policy - 2008

The aim of the 2007 NEP is to create conditions that will ensure the availability of adequate supply of energy from various sources, which are dependable, at the lowest economic, financial, social and environmental cost consistent with national development goals. This policy seeks to ensure environmentally sustainable exploitation of the biomass resource, to expand generation and transmission capacity and also increase accessibility to electricity and private sector participation. The policy seeks to ensure an adequate, reliable and affordable supply of petroleum products. On sources of energy, the policy aims to increase the contribution of coal, to promote the exploitation



of Uranium and to increase the deployment of renewable energy sources. The energy policy seeks to reduce dependence on wood fuel and ensure sustainable provision of affordable, reliable modern energy services to rural and urban households as a means of raising productivity and standards of living.

***Relevance:** Supply of energy to the infrastructures will be governed by this policy.*

6. National Policy on Environment - 2007

The National Policy on Environment was developed in 2007 to safeguard the environment and ensure the sustainable use of natural resources. The purpose of the policy is "to create an umbrella policy for the welfare of the Nation's environment so that socio-economic development will be achieved effectively without damaging the integrity of the environment or its resources".

The National Policy on Environment aims to achieve increased economic growth that is not damaging to the environment and natural resources. The policy recognises the need to develop and promote alternative energy sources to fuel-wood and technologies to reduce the use of fuel-wood and enhance carbon-sinks. It offers strategic guidance on key economic sectors related to the environment.

***Relevance:** This policy guides the planning for sustainability in development activities such as the proposed project.*

7. National Water Policy - 2010

The National Water Policy is the main policy framework for the water and sanitation sector in Zambia. The Policy was developed and adopted by the Government of the Republic of Zambia in 1994, and updated in 2010. The National Water Policy envisions "to optimally harnessing water resources for the efficient and sustainable utilization of this natural resource to enhance economic productivity and reduce poverty". In order to achieve the national goal of increasing accessibility to reliable safe water by all sectors of the economy the policy addresses two broad categories of water resources management and development. The major outcome of the policy is to improve the management of water resources, institutional coordination and defined roles and responsibilities. The policy encourages the use of water resources in an efficient and equitable manner consistent with the social, economic and environmental needs of present and future generations.

***Relevance:** The provision of water supply to the project is guided by this policy.*

8. National Industrial Policy - 2018

This policy aims to ensure the growth of industrial activity in the country especially for Micro, Small and Medium Enterprises. In addition, it serves as a framework for collaboration between the Government, private sector stakeholders and cooperating partners in the development of the Zambian Industrial Sectors. The policy aims to foster new industrial capacity, promote the diversification of production, facilitate the creation of inter-sectoral and inter-industry linkages, promote the establishment of cooperatives across value chains, promote the development of industry specific skills and facilitate the shifting of economic activity towards higher value-added activities to spur sustainable economic growth. This Policy focuses on eight (8) Manufacturing sub-sectors as priority drivers of Industrialisation. The priority sub-sectors are as follows:



- Processed Foods;
- Textiles and Garments;
- Engineering Products;
- Wood and Wood products;
- Leather and Leather Products;
- Mineral (metallic and non-metallic) processing and products (beneficiation);
- Pharmaceuticals; and
- Blue Economy

In addition to the eight priority sub-sectors, Construction, Agriculture, Tourism, Education, Energy, ICT and Health, will be the key supportive sectors.

Relevance: *The purchasing of engineering products for the construction phase will be guided by this policy.*

9. National Social Protection Policy - 2014

The overall objective of this policy is to contribute to the well-being of all Zambians by ensuring that vulnerable people have sufficient income security to meet basic needs and protection from worst impacts of risks and shocks. Specific objectives are to:

- Reduce extreme poverty and destitution among vulnerable and poor households;
- Enhance food and nutrition security for vulnerable populations;
- Build the human capital of extreme poor households;
- Attain an all-inclusive and comprehensive Social Security System;
- Achieve Universal Health Coverage through Social Health Insurance for all, with a special emphasis on the Vulnerable and the marginalised population groups;
- Enhance access by poor and vulnerable populations to productive resources and skills;
- Promote employment opportunities and income generating activities for the unemployed and other vulnerable groups;
- Increase livelihood potential among vulnerable populations;
- Protect vulnerable populations from all forms of abuse, violence, discrimination, denial and neglect;
- Enhance the social status and progressive realization of the socio-economic and cultural rights of the excluded and marginalised;
- Safeguard and promote the realisation of the right to an adequate standard of living for people living with disabilities; and
- Ensure equitable access to opportunities by persons living with disabilities.

Relevance: *This policy ensures the consideration and protection of all social groups that will be impacted by the project, as well as the promotion of employment opportunities through the construction phase.*

10. National Policy on Disability – 2012

An Act to continue the existence of the Zambia Agency for Persons with Disabilities and define its functions and powers; promote the participation of persons with disabilities with equal opportunities in the civil, political, economic, social and cultural spheres; provide for mainstreaming of disability issues as an integral part of national policies and strategies of sustainable development; incorporate a gender perspective in the promotion of the full enjoyment of human rights and fundamental freedoms by persons with disabilities; ensure accessibility by persons with disabilities to the physical, social, economic and cultural environment, and to health,



education, information, communication and technology; provide for the regulation and registration of institutions that provide services to persons with disabilities and organizations of, and for, persons with disabilities; continue the existence of the National Trust Fund for Persons with Disabilities; provide for the domestication of the Convention on the Rights of Persons with Disabilities and its Optional Protocol and other international instruments on persons with disabilities to which Zambia is party, in order to promote, protect and ensure the full and equal enjoyment of all human rights and fundamental freedoms by persons with disabilities and to promote respect for their inherent dignity; repeal and replace the Persons with Disabilities Act, 1996; and provide for matters connected with, or incidental to, the foregoing.

Relevance: *This policy will guide the design and access points to ensure persons with disabilities have suitable ramps to all public facilities*

11. National Employment and Labour Market Policy – 2004

The main objective of the Employment and Labour Market Policy is to create adequate and quality jobs under conditions that ensure adequate income, protection of workers' and basic human rights.

The National Employment and Labour Market Policy is directed by the following principles:

- Equity: facilitation of equitable and freely chosen productive employment for all;
- Equality: remunerations that are equal for work of equal value;
- Responsiveness: a free and responsive labour market environment where players have no undue leverage against one another;
- Social Protection: a comprehensive social protection system for people of all walks of life to avoid all forms of destitution;
- Productivity: a productive work culture among the workforce;
- Social Dialogue: facilitation of continuous social dialogue among players on the Labour Market; and
- Sustainability: sustainable development through effective implementation of the National Employment and Labour Market Policy

Relevance: *This policy will guide the terms of reference for the contractor to ensure fair employment conditions during construction.*

12. National Policy on Wetlands – 2018

The aim of the policy is to ensure the wise use of wetlands and their resources, and to create a comprehensive, stakeholder-based institutional and legal framework for their management.

The specific objectives are:

- To promote the integrity and natural productivity of wetland ecosystems and the maintenance of their functions and values to conserve their biodiversity;
- To promote their socio-economic development potential and contribution to the local and national economy;
- To strengthen the legal and institutional framework for their management;
- To promote a multi-sectorial approach to planning and management;
- To develop public education and awareness;
- To promote research, inventorying and monitoring of wetland resources;
- To conserve wetlands;



- To promote international action of national interest for the conservation of wetlands;
- To restore degraded wetlands;
- To promote community participation and ensure equitable sharing of benefits;
- To provide training and strengthen the capacity of wetland conservation institutions;
- To promote “new” and created wetlands.

Relevance: *This project does not impact any wetlands directly, however this policy will guide treatment of any impacts to wetlands as a result of expansion to utility lines and facilities in the future due to development.*

13. Draft National Fisheries Policy – 2009

The aim of the policy is to provide an overall national vision for the development of the sector. The National Fisheries Policy seeks to give substance to the national fisheries vision. The policy prescribes the institutional arrangements for the management of the fisheries sector and identifies relevant stakeholder institutions that will support implementation to address current concerns. The objectives of the policy are:

- To increase the quality and quantity of aquaculture production at both small-scale and industrial levels.
- To ensure and increase the production of a diversified range of fish products including finfish and crustaceans from aquaculture.
- To identify fishery areas with potential for live ornamental fish production and encourage development of aquarium fisheries;
- To increase fish production in small water bodies.

Relevance: *This project does not impact any aquaculture as there are no water bodies very close to the project site. However due to the sensitive nature of this policy, it will be considered in the project development especially with respect to discharge of treated wastewater into drainage facilities which may eventually lead to water bodies with fish present.*

14. Draft Livestock Development Policy – 2012

The overall objective of the Livestock Development Policy is to promote increased and sustainable livestock production, productivity and management in order to ensure food security, income generation, creation of employment opportunities and a reduction in poverty levels. The following are some of the principles:

- The endeavour to create an economic environment which encourages individual initiative and self-reliance among the people and promote private investment.
- Inclusiveness in the formulation of development plans and programmes.
- The stimulation of agriculture, industry and technological development.
- The eradication of poverty and illiteracy.
- The institution of measures for disaster management and preparedness.
- Development and preservation of local languages.
- Protection to privacy.
- Protection of consumer rights.
- Protection of health, safety and economic interest.
- Access to information.
- Rights of the citizen to food, water, sanitation and a safe environment.



- Sustainable and productive management of land resources.
- Sound conservation and protection of ecologically sensitive areas.
- The respect of the integrity of natural processes and ecological communities including conservation of habitats and species.
- The sustainable exploitation, utilization, management and conservation of the environment and natural resources for the present and future generations.
- Protection of genetic resources and biological diversity.

Relevance: *This policy will be considered with respect to potential impacts to livestock which may graze close to the project area, specifically during construction phase.*

15. National Land Policy - 2015

The National Lands Policy was launched on 11 May 2021, it represents an important achievement after almost two decades of periodic drafting, consultation and validation attempts. The policy sets out a vision of a “transparent land administration and management system for inclusive sustainable development by the year 2035,” providing eight policy objectives and a series of non-controversial measures.

The objectives of the National Land Policy are as follows:

- Ensure that boundaries are clearly marked in order to minimise border disputes.
- Prepare and update internal boundaries in order to promote national identity, fiscal, electoral administration and good governance frameworks.
- To address the land tenure constraints that impact social and economic development through the implementation of a comprehensive land policy.
- To implement measures that will ensure that leasehold land managed in an effective and sustainable manner.
- To strengthen customary land administration in order to guarantee security of tenure.
- To institutionalise public land tenure in policy and law.
- To protect and conserve commons lands, which are essential for the livelihood support, economic growth and for the overall well-being of a community.
- To regulate access to land by non-Zambians with a view to providing for access and use rights on land to non-Zambians while restricting ownership of land, both state and customary to Zambians only.
- To ensure accountability, transparency, monitoring and compliance to lease conditions to protect land rights and safeguard against environmental damage.
- To review the compulsory acquisition of land and other property.
- To improve security of leasehold tenure
- To achieve a gender sensitive, and a youth friendly land sector which is inclusive of persons living with disabilities and other socially marginalised groups.
- To strengthen the administration and management of land services.
- To clarify institutional mandates
- To create and maintain a professional, accountable, transparent and timely land registration system.
- To enhance efficiency and cost effectiveness of survey and mapping functions through commercialisation, notwithstanding the public need to provide all basic and control services.



- To prepare basic topographic maps at scales which conform to policy needs and technological advances and regulate the preparation of Atlases and Tourist maps according to the law.
- To fix and record property boundaries through a variety of techniques, accuracies and costs.
- Implement a National Spatial Data Infrastructure (NSDI) framework.
- To maintain an accurate, gender-disaggregated and up-to-date land information for regional and urban land management.
- To implement an easy, equitable, transparent and cost effective land allocation system.
- To simplify taxes, improve collections and strengthen valuation capacity at all levels.
- Formalise land ownership in the country to create an asset base for the poor, promote a property market, expand financial intermediation and widen the municipal tax base.
- Strengthen valuation capacity at all levels of land administration and improve valuation systems and regulatory compliance.
- Prepare and update a national planning framework to guide national development planning proposals.
- To harmonise local land allocation policies and draw up plans for major urban expansions to provide land for housing in large tracts with plot layouts and trunk services (major roads and primary water supply and sanitation services) provided ahead of demand.
- To guide the identification of most suitable areas for location of various activities in rural areas in order to provide for orderly provision of essential services.
- To regulate with a view to eliminating the growth of unplanned areas through timely provision of shelter or serviced building plots.
- To institute forward planning of land for housing and publicise its availability.
- Enhance collaboration with Chiefs and Government to continually avail adequate land for resettlement purposes in all districts of the country.
- To improve smallholder access to secure ownership of agriculture land.
- Ensure optimal utilisation of the land resources through formulation of provincial, district and local land use policies that incorporate area-specific concerns and priorities.
- To manage land with a view to improving carbon storage by protecting grasslands, rangelands and forests to meet the food needs of a growing population and exports.
- To ensure that mining developers adopt principles of Free, Prior and Informed Consent of local people for decisions that may affect them.
- To ensure the preservation of land for future use.

Relevance: *This policy will be given due consideration in the design of the concept plan, the land use plan, as well as the detailed design for the development.*

16. National Forestry Policy 2014

The current vision and policy on Forestry in Zambia is to attain the sustainable forestry management of all types of forests so as to enhance the contribution of forest products and services to the mitigation of climate, income generation, poverty reduction, job creation and to the protection and maintenance of biodiversity. The forest policy aims to reduce deforestation and forest degradation by focusing on increasing forest cover and enhance carbon stocks through integrated participatory forest management, improved law enforcement and private sector investment. It also provides for the domestication of international environmental agreements on the premise that forests play a key role in improving the global environment and sustainability.



These include the United Nations Framework Convention on Climate Change (UNFCCC), Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES), the Convention on Wetlands of International Importance, the Convention on Biological Diversity (CBD), the Convention to Combat Desertification and other relevant international agreements to which Zambia is a party

Relevance: *This policy will be considered in the positive and negative impacts of the site development, that is, positive with respect to improving access to electrical power thereby minimising need to tree cutting and charcoal usage, and negative in terms of any potential impacts to tree life impacted during construction works in the project site.*

17. Decentralisation Policy

The National Decentralization Policy was developed in 2002 and launched in 2004. The policy aimed at decentralizing government responsibilities and functions to lower levels of government through ‘devolution’. It reaffirms the local authorities as the institutions responsible for water supply and sanitation.

Relevance: *This policy will be considered when reviewing the impact of installation of the drip*

18. National Waste Management Strategy

The overall goal of the National Waste Management Strategy is to improve the environmental quality of the Zambian environs through the development and implementation of an efficient and sustainable waste management system.

The objectives of the national waste management strategy are to:

- Minimise generation of waste ;
- Maximise the collection efficiency of waste;
- Reduce the volume of waste requiring disposal and maximise the economic value of waste; and
- Develop and adopt environmentally sound treatment and disposal methods and practices.

Relevance: *This policy will be considered when reviewing the impact of solid waste management of the development.*

19. National Conservation Strategy

The National Conservation Strategy (NCS), adopted by the Government of Zambia in 1985 has been the main policy document on the environment. The NCS led to the establishment of environmental legislation and institutions. The NCS was developed to manage natural resources and the environment in the context of a centrally planned and controlled economy.

The goal of the strategy is to “satisfy the basic needs of all the people of Zambia, both present and future generations, through the wise management of natural resources”.

The objectives of the NCS are:

- To ensure the sustainable use of Zambia’s renewable natural resources;
- To maintain Zambia’s biological diversity; and
- To maintain essential ecological processes and life-support systems.



The NCS triggered the enactment in 1990 of the Environmental Protection and Pollution Control Act (EPPCA) which is a regulatory instrument that cuts across sectors; and the creation in 1991, of the Environmental Council of Zambia (now Zambia Environmental Management Agency) to regulate environmental matters and deal with related issues

***Relevance:** This policy will be considered when reviewing the impact of development on the natural environment.*

20. National Environmental Action Plan

The overall objective of the National Environmental Action Plan is to integrate environmental concerns into Zambia's social and economic development planning process. The NEAP was prepared as a comprehensive plan to contain the increasing environmental degradation in Zambia.

The NEAP is founded on three fundamental principles:

- The right of citizens to a clean and healthy environment;
- Local community and private sector participation in natural resources management; and
- Obligatory Environmental Impact Assessment is made compulsory for major development projects in all sectors.

***Relevance:** This policy will be considered when reviewing the impact of development on improving the quality and standard of living of the local population by providing employment.*

21. National Biological Diversity Strategy and Action Plan

In May 1993 Zambia ratified the Convention on Biological Diversity. By ratifying the Convention on Biological Diversity, Zambia has committed herself to fulfilling its objectives and recognises that a Biodiversity Strategy and Action Plan (BSAP) is necessary in order to guide the country's future activities intended to achieve the objectives of the CBD in line with biodiversity conservation and usage. As part of the commitment to fulfil its objectives, Zambia developed the National Biological Diversity Strategy and Action Plan (NBSAP), which was finalised in 1998.

The goals of the NBSAP are to:

- Ensure the conservation of the full range of Zambia's natural ecosystems through a network of protected areas;
- Conserve the genetic diversity of Zambia's crops and livestock;
- Improve the legal and institutional framework and human resources to implement the strategies for conservation, sustainable use and equitable sharing of benefits from biodiversity management;
- Sustainably manage and use Zambia's biological resources;
- Develop an appropriate legal framework and the needed human resources to minimise the risks of the use of Genetically Modified Organisms (GMO's).

***Relevance:** This policy will be considered when reviewing the impact of development on the natural environment.*

22. National HIV and AIDS Strategic Framework

The Revised National HIV and AIDS Strategic Framework (R-NASF) covers the period 2014 - 2016. It is a framework to guide implementation of the National HIV Multi-sectorial Response in Zambia.



The purpose of the framework is to:

- i. Provide an overall strategy for the planning, coordination and implementation of the multi sectorial national response based on available evidence;
- ii. Articulate national priorities, expected outcomes and targets that all stakeholders should work towards, based on their respective mandates, resources and comparative advantage;
- iii. Articulate an agreed framework for the implementation of the multi-sectorial response developed in partnership with civil society, private sector, public sector and development partner inputs that is in line with the three-ones principle (one strategy, one coordinating body and one M&E system); and
- iv. Provide a transparent framework to form the basis for reaching agreement with development partners on their technical and financial support and the management and coordination of the response.

The six themes of the NASF represent the cooperating partners' priority action areas and include:

- Intensifying efforts for prevention of HIV;
- Expanding treatment, care and support for people affected by HIV and AIDS;
- Mitigating the socioeconomic impact of HIV and AIDS;
- Strengthening the decentralised response and mainstreaming HIV and AIDS;
- Improving the monitoring of the multi-sectorial response; and
- Integrating advocacy and coordination of the multi-sectorial response.

Relevance: *This policy will be considered when preparing the project health and safety plan to be utilised by the contractor to ensure mitigation of the spread of viruses from external contractors on local population and vice versa.*



2.2 Legal Framework

The table below presents the legal framework relevant to the ESIA process for this Project.

Table 2.1: Legal Framework relevant to ESIA

Title	Summary of relevant contents	Relevance	Compliance
The Environmental Management Act (EMA), No. 12 of 2011	<p>This Act is the principal environmental law in Zambia and provides for integrated environmental management, the protection and conservation of the environment and the sustainable management and use of natural resources among others.</p> <p>The Zambia Environmental Management Agency (ZEMA), established under the EMA, is responsible for EIA review and approval, and for monitoring the implementation of the Proponent's Environmental Management Plan. The Act also provides specific regulations for discharge, collection, storage, transportation and disposal of gaseous, liquid and solid waste, and makes the Proponent responsible for meeting them. The ZEMA is responsible for enforcing environmental regulations and coordinating of government agencies involved in environmental management in their sectors.</p>	The EMA ensures that environmental issues are considered during the project planning and management as it is the principal law to be followed whenever projects are implemented.	<p>The Proponent and any contractor will comply with all the requirements of this Act and will obtain all approvals and permits stipulated in the Act.</p> <p>During the detailed study, the ESIA team will not only review the EMA but will also identify the positive and negative environmental and social impacts likely to result from the project.</p> <p>The ESIA team will further develop mitigation measures for the negative impacts and advise the Proponent on how best to implement the mitigation measures in order to minimise the impacts in line with these requirements.</p>
Environmental Impact Assessment Regulations No. 28 of 1997	<p>The Environmental Impact Assessment is undertaken in accordance with the requirements of the EMA.</p> <p>They provide the framework for conducting and reviewing environmental impact assessment for any project. Further, it provides regulations for auditing project implementation. The regulation requires Project Proponents undertaking projects that may have an effect on the environment to conduct environmental and social impact assessment prior to obtaining written approval of the Project from</p>	The proposed Project is likely to cause environmental and social impacts during implementation and thereby falls under the First Schedule of these Regulations.	<p>This Terms of Reference along with the Scoping Report is the first step towards fulfilling the requirements of these Regulations. The TORs and Scoping Report will be submitted to ZEMA for scrutiny.</p> <p>Once ZEMA approves this TORs and the Scoping Reports, the ESIA team shall proceed to carryout detailed studies and consequently submit an Environmental and Social Impact Statement (ESIS)</p>



Title	Summary of relevant contents	Relevance	Compliance
	ZEMA. The Project falls within the Second Schedule of the EIA regulations and as such requires an EIA.		which shall include an Environmental and Social Management Plan (ESMP).
Environmental Management (Licensing) Regulations, 2013 Part 3 (Waste Management)	These regulations provide for licensing of solid non-hazardous waste transportation and operating or owning of a non-hazardous waste disposal site.	The Environmental Management (Licensing) Waste Regulations are relevant to the proposed project because during construction, the contractor will generate solid and hazardous waste which will need to be disposed of.	The ESIA Team will propose measures of how the Proponent shall comply with requirements of these regulations and this will apply to the Project area in total. In addition, the ESIA Team will propose measures that the Proponent, through the risk assessment, environmental, health, and safety guidelines, shall use to manage all wastes generated during Project implementation.
Environmental Management (Licensing) Regulations, 2013 Part 2 (Air & Water)	These regulations provide for licensing of emissions and liquid waste discharge to the environment and provide for statutory discharge limits for respective parameters.	This Act regulates the way water waste produced during project implementation should be managed and discharged into the environment. This Act is also relevant due to the increase in vehicular emissions during construction and operation of the project.	The ESIA Team will propose measures of how the Proponent shall comply with requirements of these regulations as well as to manage all liquid wastes generated during project implementation.
Local Government Act No 2 of 2019	This legislation provides for an integrated local government system; gives effect to the decentralisation of functions, responsibilities and services at all levels of local government; ensures democratic participation in, and control of, decision making by the people at the local level; revises the functions of local authorities; provides for the review of tariffs, charges and fees within the area of a local authority; provides for the proceedings of the council and committees; provides for the role of traditional leadership in democratic governance; repeals and replaces the Local Government Act, 1991; and provides for matters connected with, or incidental to, the foregoing.	The Project falls under a district councils and the Proponent will be required to obtain all relevant permits from the council regarding the Project.	The Proponent will seek and comply with any relevant approvals from the Council.



Title	Summary of relevant contents	Relevance	Compliance
Water Resources Management Act No. 21 of 2011	This legislation establishes the Water Resources Management Authority and defines its functions and powers; provides for the management, development, conservation, protection and preservation of the water resource and its ecosystems; provides for the equitable, reasonable and sustainable utilisation of the water resource; ensures the right to draw or take water for domestic and non-commercial purposes, and that the poor and vulnerable members of the society have an adequate and sustainable source of water free from any charges; creates an enabling environment for adaptation to climate change; provides for the constitution, functions and composition of catchment councils, sub-catchment councils and water users associations; provides for international and regional co-operation in, and equitable and sustainable utilisation of, shared water resources; provides for the domestication and implementation of the basic principles and rules of international law relating to the environment and shared water resources as specified in the treaties, conventions and agreements to which Zambia is a State Party; repeals and replaces the Water Act, 1949; and provides for matters connected with, or incidental to, the foregoing.	The Proponent of the project will have to develop groundwater resources and manage surface runoff.	Protection measures, particularly for the discharge of any effluents or control of run-off, are required to avoid any potential impacts to water resources and will be included in the ESMP. The Proponent and any contractor will comply with all the regulations under this Act.
Zambia Wildlife Act No. 14 of 2015:	This legislation provides for governing the affairs of the Zambia Wildlife Authority; establishes the Department of National Parks and Wildlife in the Ministry responsible for tourism; provides 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; provides for the promotion of opportunities for the equitable and sustainable use of the special qualities of public wildlife estates; provides 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; provides for the sustainable use of wildlife and the effective management of the wildlife habitat in Game	This Act is relevant to ensure that only those areas necessary for the Project activities are cleared.	During the detailed study, the Proponent shall make recommendations in the ESMP to ensure that there is adherence to the principles highlighted in this Act during implementation of the proposed Project.



Title	Summary of relevant contents	Relevance	Compliance
	<p>Management Areas; enhances the benefits of Game Management Areas to local communities and wildlife; involve local communities in the management of Game Management Areas; provides for the development and implementation of management plans; provides for the regulation of game ranching; provides for the licensing of hunting and control of the processing, sale, import and export of wild animals and trophies; provides 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; repeals the Zambia Wildlife Act, 1998; and provides for matters connected with, or incidental to, the foregoing.</p>		
Forest Act No. 4 of 2015	<p>This legislation provides for the establishment and declaration of National Forests, Local Forests, joint forest management areas, botanical reserves, private forests and community forests; provide for the conservation and use of forests and trees for the sustainable management of forests ecosystems and biological diversity; establishes 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; repeals and replaces the Forests Act of 1999; and provides for matters connected with, or incidental to, the foregoing.</p>	<p>This Act provides that the Proponent will need to develop mitigation measures for possible impacts on terrestrial flora</p>	<p>The ESIA will be developed in line with this legislation and will be managed by the Project Proponent via the ESMP.</p>
Fisheries Act No.22 of 2011	<p>This legislation promotes the sustainable development of fisheries and a precautionary approach in fisheries management, conservation, utilisation and development; establishes fisheries management areas</p>	<p>This Act ensures consideration be given with respect to discharge of</p>	<p>The Proponent and any contractor will comply with all the regulations under this Act.</p>



Title	Summary of relevant contents	Relevance	Compliance
	and fisheries management committees; provides for the regulation of commercial fishing and aquaculture; establishes the Fisheries and Aquaculture Development Fund; repeals and replaces the Fisheries Act, 1974; and provides for matters connected with, or incidental to, the foregoing.	treated wastewater into drainage facilities which may eventually lead to water bodies with fish presence.	
National Heritage Conservation Commission Act No. 23 of 1989, and National Heritage Conservation Commission Amendment Act No. 13 of 1994	This legislation repeals and replaces the Natural and Historical Monuments and Relics Act; establishes the National Heritage Conservation Commission; defines the functions and powers of the Commission who are responsible for the conservation, restoration, rehabilitation, reconstruction, adaptive use and good management of heritage conservation; provides for the conservation of ancient, cultural and natural heritage, relics and other objects of aesthetic, historical, prehistorical, archaeological or scientific interest; provides for the regulation of archaeological excavations and export of relics; and provides for matters connected with or incidental to the foregoing.	During Project implementation, activities will be undertaken that may lead to the discovery of artefacts or objects of archaeological significance. This Act will provide guidance on reporting channels and procedures should such items be discovered.	During the detailed ESIA study, the ESIA team will pay particular attention to establish the presence of any artefacts or objects of archaeological significance in the Project area.
Petroleum Act No. 8 of 1995	This legislation provides for the conveyance and storage of petroleum, inflammable oil and liquids.	This act will regulate the handling and usage of petroleum, inflammable oils and liquids required for construction equipment.	The ESIA will be developed in line with this legislation and will be managed by the Project Proponent via the ESMP.
Explosives Act No. 10 of 1974	This legislation provides for the handling, storage and general management of explosives used for blasting in the mining industry.	The use of explosives during Project implementation will be guided by this act	If explosives are used during construction activities, measures will be included in the ESMP to ensure compliance with this Act.
Electricity Act No 11 of 2019	Regulates the transmission, distribution and supply of electricity.	This act will regulate the handling and usage of electricity during Project implementation.	The Proponent and any contractor will comply with all the regulations under this Act.
Mines and Minerals Development Act No. 11 of 2015	This legislation regulates activities relating to mines and minerals operations including quarrying; provides for safety, health and environmental protection in mining operations; repeals and replaces the Mines and Minerals Development Act of 2008; and provides for matters connected with, or incidental to, the foregoing.	Construction activities will involve the use of resources such as sand and aggregates from borrow areas.	During the detailed study, the ESIA team will make recommendations so the Proponent and contractor can implement project activities in compliance with this Act.



Title	Summary of relevant contents	Relevance	Compliance
Occupational Safety and Health Act No. 36 of 2010	This legislation provides for preventing work- related injuries, illnesses, and death by issuing and enforcing workplace health and safety standards; provide for the establishment of health and safety committees at workplaces and for the health, safety and welfare of persons at work; provide for the duties of manufacturers, importers and suppliers of articles, devices, items and substances for use at work; provide for the protection of persons, other than persons at work, against risks to health or safety arising from, or in connection with, the activities of persons at work; and provide for matters connected with, or incidental to, the foregoing.	This Act provides for the dissemination of information on occupational health and safety at the work place.	The Proponent will comply with all provisions of this Act to protect workers and the public near the site. Measures will be proposed in the ESMP to ensure compliance.
Workers Compensation Act No. 10 of 1999	This legislation provides for the establishment and administration of a Fund for the compensation of workers disabled by accidents to, or diseases contracted by, such workers in the course of their employment, and for the payment of compensation to dependants of workers who die as a result of such accidents or diseases.	The nature of the work means workers will be exposed to accident risks or risks of contracting disease, this Act provides for compensation of workers in case of accidents.	Accident prevention and mitigation measures will be developed and managed as part of the Project ESMP. The Proponent will ensure that all employees are registered, and contributions are submitted accordingly.
Water Supply and Sanitation Act No. 28 of 1997	This legislation establishes the National Water Supply and Sanitation Council and defines its functions; provides for the establishment, by local authorities, of water supply and sanitation utilities; provides for the efficient and sustainable supply of water and sanitation services under the general regulation of the National Water Supply and Sanitation Council; and provides for matters connected with or incidental to the foregoing.	Workers and the residents will require suitable water and sanitation services during the construction and operations phases of the Project.	Water used in the Project will be monitored frequently and stored appropriately. Applicable permits will be obtained from the relevant authority.
Public Health Act No. 22 of 1995	This legislation provides for the prevention and suppression of diseases and generally regulates all matters connected with public health in Zambia.	Workers and the residents may interact with disease agents and/or environmental media. Project activities have the potential to spread pollutants and increase the risk of contamination to the environment, hence the	During the ESIA study, measures to prevent diseases and pollution dangerous to human health will be considered and included in the ESMP.



Title	Summary of relevant contents	Relevance	Compliance
		relevance of this Act to the proposed Project.	
Factories Act of 1994	This legislation makes further and better provision for the regulation of the conditions of employment in factories and other places as regards the safety, health and welfare of persons employed therein; provides for the safety, examination and inspection of certain plant and machinery; and provides for purposes incidental to or connected with the matters aforesaid.	Implementation of Project activities will employ the use of various machines for construction works. The use of machinery in terms of safety and welfare of employed persons is regulated under this Act.	Measures to ensure the safety of persons operating machinery will be included in the ESMP and supporting occupational health and safety (OHS) documentation.
Road Traffic Act No. 11 of 2002	This legislation establishes the Road Transport and Safety Agency (RTSA) and defines its functions; provides for a system of road safety and traffic management; provides for licensing of drivers and motor vehicles; provides for registration of motor vehicles and trailers; provides for compulsory third party insurance of motor vehicles; provides for licensing and control of public service vehicles; provides for promotion of road safety; provide for the regulation of road transport between Zambia and other countries with which Zambia has concluded cross – border road transport agreements; provides for the implementation of the SADC protocol on Transport, Communication and Meteorology, the protocol on the third party motor vehicle insurance scheme adopted by the member states of COMESA and Protocols on transit trade and transit facilities, and repeals the National Roads Safety Council Act of 1995.	This Act ensures traffic control measures are taken to avoid accidents as a result of construction activities.	The ESIA will be developed in line with this legislation and will be managed by the Project Proponent via the ESMP.
Public Roads Act No 12 of 2002	An Act to establish the Road Development Agency and to define its functions; to provide for the care, maintenance and construction of public roads in Zambia; to regulate maximum weights permissible for transmission on roads; and to provide for matters connected with and incidental to the foregoing.	This Act is relevant to the Project because access roads to the Project site will be constructed.	The ESIA will be developed in line with this legislation and will be managed by the Project Proponent via the ESMP.
Employment Code Act No. 3 of 2019	This legislation regulates the employment of persons; prohibits discrimination at an undertaking; constitutes the Skills and Labour Advisory Committees and provides for their functions; provides for the engagement of persons on contracts of employment and provides	During construction activities, a number of individuals will be employed, and this Act is the principal	The Proponent and any contractor will comply with all the provisions of this Act to guarantee labour rights. Measures will be proposed in the ESMP to ensure compliance.



Title	Summary of relevant contents	Relevance	Compliance
	for the form and enforcement of the contracts of employment; provides for employment entitlements and other benefits; provides for the protection of wages of employees; provides for the registration of employment agencies; regulates the employment of children and young persons; provides for the welfare of employees at an undertaking; provides for employment policies, procedures and codes in an undertaking; repeals and replaces the Employment Act,1965, the Employment (Special Provisions) Act,1966, the Employment of Young Persons and Children Act, 1933 and the Minimum Wages and Conditions of Employment Act, 1982; and provide for matters connected with, or incidental to, the foregoing.	piece of legislature governing employment rights in Zambia.	
Employment of Young Persons and Children Act No. 10 of 2004	These regulations regulate the employment of young persons, and children; and provide for matters incidental thereto.	During construction activities, a number of individuals will be employed therefore making this Act relevant to the Project.	The Proponent and any contractor will comply with all the provisions of this Act to prevent child and forced labour.
Gender Equity and Equality Act No.22 of 2015	These regulations establish the Gender Equity and Equality Commission and provide for its functions and powers; provide for the taking of measures and making of strategic decisions in all spheres of life in order to ensure gender equity, equality and integration of both sexes in society; promote gender equity and equality as a cross cutting issue in all spheres of life and stimulate productive resources and development opportunities for both sexes; prohibit harassment, victimisation and harmful social, cultural and religious practices; provide for public awareness and training on issues of gender.	This Act will ensure that the Proponent provides equal employment opportunities to males and females during Project implementation.	The Proponent and any contractor will comply with all the provisions of this Act to ensure inclusion of Gender issues.
Anti-Gender- Based Violence Act No.46 of 2010	These regulations provide for the protection of victims of gender-based violence; constitute the Anti-Gender-Based Violence Committee; establish the Anti- Gender-Based Violence Fund; and provide for matters connected with, or incidental to, the foregoing.	During construction activities, a number of social dynamics may be impacted and conflicts may arise resulting in gender-based violence, therefore making this Act relevant to the current Project.	The Proponent and any contractor will comply with all the provisions of this Act to ensure protection of victims of gender-based violence.



Title	Summary of relevant contents	Relevance	Compliance
Human Rights Commission Act No. 39 of 1996	These regulations provide for the functions and powers of the Human Rights Commission; to provide for its composition and to provide for matters connected with or incidental to the foregoing.	The nature of the Project is such that many individuals will be involved with or affected by the Project to different capacities and therefore this Act provides for the rights of those individuals.	The Proponent and any contractor will comply with all the provisions of this Act to ensure protection of human rights.
Non- Governmental Organisations Act No. 16 of 2009	This Act provides for the co-ordination and registration of non-governmental organisations; establishes the Non-Governmental Organisations' Registration Board and the Zambia Congress of Non-Governmental Organisations; constitutes the Council of Non-Governmental Organisations; enhances the transparency, accountability and performance of non- governmental organisations; and provides for matters connected with or incidental to the foregoing.	The nature of the Project is such that many individuals will be involved with or affected by the Project to different capacities and therefore this Act provides for the rights of those individuals.	The Proponent and any contractor will comply with all the provisions of this Act to ensure collaboration with NGOs in the Project area.
Lands Act No. 29 of 1995	This legislation provides for the continuation of Leaseholds and leasehold tenure; provides for the continued vesting of land in the President and alienation of land by the President; provides for the statutory recognition and continuation of customary tenure; provides for the conversion of customary tenure into leasehold tenure; establishes a Land Development Fund and a Lands Tribunal; repeals the Land (Conversion of Titles) Act; repeals 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 provides for matters connected with or incidental to the foregoing.	The Project affects land that is under Local Authority and as such due consideration will be given to the provisions of this Act in managing land issues.	The Proponent and any contractor will comply with all the regulations under this Act.
Urban & Regional Planning Act No. 3 of 2015	This legislation provides for development, planning and administration principles, standards and requirements for urban and regional planning processes and systems; provides for a framework for administering and managing urban and regional planning; provides for a planning framework, guidelines, systems and processes for urban	The development cannot proceed without approval from the local authority.	The Proponent and any contractor will comply with all the provisions of this Act to guarantee labour rights. Measures will be proposed in the ESMP to ensure compliance.



Title	Summary of relevant contents	Relevance	Compliance
	<p>and regional planning; establishes a democratic, accountable, transparent, participatory and inclusive process for urban and regional planning that allows for involvement of communities, private sector, interest groups and other stakeholders in the planning, implementation and operation of human settlement development; ensures functional efficiency and socio-economic integration by providing for integration of activities, uses and facilities; establishes procedures for integrated urban and regional planning in a devolved system of governance so as to ensure multi-sector cooperation, coordination and involvement of different levels of ministries, provincial administration, local authorities, traditional leaders and other stakeholders in urban and regional planning; ensures sustainable urban and rural development by promoting environmental, social and economic sustainability in development initiatives and controls at all levels of urban and regional planning; ensures uniformity of law and policy with respect to urban and regional planning; repeals the Town and Country Planning Act of 1962, and the Housing (Statutory and Improvement Areas) Act of 1975; and provides for matters connected with, or incidental to, the foregoing.</p>		
National Council for Construction Act No. 10 of 2020	<p>This legislation provides for the establishment of the National Council for Construction (NCC) and to defines its functions; the promotion and development of the construction industry in Zambia; the registration of contractors; the affiliation to the Council of professional bodies or organisations whose members are engaged in activities related to the construction industry; the regulation of the construction industry; the establishment of the Construction School; the training of persons engaged in construction or in activities related to construction; and matters connected with or incidental to the foregoing.</p>	<p>The proposed Project involves the installation of a drip irrigation system</p>	<p>The Proponent and any contractor will comply with all the regulations under this Act.</p>
Solid Waste Regulations and Management Act No20 of 2018	<p>This legislation provides for the sustainable regulation and management of solid waste; general and self-service solid waste services; the incorporation of solid waste management companies and defines their statutory functions; the licensing and functions of solid</p>	<p>The construction and operation of the proposed Project will result in the generation of solid waste</p>	<p>The Proponent and any contractor will comply with all the regulations under this Act.</p>



Title	Summary of relevant contents	Relevance	Compliance
	waste service providers, operators and self-service solid waste providers and provides 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.		
Zambia Revenue Authority Act No. 28 of 1993 and all amendments	The Acts provide for the taxation system in Zambia for various goods and services.	All goods and services will have to be taxed	The Proponent will comply with all the regulations under this Act.
Investment Act CAP 322 of 1998	Provides a legal framework for investment in Zambia, the Act relates to the environment by encouraging investment that is not detrimental to the environment.	Due consideration will be given to this act to ensure the investment does not have an adverse effect on the local environment	The Proponent will comply with all the regulations under this Act.
The Public Health (Infected Areas) (Coronavirus Disease 2019) Regulations, 2020 Statutory Instrument 22 of 2020	The statutory instrument provides for the relation required for management and prevention of the Corona Virus 2019 (CORVID 19)	This statutory instrument provides for the dissemination of information on the spread, prevention and treatment of the COVID19	The Proponent will comply with all the regulations under this Act.



2.3 Institutional Framework

The Zambia Environmental Management Agency (ZEMA) is the umbrella environmental institution in Zambia and the main lead agency on matters pertaining to environmental impact assessments (EIA). It is empowered by the Environmental Management Act (No. 12 of 2011) (EMA) to identify Projects, plans and policies for which an EIA is necessary.

The services provided by ZEMA specifically in relation to EIA studies include:

- Assisting the developer to determine the scope of EIA studies;
- Reviewing Project briefs, terms of reference, and environmental impact statements (EIS) and decision-making;
- Disclosure of the EIS to the public through the media;
- Holding public hearing meetings to discuss the EIS with stakeholders;
- Conducting verification surveys of the affected environment;
- Monitoring the Project once implemented;
- Conducting compliance audits of the Project between 12 and 36 months after implementation; and
- General administration of all the Regulations under the EMA.

The proposed Project will be required to submit an ESIA to ZEMA and approval from ZEMA will be required to undertake the proposed Project.

Other competent authorities potentially relevant to the Project include:

- Ministry of Lands and Natural Resources
- Ministry of Green economy and Environmental
- Ministry of Housing and Infrastructure Development
- Ministry of Local Government
- Ministry of Agriculture and Livestock
- Ministry of Labour and Social Security
- Ministry of Health
- Ministry of Education
- Ministry of Community Development and Social Welfare
- Ministry of Water Development, Sanitation and Environmental Protection
- Ministry of Chiefs and Traditional Affairs
- Ministry of Tourism and Arts
- Ministry of Transport and Communications
- Ministry of Works and Supply
- Ministry of Mines and Minerals Development
- Water Resources Management Authority
- Forestry Department
- National Heritage Conservation Commission (NHCC)
- ZESCO Limited
- Department of Water Affairs



- Department of National Parks and Wildlife
- Mazabuka Municipal Council

2.4 International and Regional Conventions

The following list summarises the international conventions to which Zambia is a signatory and that are relevant to the Project.

- African Convention on the Conservation of Nature and Natural Resources, signed in Maputo (2003)
- Kyoto Protocol Paris Climate Agreement (2015)
- Convention on Wetlands of International Importance especially as waterfowl habitat, known as Ramsar Convention (1975)
- Convention on the Conservation of Migratory Species of Wild Animals, known as the Bonn Convention (1983)
- Convention on Biological Diversity (1992)
- Convention on International Trade in Endangered Species of Wild Fauna and Flora, known as CITES (1975)
- Convention concerning the Protection of the World Cultural and National Heritage (1972)
- United Nations Framework Convention on Climate Change (1992)
- United Nations Convention to Combat Desertification, UNCCD (1994)
- The Vienna Convention for the Protection of the Ozone Layer (1985)
- The Montreal Protocol on Substances that Deplete the Ozone Layer (1987)
- The Stockholm Convention on Persistent Organic Pollutants (2001)
- The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal (1989)
- The Universal Declaration of Human Rights (1949)
- International Covenant on Economic, Social and Cultural Rights, ICESCR (1966)
- Convention on the Elimination of All Forms of Discrimination against Women (1981)
- Convention on the Rights of the Child (1990)
- Convention on the Rights of Persons with Disabilities (2008)
- African Charter on Human and People's Rights (1987)
- Protocol to the African Charter on Human and Peoples' Rights on the Rights of Women in Africa (2003)
- African Charter on the Rights and Welfare of the Child (2001)
- ILO Declaration on Fundamental Principles and Rights at Work (1998)



2.5 International Framework

2.5.1 International Finance Corporation (IFC) Performance Standards on Environmental and Social Sustainability

The Performance Standards (PSs) are directed towards clients providing guidance on how to identify risks and impacts, and are designed to help avoid, mitigate, and manage risks and impacts as a way of doing business in a sustainable way, including stakeholder engagement and disclosure obligations of the client in relation to project-level activities. The International Finance Corporation Performance Standards (IFC PSs) on Environmental and Social Sustainability has eight performance standards which include the following:

- IFC PS1: Assessment and Management of Environmental and Social Risks and Impacts
- IFC PS2: Labour and Working Conditions.
- IFC PS3: Resource Efficiency and Pollution Prevention
- IFC PS4: Community Health, Safety and Security
- IFC PS5: Land Acquisition and Involuntary Resettlement
- IFC PS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources
- IFC PS7: Indigenous Peoples
- IFC PS8: Cultural Heritage

Performance Standard 1 establishes the importance of (i) integrated assessment to identify the environmental and social impacts, risks, and opportunities of projects; (ii) effective community engagement through disclosure of project-related information and consultation with local communities on matters that directly affect them; and (iii) the client's management of environmental and social performance throughout the life of the project.

Performance Standards 2 through 8 establish objectives and requirements to avoid, minimise, and where residual impacts remain, to compensate/offset for risks and impacts to workers, Affected Communities, and the environment. While all relevant environmental and social risks and potential impacts should be considered as part of the assessment, Performance Standards 2 through 8 describe potential environmental and social risks and impacts that require particular attention. Where environmental or social risks and impacts are identified, the client is required to manage them through its Environmental and Social Management System (ESMS) consistent with Performance Standard 1.

The World Bank Group Environmental, Health and Safety Guidelines (EHS Guidelines) are technical reference documents with general and industry-specific examples of good international industry practice (GIIP). The General EHS Guideline contains information on cross-cutting environmental, health, and safety issues potentially applicable to all industry sectors, including construction projects. They provide guidance on performance levels and measurements considered to be achievable at reasonable cost by new or existing projects with the use of existing technologies and practices. Projects are expected to comply with the levels and measures identified in the General EHS Guidelines where host country requirements are less stringent or do not exist.



World Bank Group EHS Guidelines applicable to the Project ESIA are the EHS General Guidelines (April 2007).

The General EHS Guidelines cover 4 areas of GIIP:

- Environmental
- Occupational Health & Safety (OHS)
- Community Health & Safety (CHS)
- Construction and Decommissioning

The World Bank Group EHS Guidelines with respect to emergency preparedness and response state that Projects should have an Emergency Preparedness and Response Plan (EPRP) that is commensurate with specific risks. This includes the requirement to assess the risk posed to the Project by geological hazards, natural disasters, blade throw, etc. and formulate appropriate strategies that effectively reduce any potential impact associated with these hazards on the Project.

IFC Performance Standard 2 requires compliance with specific International Labour Organization (ILO) and United Nations (UN) conventions. Zambia has ratified all of the 8 core (fundamental) ILO conventions, namely:

- ILO Conventions 29 and 105 on elimination of forced and compulsory labour
- ILO Convention 87 and 98 on collective bargaining and freedom of association
- ILO Conventions 100 and 111 on elimination of discrimination in respect of employment and occupation
- ILO Conventions 138 and 182 on abolition of child labour

Zambia has ratified all 4 of the ILO governance (priority) conventions.



3 PROJECT DESCRIPTION

3.1 Project Location

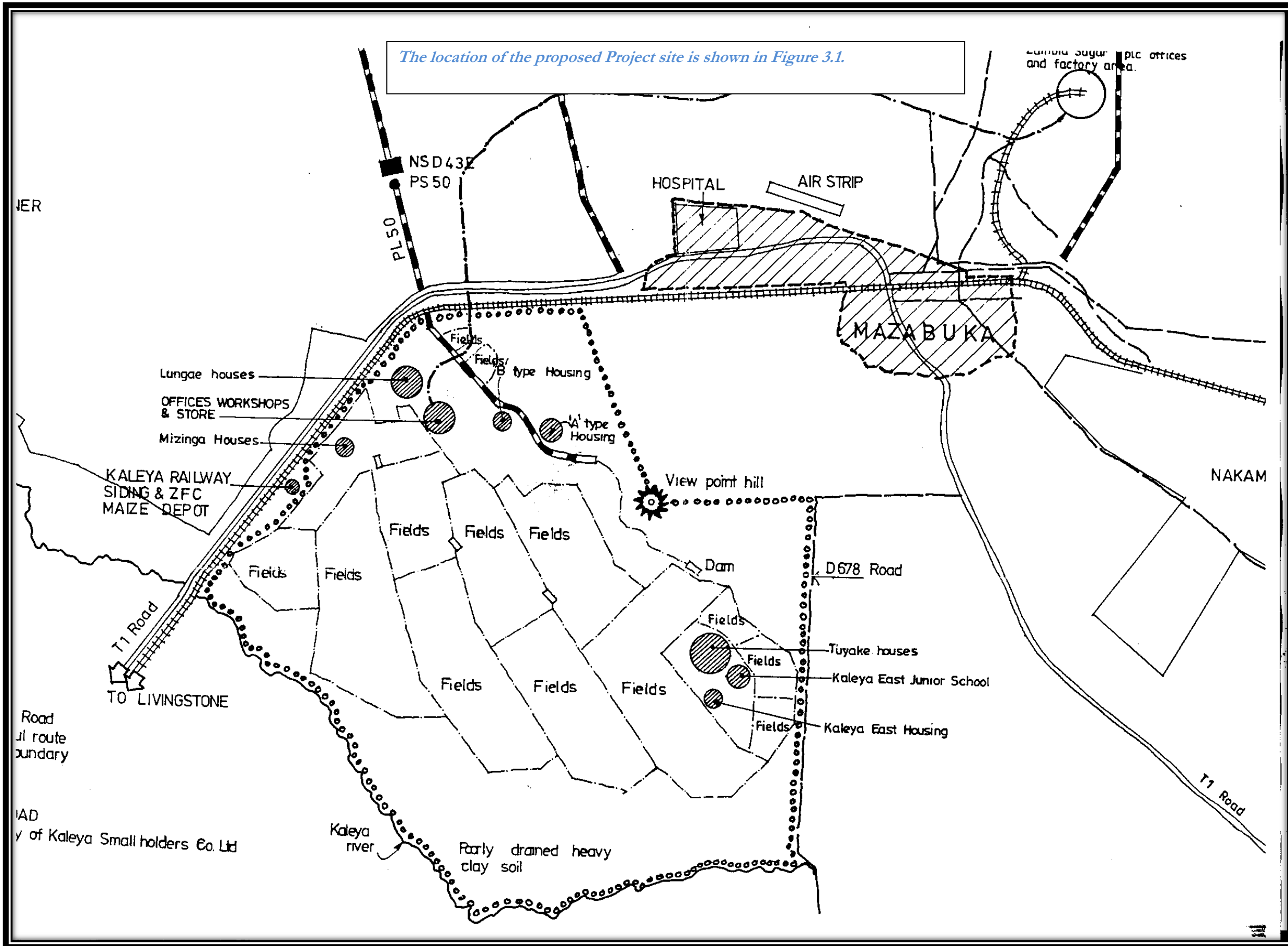
The proposed project comprises the Conversion of sugar cane irrigation system at Kaleya Smallholders sugar cane estate from farrow to sub-surface drip irrigation in Mazabuka Districts of Southern Province. The Project site is located to the south-east of Mazabuka on the Mazabuka to Livingston road approximately 7km from the Central Business District (CBD) and can be accessed via the T1 road. The proposed site covers a total area 2500. Table 3.1 shows the corner coordinates of the Project site.

Table 3.1: Project site Corner Coordinates

KASCOL COORDINATES

COORDINATE SYSTEM: UTM 35L

A.	35L 580496.14 m E	8243616.67 m S
B.	35L 580525.47 m E	8238748.59 m S
C.	35L 572125.71 m E	8241393.59 m S
D.	35L 573370.93 m E	8242908.59 m S
E.	35L 573125.24 m E	8243102.57 m S
F.	35L 574562.27 m E	8245375.00 m S
G.	35L 576403.67 m E	8245798.69 m S
H.	35L 577896.92 m E	8243359.04 m S





<p>MAPPING DETAILS</p> <p>Projection: Gauss Conform Reference Ellipsoid: WGS84 Datum: Hartbeeshoek 94 Central Meridian: Eo 33° East Grid Interval: 2000 metres Date of Photography: June 2009 Date of Print: January 2010 Note: Farm boundaries are approximate.</p>	<p>LEGEND</p> <ul style="list-style-type: none"> — Dams — Roads - - - Drains — Cane □ Cadastral 	<p>KASCOL</p> <p>Scale: 1:35000</p>	<p>GROWER DETAILS</p> <p>Grower: Kaleya Smallgrowers Co Ltd Grower Number: 00</p> <table border="1"> <thead> <tr> <th>MEASURED AREAS</th> <th>Hectares</th> </tr> </thead> <tbody> <tr> <td>Farm Area (approx):</td> <td>4314.9</td> </tr> <tr> <td>Measured Cane Area:</td> <td>2265.3</td> </tr> </tbody> </table>	MEASURED AREAS	Hectares	Farm Area (approx):	4314.9	Measured Cane Area:	2265.3
MEASURED AREAS	Hectares								
Farm Area (approx):	4314.9								
Measured Cane Area:	2265.3								

The location of the proposed Project site is shown in Figure 3.2.



3.2 Project activities

3.2.1 Site Preparation Phase

This phase will involve carrying out surveys of the proposed site. Surveys in this case refer to land investigations, drilling, measurements and pre-works examination of the site. This will facilitate the development of a conceptual design of the site structures, especially the road network. The output from this phase is an environmentally friendly-engineered final design for the drip irrigation facilities to be implemented in the construction phase.

3.2.2 Construction Phase

The actual development of the proposed Project will take place in the construction phase.

Project activities during construction will include the following:

- Creation of service tracks to site
- Excavation, filling, levelling,
- Construction of foundations involving excavations and concrete works
- Transportation of construction materials
- Construction of Project components and supporting infrastructure

Initial Management Activities

The initial activities during this phase relating to construction management will include:

- Establishment of the construction Project Management Team (PMT);
- Establishment of a professional Site Inspection Team;
- Establishment a management, inspection, and reporting procedure.

There will be no labour camp on the Project site, although security personnel will be accommodated on the site. Unskilled labour will be sourced locally, and therefore will not require on site accommodation. Skilled labour will be accommodated in town to avoid the necessity for a costly site camp. Various plant and equipment to be mobilised to site for the execution of civil works and will include:

- Graders
- Bulldozers
- TLB- Tractor-Loader-Backhoe)
- Generator Set 125 KVA
- Excavators
- Water Pumps
- Mechanical Tool Boxes
- Tipper Trucks
- 10 Ton Trucks



Site Preparation, Levelling and Clearing

Initial site preparation will entail removal of the existing vegetation, scarifying of topsoil and earthworks to establish the required levels. The project will be constructed on the existing level requiring minimal basic earthworks, which will minimise the need for filling of areas with topsoil. Earthworks will for the most part involve the use of heavy machinery such as bulldozers and graders.

Materials Mobilisation, Handling and Storage

This refers to the acquisition, delivery, and storage of materials required for construction works. Gravel, laterite, and stone aggregates, if necessary, will be acquired and transported to the site from Zambia Environmental Management Agency (ZEMA) approved quarry sites within the district. Provision will be made for bulk storage of materials such as sand, aggregate and laterite. Petroleum products, such as fuels (petrol/diesel), lubricating oils, and hydraulic fluids will also be sourced. Only limited amounts of these materials will be stored on site as reliable supply sources will be in close proximity within the district. Other materials that will be transported and stored on site include sand, cement and blocks.

Movement of Construction Traffic and Heavy Machinery

Transportation of construction materials and waste to and from the site will involve the movement of heavy vehicles on access roads to the Project site as well as within the site. Construction activities such as clearing, excavation, earth moving and mixing of concrete will involve the movement and operation of heavy machinery and equipment on and around the site.

Construction Workers Activities

Although no labour camp is planned on the Project site, social interaction activities will undoubtedly result between Project workers and local communities. The Project will as much as is possible hire labour from within local communities. The presence of construction workers will require the provision of water for food preparation and domestic purposes as well as the provision of sanitation and health services on site or easily accessible.

Waste Management

Waste management during the construction phase will include:

- Provision of workers sanitation.
- Collection and disposal of domestic waste at ZEMA approved disposal sites.

Access Road Construction

The proposed site is situated along the Mazabuka to Livingstone about 7km from the CBD so there will be no need for the construction of the access routes. Therefore, no foreign materials will be brought during tract construction, and the tracts will only be clear and compacted paths. No laterite or any other materials will be used.



3.2.3 Operation Phase

The completion of each development phase of the Project will result into the commencement of the respective operation of the particular facilities. Thus the main activities that will exist during the operation stage will be those that will relate to the residential operation.

Commuter Traffic

The volume of traffic to and from the Project area is expected to increase appreciably once the Project is operational. This will especially apply at peak times during the day with commuter traffic and during peak periods.

Potable Water Supply

The Project site is serviced with Water.

Solid Waste Management

Solid waste management from the facility will be the responsibility of both Mazabuka Municipal Council and Kascol who will need to ensure that they have adequate garbage collection facilities as part of their area development plan. Waste will be collected regularly by an approved contractor for disposal in accordance with section 10 of SI No. 112 of 2013. Additionally, the council will need to ensure they have allocated a suitably sized dump site area. The Council will be able to use this development as an opportunity to invest in equipment which will be able to become a revenue generating source of income for the council.

3.2.4 By-Products and Processes

Table 3.2 summarises the processes and corresponding by products expected from the proposed project. The Management plan to be prepared shall include the handling of by products that have the potential to harm the environment.

Table 3.2: Processes and corresponding by-products

Phase	Process	By-product/ waste
Construction	Land Clearing and Excavation	Wood waste, Top soil.
	Concrete mixing	Slurry
	Maintenance of Construction Equipment	Waste oil, Batteries and Tires
	Construction	Packaging material, scrap material, wood waste
Operation/ Maintenance	Operation of drip irrigation.	Domestic waste, Sewage, and tree/wood chippings.



Where applicable, waste will be reduced, reused and recycled employing Good International Industry Practice (GIIP). Where reuse or recycling is not an option, wastes will be collected and disposed of at the closest ZEMA approved dump site.

3.2.5 Resources Required for Successful Implementation of Project

The resources required for successful implementation of the Project include:

- Water resource
- Materials e.g. aggregate, cement, steel, petroleum products, gravel, etc.
- Human resource
- Capital (Finances)
- Machinery e.g. compactors, excavators etc.



4 ESIA SCOPE OF WORK

4.1 General scope

The scope of the ESIA comprises the Kaleya drip irrigation project site as well as any working sites that are likely to be used during construction.

The ESIA report shall be in compliance with the Zambian Environmental Legislation and Policies. The ESIA study will be developed to get the approval from ZEMA, the national authority issuing the needed environmental permits to such Projects.

In general, the environmental impact assessment will follow the national procedure for Project permitting. Prior to the ESIA study, a Scoping Study will be submitted to ZEMA, accompanied by the TORs for preparing the ESIA study (the present document). These are submitted to ZEMA for comments and eventual approval. The Scoping Study will present the Project in brief, discuss alternative options and present the preferred alternative, outline potential impacts to the environment, society and cultural heritage, and propose generic mitigation measures for alleviating the impacts. The Scoping Study will also present an overview of stakeholder engagement activities during the Project.

4.2 Spatial extent of the study

The spatial scope generally varies depending on the type of impact being considered. In any case, it includes all areas within which significant impacts are likely to occur and takes into account the following considerations:

- The physical extent of the proposed works, defined by the limits of land to be used (temporarily or permanently) by the Project.
- The nature of the baseline environment and manner in which impacts are likely to be propagated beyond the Project boundary.
- The geographical boundaries of the political and administrative authorities which provide the planning and policy context for the Project.

For the purpose of the ESIA, the area of influence for the proposed project has been defined as the area in which a direct or indirect impact on the physical, biological, social or cultural heritage environment might occur. For the detailed analysis of the current baseline of the Project, the following areas of influence have been defined.

- For environmental impacts, the area of influence is proposed as the area at 1km distance from the boundary of the Project site. This area is considered sufficient to encompass the area physically affected by Project activities and most off-site environmental impacts (e.g. noise and air quality impacts).
- For socioeconomic impacts, a direct area of influence of 1km from the boundary of the Project site is proposed. Settlements within this area are potentially affected by direct



impacts that may occur from changes to land use, disruption to infrastructure and reduced environmental quality.

- For cultural heritage impacts, the area of influence is delineated by the physical footprint of the construction and work areas.

The specific, direct area of influence for certain receptors is in some cases wider than the previously described corridors. For these cases, specific areas of influence will be defined:

- The discharge areas of water bodies (rivers, streams) directly or indirectly affected by Project activities;
- Mobile species that may travel across the site (on migration) or may be associated with a protected area and use other habitat in the wider area (as often occurs with bird species and estuaries) and therefore could be directly or indirectly affected by Project activities;
- Major populated areas outside the 1km distance that may be directly or indirectly affected by Project activities.

4.3 ESIA preparation specifics

The ESIA study shall be prepared for the construction, operation/maintenance and decommissioning phases of the Project.

The following issues will be particularly considered:

- The ESIA Study will focus on the identification and assessment of potential environmental, socioeconomic and cultural heritage impacts of the Project, as well as of cumulative impacts with other infrastructure Projects.
- The Consultant will put emphasis on assessing the positive and negative impacts on communities, e.g. socio-economic impacts, health impacts, etc. In principle, no physical resettlement is foreseen as a result of the Project activities. If however such a need arises, the consultant will undertake a resettlement screening giving an estimate of the number of people being affected by the Project and prepare a Resettlement Action Plan appropriate for the needs of the Project.
- The Consultant will undertake the needed public consultations with affected stakeholders in the Project area. The relevant procedure and the details of the stakeholder engagement and disclosure of information will be outlined in the Scoping Study.
- The responses of the public to the Scoping Study and the draft ESIA will be recorded and, if necessary, the documents will be modified and updated accordingly for the final version, thus ensuring that stakeholders' views regarding Project design, implementation and monitoring are taken into account.
- The ESIA Study will be complemented by an Environmental and Social Management Plan (ESMP) containing mitigation and monitoring measures, needed training programs for stakeholders, describe institutional arrangements for implementing the ESMP, describe



reporting needs, develop proposals for institutional strengthening if required and give the costs for implementing of the measures.

4.4 ESIA tasks

The tasks of the ESIA specialists who will execute the study are presented below.

4.4.1 Air Quality

The Environmentalist will:

- Conduct air sampling to establish baseline air quality in the Project area for Dust/Particulate Matter (PM₁₀).
- Identify any sources of existing air pollution in the Project area, if any.
- Identify and map sensitive receptors with regards to air pollution.
- Assess Project related air quality impacts on the biophysical and socio-economic impacts during construction of the Project.
- Suggest mitigation and avoidance measures for Project related impacts to air quality during the construction phase.

4.4.2 Noise

The Environmentalist will:

- Conduct noise sampling to establish baseline noise and sound levels.
- Identify and map noise receptors in close proximity to Project site.
- Assess Project related noise impacts on the biophysical and socio-economic environment during construction and operation of the Project.
- Suggest mitigation and avoidance measures for Project related noise impacts.

4.4.3 Hydrology and Hydrogeology

The hydrologist and Environmental Engineer will:

- Assess the quantity of surface and ground water in the Project area.
- Identify the potential flood areas and potential impacts in the Project area.
- Identify water resources (surface and ground water) in the Project area through site visits and physical maps.
- Identify use and availability of the water resources identified.
- Conduct water sampling to establish baseline surface and ground water quality at selected locations in the Project area.
- Assess the impacts of Project activities on surface and ground water resources.
- Suggest mitigation and avoidance measures for Project related impacts to water use and quality.

4.4.1.1 States of furrow post drip irrigation operation

The hydrologist and Environmental Engineer will:



- Identify and describe what the functions of the furrows will be during the operation stage of the project through a detailed study at environmental impact assessment stage

4.4.4 Biodiversity

The Ecologist will:

- Identify and describe the main vegetation types that occur in the Project area through desk research and transect surveys.
- Identify areas of high biodiversity in the Project area.
- Assess the spatial extent of these various plant communities in the Project area, in order to assess the significance of vegetation loss at the plant community level.
- Describe the impacts of current land use, so that the potential impacts from construction of the Project on the natural environment can be understood in this context.
- Discuss existing land use impacts on the various faunal groups.
- Identify and discuss the importance of any species of special concern, including sensitive, endemic and protected species.
- Identify nationally and internationally protected areas nearby or within the Project area.
- Investigate mitigation measures that reduce the risk of introducing invasive alien species, and note the presence of areas sensitive to invasion by alien species.
- Using field surveys, literature and other data sources prepare an annotated checklist for the four faunal groups (birds, mammals, reptiles & amphibians) to be used during future field surveys.
- Assess potential direct and indirect impacts resulting from the Project, both directly and in the immediate surrounding area during construction and operation.
- Provide a detailed description of appropriate feasible mitigation measures that can be adopted to reduce negative impacts for each phase of the Project, where required.

4.4.5 Ecosystem services

The Environmentalist Engineer and the social specialist will:

- Identify and describe any ecosystem services (provisioning, regulating, cultural, and supporting ecosystem services) provided by the Project area.
- Assess the potential impacts of Project activities on ecosystem services identified.
- Recommend measures to avoid, minimise, mitigate, or, if necessary, compensate for impacts to ecosystem services.

4.4.6 Geology and Soils

The Ecologist and Environmental Engineer will:

- Establish the potential for existing sites and/or sources of contaminated soils in the Project site.
- Assess the implication of vegetation removal and earthworks associated with the Project on soil quality and erosion risk.
- Assess the implication of removing the top soil in the Project area and creation of borrow pits on the soils of the Project area;



- Assess the effects of soil erosion on the quality of surface water as the result of spillage of chemical pollutants during construction and operation.
- Identify the geology and types of soils present in the Project area through desktop research, review of the existing geotechnical study already undertaken at the Project site, and field observations.
- Recommend ways to avoid or mitigate impacts to soil quality and measures for erosion control.

4.4.7 Landscape

The Environmental Engineer will:

- Identify the existing landscape units in the Project area and their visual quality.
- Suggest design and minimisation measures to address landscape and visual impacts, taking into consideration siting layout in relation to the surrounding landscape, sensitive receptors and existing and proposed infrastructure.

4.4.8 Cultural and Archaeology Heritage

The social and heritage specialists will:

- Identify the potential cultural and natural heritage in the Project area through walk-over surveys, consultation with local and national authorities, consultation with local residents and through desk-based research.
- Identify the ethnic, language and religious make-up of the communities affected by the Project.
- Assess the existence of and impacts on traditional customs and indigenous or vulnerable peoples.
- Develop relevant impact management plans for the indigenous or vulnerable peoples identified as impacted by the Project.
- Assess impacts on the cultural and natural heritage sites and events through the Heritage Impact Assessment.
- Indicate mitigation measures, including a Project-specific chance-finds procedure to be implemented in order to prevent impacts as well as mitigate them if they do occur.

4.4.9 Socio-economy

The socio-economist will:

- Identify baseline social parameters on a regional and local level for education, health, employment, income, production, economy, demographics, infrastructure and social amenities.
- Identify socio-economic impacts of the installation of Project components.

4.4.10 Land tenure, land uses and livelihood

The socio-economist will:

- Identify livelihood and land use activities in the Project area.
- Assess the land tenure systems in practice in the Project area.



- Assess impacts from the installation of the Project components on people's livelihood, land use and land tenure system in the area.
- Suggest mitigation, avoidance and compensation measures for Project impacts on livelihood and land use.

4.4.11 Vulnerable and Indigenous People

The social and heritage specialists will:

- Assess the existence of and impacts on traditional customs and indigenous or vulnerable peoples.
- Suggest mitigation, avoidance and compensation measures for Project impacts on vulnerable and indigenous peoples.

4.4.12 Community Health and Safety

The social specialist will:

- Undertake an assessment with regard to health, safety and security issues which will include analysis of existing types and rates of diseases, accidents and attacks in the area; changes on health, safety and security features.
- Assess the community health and safety hazards as a result of Project activities such as public access, public health and other nuisances.
- Suggest mitigation and avoidance measures for such impacts.

4.4.13 Cumulative Impacts

The Environmental Engineer will:

- Undertake a cumulative impact assessment which will respond to the requirement in the national regulations and international standards to assess the cumulative effects of the proposed Project and other developments in or near the Project area.

4.4.14 Review of legal and administrative aspects pertaining to the Project

The Team leader will:

- Describe legal instruments and administrative aspects that have a bearing on the social and biophysical environment.
- Assess impacts on the interface with other planned Projects or Projects in development in the Project area.
- Assess cumulative impacts with other Projects in or near the Project area.

4.5 Stages of ESIA Process

The preparation of the ESIA will follow the stages presented below, as per Zambian regulations and international best practice.



Table 4.1: Stages of the ESIA Process

Step	Description	Status
Screening	Screening is performed to determine if the project requires an EPB or a detailed ESIA.	Complete
Alternatives Assessment	Assessment of alternatives with the aim to identify the project alternative that are technically feasible and have the least environmental and social impacts.	Complete
Scoping	Scoping identifies and consults upon the key issues to be addressed in the ESIA.	Current Stage
ESIA	For the key issues identified in scoping, secondary data and field studies will be used (as necessary) to assess existing environmental and social conditions. The ESIA will assess predicted environmental and social changes as a result of the project and propose mitigation measures where necessary.	Planned for the subsequent project period
Stakeholder Engagement and Consultation	During the ESIA study the team will provide relevant information and seek the views of interested parties so that these can be taken into account in the assessment and reflected in the proposals for mitigation. Once complete, the ESIA Report will be subject to public disclosure and consultation. Comments will be taken into account in revising the final ESIA Report.	Scoping Consultation: completed ESIA disclosure and Consultation: planned when draft ESIA is complete

5 ESIA METHODOLOGY

5.1 Baseline data collection

The proposed Project is to be developed in Mazabuka District of Southern Province. The ESIA study will be informed by the district reports compiled by various government departments complemented by field surveys and assessments.

Table 5.1: Summary of baseline data collection methodologies

Discipline	Baseline data collection methodologies
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Noise and vibration	<p>Noise monitoring will be conducted at key representative receptors covering all four cardinal directions of the Project site. Baseline noise measurements will be conducted in line with IFC/World Bank EHS Guidelines on noise.</p>
Air quality	<p>The study area for air quality shall be limited to the Project area. Baseline conditions will be assessed based on data from recent ESIA's for Projects conducted in or near the Project area as well as data collected from sampling in selected locations at key representative receptors covering all four cardinal directions site.</p> <p>Ambient concentrations of pollutants will be determined at different locations throughout the Project area. The proposed contaminant to be measured is Dust/Particulate Matter (PM10).</p> <p>The sampling process will include measuring time intervals ranging from thirty minutes (00:30 min) to one hour (01:00 hour) with a portable air quality monitor.</p>
Landscape and visual impacts	<p>An assessment of the existing landscape will be conducted during the site visit and through desk study. Available data from topographical maps, aerial images and other relevant reports will be reviewed. Aspects to be considered include landscape units and their visual quality, topography, current land use, existing vegetation, water bodies and drainage channels.</p>
Hydrology and hydrogeology	<p>Water samples will be collected and analysed for selected parameters such as pH, turbidity, total suspended solids and coliforms to establish the baseline water quality. Water sampling will be conducted in compliance with ZEMA and Zambia Bureau of Standards (ZABS) standards.</p> <p>Available water resources in the Project area such as Kaleya and Kafues River will be identified through site visits and desk study.</p> <p>Comprehensive desk studies and walk-over surveys will be conducted to assess the surface and ground water baseline conditions in the Project area. Data to be assessed will include existing groundwater and/or abstraction well monitoring data (where available) for the Project area, readily available information on the hydrogeology of the area including published data and maps.</p>
Biodiversity	<p>Comprehensive desk study will be conducted to source relevant ecological data such as ESIA's and ecology studies for any other Projects near the Project area, Protected Planet and International Union for Conservation of Nature and Natural Resources (IUCN) Red List of Threatened Species.</p> <p>Consultation with stakeholder organisations will be conducted as required.</p> <p>Data relating to habitats existing in the study area, notable flora and fauna species, and statutory and non-statutory designated sites will be obtained from published bibliography and pertinent institutions.</p> <p>Field surveys including habitats identification and flora and fauna searches will be conducted in order to identify sensitive species, understand their reproductive cycle and relationship with other components of the habitats and their resilience to changes.</p> <p>The focal areas of Project activities {Potential Areas of Concern (PACs)} where impacts are expected to emanate from will be defined. The Project area will be divided into sampling plots and sampled for fauna and flora.</p>



Fauna survey

This will involve observation methods for mammals in the area including identification of dung, animal tracks and other signs. Live-trap transects sampling will be used for small burrowing rodents. These Night traps - which capture the rodents alive – will be made with the help of local guides/Key informants.

Three types of insect traps (Malaise traps, pitfall traps as well as food bait traps) will be used to trap both crawling and flying insects. These will be supplemented with transect sweeping exercise on all the sampling plots between 500m and 1km using hand held-sweep nets. Transect survey method will be used for reptile survey. The search will be conducted at the same time with the insect sweeping to facilitate the reduction of disturbance for reptiles.

Interviews with local fishermen will be conducted to gather information on the fish and other aquatic fauna found in the Project area. Observations and Fish Traps Sampling Methods such as the use of hand nets will be used to assess the types of fish in the river. Fish traps shall be set in strategic areas. Fish Traps Sampling Methods will also be used for amphibians. With the help of Local Key Informants (KIs), in this case expert fishermen in the Project area, the niches of the surface water bodies where amphibians are mostly present shall be identified. Fish traps – aimed at trapping fish and amphibians - shall be set in these areas to stay in the water during day and throughout night time and then inspected the following morning.

The fauna data collected will be used to determine the faunal diversity in the Project area. Species will be checked against their conservation status as classified by the IUCN (critically-endangered, endangered, vulnerable, near threatened, least concern).

Flora survey

To assist in data collection, a few locals with the ability of perceiving the concepts of the survey easily will be trained in sampling techniques.

Google Earth image analysis will be used to select areas based on the vegetation/biomass abundance to signify areas which have undergone minimal human influence. To increase precision of sampling, the sample areas will be replicated at a distance of at least One (1) kilometre.

Parameters to be measured

- Diameter at Breast Height (DBH)
- Total Height
- Tree species
- Evidence of fire
- Health of canopy
- Vegetation and habitat type

Ecosystem services

A desk study will be conducted to identify baseline ecosystem services used by the locals. This will be supported with observations and interviews with the locals on their use of the forest products in the project area and whether they have any cultural significance.



Geology and soils	<p>Comprehensive desk studies and walk-over surveys will be conducted to assess the soil baseline conditions in the project area. Data to be reviewed will include readily available information on geology and soils including published data and maps. Site observations and interviews with the locals will be conducted.</p> <p>Erosion and sedimentation potential will be assessed including the quantity and quality of soil available for re-vegetating and restoring the disturbed areas after temporary use.</p>
Cultural and archaeological	<p>A heritage desk-based assessment will be conducted with the objective of identifying the baseline information on heritage in the project area in order to inform an assessment of the potential for archaeological remains in the site and other items of cultural value.</p> <p>Data gathering will focus on accessing information from bibliography, satellite imagery, and interactions with pertinent institutions.</p> <p>A project specific chance finds procedure will be developed to be used during construction for any chance finds.</p>
Socio-economic	<p>Comprehensive Desk socio-economic study will be conducted , including local demography and economy, in terms of population dynamics (population sizes, growth, gender, age and ethnic profiles), settlement patterns, culture and tradition, gender based roles and responsibilities, employment, economic activities, income, service capacity and economic growth, relevant services and facilities (water, energy, transport, education, healthcare, recreational facilities, social support institutions and organisations).</p> <p>Determination of resettlement needs and preparation of a Resettlement Action Plan Framework encompassing resettlement, livelihood restoration and compensation strategies for the project will be conducted if required.</p> <p>Field work will involve the observation method to identify the prominent physical structures and features such as settlements, sensitive receptors (schools, hospitals, churches, etc.), and to identify social and productive economic activities such as type of crops grown, means of transportation and available social facilities and services.</p> <p>Semi structured interviews and discussions will be held with heads of households located in the project area and secondary stakeholders from public and private institutions. Interviews and discussions will be held with personnel from the District administration, the Council, Health and Education sectors. Interviews with local Key Informants will also be used.</p> <p>Using the methods above, the following baseline information will be identified:</p> <ul style="list-style-type: none"> ■ Location, estimated number and general condition (employment/livelihood, health, education) of the residents of the study area. ■ Location and use of other relevant structures in the project area (schools, health centres, churches, among others).



5.2 Impact assessment

5.2.1 Introduction

The assessment of impacts is an iterative process that considers four questions:

- Prediction – what will happen to the environment and people as a consequence of the potential impacts associated with the project?
- Evaluation – does this impact matter? How important or significant is it?
- Mitigation – if the impact is significant, can anything be done about it?
- Residual Impact/risk – is it still significant?

Where significant residual impacts remain, further options for mitigation may be considered and impacts re-assessed until they are as low as is technically and financially feasible for the project and deemed to be within acceptable levels.

5.2.2 Prediction of magnitude of impacts

The ESIA describes what will happen to the environment as a result of the project, by predicting the magnitude of impacts (both positive and negative) and quantifying these to the extent practicable. The magnitude of impact is determined based on the combination of a number of characteristics such as nature, scale, duration or frequency and likelihood of occurrence.

Given the inherent differences between resources/receptors, and in many cases between different types of impacts to a given resource/receptor, the definitions of the magnitude designations are defined differently according to the resource/receptor or the type of impact in question. These are based upon professional judgement and specialist experience where required.

Table 5.2: Factors defining impact magnitude

Factors defining impact magnitude	Generic Definition
Nature / Type	Negative – an impact that is an adverse change from the baseline, or introduces an undesirable element into the baseline; Positive – an impact that is considered to represent an improvement to the baseline or to introduce a new desirable factor; Direct – impacts resulting from a direct interaction between a Project activity and a resource/receptor; and Indirect – impacts resulting from non-Project activities that occur as a consequence of the Project.



Factors defining impact magnitude	Generic Definition
Scale	<p>Local – impacts that affect local resources or that are restricted to the area of influence;</p> <p>Regional – impacts that affect regionally important resources or that are felt at a regional scale;</p> <p>National – impacts that affect nationally important resources or that are felt at a national scale; and</p> <p>International – impacts that affect internationally important resources or that are felt at an international scale (e.g. areas protected by International Conventions) including trans-boundary effects on society and health.</p>
Duration	<p>Temporary – impacts predicted to be of duration shorter than the length of construction and/or of an intermittent/occasional nature;</p> <p>Short-term – impacts predicted to last only during construction;</p> <p>Medium-term – impacts predicted to last for an intermediate period extending beyond the end of construction;</p> <p>Long-term – impacts predicted to continue over an extended period beyond the end of construction; and</p> <p>Permanent – impacts that occur during the development of the Project and result in a permanent change to the baseline.</p>

Where applicable, the evaluation of the impact takes also into consideration reversibility of an impact. This applies mainly for removal of vegetation, where for example the loss of vegetation is largely reversible by appropriate habitat reinstatement once construction ends, whilst the loss of old growth forest habitat is not reversible, since in case trees can be replanted, they will take decades to mature.

An overall grading of the magnitude of impacts is provided taking into account all the relevant factors noted above to determine whether an impact is of negligible, small, medium or large magnitude. This scale is defined differently according to the type of impact. For readily quantifiable impacts, such as noise, numerical values are used whereas for other topics (e.g. ecology) a more qualitative classification is necessary.

5.2.3 Analysis of impacts

Analysis of the impacts identified will be carried out, involving the evaluation of the overall significance of each identified impact by assigning values to a set of criteria as defined in the tables below.

Table 5.3: Definition of Criteria

SN	Criterion	Definition
1	Frequency of occurrence of Impact	Refers to the frequency with which a stressor (aspect) will impact on the receptor
2	Sensitivity of the Element	Refers to the degree of change effected on natural element, process or receptor
3	Intensity/ Severity / Magnitude of Impact	Refers to the degree of change to the receptor status in terms of reversibility of the impact
4	Spatial Extent of Impact	Refers to the geographical extent or coverage of a possible impact



5	Duration of Impact	Refers to the length of time over which the stressor will cause a change in the resource or receptor
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Each of the above outlined criteria is ranked with scores assigned as presented in the table below. Each criterion is considered in two categories and the overall impact significance is arrived at as a result of consequence and likelihood. The product of the sum of the scores recorded for the consequence and likelihood are read off the matrix presented to determine the overall significance of the impact (i.e. either negative or positive).

Table 5.4: Criteria for assessing Significance of Impacts

Severity / Intensity of Impact	Rating		Frequency of occurrence of Impact	Rating
Negligible	1		Almost impossible	1
Low	2		Highly unlikely	2
Moderate	3		Unlikely	3
High	4		Possible	4
			Definite	5
Spatial Extent of Impact	Rating		Sensitivity	Rating
Site	1		Low	1
Local	2		Moderate	2
Regional	3		High	3
Impact Duration	Rating			
Intermittent	1			
Temporary	2			
Short term	3			
Medium term	4			
Long term	5			

Table 5.5: Significance Ranking Matrix

CONSEQUENCE (Severity, Spatial Extent, Duration of impact)															
LIKELIHOOD (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



Table 5.6: Positive/ Negative Ratings

Significance Rating	Value		Negative Impact Management Recommendation	Positive Impact Management Recommendation
Very High	126-150		Propose mitigation measures	Maintain current management
High	101-125		Propose mitigation measures	Maintain current management
Medium-High	76-100		Propose mitigation measures	Improve current management
Low-Medium	51-75		Maintain current management	Propose mitigation measures
Low	26-50		Maintain current management	Propose mitigation measures
Very low	1-25		Maintain current management	Propose mitigation measures

5.2.4 Mitigation

A very important step of the ESIA process is the identification of measures that will be taken by the project to mitigate its impacts. In some instances, mitigation will be inherent in the design, and in other cases mitigation measures are identified during the ESIA process. Mitigation measures are technically and financially feasible and cost-effective means of mitigating significant impacts to levels that are deemed acceptable. These measures are agreed with the Project owner and integrated into the ESIA and the ESMP as project commitments.

The hierarchy of mitigation options is as follows.

- Avoid at source – remove the source of the impact.
- Abate at source – reduce the source of the impact.
- Attenuate – reduce the impact between the source and the receptor.
- Abate at the receptor – reduce the impact at the receptor.
- Remedy – repair the damage after it has occurred.
- Compensate / Offset – replace in kind or with a different resource of equal value.

5.2.5 Residual Impacts

Following agreement on technically and financially feasible and cost-effective mitigation, the ESIA team, where necessary, will reassess the impacts taking into account the further mitigation commitments integrated into the design and operation of the project. This iterative process will continue until an impact is deemed acceptable.

All residual significant impacts will be described in the ESIA in terms of their overall significance. Where an impact is of more than minor significance, the ESIA will explain in greater detail how the mitigation hierarchy will be applied to reduce an impact to a level that is deemed to be acceptable.



5.2.6 Cumulative Impacts

Cumulative positive or negative impacts resulting from several or from the same source and affecting a specific environmental, social or cultural heritage receptor are taken into consideration during the evaluation of identified impacts. Where appropriate, their combined effect on the receptor is defined. In addition, cumulative impacts that can potentially occur from the combined effects of this project with other presently on-going or reasonably foreseeable future activities within the project area are also taken into consideration and assessed.

The assessment of cumulative impacts is performed, in general terms, in a qualitative manner based on the existing information of the present or future activities taken into consideration for the judgment of the ESIA team.

The recommendations for mitigation and compensation measures will be proposed in order to avoid, alleviate or compensate for any negative impacts that may be generated by the project. These shall be in proportion to the magnitude of the impacts, and designed to ensure that the potential negative impacts are kept within the acceptable level. The costs of delays resulting from these proposed mitigation and compensation measures, as well as the nature and extent of residual impacts after such measures, will also be quantified for Kascol.

After ZEMA's approval of the Scoping and TORs, the Baseline Phase will be implemented. The period of the Baseline Phase will be dependent on the outcome from the Scoping Phase. The output of this phase, the Draft Environmental and Social Impact Statement (ESIS), will include the Environmental and Social Management Plan (ESMP) which will address the roles and responsibilities of all responsible persons throughout the life-cycle of the project, including potential for decommissioning. This will capture all measures necessary to eliminate, reduce or offset the damaging consequences of the project, as well as measures to enhance and improve its positive impacts.

In drafting the ESIS, all the requirements of the objectives of the ESIA study will be fulfilled. In addition, the full content of the Draft ESIS will be subject to review by ZEMA.

5.3 Disclosure Phase

There will be need to review the draft ESIS to incorporate views from various stakeholders, including ZEMA. The document will therefore be subject to extensive disclosure to the project interested and affected persons (IAPs). To make it easier to present, the Consultant will prepare a non-technical Executive Summary which will provide the project location, identified impacts, mitigation and enhancement measures, conclusions and recommendations of the study.

Over a one month period, the relevant team members will engage with stakeholders, as envisioned in the Stakeholder Engagement Plan, to disclose the findings and ensure that all concerns are addressed, or that residual concerns are documented for further action and decision making. Based on the feedback received from various stakeholders, a final Environmental and Social Impact Statement will be produced, in conformity with national and international standards. The



Consultant will hand over the final ESIS to Kascol for transmission to ZEMA. All financial costs associated with the scrutiny and approval will be borne by Kascol.

5.4 Resettlement Action Plan

Should the outcome of the baseline investigations indicate that a Resettlement Action Plan is required, a separate document – the Resettlement Action Plan – will be produced. This plan will provide extensive details on the Grievance Redress Mechanism, as envisioned under IFC PS5 (Land Acquisition and Involuntary Resettlement), for the project affected persons. Livelihood Restoration will be a significant component of the RAP.



6 ESIA SCHEDULE

An indicative time plan for the ESIA process is as follows.

Table 6.1: Time Plan for ESIA

Deliverable	Indicative timing
Submission of the Scoping Study and TOR for ESIA	September 2021
ESIA Scoping and TOR approval	October 2021
Desktop studies, ESIA and Consultation site visits	September – October 2021
Submission of the Draft ESIA	October 2021
ESIA Disclosure and Stakeholder Engagement	October 2021
Submission of Final ESIA	November 2021



7 ESIA REPORTING AND OUTPUTS

The ESIA Report will be structured with the following contents. These contents are provided here indicatively, as the actual contents will be formed after the approval of the Scoping Study.

ToC No.	Chapter Name
	EXECUTIVE SUMMARY
	TABLE OF CONTENTS
	LIST OF FIGURES
	LIST OF TABLES
	ABBREVIATIONS AND ACRONYMS
1	INTRODUCTION
1.1	BACKGROUND OF THE PROJECT
1.2	SUMMARY DESCRIPTION OF THE PROJECT
1.3	OBJECTIVES OF THE PROJECT
1.4	PROJECT DEVELOPER
1.5	TRACK RECORD
1.6	TOTAL PROJECT COST
1.7	PROPOSED PROJECT IMPLEMENTATION DATE
1.8	PROJECT LIFESPAN
2	STUDY APPROACH
2.1	SCREENING
2.2	STAKEHOLDER ENGAGEMENT
2.3	SCOPING REPORT
2.4	SPECIALIST STUDIES
2.5	LIMITATIONS OF THE STUDY
3	POLICY, INSTITUTIONAL AND ORGANISATIONAL FRAMEWORK
3.1	POLICY FRAMEWORK
3.2	REGULATORY FRAMEWORK
3.3	ADMINISTRATIVE FRAMEWORK
3.4	INTERNATIONAL REQUIREMENTS
4	PROJECT DESCRIPTION
4.1	LOCATION
4.1.1	Other Developments in the Project Area
4.2	PROJECT COMPONENTS
4.2.1.	Project Activities
4.2.2	Proposed Improvements
5	PROJECT LIFECYCLE
5.1	DESIGN PHASE
5.1.1	Design
5.2	SITE PREPARATION AND CONSTRUCTION PHASE
5.2.1	Introduction
5.2.2	Activities
5.2.3	Raw Materials and their Sources
5.2.3.1	Transportation and Handling of Construction Materials
5.2.4	Construction Waste Inventories



- 5.3 OPERATION AND MAINTENANCE PHASE
 - 5.3.1 Activities during operation and maintenance
 - 5.3.2 Raw Materials and their Sources
 - 5.3.2.1 Transportation and Handling of Maintenance Materials
 - 5.3.3 Operation Waste inventories
- 5.4 DECOMMISSIONING PHASE
 - 5.4.1 Introduction
 - 5.4.2 Activities during Decommissioning
 - 5.4.3 Waste quantification
- 6 PROJECT ALTERNATIVES
 - 6.1 IDENTIFICATION OF PROJECT ALTERNATIVES
 - 6.1.1 No project
 - 6.1.2 Site Alternatives
 - 6.1.3 Design Alternatives
 - 6.1.4 Power Alternatives
 - 6.1.5 Water Supply and Sewer Disposal Alternatives
 - 6.2 SELECTION OF PREFERRED ALTERNATIVE
- 7 ENVIRONMENTAL BASELINE
 - 7.1 INTRODUCTION
 - 7.2 PHYSICAL ENVIRONMENT
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 - 7.2.5 Landscape
 - 7.2.6 Built Environment
 - 7.2.7 Geology and soils
 - 7.2.8 Hydrology and Hydrogeology
 - 7.3 BIOLOGICAL ENVIRONMENT
 - 7.3.1 FLORA
 - 7.3.1.1 Methodology of assessment
 - 7.3.1.2 Vegetation types and ecosystems
 - 7.3.1.3 Detailed Survey Findings
 - a. Extent and nature of human influence
 - b. Biodiversity indicators
 - c. Locally protected and endangered species
 - d. IUCN Red List Categorisation
 - 7.3.2 TERRESTRIAL FAUNA
 - 7.3.2.1 Mammals
 - 7.3.2.1.1 Methodology of assessment
 - 7.3.2.1.2 Detailed Survey Findings
 - a. Extent and nature of human influence
 - b. Biodiversity indicators
 - c. Locally protected and endangered species
 - d. IUCN Red List Categorisation
 - 7.3.2.2 Reptiles and Amphibians
 - 7.3.2.2.1 Methodology of assessment



- 7.3.2.2.2 Detailed Survey Findings
 - a. Extent and nature of human influence
 - b. Biodiversity indicators
 - c. Locally protected and endangered species
 - d. IUCN Red List Categorisation
- 7.3.2.3 Insects
 - 7.3.2.3.1 Methodology of assessment
 - 7.3.3.2.2 Detailed Survey Findings
 - a. Extent and nature of human influence
 - b. Biodiversity indicators
 - c. Locally protected and endangered species
 - d. IUCN Red List Categorisation
- 7.3.3 AQUATIC FAUNA
 - 7.3.3.1 Methodology of assessment
 - 7.3.3.2 Detailed Survey Findings
 - a. Extent and nature of human influence
 - b. Biodiversity indicators
 - c. Locally protected and endangered species
 - d. IUCN Red List Categorisation
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 - 7.3.4.2 Detailed Survey Findings
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- 7.4.9.5 Trading Centres
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- 7.4.9.7 Financial services
- 7.4.10 Community Health, Safety and Security
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- 7.5 CULTURAL AND NATURAL HERITAGE ENVIRONMENT
 - 7.5.1 Methodology of assessment
 - 7.5.2 Cultural heritage resources
 - 7.5.2.1 Traditional, Religious Practices and Rites
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 - 7.5.3.1 Designated Sites
- 8 IMPACT ASSESSMENT
 - 8.1 IDENTIFICATION OF IMPACTS DURING CONSTRUCTION
 - 8.1.1 Biophysical Environment
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 - 8.2.1 Biophysical Environment
 - 8.2.2 Socio-Economic and Cultural Environment
 - 8.3 IDENTIFICATION OF IMPACTS DURING DE-COMMISSIONING
 - 8.3.1 Biophysical Environment
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 - 8.4 IMPACT ASSESSMENT
 - 8.4.1 Introduction
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 - 8.5 SUMMARY OF IMPACT ASSESSMENT
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 - 9.1 GENERAL MEASURES
 - 9.2 MEASURES RELATED TO CLIMATE CHANGE
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 - 9.5 PROTECTION OF GEOLOGICAL RESOURCES
 - 9.6 PROTECTION OF SOILS
 - 9.7 PROTECTION OF HYDROLOGICAL AND HYDROGEOLOGICAL RESOURCES
 - 9.8 PROTECTION OF FLORA AND FAUNA
 - 9.9 PROTECTION OF DESIGNATED SITES
 - 9.10 LANDSCAPE INTEGRATION MEASURES
 - 9.11 PROTECTION OF CULTURAL HERITAGE
 - 9.12 RESETTLEMENT AND LIVELIHOOD RESTORATION MEASURES
 - 9.13 PROTECTION OF COMMUNITY HEALTH, SAFETY AND SECURITY
 - 9.14 MEASURES TO ENHANCE EMPLOYMENT OPPORTUNITIES AND ECONOMIC OUTPUT
- 10 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN
 - 10.1 INTRODUCTION
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 - 10.3 ORGANISATIONAL ARRANGEMENTS AND RESPONSIBILITIES



- 10.3.1 KASCOL
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8 SPECIALIST STUDIES

The information provided in this TOR and in the Scoping Report for the project has been based on desktop information available for the project area, feedback from stakeholders provided during the Scoping meetings and expert opinion of the project team.

During the baseline phase of the Project, aspects will need to be studied in more detail in order to provide a solid basis for impact assessment and definition of mitigation measures. Such aspects may need to be subjected to specialist studies or to more elaborated data gathering, if such data is available.

The following specialist studies will be developed as a part of the ESIA:

- Air Quality Sampling Analysis
- Soil Quality Sampling and Analysis
- Water Quality Analysis
- Biodiversity Assessment (Flora and Fauna Sampling and Analysis)
- Heritage Impact Assessment
- Socio-Economic Assessment
- Cumulative Impact Assessment

Further details on the methodologies and content of these studies can be found in sections 4.4 and 5 above.



9 PROPOSED EIA TEAM

The ESIA will be prepared by a multidisciplinary team of experts. A short description of the proposed key experts is given below, while CVs are presented in Appendix A.

Table 9.1: Proposed ESIA team

1. Key Staff		
Name	Position	Task
Lovemore Kapeya Muma	Team Leader Environmental policy and management	Document review, Field studies, Data collection and analysis, recommendations
Charles M. Phiri	Specialist environmental management	Field studies recommendations
Vincent Kapundu	Specialist Social & Economic	Field studies, recommendations
Timothy Sakala	Specialist Agricultural economic	Document review, Field studies, Data collection and analysis, recommendations



10 DECLARATION OF AUTHENTICITY OF REPORT CONTENTS

Project Proponent

I, Mufana Muimui, on behalf of Kaleya Smallholders Company Ltd (KASCOL), confirm that this Terms of Reference (TOR) for the proposed Conversion of sugar cane irrigation system from farrow to sub-surface drip Project in Mazabuka area is the work of Earth Environmental Consultants, other works referred to in this report have been acknowledged.

Signed at Mazabuka on October, 2021

Signature:

Designation: Estate Manager

Kaleya Smallholders Company Ltd (KASCOL)

ESIA Consultant

I, Lovemore Muma , on behalf of Earth Environmental Consultants, hereby submit this Terms of Reference (TOR) for the proposed Conversion of sugar cane irrigation system from farrow to sub-surface drip Project in Mazabuka town. These Terms of Reference have been prepared in accordance with the Environmental Management Act 2011 and the Environmental Impact Assessment Regulations S.I. No. 28 of 1997.

Signed at Mazabiuka on October, 2021

Signature:

Designation: Director

Earth Environmental Consultants



Appendix A – ESIA team members CVs



POSITION: Specialist - Occupational Health Safety and Environment
NAME OF FIRM: Earth Environmental Consultants Limited
NAME: Lovemore Kapeya Muma
NATIONALITY: Zambian
DATE OF BIRTH: 7th December 1972
SEX: Male
MARITAL STATUS: Married
ADDRESS: P.O. Box 21024
 Kitwe, Zambia.
TELEPHONE 0966 – 904 567
EMAIL earth@zambia.co.zm

11 ACADEMIC QUALIFICATION

2012 2016 Bachelor of Science Degree in Occupational Health Safety and Environmental (OSHE)
 2006- 2006: Certificate in Human rights approach to HIV/AIDS programming
 2004 – 2005: Certificate in HIV/AIDS Care and Counselling - University of South Africa.
 2004 – 2004: Certificate in Basic First AID.
 1999 – 2003: Bachelor of Arts Degree in Development Studies with a minor in Public administration, University of Zambia. (Distance Education, 1st Year.)
 1998 – 1999: National Accounting Technician Programme (NATech) – Zambia Institute of Chartered Certified Accountants (ZICA)
 1994 – 1995: First stage of the Zambian Diploma in Accountancy (ZDA) - Evelyn Hone College

PROFESSIONAL QUALIFICATION:

In House training
 2006 – 2006 Strategic information training
 2002 – 2006 Finance and Administration
 2000 – 2002 Credit survey, appraisal, Utilization and Management
 1999 – 2000: Customer Relations and Marketing
 1997 – 1998: Microsoft works
 1994 – 1996: WordPerfect, Professional Write, Quattro and Microsoft works

TRAININGS, WORKSHOPS & SEMINARS:

- Faecal sludge management as a business – AfDB, Lusaka Sanitation
- Strategic Financial Management - MANGO
- Managing for Financial Sustainability - MANGO
- Strategic visioning – ZIHP
- Skills building for personnel in project management – CLUSA USAID
- Project identification and assessment – SCOPE OVC
- Sub granting – Care International
- Skills building on programming and financial management - ZIHP
- Skills building in documentation – CARE International
- Community participatory assessment workshop – International AIDS Alliance



- Development of finance and administration policy and procedures
- HIV & AIDS workplace formulation
- Strategic planning workshop - SHARe

PROFESSIONAL EXPERIENCE:

2008 to date Working for the Earth Integrated Environmental Consultants, as an Occupational Health Safety and Environment specialist,

SPECIALISATION:

Environmental impact assessment (EIA), environmental auditing, strategic environmental assessment (SEA), Environmental design, safety, health and management, pollution control and environmental management Systems, chemicals and waste management, environmental legislation and regulation and water quality assessment

EXPERTISE:

- Environmental Impact Assessment
- Environmental Auditing
- Environmental Policy and Legislation
- ISO 14001 Environmental Management Systems
- Water and sanitation quality assessment
- Stack emissions sampling
- Chemicals and Waste Management
- Safety, Health and Environment
- Feasibility Studies.

WORK RECORD

2016 – 2017	Earth Environmental Consultants Limited
Project Name:	Lukulu Farm, development of 1,900 hectares of irrigated farm,
Responsibilities:	Conducting an Environmental Social Impact Assessment (ESIA) and preparation of an Environmental Social Impact Assessment report for the development of 1,900 hectares of irrigated Arabica coffee at Lukulu Estates in Northern Province.
Position	Specialist - Occupational Health Safety and Environment
Sponsor:	Olam International Zambia Ltd
2014 - 2015 -	Earth Environmental Consultants Limited
Project Name:	Kasama fish farms project
Responsibilities:	conducting an Environmental Impact Assessment and Preparation of an Environmental Project Brief (EPB) for the proposed development of Aquaculture fish ponds off the Luombe River in Kasama, Northern Province.
Position:	Specialist - Occupational Health Safety and Environment
Sponsor:	Kalungwishi Estate ltd
2014 – on going	Earth Environmental Consultants Limited
Project Name	CCS Air and soil monitoring project
Responsibilities:	Carrying out site environmental surveys including air and soil surveys on and around Chambishi Copper Smelter (CCS) Plant, Works include



surveys of the entire area, including wind direction, upstream and downstream of the stack

Position: Specialist - Occupational Health Safety and Environment
Sponsor: Chambeshi Copper Smelter CCS

2013 - 2015

Earth Environmental Consultants Limited

Project Name: Magnias Catering Limited hotel and restaurant

Responsibilities: Conducting an Environment Impact Assessment and preparation of an Environmental Impact Assessment report for the construction of a three story hotel building and restaurant near the Simon MK International Airport, in Ndola.

Position: Specialist - Occupational Health Safety and Environment
Sponsor: Magnas Catering Limited

2014 – 2015

Earth Environmental Consultants Limited

Project Name: Luombe Farm, development 456 hectares of irrigated farm,

Responsibilities: **Conducting an** Environmental Social Impact Assessment and Preparation of an Environmental Social Impact Assessment report for the development of 456 hectares of irrigated farm at Luombe Estates in Kasama, in Northern Province.

Position: Specialist - Occupational Health Safety and Environment
Sponsor: Olam International Zambia Ltd

2014- 2014

Earth Environmental Consultants Limited

Project Name: Sharpco Steel rebar manufacturing plant

Responsibilities: Conducting an Environmental Impact Assessment and preparation of an Environmental Project Brief (EPB) for the proposed steel rebar manufacturing plant in Lusaka. The project involved assessing potential impacts of scrap metal processing into steel bars.

Position: Specialist Social, Economics and gender main streaming
Sponsor: Sharpco Co. Ltd

2013 – 2014

Earth Environmental Consultants Limited

Project Name: Independent Environmental Audit for Chambishi Copper Smelter.

Responsibilities: carrying out an independent environmental audit, works included reviewing relevant documents, conducting site visit and interviews at the smelter and submitting a draft and final report. The objective of the audit was to evaluate the status of the environmental management system and compliance to the Environmental Impact Assessment of the Copper Smelter project.

Position: Specialist - Occupational Health Safety and Environment
Sponsor: Chambishi Copper Smelter (CCS),

2014- 2014

Earth Environmental Consultants Limited

Project Name: Kaoma Quarries

Responsibilities: Conducting an Environmental impact Assessment and preparation of an Environmental Project Brief (EPB) for the construction of a quarry Facility in Kaoma of Western Province of Zambia.

Position: Specialist Social, Economics and gender main streaming



Sponsor:	Kaoma Quarries Ltd
2013- 2013	Earth Environmental Consultants Limited
Project Name:	Luhang Stone Zambia Ltd
Responsibilities:	Conducting an Environmental impact Assessment and Preparation of an Environmental Project Brief (EPB) for the construction of a quarry facility in Chilanga of Lusaka Province.
Position:	Specialist - Occupational Health Safety and Environment
Sponsor:	Luhang Stone Zambia Ltd
2011-2011	Earth Environmental Consultants Limited
Project Name:	Sulphur cleanup and soil restoration
Responsibilities:	Cleaned 30 tonnes of sulphur that spilled on the Kitwe Ndola Highway and conducted a soil remediation on the contaminated site
Position:	Specialist Social, Economics and gender main streaming
Sponsor:	Earth Organisation Zambia
2011 – 2011	Earth Environmental Consultants Limited
Project Name:	Wada Chovu Filling Station
Responsibilities:	Conducting an Environmental impact Assessment and preparation of an Environmental Project Brief (EPB) for the proposed Wada Chovu Filling Station in Luanshya. The project involves digging of the tank farm, installation of tanks, pumps and the canopy.
Position:	Specialist - Occupational Health Safety and Environment
Sponsor:	Wada Chovu limited
2012 – 2012	Earth Environmental Consultants Limited
Project Name:	Expansion of 150 hectares of irrigated sugar cane
Responsibilities:	Conducting an Environment Impact Assessment and Preparation of an Environmental Impact Statement report for the development of a 150 hectares of irrigated sugar cane on the eastern boundary of Kaleya Sugar Estates in Mazambuka, Southern Province
Position:	Specialist - Occupational Health Safety and Environment
Sponsor:	Kaleya Smallholders limited
2011 – 2011:	Earth Environmental Consultants Limited
Project Name:	Independent hydro geological investigation
Responsibilities:	Conducting an Independent hydro geological investigation at Chambeishi Copper Smelter
Position:	Specialist Social, Economics and gender main streaming
Sponsor:	Chambishi Copper Smelter
2011 – 2011	Earth Environmental Consultants Limited
Project Name:	Dangote Cement Factory
Responsibilities:	Conducted a geotechnical investigations at the proposed new cement site in Ndola
Position:	Specialist - Occupational Health Safety and Environment
Sponsor:	Dangote Cement Factory



- 2011 - 2012**
Project Name: Silverest Civil Servants Housing complex
Responsibilities: Conducting an Environment Impact Assessment and preparation of an Environment impact assessment report for the housing complex in Chongwe district, Lusaka Province
Position: Specialist - Occupational Health Safety and Environment
Sponsor: Zambia Development Agency / China Henan December
- 2011 – 2011:**
Project Name: Kankoyo Gardens
Responsibilities: Carried out a research on the possibility of growing plants in Kankoyo township that is heavy polluted by sulphur dioxide from Mopani Copper Smelter
Position: Specialist - Occupational Health Safety and Environment
Sponsor: Mopani Copper Mine Plc
- 2006 – 2010**
Project Name: Zambia Interfaith Networking Group on HIV/AIDS (ZINGO)
Responsibilities: ZINGO Copperbelt Region,
 - In charge of all programmes ensuring that they are well planned and implemented
 - Responsible for resource management – both human and Financial
 - Maintain oversight of the project in the planning, implementation, monitoring and reporting of the project activities
 - Managing the technical aspect of the organization
 - Ensure timely submission of reports
 - Working as a residential counselor of the Faith Based organization on the copperbelt
 - Utilize leadership and authority in a consistent manner and in such a way as to reinforce the residential philosophy and program of the organization.
 - Planning, development, marketing and execution of all engagements including formation and capacity building of HIV/AIDS programmes for affiliate members.**Position** Regional Manager
Sponsor: Various Donors.
- 2003 – 2006**
Project Name: Cooperative League of the United States of America, CLUSA Zambia
Responsibilities: CLUSA /SHEMP copper belt project, Responsible for financial and personnel management and for supervising the accounting staff
 - Providing leadership to ensure that system and procedures in the area of financial and personnel management, management information systems and information technology are adhered to, closely monitored and are continually enhanced in order to support the continued growth and diversification of the program.**Position** Assistant Finance and Administration Manager



Sponsor:	USAID
2003 – 2003	Ranking Engineering Consultants
Project Name:	Finance and Administrative Assistant,
Responsibilities:	<p>Implement the policies and procedures as stated by management and ensure compliance so as to meet standards</p> <ul style="list-style-type: none"> • Making bank deposits, withdraws and liaison with the banking staff • Computation and preparation of salaries. • Organise, maintain, and manage office support services including transport, travel etc • Preparing and extracting of monthly financial accounts. • Developing systems of internal control for funds and company assets
Position	Finance and Administrative Assistant
Sponsor:	Ranking Engineering Consultants
2000 – 2003	CETZAM Opportunity Micro Finance Limited
Project Name:	CETZAM Copperbelt project,
Responsibilities:	<p>Conducting surveys to decide credit needs within the area of assignment</p> <ul style="list-style-type: none"> • Conducting surveys to decide the type and nature of business activity that will be sustainable and help alleviate poverty and create food security • Initiating client contact and arrange for initiation • Helping clients with applications including completion of financial analysis forms, collection of client-based data, verification of guarantee information, • Disbursing of funds obtain necessary signatories on contract, • Verify conditions and formalize relationships for approved loans • Follow up clients to ensure payment procedure • Offer training to client to ensure suitability and compliance • Officer consultancy and advisory services to clients and prospecting clients • Officer counseling to clients.
Position	Loan Officer
Sponsor:	CETZAM Opportunity Micro Finance Limited
1999-2002	Micmar Investments Ltd
Project Name:	Micmar Investments Ltd,
Responsibilities:	<p>Organizes maintain and manage offices of the copperbelt region and assist to consolidate inter branch accounts in the region.</p> <ul style="list-style-type: none"> • Responsible for monitoring stock levels, inters branch transfers and evaluation, determine reorder levels. • Preparation of Management Accounts and reporting to management. • Making bank deposits and liaison with the banking staff • Supervising sales cashier and casual staff • Preparing daily cash up sheet, reconciliation of sales invoices and the cashiers day taking
Position	Accounts Assistant



Sponsor: Micmar Investments Ltd

1997 – 1998 William. M. Masetlha foundation

Project Name: Banani International Secondary and Primary School,

Responsibilities: Maintenance of computerized accounting system and data – using pastel accounting and Microsoft works.

- Prepare regular internal accounting reports for management
- Maintenance of customer and suppliers accounts (Manual and computerized books)
- Making bank deposits and liaison with the banks
- Taking inventories and costing of various stocks
- Assist in the preparation of budgets
- Organise and maintain transport, travel and housing services

Position Accounts' Clerk.

Sponsor: William. M. Masetlha foundation

1994 –1996 Ranking Engineering Consultants

Project Name: Ranking Engineering Consultants,

Responsibilities: Computing and arranging of payments – VAT, PAYE and NAPSA
Maintenance of manual and computerized books of Accounts.
Liaison with co-operating partner

.Position Accounts' Clerk

Sponsor: Ranking Engineering Consultants

LANGUAGES:

English	-Very Good
Bemba -	Excellent
Njanja -	Very Good

Suzaan Alavian
Managing Director
Ranking Engineering Consultants
P.O. Box 50566
Lusaka
Cell: 0977770249

Mr Patson Zulu
Manager Northern Region
Zambia Environment Management Agency (ZEMA)
Corner Church and Suez Roads
P.O. Box 35131
Lusaka
Zambia,
Cell 0977470849



CURRICULUM VITAE

PERSONAL DETAILS

Name Charles M. PHIRI
Cell +260 966 100 841/977 760 469
E-Mail phiricharlie@gmail.com
Address Hillview Park, Chalala, Lusaka
Nationality Zambian

KEY QUALIFICATIONS

- Environmental and Social Impact Assessments (ESIA), Environmental Management Systems (Environmental Auditing and Monitoring); Contractor's Environmental and Social Management Planning, Health and Safety Management Planning, REDD+ Project Planning and Management,
- Community Based Natural Resources Management, Community Mobilisation, Community Livelihoods (Forestry, Water, Wildlife, Agriculture & Aquaculture) and Enterprise Development, Business Planning, and Development of Partnership models.
- Integrated Water Resources Management; Water, Sanitation and Hygiene Management Practices.

EDUCATION & QUALIFICATIONS

2019 (April) Certificate on Environmental and Social Risk Management for Environmental and Social Safeguards Development Practitioners

2018 (Dec) Training on Gender Based Violence, Preventing, Mitigating and Managing Social Risks in Infrastructure Projects, Lusaka, Zambia

2018 (June) Certificate on the World Bank Environmental and Social Framework, Lusaka, Zambia

2011 -2012: **Master's in Environmental Education**, Rhodes University, South Africa.

Key thematic areas included: 1) Educational Responses to Socio-ecological issues and risks, 2) Sustainability, Learning and Social Change, 3) Educational Quality, Quality of Life and Sustainability in the 21st Century, 4) Situated Learning and Learning in various educational settings, 5) Environmental Management and Integrated Water Resources Management, and 6) Sustainability Education Research.

My Master's Research thesis was on investigating community learning in integrated water resources management practices. The research was to develop a deeper understanding of community learning processes, participation structures and factors that influence learning in IWRM practices. Part of my research work was also reviewing the South African water legislation, policy and principles for water resources management (Water Act, Water Policy, and stakeholder participation platforms – Water User Associations, Water Management Authorities).

2000: **Integrated Watershed Management - Sweden and Tanzania**



Themes covered included among others, IWRM practices, Common Property Resources Management, Rainwater harvesting practices; Security and Gender concerns in water resources management; and Missing links to Water Management in the 21st century. Integrated Watershed Management, Environmental Information Management, Climate Change Adaptation & Risk Assessment; Ecology and Equity-key determinants for Sustainable Water Security; Stakeholder Analysis, Community Mobilization and Facilitation; and Conflict Resolution Skills in water resource disputes at local level.

1999: Natural Resources Management and Development (NRMD); Eastern and Southern African Management Institute (ESAMI) – Arusha, Tanzania

Areas covered include Concepts of Sustainable Development; Natural Resources Project Planning and Management; Water Resources Management, Forest Resources Management and Development; Monitoring and Evaluation; Economic Evaluation of Natural Resources, Environmental Impact Assessment of Development projects; Natural Resources Management & Development policy formulation; Institutional Framework and Gender Participation in water resources management.

1989 -1993: Bachelor of Science with Biology and Chemistry; University of Zambia – Lusaka, Zambia

WORK EXPERIENCE

2020 Sep – Date: Environmental Safeguard Expert – Improved Rural Connectivity Project (IRCP)/Road Development Agency (RDA)

The Improved Rural Connectivity Project (IRCP) is a World Bank funded project through the Road Development Agency (RDA) to rehabilitate, improve and maintain selected rural roads in all the 10 provinces of Zambia. Key responsibilities among others include:

- Provide overall policy and technical guidance and direction for safeguards issues under the project, as defined by the project's environmental and social safeguard instruments.
- Coordinate the timely preparation of Environmental Project Briefs (EPBs), Contractor's Environmental and Social Management Plans (C-ESMPs) and other environmental safeguard documents.
- To review among others Environmental and Health Safety (EHS policies and procedures, Health and Safety Management Plans (HSMPs), EPBs, C-ESMPs, and site specific EHS management plans to ensure compliance with established standards.
- Promote community participation during project implementation through sensitisation meetings.
- Support the contractor and supervising engineer in coordinating and providing safety training on appropriate health and safety matters as required by law.

2018 Jan – 2019 Dec: Environmental and Social Inclusion Officer – National, for Zambia Integrated Forest Landscape Project (ZIFLP)

The objective the project is to improve landscape management and increase environmental and economic benefits for rural communities in Eastern Province and to improve the recipient's capacity to respond promptly to environmental impacts of climate change or emergency. Key tasks included:

- Facilitating the implementation of the following frameworks - Environmental Social Management Framework (ESMF), Resettlement Process Framework (RPF), Process Framework (PF).



- Development of the Feedback & Grievance Redress Mechanism (FGRM)) for the project and ensure its implementation.
- Guide the preparation of the Strategic Environmental and Social Assessment including overseeing its preparation and ensuring quality of the final documents, consultations, etc. and its implementation for project activities as necessary.
- Reviewing of projects (current or future) in line with Environmental and Social Management Plans, Resettlement Action Plans and Livelihoods Support Plans.
- To liaise with relevant local authorities, local chiefs, relevant Provincial Government representatives on the implementation of environmental and social safeguards of the project.
- Support the community facilitators in the identification and appraisal of sub-projects and ensure the use of the environmental and social screening checklist of sub-projects for inclusion into the overall project design.
- Support and guide the preparation of local land-use plans and community natural resource action plans for REDD+ projects.
- Ensure the development of a gender strategy for the project, including overseeing the effective implementation of the strategy Gender Strategy development.
- Preparation of the ESMF Addendum and Contingency Emergency Response Component (CERC) Manual

2015 – 2017: Natural Resources Management and Livelihoods Development Advisor – Muchinga Province, for the Decentralised Forests and Other Natural Resources Management Program

The Decentralised Forest and other Natural Resources Management Programme (DFNRMP) with financial support from the Government of Finland was designed to set up an enabling framework, strengthen and operationalise devolved integrated sustainable forest and other natural resource management systems. The project operating in Muchinga and North-Western Provinces, was targeting forest dependent individuals and households including women, vulnerable groups and households living in extreme poverty. Forestry provided an entry point to achieve the development objective of the program relating to reducing poverty and inequality while improving environmental conditions through devolved integrated sustainable forest and other natural resources management. My tasks included among others:

- Promoting and supporting decentralized approaches for stakeholder participation at district and community level and facilitating the implementation of developmental and livelihood strategies to reduce unsustainable environmental practices, poverty and inequality among rural households
- Promoting sustainable approaches to improve the environment and reduce forest and land degradation through unsustainable land use practices through integrated natural resources management such as forestry, agroforestry, reforestation, agriculture, aquaculture and water catchment management practices;
- Ensure networking and cooperation with district and sub-district stakeholders such as WDCs, CBOs regarding project activities.
- Supporting local communities to develop local enterprises based on sustainable use of forests and other natural resources (wildlife, water, agriculture and aquaculture) that provides an opportunity for promoting local economic development and providing an economic incentive to conserve forests through sustainable management practices.
- Mobilizing local communities including traditional leaders to promote community forest areas for the devolution of control, use and management rights and responsibilities over forest resources to local communities.
- Capacity building of district staff and local communities with skills in enterprise development, planning, resource management, resource mobilization and project management to promote



socio-economic development of the producer communities in order to reduce poverty and improve income generation at household level.

2012 - 2014 Environmental Management and Climate Change Consultant for RuralNet Associates Limited

As an Environmental and Climate Change Consultant my tasks areas included among others;

- Land tenure systems; Environmental Management, Land information systems and GIS; natural resources inventories; Natural resource use planning; Natural resources legal frameworks; Promotion of Forestry and Agroforestry management practices; Vulnerability assessments to climate change; Adaptive capacity to climate change; and designing of projects for climate change adaptation.
- Conducting environmental impact assessments, undertaking biodiversity inventories and providing evidence of major threats to biodiversity and proposing practical actions to improve status quo or reduce threats of selected biodiversity groups. Undertaking vulnerability assessments for biodiversity to climate change and adaptive capacities, and development of capacities in biodiversity monitoring and establishment of biodiversity observatories in representative habitats
- Coordinated a consultancy on Technology Needs Assessment (TNA) for Zambia for climate change adaptation. This involved the prioritization of technologies for reducing the country's vulnerability to climate change hazards.

2009-2010 Assistant Coordinator (NRM and Training) – Regional CBNRM Project - Zimbabwe: Funded by WWF NORWAY and USAID

Assistant Coordinator for Natural Resources Management and Training under the Regional Community Based Natural Resources Management (CBNRM) capacity Building programme for Southern Africa. Tasks involved conducting training in adaptive management tools for community-based projects (IWRM, WASH projects) and identifying best practices in all SADC countries.

2005-2008: Project Technical Manager – Lower Zambezi Demonstration Site for the GRZ/UNDP/GEF Funded Reclassification and Effective Management of National Protected Area Systems Project in Zambia

The main purpose of the project was to strengthen the enabling frameworks for managing the National Protected Areas System and biodiversity in Zambia. My tasks were focused on the development of management partnerships and capacities of the stakeholders especially that of local communities that contribute to socio-economic development and rural development through sustainable management of natural resources. The tasks also involved the development of the management and land use plans for biodiversity conservation through participatory approaches.

1999-2004: Natural Resources Senior Inspector/Chief Technical Advisor-Counterpart under Environmental Council of Zambia: Funded by Royal Dutch Government

Chief Technical Advisor Counterpart for the Natural Resources Monitoring Unit under Environmental Council of Zambia, now ZEMA. The unit with funding from the GRZ and Royal Netherlands Government was established among others to provide audit monitoring, developing cost-effective monitoring methodologies for stakeholders involved in natural resources management, build capacities among



institutions involved in natural resources management and advising Government on issues related to NR management.

1996-1999: Senior Research Officer (National Parks and Wildlife Services) – Chilanga

My tasks involved supervising all ecologists under the department and coordinating all research work in all wildlife estates (Parks and GMAs) including promoting CBNRM in GMAs. Coordinating surveys/inventories and animal hunting quotas in Zambia. Executing international agreements like the Convention on Biological Diversity (CBD), Convention in International Trade in Endangered Species of Wild Flora and Fauna (CITES).

1994-1994: Wildlife Biologist (National Parks and Wildlife Services) – Chilanga

My tasks involved undertaking surveys in the Lower Zambezi ecosystem and promoting co-management of wildlife resources with local communities in Game Management Areas. Spearheading the development of Land Use and General Management Plans for Wildlife Protected Areas.

CONSULTANCIES

- 2019 Sub-Consultant** for the TRALARD GCF for the Institutional and Stakeholder Analysis; A review of key agencies, Government departments and stakeholders.
- 2019 Ecologist (Fauna and Flora) for Rankin Engineering Ltd;** for the Development of the Environmental and Social Impact Assessment (ESIA) study for the development of a Small Hydro-Power Plant in Mpika district, Muchinga Province.
- 2018 Lead Consultant for DH Engineering Consultants Ltd:** Development of the Environment Impact Statement (EIS) and Resettlement Action Plan (RAP) for Mixed Use Development by NAPSA along Twin Palm area in Chongwe District of Lusaka Province
- 2018 Lead Consultant for DH Engineering Consultants Ltd:** Development of the Environment and Social Impact Assessment for the development of a Hotel and Golf Course in the Mosi-oa-Tunya National Park in Livingstone, Southern Province by Legacy Holdings Limited
- 2016 Lead Consultant for DH Engineering Consultants Ltd:** Feasibility study and Environmental and Social Impact Assessment for the development of a Solar Power Plant for the Michael Chilufya Sata Foundation in Mpika District, Muchinga Province
- 2016 Lead Consultant for DH Engineering Consultants Ltd:** Feasibility study and Environmental and Social Impact Assessment for the development of a Solar Power Plant for Buffalo Energy in Sesheke District, Western Province
- 2016 Lead Consultant for SMEC Zambia:** Environmental and Social Impact Assessment for the construction of the bridge on Lwela River in Luapula Province for Roads Development Agency including development of the Resettlement Action Plan



- 2016** **Lead Consultant for DH Engineering Consultants Ltd;** for the development of an Environmental and Social Impact Assessment Study for the Limulunga-Lukulu Road project (102 Km) in Western Province of Zambia for the Road Development Agency.
- 2015** **Wildlife (Mammal) expert for NIRAS Zambia** on the review and upgrading of the National Biodiversity Strategy Action Plan (NABSAP) for Zambia on behalf of the Ministry of Lands, Natural Resources & Environmental Protection.
- 2015** **Lead Environmental and Social Consultant for DH Engineering Consultants Ltd** for the development of an Environmental and Social Impact Assessment Study for the Mporokoso to Kaputa and Nsumbu Road Project via Mutundu gate (220 Km) in Northern Province of Zambia for the Road Development Agency. Conducted scoping meetings, prepared TORs and supervised baseline studies in Mporokoso, Nsama and Kaputa districts of Luapula Province including the development of a Resettlement Action Plan (RAP).
- 2014** **Environmental Consultant for International Development Enterprise (IDE) Zambia,** for the environmental appraisal and climate change analysis of the proposed Small Holder Agricultural Reform through Enterprise Development (SHARED) Project. Assignment was to undertake an environmental appraisal of the Small Holder Agricultural Reform through Enterprise Development in Southern, Central, Copperbelt & Eastern Provinces of Zambia. Activities included undertaking impact assessment of the proposed SHARED project activities on the environment including developing an Environmental and Social Management Plan (ESMP).
- 2013** **Lead Climate Change Consultant for Oxfam Zambia** study to establish baseline values for the Water Resources Management program indicators that will be used to measure overall impact of the program in Kazungula and Namwala Districts. Study also included sustainable WASH activities in Kazungula and Namwala districts
- 2010** **Ecologist for Ranking Engineering (Z) Ltd** for the preparation of an Environmental Impact Statement for the Kazungula Bridge project between Zambia and Botswana.
- 2008** **Assistant National Consultant** for the Ministry of Environment and Natural Resources for the development of an Environmental Policy for Zambia. Conducted scoping meetings and interviews in Southern Province (Monze, Gwembe, Namwala, Choma and Kalomo districts) which was analyzed and compiled a district profile report for environmental policy development.

Papers

1. Rehabilitation of the Brahim and Matipa water catchment areas in Nakonde district of Muchinga Province, Zambia, for promoting sustainable rural livelihoods (2016)
2. Community Learning in Integrated Water Resources Management: A Case of Cata, Eastern Cape, South Africa (2012) (*extract of master's thesis*)
3. Community-based Integrated Water Resources Management amongst communities in Bangweulu swamps, Zambia and Morogoro in Tanzania that promote sustainable hygiene practices (2000).



Membership and Affiliations

1. Impact Assessment Association of Zambia
2. National Safeguards Technical Working Group - Zambia
3. Zambia Community Based Natural Resource Management Forum
4. Global Water Partnership (GWP)
5. UNU Regional Centre for Expertise in Environmental Education for Sustainability
6. Zambia Climate Change Network

Computer Literacy

- 1.
2. Micro-soft Office, internet & e-mail services, statistical programs like SPSS & MS Excel

Referees

Ms. Guni Kokwe	Consultant, Sanga Consultant Ltd, Lusaka, Zambia, Cell: +260 977 771 2 24, email: gmickelskokwe@gmail.com
Ms. Ethel Mudenda	Provincial Project Operations Officer, TRALARD Project, Northern Province, Kasama. Cell: +260 965713936/0967456067; email: ethelsibajene@gmail.com
Dr. Victor Siamudaala	Director, World Fish Centre, Lusaka, Cell: +260 966 701 239, Email: siamudaalavictor62@gmail.com

POSITION: Specialist Education, Social & Economic
NAME OF FIRM: Earth Integrated Environmental Consultants
NAME: Vincent Mwape Kapundu
NATIONALITY: Zambian
DATE OF BIRTH: 19th July, 1973
SEX: Male
MARITAL STATUS: Married
ADDRESS: P.O. Box 33292
 Kitwe, Zambia
TELEPHONE 0966-576604
EMAIL Vincentkapundu@yahoo.co.uk

ACADEMIC QUALIFICATION

2005- 2009	Degree in Development Studies - University of Zambia
2000	Certificate in General Principals of Law University of Zambia
2000	Certificate of Training in Paralegal work: March 2000
1997- 1997	National Vocational Qualification in Accounting Level 2
1996 -1996	ACCA – Zamin College
1989 – 1993	General School Certificate - Matero Boys Secondary School



EMPLOYMENT HISTORY

1997 – 1997: Matero Boys Secondary School
Responsibilities: Receipting Cash for exam and school fees
Position: Bursar
Sponsor: Matero Boys Secondary School

1997 1997: Project San Francisco
Project Name: HIV Aids Research and Counselling Centre
Responsibilities: Payment and Verification of Bills, Bank reconciliations of Kwacha and Dollar Accounts, Preparing of monthly Income and Expenditure Reports, Preparing the payroll and all tax returns, Preparing bi-monthly financial management reports for the head office in the United States of America
Position: Senior Finance and Administration Officer
Sponsor: San Francisco University- USA

2000 – 2005: Legal Resources Foundation Kitwe
Project Name: Human Rights support
Responsibilities: Providing free legal advice to the poor and underprivileged
 In charge of the Copperbelt prisons program for Refugees, Asylum seekers and over detained suspects and convicts, General office administration, Advocating for a Human Rights Culture through Community mobilization and sensitization, Managing a computerized case tracking system and register, Coordinating activities with stakeholders such as the Victim Support Unit (VSU), Permanent Human Rights Commission (PHRC) and the Young Women’s Christian Association (YWCA) among others
Position: Paralegal
Sponsor: Legal Resources Foundation

2011 – 2011: **Earth Environmental Consultants Limited**
Project Name: Kankoyo Gardens
Responsibilities: Carried out a research on the possibility of growing plants in Kankoyo township that is heavy polluted by sulphur dioxide from Mopani Copper Smelter
Position: Education, Social & Economic
Sponsor: Mopani Copper Mine Plc

2011 – 2011: **Earth Environmental Consultants Limited**
Project Name: Independent hydro geological investigation
Responsibilities: Conducting an Independent hydro geological investigation at Chambeishi Copper Smelter
Position: Specialist Education, Social & Economics
Sponsor: Chambishi Copper Smelter

2012 – 2012 **Earth Environmental Consultants Limited**
Project Name: Expansion of 150 hectares of irrigated sugar cane



Responsibilities: Preparation of environmental impact statement for the development of a 150 hectares of irrigated sugar cane on the eastern boundary of Kaleya Sugar Estates

Position: Specialist Education, Social & Economics

Sponsor: Kaleya Smallholders limited

2011 – 2011 Earth Environmental Consultants Limited

Project Name: Wada Chovu Filling Station

Responsibilities: Conducted an Environmental Project Brief of the proposed Wada Chovu Filling Station in Luanshya. The project involves digging of the tank farm, installation of tanks, pumps and the canopy.

Position: Specialist Education, Social & Economics

Sponsor: Wada Chovu limited

2011-2011 Earth Environmental Consultants Limited

Project Name: Sulphur cleanup and soil restoration

Responsibilities: Cleaned 30 tonnes of sulphur that spilled on the Kitwe Ndola Highway and conducted a soil remediation on the contaminated site

Position: Specialist Education, Social & Economics

Sponsor: Earth Organisation Zambia

2011 - 2012 Earth Environmental Consultants Limited

Project Name: Silverest Civil Servants Housing complex

Responsibilities: Preparation of an Environment impact assessment for the housing complex in Chongwe district

Position: Specialist Education, Social & Economics

Sponsor: Zambia Development Agency / China Henan December

2011 – 2011 Earth Environmental Consultants Limited

Project Name: Dangote Cement Factory

Responsibilities: Conducted a geotechnical investigations at the proposed new cement site in Ndola

Position: Specialist Education, Social & Economics

Sponsor: Dangote Cement Factory

2013- 2013 Earth Environmental Consultants Limited

Project Name: Luhang Stone Zambia Ltd

Responsibilities: Preparation of an Environmental Project Brief (EPB) for the construction of a quarry facility in Chilanga of Lusaka Province.

Position: Specialist Education, Social & Economics

Sponsor: Luhang Stone Zambia Ltd

2014- 2014 Earth Environmental Consultants Limited

Project Name: Kaoma Quarries



Responsibilities: Preparation of an Environmental Project Brief (EPB) for the construction of a quarry Facility in Kaoma of Western Province of Zambia.

Position: Specialist Education, Social & Economics

Sponsor: Kaoma Quarries Ltd

2014 – 2014 **Earth Environmental Consultants Limited**

Project Name: Independent Environmental Audit for Chambishi Copper Smelter.

Responsibilities: carrying out an independent environmental audit, works included reviewing relevant documents, conducting site visit and interviews at the smelter and submitting a draft and final report. The objective of the audit was to evaluate the status of the environmental management system and compliance to the Environmental Impact Assessment of the Copper Smelter project.

Position: Specialist Education, Social & Economics

Sponsor: Chambishi Copper Smelter (CCS),

2014- 2014 **Earth Environmental Consultants Limited**

Project Name: Sharpco Steel rebar manufacturing plant

Responsibilities: Conducted an Environmental Project Brief for the proposed steel rebar manufacturing plant in Lusaka. The project involved assessing potential impacts of scrap metal processing into steel bars.

Position: Specialist Education, Social & Economics

Sponsor: Sharpco Co. Ltd

2014 – 2015 **Earth Environmental Consultants Limited**

Project Name: Luombe Farm, development 456 hectares of irrigated farm,

Responsibilities: Preparation of an Environmental Social Impact Statement for the development of 456 hectares of irrigated farm at Luombe farm in Northern Province.

Position: Specialist Education, Social & Economics

Sponsor: Olam International Zambia Ltd

2013 - 2015 **Earth Environmental Consultants Limited**

Project Name: Magnias Catering Limited hotel and restaurant

Responsibilities: Preparation of an Environment Impact Assessment on the construction of a single story hotel building and restaurant near the Simon MK International Airport, in Ndola.

Position: Specialist Education, Social & Economics

Sponsor: Magnas Catering Limited

2015 – 2015 **Earth Environmental Consultants Limited**

Project Name: CCS Air and soil monitoring project

Responsibilities: Carrying out site environmental surveys including air and soil surveys on and around Chambishi Copper Smelter (CCS) Plant, Works included surveys of the entire area, including wind direction, upstream and downstream of the stack

Position: Specialist Education, Social & Economics



Sponsor: Chambeshi Copper Smelter CCS

2014 - 2015 - **Earth Environmental Consultants Limited**

Project Name: Kasama fish farm project

Responsibilities: Preparation of an Environmental Project Brief for the proposed development of Aquaculture fish ponds off the Luombe River in Kasama.

Position: Specialist Education, Social & Economics

Sponsor: Kalungwishi Estate ltd



SURNAME: Sakala Mr.

FIRST NAME: Timothy

MIDDLE NAME: Phillemon

Address for correspondence:

Margam Valley Farm Ltd

P O Box 260270

Plot 2556

Off Chingola Kalulushi Road

Kalulushi

Place of Birth: Petauke, Zambia.

Date of Birth: 14th July, 1967.

Nationality: Zambian

Marital Status: Married

ACADEMIC & PROFESSIONAL RECORDS

ACADEMIC QUALIFICATIONS

Name of Institution	Dates of Attendance	Qualification Obtained	Field of Study
The University of Zambia - Great east Road Campus, Zambia.	1994 - 2000	Bachelor of Science Degree in Agriculture - Majored in Crop sciences.	Agriculture
AVRDC - World Vegetable Centre. Arusha, Tanzania.	7 th July - 7 th November 2003	Post Graduate Diploma certificate in Vegetable crop production and research.	Specialisation in Vegetable production, Utilisation and research.
Copperbelt Secondary Teachers College, Kitwe.	Jan 1990 - December 1991	Secondary School Teacher's Diploma	Secondary School Mathematics



PROFESSIONAL TRAINING

Name of Institution	Dates of Attendance	Type of Training attended	Sponsoring Agency
In-Service Training Trust (ISTT) at NRDC	17 th Jan - 4 th February 2005	High Value Crop Management	Africa Development Bank (ADB)
In-Service Training Trust (ISTT) at NRDC	6 th - 17 th September 2004	Entrepreneurship Development Promotion	Africa Development Bank (ADB)
In-Service Training Trust (ISTT) at NRDC	1 st - 12 th March 2004	Training of Trainers Course in Participatory Methodologies	Africa Development Bank (ADB)
AVRDC - World Vegetable Centre (mobile training held at Monze College of Agriculture)	11 th - 16 th November 2002	Vegetable Crop Production and Utilisation	UNICEF
World Vision Zambia (RAPIDS)	September 2005	Intensive Psychosocial Care & Support Training	USAID
World Vision Zambia (RAPIDS)	June 2005	Training of Trainers workshop in Strengthening Community-Led Care for OVCs.	USAID
World Vision Zambia (RAPIDS)	5 th - 8 th June 2005	Program Management and Evaluation Training	USAID
The AIDS Support	6 th - 31 st August 2007	Experiential Attachment to Combat	Swedish International



Organization (TASO) Uganda.		HIV/AIDS Projects.	-	Development Agency (SIDA)
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A. EMPLOYMENT RECORD

Date of Employment	Name of Employer	Positions held	Responsibilities (Summary)
31 st January 2001 - 30 th May 2005	Ministry of Agriculture and Cooperative	Senior Agriculture Office	Coordinate and provide management of Extension Services for agricultural Livelihood programmes of this Ministry in Mazabuka District.
1 st June 2005 - 16 th November 2007	World Vision Zambia (RAPIDS)	Project Officer - Agriculture Livelihood, Youth & Sub Grants.	To coordinate and provide technical support at National Level for all the 19 WVZ RAPIDS participating districts in the fields of Agriculture Livelihood, Youth & Sub Grants.
16 th November 2007 to 2010	Margam Valley Farm Ltd	Partner and Farm Manager	Provide management at the Farm, exploit opportunities and increase company's profits from Commercial Agricultural activities.
February 2011 to November 2011	Earth Environmental Consultants Limited	<i>Specialist Agriculture and Ecological Studies</i>	Research on the possibility of growing plants in Kankoyo Responsibilities:
2012 - 2013	Earth Environmental Consultants Limited	<i>Specialist Agriculture and Ecological Studies</i>	Preparation of an Environment Impact Assessment for the construction of the Copperstone University Campus - in Luanshya along the Kitwe Ndola Dual Carriage way.



2013 - 2015	Earth Environmental Consultants Limited	<i>Specialist Agriculture and Ecological Studies</i>	Preparation of an Environment Impact Assessment on the construction of a single story hotel building and restaurant near the Simon MK International Airport, in Ndola
2011 - 2012	Earth Environmental Consultants Limited	<i>Specialist Agriculture and Ecological Studies</i>	Preparation of environmental impact statement for the development of a 150 hectares of irrigated sugar cane on the eastern boundary of Kaleya Sugar Estates
2011 - 2011	Earth Environmental Consultants Limited	<i>Specialist Agriculture and Ecological Studies</i>	Preparation of an Environmental Project Brief of the proposed Filling Station in Luanshya.
2014 - 2015	Earth Environmental Consultants Limited	<i>Specialist Agriculture and Ecological Studies</i>	Preparation of an Environmental Project Brief for the proposed development of an Aquaculture fish ponds

B. REFEREES

I. Mrs Dimuna Moomba Mwanza

Regional Manger
World Vision Zambia
Plot 50/51, Great East Road.
Lusaka.
Cell: +260 977 638 110
E-mail: dimuna_moomba@wvi.org

II. Mr. Grey Mwale

Senior Cooperatives Officer
Ministry of Agriculture and Cooperatives
Lusumpuko House,



Choma.
Cell: +260 977 757 760
Email: mwalecg@yahoo.co.uk

III. Mr Lovemore Nkhoma
Former Deputy Ops Manager
WVZ RAPIDS
Cell: +260 977 871 150



Appendix B – Preliminary List of Supporting Information



A preliminary list of supporting information to be used in the preparation of the ESIA report will include:

- i. Maps showing the project area;
- ii. Photographs;
- iii. Tables;
- iv. Graphs;
- v. Signed lists of meeting attendees;
- vi. Minutes of meetings;
- vii. Company permits and certificates;
- viii. CV's of each member of the EIA team and any questionnaires to be used for preparing the report and
- ix. Any other relevant documents.