ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

REVITALISATION AND CLIMATE PROOFING OF SEVEN SMALLHOLDER IRRIGATION SCHEMES UNDER LOT 2 IN MASVINGO PROVINCE, ZIMBABWE

Building Climate Resilience of Vulnerable Agricultural Livelihoods in Southern Zimbabwe

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APPROVAL

This Environmental and Social Management Plan was prepared for the construction and revitalization of seven irrigation schemes in Masvingo Province under the Project "**Building the climate resilience for vulnerable agricultural livelihoods in Southern Zimbabwe"** has been approved by the Ministry of Lands, Agriculture, Fisheries, Water and Rural Development and by the consultant, Ascon Africa in association with WAPCOS.

APPROVED BY PROJECT PROPONENT

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Public Consultation/Disclosure Notice

Date: 01 March 2023

The United Nations Development Programme (UNDP) is requesting feedback on the attached draft Environmental and Social Management Plan for this project.

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The last date for receiving of comments is 30 March 2023

EXECUTIVE SUMMARY

ES 1: Project Introduction

The Government of Zimbabwe through the Ministry of Lands, Agriculture, Fisheries, Water and Rural Development (MLAFWRD) in partnership with the United Nations Development Programme (UNDP) is implementing a seven-year project **"Building the climate resilience for vulnerable agricultural livelihoods in Southern Zimbabwe".** The Project (Activity No, FP127) aims to strengthen the adaptive capacities of vulnerable smallholder farmers, especially women, to climate change induced impacts on their agro-ecosystems and livelihoods through revitalization and climate proofing of 21 irrigation schemes, upgraded water and soil moisture management and water use efficiency, climate-resilient agriculture, improved access to climate information and markets, and partnerships with public and private sector actors. The project is targeting the revitalization of 15 existing irrigation schemes and the establishment of 6 new schemes in 15 priority districts of Manicaland, Masvingo and Matabeleland South Provinces.

The irrigation schemes have been classified into three lots, namely lot 1, 2 and 3. Each lot is defined by a specific hydrological catchment with similar biophysical and socio-economic characteristics. Lot 1 consist of three irrigation schemes and all are situated in Matabeleland South Province. Lot 2 consist of 7 irrigation schemes and all are situated in Masvingo Province. Lot 3 consist of 5 irrigation schemes and all are situated in Manicaland Province. The other 6 alternative schemes (presumably lot 4) are still yet to receive GCF approval. These are alternative schemes that no longer conformed to the GCF selection criteria between the project design phase in 2016 and the project implementation phase in 2020.

A site-specific Environmental and Social Management Plan (ESMP) was prepared for each of the 7 irrigation schemes under Lot 2. A review of the 7 ESMPs show that the reports largely share the same content particularly on legal and policy framework, baseline biophysical and socio-economic setting, anticipated environmental and social impacts, proposed environmental and social management measures, grievance redress mechanisms, etc. This is because Lot 2 schemes are situated in the same hydrological catchment with similar biophysical and socio-economic characteristics. Based on this, it was therefore logical to prepare a consolidated ESMP for the 7 irrigation schemes to ease the review process.

This ESMP is therefore a consolidation of the site specific ESMPs of the 7 irrigation schemes under Lot 2. Of the 7 schemes, 4 are existing schemes which are targeted for revitalisation and climate proofing, while the remaining 3 are new schemes which will be constructed and climate proofed. The existing schemes are Nyahombe, Pikinini-Jawanda, Chizumba and Bindamombe while Rusununguko, Zvinyaningwe and Bwanya are new schemes. All the irrigation schemes under Lot 2 are situated in Masvingo Province and have a total net irrigated area of 640.6 hectares (ha). The proposed area is prone to climate hazards such as frequent and prolonged dry spells, cyclone induced flash floods and extremely high temperatures.

ES 2: Sub-project description

This section provides brief details particular to each irrigation scheme in terms of location, water source as well as revitalisation and climate proofing interventions proposed.

- **Chizumba Irrigation Scheme:** The scheme is situated in Ward 7, Mwenezi District, Masvingo Province. The scheme has a net irrigated area of 85 hectares (comprising of 20ha extension under

pivot/sprinklers + 45ha existing under drip - to be supported by constructing additional PV solar system to power drip + 20ha existing surface system - to be supported with training and other water scheduling technologies). Climate proofing of the scheme will be achieved through: (1) installation of a highly efficient center pivot system coupled with a semi-portable sprinkler system on the area targeted for extension, (2) extending PV solar field for the existing section under drip irrigation and (3) installing soil moisture sensors for the 20ha on the existing surface system. Hydroelectricity shall be used to power the irrigation scheme, and there is also an opportunity to put in place a hybrid energy supply at the main booster pump station, whereby solar and grid electricity can be connected as a hybrid system. The water source is Manyuchi Dam. Water allocations and commitments in the dam leave more than enough water for meeting Chizumba irrigation water needs. The topography is suitable for the selected hybrid method of irrigation. The geo-technical and soil surveys show that land is irrigable and the soils are suitable for crop production. The cost of the system is estimated at US$720,157.44 for the 74ha which translates to about $9731.85 per hectare.

- **Zvinyaningwe Irrigation Scheme:** Zvinyaningwe irrigation scheme is a new scheme with a net irrigated area of 46 hectares (ha). The scheme is located approximately 65km west of the City of Masvingo off Masvingo-Zvishavane Road at UTM Zone 36 coordinates 238462.95m E and 7793963.65m S. Climate proofing of the scheme will be achieved through installation of a semi-portable sprinkler irrigation system. Hydroelectricity shall be used to power the irrigation scheme. Water supply to the scheme will be drawn directly from Muzhwi dam using four submersible pumps. A floating pontoon/barge pumping station will be installed as an intake facility for the scheme. The topography of the area is suitable for the selected method of irrigation. The geo-technical and soil surveys show that land is irrigable and the soils are suitable for crop production. The cost of the system is estimated at US$591,001.75 for the 46 ha which translates to about $12847.86 per hectare.
- **Nyahombe Irrigation Scheme:** The scheme is located in Ward 27, Chivi District, Masvingo Province. The scheme has a net irrigated area of 99.8ha. Climate proofing of the scheme will be achieved through the installation of a highly efficient center pivot system. Hydroelectricity shall be used to power the irrigation scheme. The scheme will be supplied with water from Tugwi Mukosi Dam. Water allocations and commitments in the dam leave more than enough water for meeting Nyahombe irrigation water needs. The topography is suitable for the selected hybrid method of irrigation. The geo-technical and soil surveys show that land is irrigable and the soils are suitable for crop production. The cost of the system is estimated at US$1,063,202.69 for the 99.8 ha which translates to about $10653.33 per hectare.
- **Pikinini-Jawanda Irrigation Scheme:** The scheme is situated in Ward 4, Mwenezi District, Masvingo Province and has a net irrigated area of 156ha. Climate proofing of the scheme will be achieved through the installation of a highly efficient centre pivot system coupled with a semi-portable sprinkler system in areas that fall out of the circle coverage of the centre pivot. The percentage of area under centre pivot will be 40% while 60 % will be under a semi- permanent sprinkler system. At this scheme, water will be withdrawn from Manyuchi dam using four submersible pumps. A floating pontoon/barge pumping station will be installed as an intake facility for the scheme. Hydroelectricity shall be used to power the irrigation scheme. The Scheme targets about 300 farmers. The geo-technical and soil surveys show that land is irrigable and the soils are suitable for crop production. The average plot size shall be 0.5ha. The total cost of the scheme is USD 1,565,591.13 which translates to $10035.84 per ha. The topography is suitable for the selected hybrid method of irrigation.
- **Bindamombe Irrigation Scheme:** The scheme is an existing scheme located in Ward 18, Chivi District, Masvingo Province. It has a net irrigated area of 38.8ha. About 300 are plot beneficiaries. Each farmer

has a plot size of 0.1ha. The scheme is currently not functional as water was no longer reaching the field. Climate proofing will be achieved through implementing the following interventions:

- Water will be pumped directly to the field by coupling the existing gravity and pressure mains with a 105m long pipeline. It is also checked that the capacities of the installed pumps support direct pumping.
- Some ancillary equipment viz., tripod complete set with riser pipe and sprinklers, garden taps and new hoses will be provided to all the farmers.
- A 45KW solar system is also proposed as a hybrid power system to reduce incidences of power outage.
- The cost of rehabilitation works of the scheme is estimated at US$242,817.00 for the 34ha which translates to about $7141.67 per hectare

- **Rusununguko Irrigation Scheme:** The scheme is a new scheme situated in Ward 11, Bikita District, Masvingo Province. The scheme has a net irrigated area of 59ha. Climate proofing of the scheme will be achieved through the installation of a highly efficient semi- portable sprinkler system. Hydroelectricity shall be used to power the irrigation scheme. There is also an opportunity to put in place a hybrid energy supply at the main booster pump station, whereby solar and grid electricity can be connected as a hybrid system. The cost of the system is estimated at US$696,563.61 for the 59 ha which translates to about $11806.16 per hectare. The water source for the scheme is a proposed weir across Mungezi river at UTM coordinate 340631.78 m E and 7798338.11 m S that get releases from Matezva Dam. The water allocations and commitments in the dam leave more than enough water for meeting Rusununguko irrigation water needs. The topography is suitable for the selected method of irrigation. The geo-technical and soil surveys show that land is irrigable and the soils are suitable for crop production.
- **Bwanya Irrigation Scheme:** The scheme is a new scheme situated in Ward 3, Chivi District, Masvingo Province. The scheme has a net irrigated area of 156ha. Climate proofing of the scheme will be achieved by the installation of a highly efficient center pivot system coupled with a semi-portable sprinkler system. Hydroelectricity shall be used to power the irrigation scheme. The water source is Muzhwi Dam which was constructed as part of the water supply system for the sugarcane production in the Lowveld in 1991. The topography is suitable for the selected hybrid method of irrigation. The geo-technical and soil surveys show that land is irrigable and the soils are suitable for crop production. The cost of the system is estimated at US$1,607,112.25 for the 156ha which translates to about $10 302 per hectare.

ES 3: Legal and Technical Basis for the ESMP

As stipulated in the ESMF, the sub-project was screened for potential environmental and social risks in line with national environmental impact assessment guidelines (1997) as well as UNDP's Social and Environmental Standards using the environmental and social screening procedure. In addition, the sub-project activities were also screened against the "negative list" or "exclusion list" provided in the ESMF. This initial environmental and social screening resulted in the development of an environmental and impact assessment prospectus for the sub-project. Upon review of the EIA prospectus by the Environmental Management Agency, the sub-project was categorised as a moderate risk, and the preparation of the ESMP was required. Moreover, the sub-project does not fall within the negative or exclusion list stipulated in the Project ESMF.

To comply with national requirements as well as GCF and United Nations Development Programme Social and Environmental Requirements, the Ministry of Lands, Agriculture, Fisheries, Water and Rural Development

(MoLAFWRD) engaged Wapcos (Private) Limited to assess the environmental and social impacts of the proposed sub-project and prepare an Environment and Social Management Plan (ESMP). The ESMP was produced as per the requirements of Environmental Management (Environmental Impact Assessment and Ecosystem Protection) Regulations, SI 7 of 2007 and in fulfilment of the requirements of the Environmental Management Act (CAP 20:27) – First Schedule (Section 2 and 97) under the "Prescribed Activities". Internationally, United Nations Development Programme's Social and Environmental Standards (2015 Policy) were used. The centrality of human rights, gender equality and women's empowerment and environmental sustainability were considered throughout the course of sub-project development. The Human rights principle and the five project-level safeguards standards were triggered, and these include:

- Principle 1: Human rights
- Standard 1: Biodiversity conservation and sustainable natural resources management
- Standard 2: Climate change mitigation and adaptation
- Standard 3: Community health, safety and working conditions
- Standard 4: Cultural heritage
- Standard 7: Pollution prevention and resource efficiency

ES 4: Legal and Policy Framework

The design, implementation, operation and management of irrigation schemes shall be done in compliance with national and international legislations, rules, regulations, standards, treaties, conventions, policies, plans and strategies that exist to govern the development of irrigation schemes in Zimbabwe. This helps to ensure that projects are developed in a socially acceptable, environmentally sound, technically possible and economically viable manner. The legal and policy framework governing have been identified. The relevant legislation include the Environmental Management Act (Chapter 20:27), Water Act (Chapter 20:24), Public Health Act (Chapter 15:17), Labour Act (28:01), Forestry Act (Chapter 15:09), Parks and Wildlife Act (Chapter 20:14), Traditional Leaders Act (Chapter 29:17), Farm Feeds, Fertilizer and Remedies Act (Chapter 18:12), Factories and Works Act (14:08), Rural District Councils Act (Chapter 29:13), The Communal Lands Act (Chapter 20:04) and their applicable regulations. Relevant national policies include the Zimbabwe National Gender Policy (2017-2022), National Occupational Health and Safety Policy (2014), climate change policy (2017), Zimbabwe National Climate Change Response Strategy (2014), Zimbabwe National Environmental Policy (2009), etc.

ES5: Environmental and Social Assessment Methods

Environmental and social impacts were identified through several methods which include screening checklist, stakeholder consultation, literature review, safety data sheets and professional judgement. An impact risk analysis was undertaken using the UNDP Risk Assessment Matrix stipulated in the ESMF to assess the probability and the impact of the risk. From this, a significance value was attributed to the potential impact (Low, medium, high). Appropriate measures to manage the identified impacts were selected following the mitigation hierarchy. Moreover, an analysis of alternatives for the proposed sub-project was conducted with respect to site location, technology (irrigation system), water and energy source and do-nothing alternatives. These alternatives were subjected to multiple criteria evaluation ranging from environmental, economic, social and climate risk.

ES 6: Anticipated Environmental and Social Impacts

The development of the schemes is slated to engender significant positive impacts on food production, climate resilience, employment, economic development, livelihoods and quality of life. Good harvests improve their economic status and livelihoods. Marketing and climate smart crop value chain will come with economic expansion and diversification that would lead to stimulation of economic development. The local economy would be improved. There would be creation of employment to a number of people in the targeted area. There would be improved public accessibility to health and education, knowledge and skills enhancement of agriculture related activities, information exchange and strengthened social capital. That kind of development promotes women and youth empowerment. There will also be increased resilience and improved well-being of vulnerable beneficiaries. With proper management, the scheme would notably promote good governance.

Despite these positives, the sub-project is also likely to bring some negative environmental and social risks. Biophysical negative impacts include water pollution, water depletion; biodiversity loss; waterlogging; degradation of air quality; land pollution, soil erosion, noise and vibration, sedimentation and siltation of rivers, etc. The anticipated social risks include conflicts during plot allocation; poor labour conditions; health and safety incidents; increased crime rates; sexual exploitation, abuse and harassment (SEAH); prevalence of Sexually Transmitted Infections; HIV and AIDS; water borne diseases, child labour, Gender Based Violence (GBV); etc.

There are no homesteads within the land targeted for the development of the schemes, hence there will be neither displacement of persons nor destruction of property and assets. Moreover, no Indigenous Peoples are present in the Project area of influence. Archeological studies conducted in all the schemes revealed that no artefacts or heritage sites were identified in the targeted areas apart from 2 graves identified graves at Zvinyaningwe scheme area and 4 graves at Pikinini-Jawanda irrigation scheme. Through consultations with relatives, traditional leadership, local authorities and the Department of National Museums and Monuments, there was consensus that the graves be fenced off and excluded from farming activities.

However, the environmental and social assessment studies conducted so far show that the environmental and social risks identified are likely to be very minimal or moderate and can be addressed through straight forward application of environmental siting, permitting requirements, pollution prevention, design criteria, construction standards, training and awareness raising.

ES 7: Environmental and Social Mitigation Measures

The following are some of the management measures that will be implemented during the planning, construction, operational and decommissioning phases of the sub-project.

- Ensuring that all sub-project activities will be conducted in compliance with financing agreement; national laws, regulations and procedures; the UNDP's environmental and social requirements; and international industrial best practices
- Ensuring that stakeholders including beneficiaries are continuously engaged throughout the project cycle as outlined in the Stakeholder Engagement Plan. The consultation process shall be inclusive taking consideration of the views of the vulnerable groups including those living with disabilities
- Engaging community landowners, traditional authorities and local governmental structures at district level on discussions around sustainable models on land use to prevent disputes over land use and plot allocation

- Ensuing that the land donors are the primary beneficiaries during the plot allocation, and that they obtain double the plot size as compared to other beneficiaries. This position was agreed by all stakeholders during the consultative meetings
- Ensuring that locals are given precedence in terms of employment opportunities taking into consideration of gender perspectives
- Ensuring that the graves identified at Pikinini-Jawanda and Zvinyaningwe irrigation schemes are fenced off and protected from any farming activities as agreed during the consultative meetings
- Ensuring that equipment and machinery for use at construction sites is properly serviced and that maintenance shall be performed only by approved dealers in order to minimize health and safety risks as well as environmental pollution
- Ensuring that warning posts and barrier tapes are erected at construction and excavation sites to ensure restricted access to construction sites
- Implementing the "chance find" procedure in the event that tangible forms of cultural or archaeological importance are encountered during excavation and trenching
- Practicing best agroecological practices founded Integrated Catchment Management, Integrated Pest Management and Climate Smart Agriculture
- Minimising and limiting vegetation clearing to working and construction sites only
- Ensuring that the development and construction of Zvinyaningwe irrigation scheme complies with the buffer zones stipulated by the Zimbabwe National Water Authority (ZINWA) and the Environmental Management Agency (EMA). The construction of the scheme shall:
    - not be within the 100m buffer zone from the highest dam crest level for large dams set by the Zimbabwe National Water Authority (ZINWA)
    - comply with the EMA's water course buffer zone which falls at 50m from the highest flood level or (from the bank of the water course)
- Re-vegetation of degraded areas with indigenous trees
- Implementing air pollution control measures from vehicle use through compacting loose soil along routes, speed limits and wetting the ground to minimise dust emissions
- Promoting the integrated water resources management approach that seeks the coordinated development and management of water, land and related resources in order to maximize the economic and social welfare in an equitable manner and without compromising the sustainability of ecosystems
- Installing proper storm water drainage at the irrigation scheme including contour farming to minimize soil erosion
- Implementing integrated pest and vector control practices to minimize excessive application of fertilizers, herbicides and insecticides
- Adopting crop rotation and promoting crop varieties that are resistant to pests and disease
- Use of mechanical weed and pest control such as ridging and hand hoes
- Adopting proper crop husbandry methods including early planting and early harvesting
- Ensuring continuous environmental flow analysis and management to ensure river basin planning
- Applying resource efficiency to maximize water usage so that the water consumption activities do not have significant adverse impacts on other water users. This will also improve infiltration and reduce excessive runoff, water logging, and leaching of nutrients
- Adopting drainage management e.g., proper maintenance of diversion drains around the proposed irrigation scheme

- Application of green manure and other environmentally friendly organic nutrients to continuously improve the soil structure in the fields to reduce runoff, limit soil erosion and subsequent siltation of water bodies
- Implementing fire control measures such as fire guards
- Early detection of pollution by routine surface and ground water monitoring and taking remedial action
- Ensuring that the Code of Conduct on Sexual Exploitation, Abuse and Harassment is developed and implemented
- Collaborate with medical facilities and community based organizations in fighting Sexual Exploitation, Abuse and Harassment, HIV and AIDS, water borne diseases, etc
- Strengthening the participation of women in decision-making processes on climate adaptation, mitigation and disaster risk reduction
- Respecting and promoting workers' rights, to ensure the right to decent work, fair treatment, non-discrimination, and equal opportunity for workers, and to avoid the use of forced labour and child labour
- Ensuring that appropriate information about emergency preparedness and response activities, resources, and responsibilities is disclosed to local communities, contractor staff and other stakeholders
- Ensuring that the rights and special needs of indigenous elders, youth, children, persons with disabilities, including consideration of special measures to improve their participation in decision-making and their general well-being
- Ensuring that provision of adequate security personnel and security measures are implemented to limit vandalism and theft of property
- Implementing proper emergency response plan in terms of first aid, emergency evacuation and transport during health-related instances
- Ensuring scheduled inspections of the power infrastructure

The cost of implementing this Environmental and Social Management plan is estimated at USD140 000.00. This include the cost of training and capacity building for ESMP implementation and environmental and social monitoring. The cost of implementing and operating the Grievance Redress Mechanism is estimated at USD 14 683.00. All other costs for implementing mitigation measures by the contractor shall be borne by the contractor as may be stipulated in the contract of works.

ES 8: Roles and Responsibilities in ESMP implementation

ESMP implementation during construction and operation phases of the sub-project will require the involvement of several stakeholders each with specific roles and responsibilities. Key stakeholders involved in the implementation of the ESMP include the Project Management Unit (PMU), relevant government ministries and agencies, contractors, local leadership and beneficiaries, etc. The Project steering committee and board has the responsibility for overseeing the implementation of the ESMP and giving strategic direction to any changes that may require changes in project design. The PMU will be responsible for overall coordination in the implementation of the ESMP and ensuring compliance with national, GCF and UNDP SES requirements. The Contractors will be responsible for implementing the Contractor ESMP (C-ESMP) for their work sites.

An environmental and social compliance framework has been developed to monitor the implementation of the ESMP in accordance to the provisions and conditions stipulated in the ESMF. EMA shall be responsible for providing the overall environmental and social monitoring of the sub-project. Contractors shall undertake periodic site audits and inspections to ensure that the ESMP is fully implemented. Officers from the Responsible Parties (RPs) shall be responsible for conducting routine site checks and inspections and report any

environmental and social incidents to EMA or the PIU. The targeted beneficiaries and local communities have the responsibility to routinely monitor environmental and social performance during all phases of sub-project development to ensure that their constitutional rights are adequately observed and that the contractors effectively implement the mitigation measures provided in the ESMP. The local authorities and other relevant government agencies will be responsible for dealing with specific issues or conflicts that may arise during sub-project implementation. All monitoring and evaluation data shall be collated by UNDP and consolidated in the Annual Progress Report (APR) for submission to GCF.

ES 8: Stakeholder Consultation and Information Disclosure

Different categories of stakeholders which include land donors, targeted beneficiaries, traditional leaders, relevant government departments at all levels, industry groups and civil society organisations were consulted. Methods of consultations included key informant interviews, questionnaires, focus group discussions and public meetings. Separate conversations were also held with women due to cultural barriers which mostly provide them with less authority and mobility. Special transport arrangements were made for the elderly and the disabled so that they could attend the stakeholder consultative meetings. Project Affected Persons (PAPs), in particular, the land donors were given sufficient time to express their views and follow up discussions were held concerning the process of land transfer and planning.

To ensure fairness in the process of land transfer and allocation, it was agreed that the land donors shall be the primary beneficiaries to plot holding and that they are allocated double the plot size as compared to other plot beneficiaries. All the necessary information pertaining to possible impacts will be communicated to the PAPs at the right time in a language, format, and manner that is culturally appropriate, clear, and accessible to ensure transparency in the land transfer process. A Grievance Redress Mechanism has been developed and shall be communicated and popularized in the project implementation areas so that PAPs have access to a transparent, fair, and equitable mechanism that seeks to resolve their concerns.

A stakeholder Engagement Plan was developed as part of this ESMP to ensure that stakeholders including PAPs are kept informed and involved throughout project implementation and in transition arrangements for the closing of the sub-projects. The stakeholder consultation process will be ongoing and iterative throughout the project cycle. For public disclosure, this ESMP shall be made available to the public at local, district, provincial and national levels. At local level, a summary ESMP translated into local language (Shona) shall be made available to the Irrigation Scheme Management Committee (IMC) as well as at a local district office. A full ESMP document will be made available to the public both at EMA provincial and national offices. Furthermore, digital copies of the ESMP will be disclosed through online platforms such as the UNDP country office website and the UNDP transparency portal to enhance public access.

ES 9: Project Grievance Redress Mechanism

The Project will set up a Grievance Redress Mechanism (GRM) on traditional conflict-resolution flows as well as administrative and project-based steps to ensure community members or any stakeholders have the opportunity and means to raise their concerns, complaints and suggestions. A four-tier redressal structure is proposed to address complaints that may emanate from the sub-project. It represents different stakeholders at the various levels of the conflict resolution process. The four levels of grievance redressal at project level include (1) Local/community level, (2) District/Provincial level, (3) PMU level & (4) Project Steering Committee (PSC). A reporting line of received (and addressed) grievances will be clearly defined, so that the project

Implementation Unit (PIU) will have a full set of data. Complaints will be categorized and recorded at each level of the GRM structure and consolidated periodically in a project grievance database. The database will also be an effective management tool to monitor progress and detect potential obstacles in project implementation. The database will be established in an easy-to-use software system (Microsoft Excel) to allow ease of use.

The necessary procedures for grievance resolution shall be activated until the matter is closed, preferably within 30days from the date the complaint was received. Stakeholders will be sensitized to take their complaints or grievances to the Project level GRM. In the event of dissatisfaction from affected parties that cannot be resolved within the project's proposed grievance resolution process, the Project Steering Committee shall refer the dispute or difference to arbitration within 30 days. Where there is no consent, the aggrieved party can seek legal redress.

Sensitive grievances may also be addressed using appropriate approaches by different actors. These include local leadership, respected elders, clinics, Masvingo One Stop Center (Located at the New Start Center) spiritual leaders, church leaders and civic organisations. There are organizations that work with communities to deal with gender-based violence. An example is collaborated work among Musasa project, the Ministry of Home Affairs and the Zimbabwe Women Lawyers Association (ZWLA) in dealing with issues to do with sexual exploitation, abuse, harassment and gender-based violence.

ES 10: Conclusion

This ESMP concludes that the development of the 7 irrigation schemes will generate significant positive impacts such enhancing food security, improving nutrition, employment creation and contribute to local economic development. The negative environmental and social impacts of the sub-project are likely to be minimal and can be easily addressed through implementing of readily available management measures. However, during the construction and operation of the sub-projects there is need for periodic monitoring of water quantity and quality, soil quality, environmental flows, air quality, waterborne diseases, health and safety aspects and Sexual Exploitation, Abuse and Harassment (SEAH) by different stakeholders which include the beneficiaries, irrigation management committees, relevant government agencies, contractors and the PMU. If the environmental and social safeguard measures proposed in this ESMP are implemented, the benefits that the sub-project will bring to the communities will far outweigh the negative impacts which also of course shall be avoided, minimized or mitigated. In this regard, our recommendation is that this proposed sub-project should be given the green light to go ahead.

ES 11: ESMP Team

The following persons were involved in the study and compilation of the Environmental and Social Management Plan for the 7 Irrigation Schemes.

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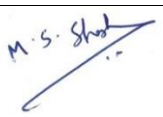
Mr Madireddy Shashank	Associate Consultant- Project Coordinator	+263 781334496 wapcosmasvingo@gmail.com	
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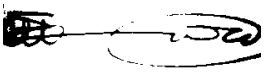
Mr Francis Muchemwa	Associate Consultant (Archaeologist and socio-economist)	+263 715381205 frankomuchemwa@gmail.com	

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AGRITEX	Department of Agricultural, Technical and Extension Services
CBPP	Community Based Prominent Persons
CSO	Civil Society Organization
DDC	District Development Coordinator
DDF	District Development Fund
DOIR	Department of Irrigation,
DR&SS	Department of Research and Specialist Services
EMA	Environmental Management Agency
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
GCF	Green Climate Fund
GRC	Grievance Redress Committee
GRM	Grievance Redress Mechanism
IAASTD	International Assessment of Agriculture Knowledge, Science and Technology for Development
ARDA	Agricultural and Rural Development Authority
IEE	Initial Environmental Examination
IFC	International Finance Corporation
IMC	Irrigation Management Committee
ISDC	Irrigation Scheme Disciplinary Committee
LGC	Local Grievances Committee
M&E	Monitoring & Evaluation
MLAFWRD	Ministry of Lands, Agriculture, Fisheries, Water and Rural Development
MSD	Meteorological Services Department and
NGO	Non-Governmental Organisation
PMU	Project Management Unit
RDC	Rural Development District Council
RPs	Responsible Parties
SEAH	Sexual Exploitation, Abuse and Harassment

SECU	Social and Environmental Compliance Unit
SEP	Stakeholder Engagement Plan
SES	Social and Environmental Standards
SESA	Strategic Environmental and Social Assessment
SMP	Social Monitoring Plan
SRM	Stakeholder Response Mechanism
ToT	Training of Trainers
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
WCCW	Ward Child Care Workers
ZINWA	Zimbabwe National Water Authority,
ZRP	Zimbabwe Republic Police
ZWLA	Zimbabwe Women Lawyers Association

1.0 INTRODUCTION

1.1 Background

With continued intensification of climate variability and change, Zimbabwe's current coping strategies for the agriculture and water sectors are becoming increasingly ineffective, requiring essential adaptation investments to achieve lasting climate resilience among vulnerable rural farming households. Adaptation to climate change for vulnerable smallholder farmers requires resources and capacities for adaptive management of their agro-ecosystems with the aim of stabilizing, increasing and sustaining agricultural yields and incomes. In areas that are becoming drier and hotter, particularly the Southern part of Zimbabwe, these resources include access to, as a priority, sufficient, dependable water and a diversity of climate-resilient crop varieties and livestock breeds and management practices.

To respond to and manage growing climate risks and hazards, the Government of Zimbabwe through the Ministry of Lands, Agriculture, Fisheries, Water and Rural Development (MLAFWRD) in partnership with United Nations Development Programme (UNDP) is implementing a seven-year project "Building climate resilience of vulnerable agricultural livelihoods in southern Zimbabwe". The project is financed by the Government of Zimbabwe and the Green Climate Fund (GCF). The project intervention builds the climate resilience of vulnerable agriculture livelihoods in 15 districts across three provinces of Manicaland, Masvingo and Matabeleland South through the following strategic components:

- Increasing access to water for climate-resilient agriculture through climate-resilient irrigation systems and efficient water resource management.
- Increasing access to climate-resilient inputs and practices, as well as stronger market linkages;
- Improving access to weather, climate, and hydrological information for climate-resilient agriculture.

The objective of the project is to strengthen resilience of agricultural livelihoods of vulnerable communities, particularly women, in the face of increasing climate risks and impacts. The proposed project will be implemented in 15 selected districts and 137 wards in southern Zimbabwe in the semi-arid Agro-Ecological Regions (AERs) IV and V of the provinces of Manicaland, Masvingo and Matabeleland South. The 137 wards are distributed as shown in Table 1 and the geographical spread of the project is shown in Figure 1.

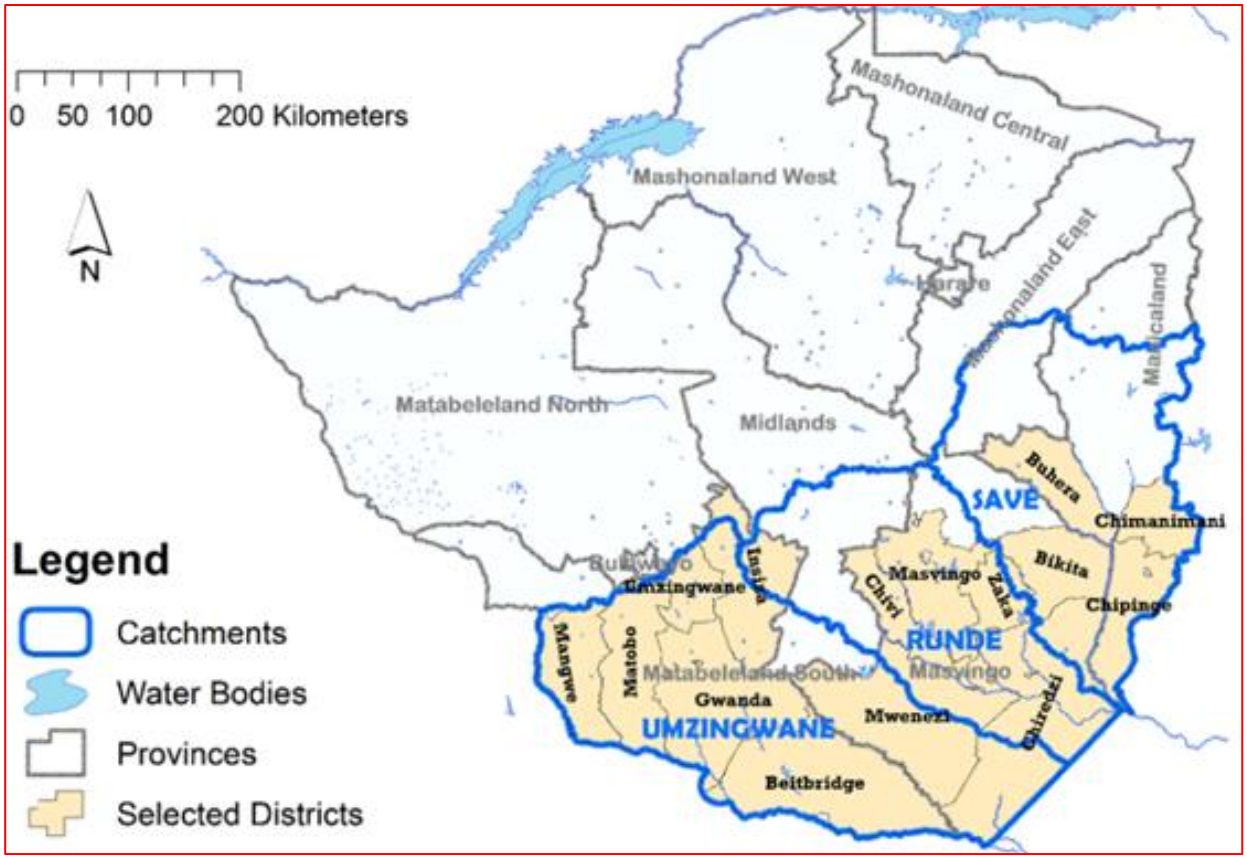

Figure 1: Geographical Spread of the Project

Table 1 Distribution of the Wards in 15 priority districts

Province	District	Number of Wards
Manicaland province	Buhera	13
	Chimanimani	7
	Chipinge	15
Masvingo	Masvingo	9
	Bikita	4
	Zaka	4
	Chivi	9
	Chiredzi	8
	Mwenezi	5
Matabeleland South	Beitbridge	5
	Gwanda	13
	Matobo	16
	Insiza	16
	Umzingwane	7
	Mangwe	6

The project is targeting the revitalization of 15 existing irrigation schemes and the establishment of 6 new schemes in 15 priority districts of Manicaland, Masvingo and Matabeleland South Provinces.

The irrigation schemes have been classified into three lots, namely lot 1, 2 and 3. Each lot is defined by a specific hydrological catchment with similar biophysical and socio-economic characteristics. Lot 1 consist of three irrigation schemes and all are situated in Matabeleland South Province. Lot 2 consist of 7 irrigation schemes and all are situated in Masvingo Province. Lot 3 consist of 5 irrigation schemes and all are situated in Manicaland Province. The other 6 alternative schemes (presumably lot 4) are still yet to receive GCF approval. These are alternative schemes that no longer conformed to the GCF selection criteria between the project design phase in 2016 and the project implementation phase in 2020.

Site-specific Environmental and Social Management Plans (ESMPs) were prepared for each of the 7 irrigation schemes under Lot 2. A review of the 7 ESMPs show that the reports largely share the same content particularly on legal and policy framework, baseline biophysical and socio-economic setting, anticipated environmental and social impacts, proposed environmental and social management measures, grievance redress mechanisms, etc. This is because Lot 2 schemes are situated in the same hydrological catchment with similar biophysical and socio-economic characteristics. Based on this, it was therefore logical to prepare a consolidated ESMP for the 7 irrigation schemes to ease the review process.

This ESMP is therefore a consolidation of the site specific ESMPs of the 7 irrigation schemes under Lot 2. Of the 7 schemes, 4 are existing schemes which are targeted for revitalisation and climate proofing, while the remaining 3 are new schemes which will be constructed and climate proofed. The existing schemes are Nyahombe, Pikinini-Jawanda, Chizumba and Bindamombe while Rusununguko, Zvinyaningwe and Bwanya are new schemes. All the irrigation schemes under Lot 2 are situated in Masvingo Province and have a total net irrigated area of 640.6 hectares (ha).

The ESMP objectives are as follows;

i. To inform the Ministry of Environment, Tourism and Hospitality Development and the Green Climate Fund about the project, its location and activities.
ii. To provide preliminary identification of potential impacts on the biophysical and socio-economic environment.
iii. To propose mitigation options managing the potential negative impacts, while promoting positive ones in line with the requirements of the Environmental Management Act Cap 20:27 and UNDP SES (2015 Policy).

1.2 Proponent contact Details

Table 2 provides details of the Project proponent.

Table 2: Contact details of the project proponent

Organisation	Ministry of Lands, Agriculture, Fisheries, Water and Rural Development
Contact Name	Mr Shepard Kadaira
Physical address	10th Floor, Kaguvi Building Corner 4th Street and Central Avenue
Tel	+263 714 900 693/+263 773 375 353
Email	skadaira@gmail.com

1.3 Methodology

Both qualitative and quantitative methods were used to collect baseline data against which impact analysis was measured. Data was collected from both primary and secondary sources. Ecological data was collected from the field through field measurements and observations. Consultations were thoroughly done with the locals who had historical and indigenous knowledge about their natural resources. Some information was derived from satellite remote sensing data using ArcGIS software and the Google Earth Engine. Socio-economic data was collected from stakeholders though direct observations, questionnaires, in-depth face to face interviews, social media platforms, tele-interviews, meetings and focus group discussions. Analysis was done both quantitatively and qualitatively.

Risk identification and analysis tools such as the Integrated Environmental and Social Impact Assessment Risk Assessment Tool and the United Nations Development Programme's Environmental and Social Screening procedure were used. The Environmental and Social Impact risk assessment was determined by assessing the level of impact and the likelihood (levels of probability) as provided in the Project ESMF. Significance level = Level of impact x Likelihood; The rating of environmental and social impacts to determine significance was done for the irrigation schemes using this matrix provided in Table 3.

Table 3: Impact Rating matrix

Impact	1	2	3	4	5
5	High	High	High	High	High
4	Medium	Medium	High	High	High
3	Low	Medium	Medium	Medium	Medium
2	Low	Low	Medium	Medium	Medium
1	Low	Low	Low	Low	Low
	Probability				

2.0 SUB-PROJECT DESCRIPTION

2.1 Introduction

The irrigation schemes experience extreme weather conditions that have been exacerbated by the effects of climate change. Climate hazards such as recurrent droughts, flush floods and very hot temperatures are much prevalent. The rainfall patterns have become highly unpredictable making it imperative to have climate proofed irrigation schemes. The selection of an appropriate irrigation system to be considered at each scheme was done in consultation with stakeholders including the beneficiaries through consultative meetings. The main consideration was to select an irrigation method that is climate proof, lower installation costs, efficient, easier to operate and maintain, and socially acceptable. This Chapter describes the status at each irrigation scheme and provides a description of the proposed climate proofing activities at each of the seven schemes.

2.2 Zyinyaningwe Irrigation scheme

The irrigation scheme is one of the 21 irrigation schemes targeted for climate proofing under the GCF project. It is a new scheme located in Ward 4 of Masvingo District in Masvingo Province. The targeted area to be developed measures 46 hectares. This area will be operated under a modified combined irrigation model. The scheme is expected to benefit approximately about 300 beneficiaries both directly and indirectly.

2.2.1 Site location

The proposed Zvinyaningwe irrigation site lies at UTM Zone 36 coordinates 238462.95m E and 7793963.65m S. The site can be accessed by traveling about 22km North of Mashava from a turn off at approximately 44km away west of the City of Masvingo along the Masvingo-Mbalabala road. Figure 2 shows the location of the project area on a satellite image and Figure 3 shows topographical map of the area.

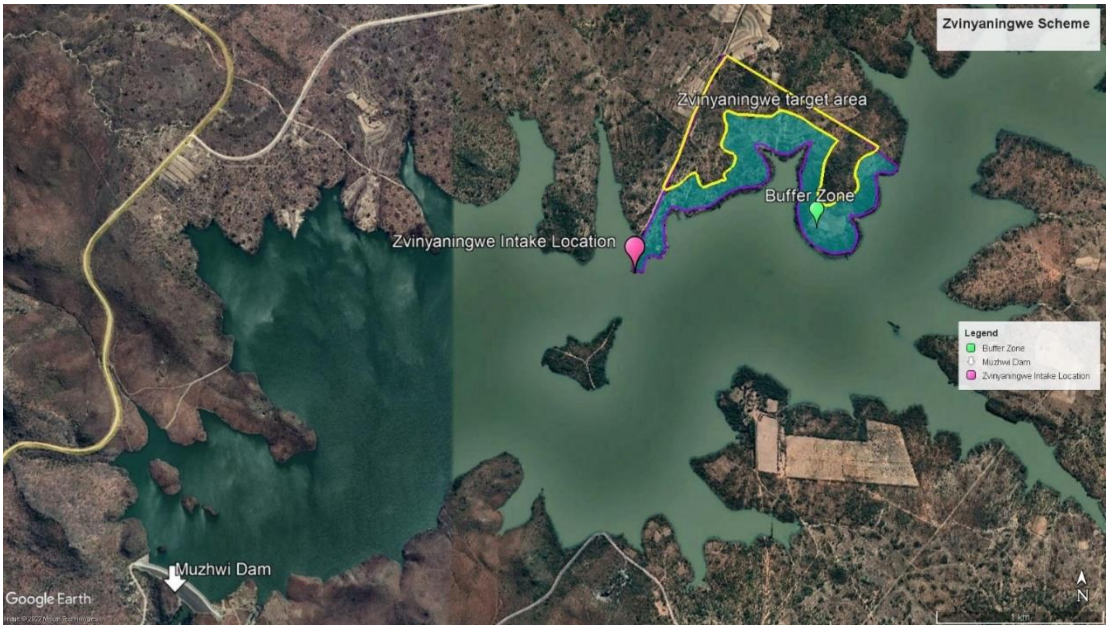

Figure 2: Proposed Project Site

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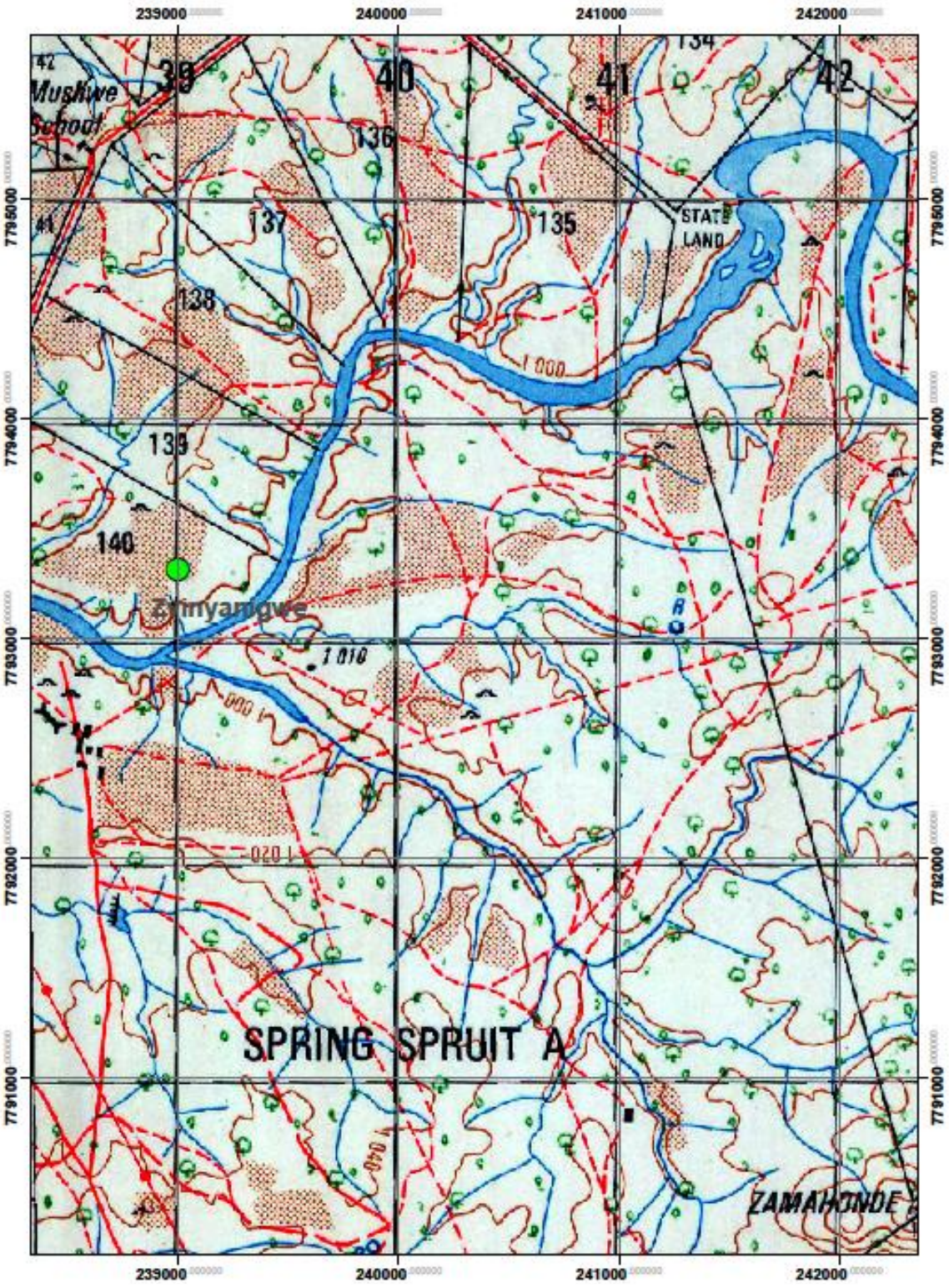

Figure 3: Topographic Map of the Project Site

2.2.2 Climate proofing interventions at the scheme

Water will be withdrawn from Muzhwi dam at an existing intake using one submersible pump (1 working and 1 standby). Floating pontoon will float inside the Muzhwi reservoir up to 80 m from the bank, anchored with the shore, accommodating two pumps and withdrawing discharge of 3.2 MLD. The typical drawing of a floating pontoon is shown in Figure 4. Two (2) submersible pumps (1 working and 1 standby) of 50 Kw were provided for nearly 22 hours a day and six days a week of pumping, following daily farming schedule and feeding irrigation water directly into the sprinkler irrigation system as shown in Table 4. The pumps have been designed for the static head difference between lowest water level i.e. 980 m and nearest RL on field of 1012 m. Static head is 32 m, residual head for sprinkler operation is 35 m including conveyance losses.

Rising/Pumping mains conveys irrigation water from intake facility to command area irrigation system. The length of pumping / rising that will deliver irrigation water to the command area would be 0.6km. Hydropower source of energy shall be used to power the irrigation scheme. Considering the topography of the area the stakeholders opted to use a semi-permanent system covering the entire 46ha as shown in Figure 5. The semi-permanent sprinkler system would ensure effective utilization of the land resource. The system has portable lateral lines, permanent main lines, sub-mains, and a stationary water source with pumping unit. The main-lines and/or sub-mains will be buried. The risers are located for nozzle connections at suitable intervals to connect with laterals. The layout map of sprinkler system in the target area and the ZINWA's buffer zone are shown in the Figure 6. Farmers will be trained on efficient water management, capacity building of Irrigation Management Committees, and strengthening access to climate, weather and hydrological information.

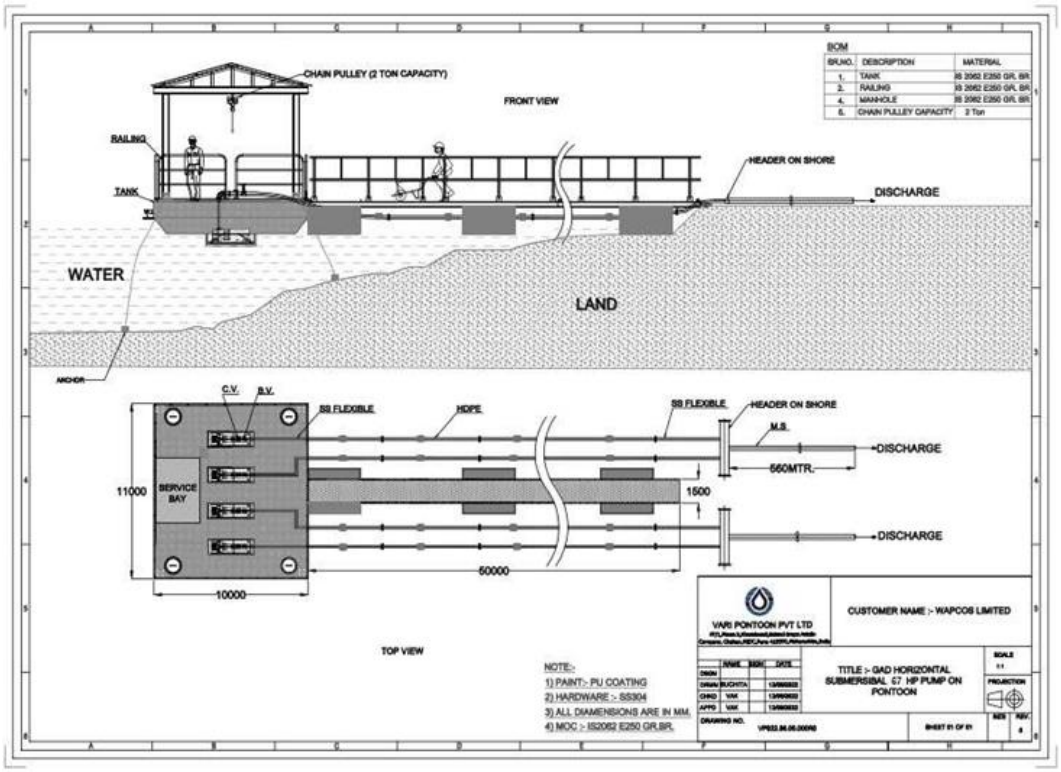

Figure 4: Typical drawing of a floating pontoon

Table 4: Pump design Summary

Sr. No.	Description	Symbol / Formula	Pumping Station (Three Rising Mains)
1	Design Capacity Peak flow in MLd	Q	3.01
2	No. of working hours	Hr.	22
3	Average discharge (peak) in MLd	Aq = Q x 24 / Hr.	3.28
4	Configuration of Pump Provided (2 Nos. in caisson)	Tp	2
	a) Working	Np	1
	b) Standby	-	1
	Design Flow per pump in MLD	Qd	3.30
5	Static Head on pump in meters	Hs = R2 - R1	67
6	Length of Rising /Pumping Main in Meters	L1	600
7	Total KW Requirement	KW	50

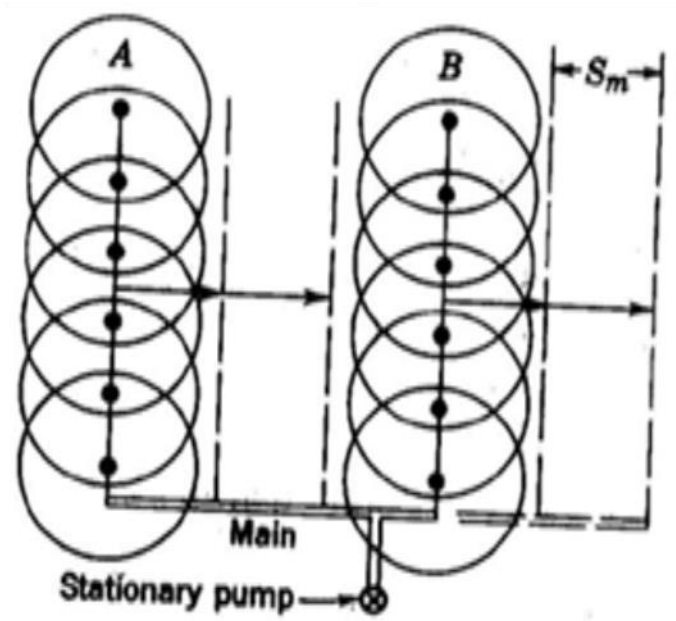

Figure 5: Sprinkler System

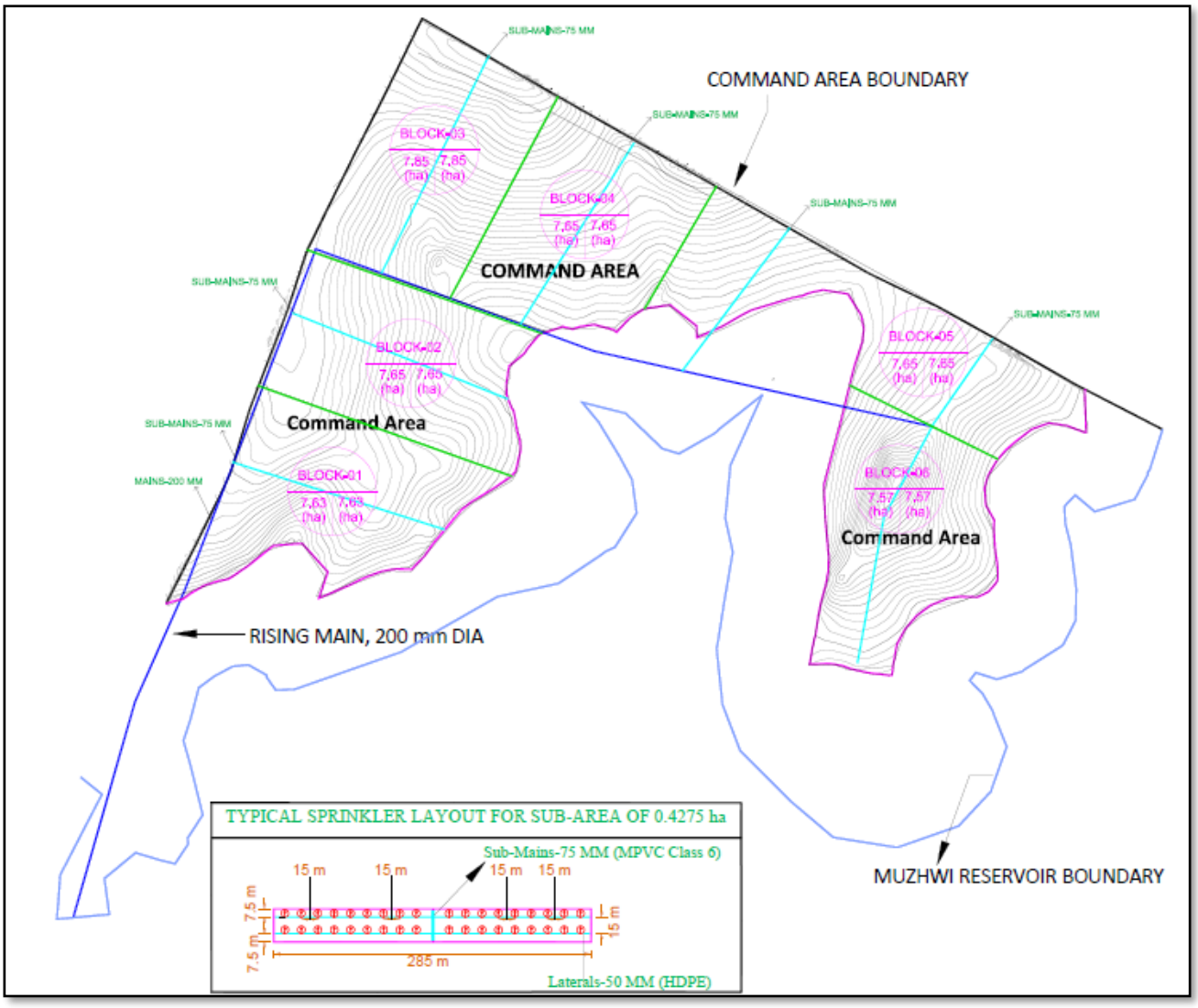

Figure 6: Sprinkler system layout

2.2.3 Current land use

The land to be used for irrigation is currently not under farming and it is completely covered with thick bushes as illustrated in Plate 1.

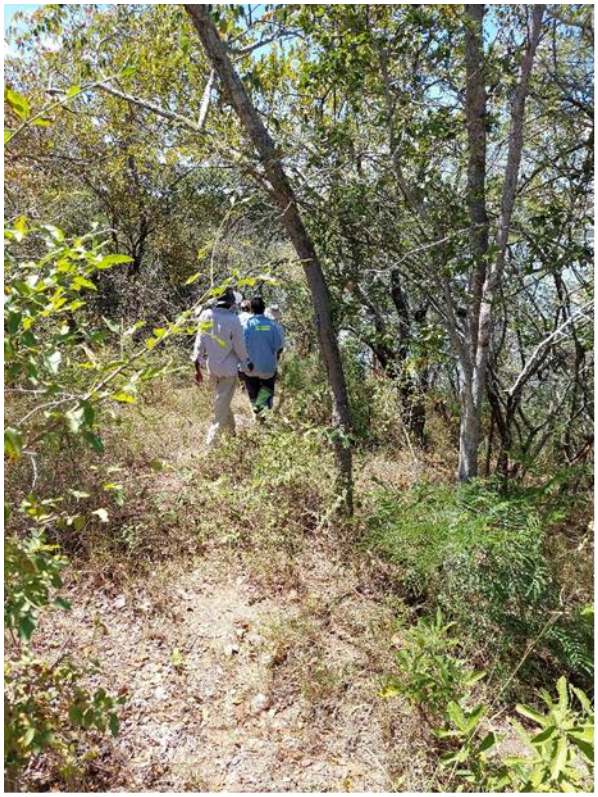

Plate 1: Current land use (July 2022)

2.3 Nyahombe Irrigation Scheme

Nyahombe irrigation scheme is one of the 21 irrigation schemes targeted for climate proofing under the GCF project. The proposed area to be developed measures 99.8 hectares. This area will be operated under a modified combined irrigation model. A centre pivot system will be the main irrigation method covering 82% of the land whilst the remaining area outside the center pivot coverage will be commanded by a semi-permanent type of sprinkler system. The scheme is expected to benefit approximately about 300 beneficiaries both directly and indirectly.

2.3.1 Site location

The proposed Nyahombe irrigation is situated in Ward 27 of Chivi District in Masvingo Province. The scheme lies at UTM Zone 36 coordinates 290162.00m E and 7694601.00m S. The site can be accessed by traveling about 15km East of Ngundu Rural Service Centre from a turn off at approximately 118km away South of the City of Masvingo along the Masvingo-Beitbridge highway. Figure 7 shows the location of the proposed area on a satellite image and Figure 8 shows the topographic map of the site.

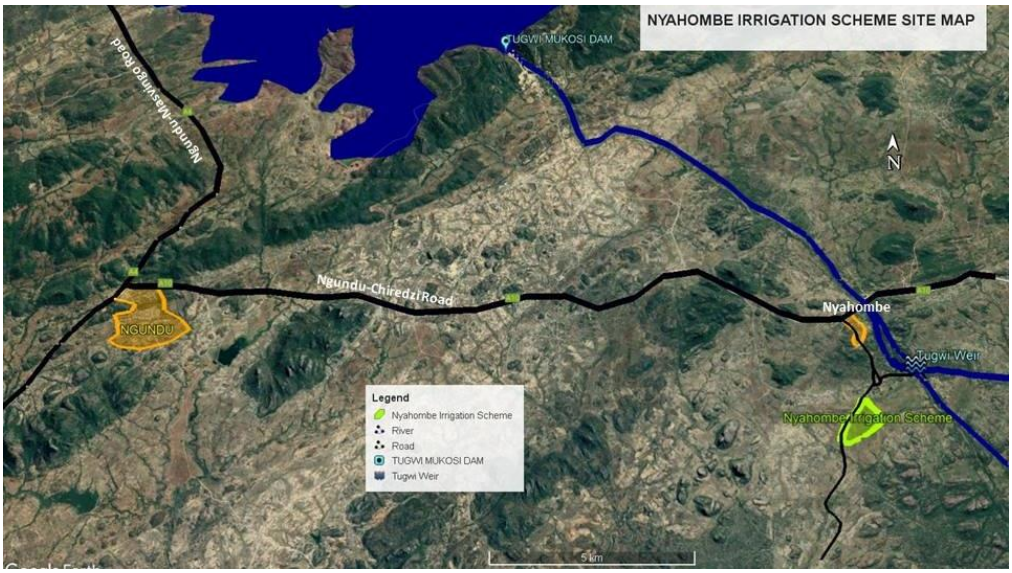

Figure 7: Proposed project site

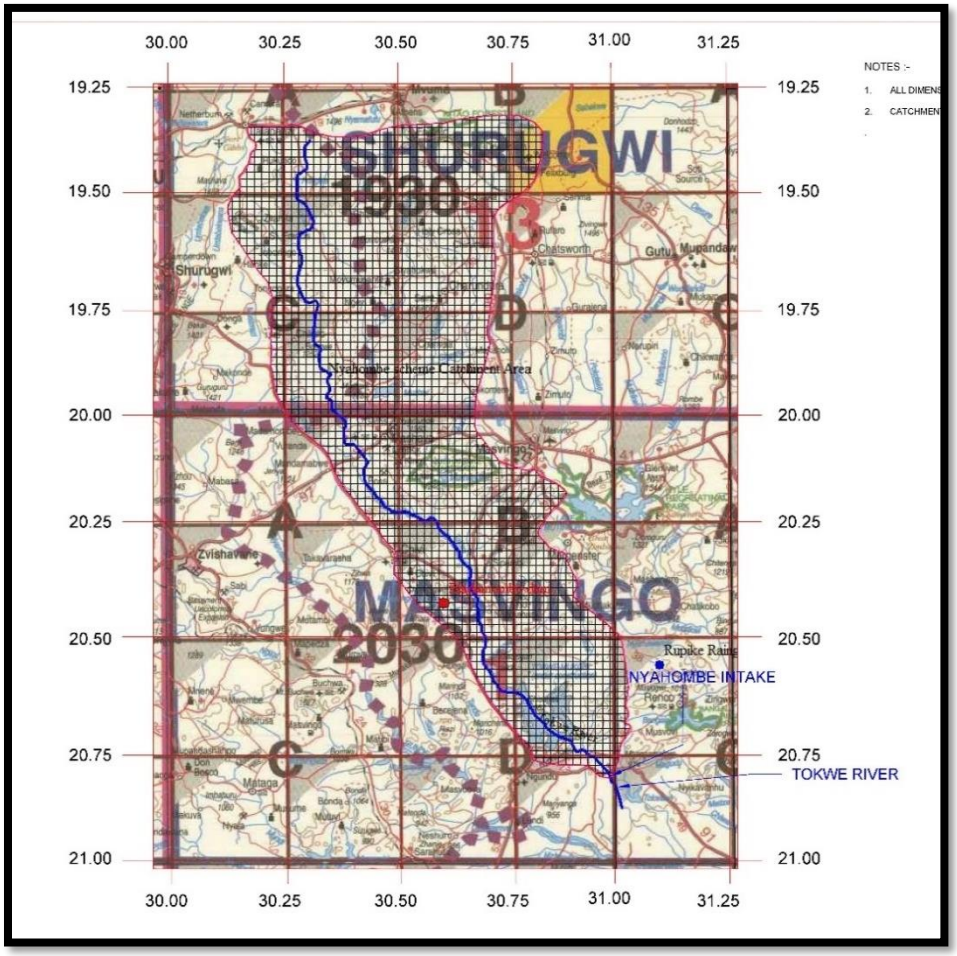

Figure 8: Topographic Map of the proposed site

2.3.2 Existing infrastructure

The scheme draws its water from Tugwi Mukosi Dam through an existing weir that was constructed across Tugwi River at 20°49'18.62"S and 31° 0'10.69"E. There is an existing Rural Electrification Agency (REA) hydro-electricity transformer for the pump house of an existing Irrigation scheme. The same transformer shall be used for the proposed scheme. The pictures of existing pump house and the transmission lines are shown in the Plate 2.

Plate 2: Pump house and transmission lines of the existing Irrigation Scheme under DOIR (June 2022)

2.3.3 Current land use

The land targeted for developing the scheme is currently under dry-land farming as illustrated in Plate 3. The crops mainly grown include maize, traditional grains and groundnuts. Cotton is also grown in the area.

Plate 3: Current land use (July 2022)

The adjacent land is under center pivot irrigation. There was a wheat crop under irrigation during fieldwork as illustrated in Plate 4.

Plate 4: Adjacent land under a center pivot irrigation system (July 2022).

2.3.4 Climate Proofing activities

Water will be withdrawn from an existing intake using two submersible pumps (2 working and 1 standby). A reinforced cement concrete intake jack well cum pump house was proposed on the right bank of the Tugwi River upstream of existing causeway. The depth of jack well is around 7 m with inner and outer diameter around 6.4 and 7.3 m. Three (3) submersible pumps (2 working and 1 standby) of 45 Kw were provided for nearly 22 hours a day and six days a week of pumping, following daily farming schedule and feeding irrigation water directly

into the sprinkler irrigation system as shown in Table 5. The pumps have been designed for the static head difference between lowest water level, that is, 553 m and nearest RL on field of 595 m. Static head is 42 m, residual head for sprinkler operation is 35 m including conveyance losses.

Table 5: Pump design Summary

Sr. No.	Description	Symbol / Formula	Pumping Station (One Rising Main)
1	Design Capacity Peak flow in MLd	Q	4.53
2	No. of working hours	Hr.	22
3	Average discharge (peak) in MLd	Aq = Q x 24 / Hr.	4.94
4	Configuration of Pump Provided (3 Nos.)	Tp	3
	a) Working	Np	2
	b) Standby	-	1
5	Design Flow per pump in MLD	Qd	2.50
6	Static Head on pump in meters	Hs = R2 - R1	77
7	Length of Rising /Pumping Main in Meters	L1	1950
8	Total KW Requirement for each pump	KW	45

Rising/Pumping mains will convey irrigation water from intake facility to command area. The length of pumping /rising that will deliver irrigation water to the command area would be 1.95km. A center pivot irrigation technology will be used to irrigate relatively flat land and wide areas which is typical of the Nyahombe irrigation scheme. However, there are gaps that will be left out in between the circles. Stakeholders agreed to use a semi-portable system to cover the gaps to maximize the use of the available land. Therefore, a highly efficient center pivot system coupled with a semi-portable sprinkler system shall be installed at the scheme. Combining the center pivot system and the semi-permanent sprinkler system would ensure effective utilization of the available land resource. 82% of the command area will be irrigated by a centre pivot irrigation system covering 81.44 ha. The remaining 18% (18.46ha) will be covered by a semi-permanent sprinkler system. A typical center pivot system and the centre pivot system layout is shown in Figure 9 and Figure 10 respectively.

Hydropower source of energy shall be used to power the irrigation scheme. Farmers will be trained on efficient water management, capacity building of Irrigation Management Committees, and strengthening access to climate, weather and hydrological information.

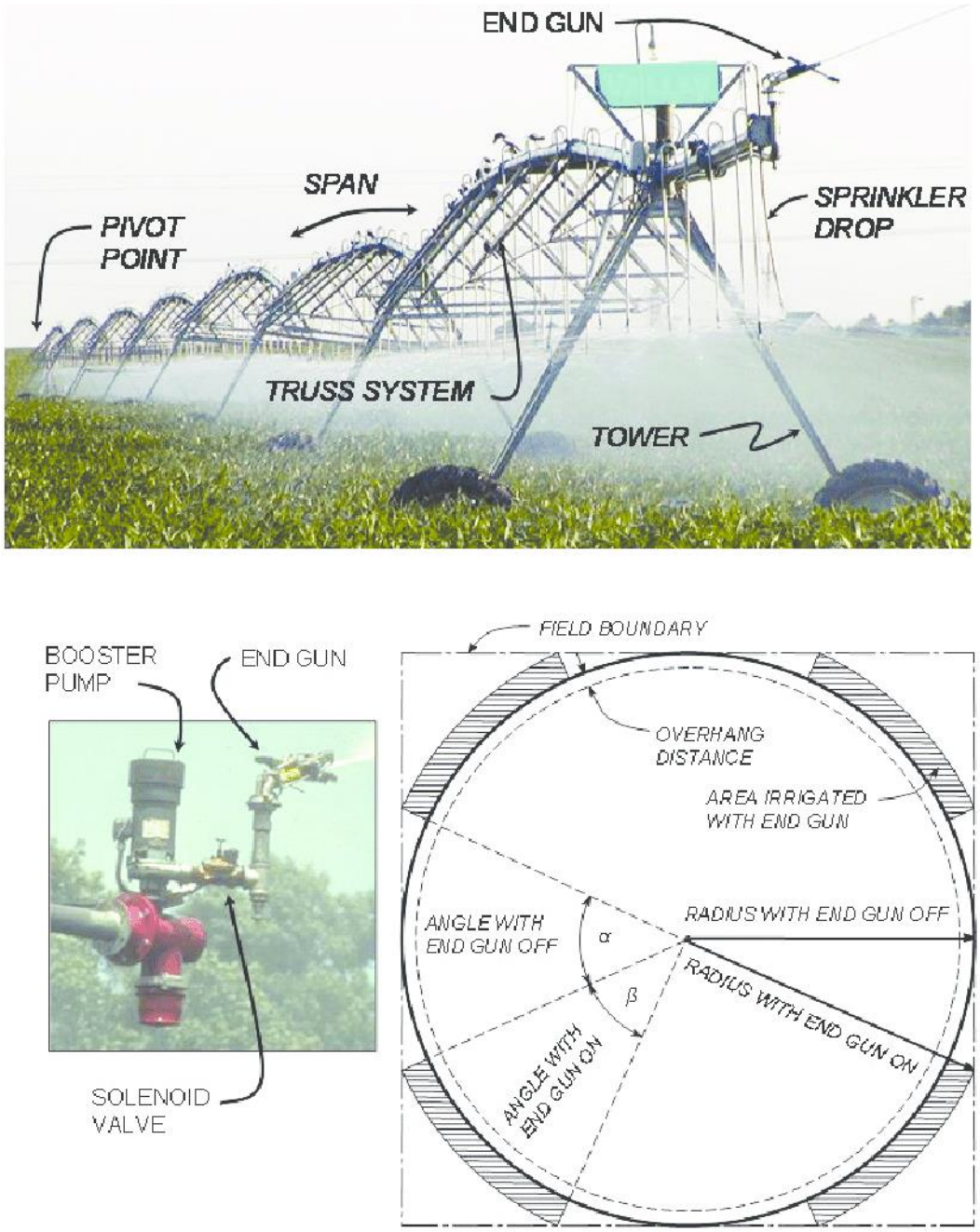

Figure 9: Typical Centre Pivot System

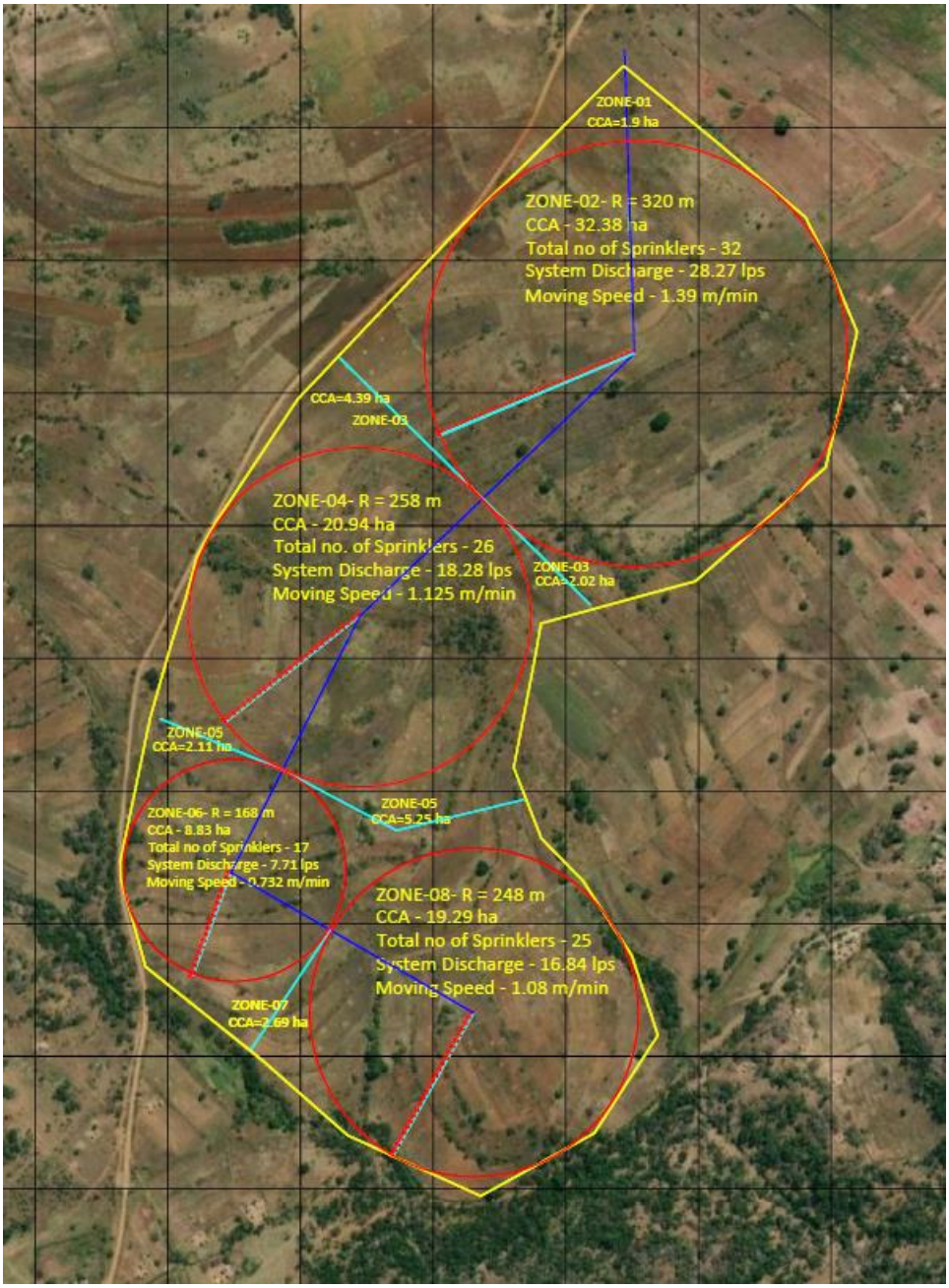

Figure 10: Centre Pivot System Layout

2.4 Pikinini-Jawanda Irrigation Scheme

Pikinini-Jawanda irrigation scheme is one of the 21 irrigation schemes targeted for climate proofing under the Project. It is a potentially new scheme. It has a net irrigated area of 156 hectares (ha). About 300 farmers are expected to benefit from the scheme.

2.4.1 Site location

Pikini-Jawanda irrigation scheme is located in Ward 4 of Mwenezi District in Masvingo Province. The site lies at UTM Zone 36 coordinates 232447.00mE and 7672879.00mS. The scheme is located approximately 180km from the City of Masvingo along the Masvingo-Beitbridge highway. It is situated approximately 35km from Neshuro Growth Point. Figure 12 shows the location of the project area on a satellite image. Figure 13 shows the location on a 1:50000 topographic map.

Figure 11: Proposed Project Site

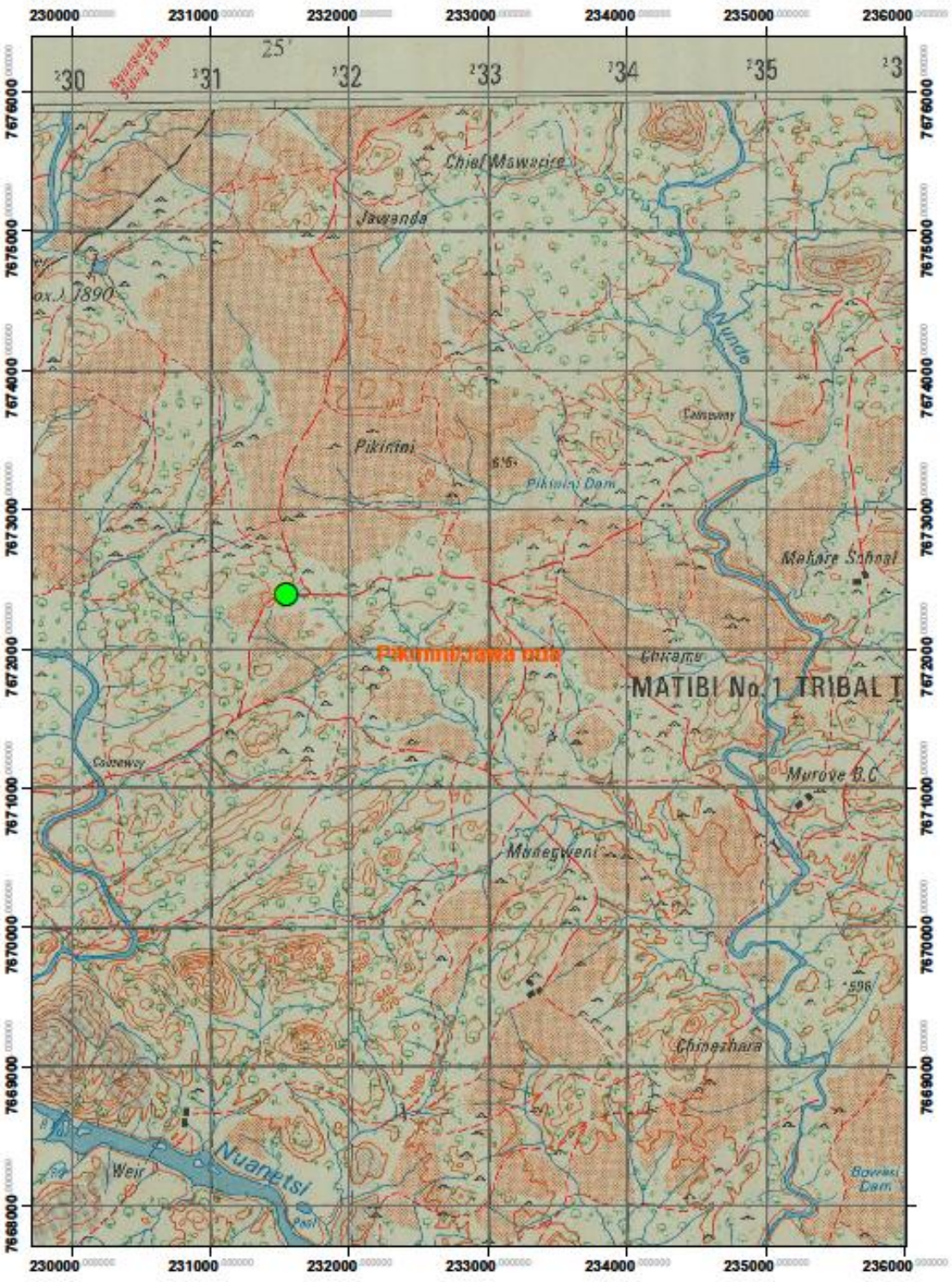

Figure 12: Topographic Map of the proposed

2.4.2 Climate Proofing and Revitalization activities

Water will be withdrawn from Manyuchi dam using 4 submersible pumps (3 working and 1 standby) of 50 Kw installed on a floating pontoon. The pumps have been designed for the static head difference between lowest water level i.e. 585 m and nearest RL on a field of 630 m. Static head is 45 m, residual head for sprinkler operation is 35 m including conveyance losses. Hydro-electricity power supply shall be used to power the irrigation scheme.

Table 6: Pump design Summary

Sr. No.	Description	Symbol / Formula	Pumping Station (One Rising Main)
1	Design Capacity Peak flow in MLd	Q	7.87
2	No. of working hours	Hr.	22
3	Average discharge (peak) in MLd	Aq = Q x 24 / Hr.	8.58
4	Configuration of Pump Provided (3 Nos.)	Tp	4
	a) Working	Np	3
	b) Standby	-	1
5	Design Flow per pump in MLD	Qd	2.90
6	Static Head on pump in meters	Hs = R2 - R1	80
7	Length of Rising /Pumping Main in Meters	L1	1300
8	Total KW Requirement for each pump	KW	50

A floating pontoon/barge pumping station will be installed as an intake facility for the scheme. Rising/Pumping mains conveys irrigation water from the intake facility to the command area irrigation system. The length of pumping / rising that will deliver irrigation water to the command area would be 1.3km. The irrigation system will adopt a hybrid system composed of a centre pivot and semi-permanent sprinkler system. Irrigation will mainly be through a semi-permanent sprinkler irrigation system covering 93 ha. The remaining 63 ha will be irrigated using a Centre Pivot sprinkler system. It was noted that among other irrigation systems, centre pivot irrigation systems had been shown to be water and labour efficient, and can easily irrigate relatively flat land and wide areas which is typical of the Pikinini-Jawanda irrigation scheme. However, there is a stream in the middle of target area, therefore to avoid the wastage of land, a part of the area will be irrigated using a semi-permanent Sprinkler system. Figure 13 shows the layout of the combined irrigation system.

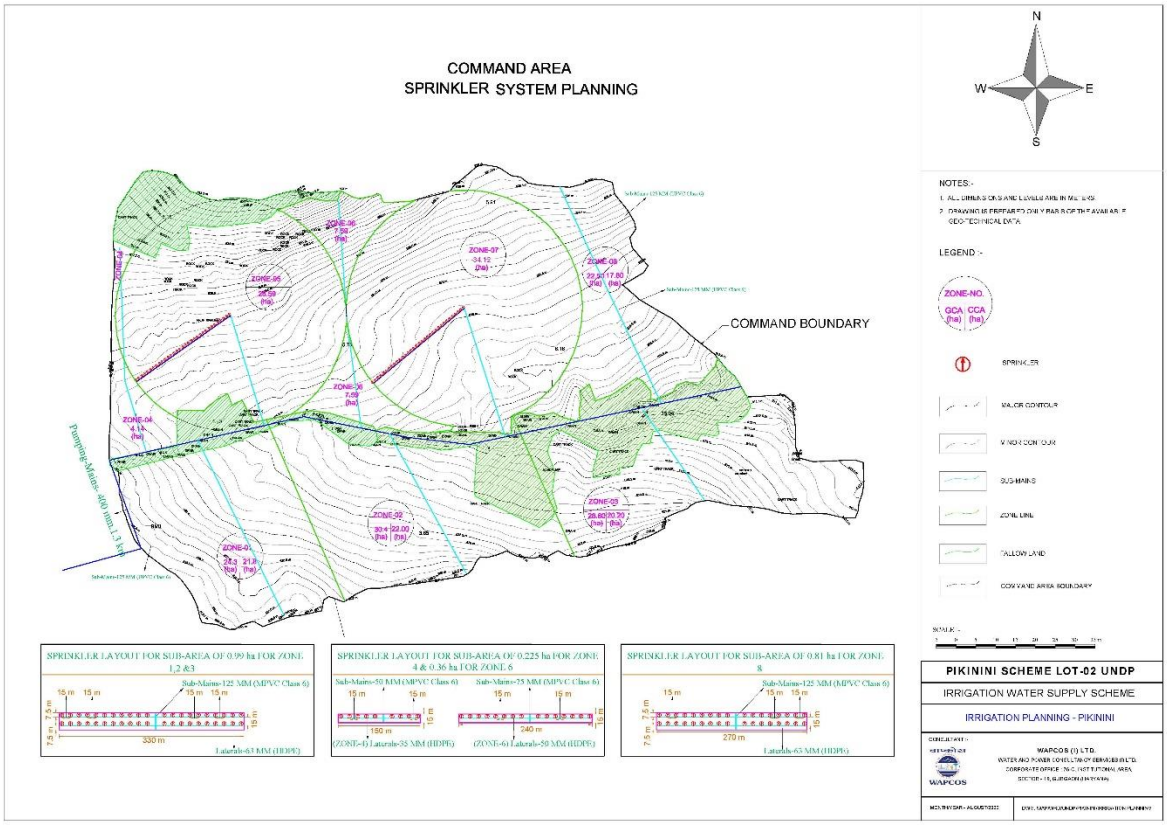

Figure 13: Layout of Irrigation System

2.4.3 Current land use

The land to be used for irrigation is currently under dry-land farming as illustrated in Plate 6.

Plate 5: Current land use (July 2022)

2.5 Chizumba Irrigation Scheme

The proposed Chizumba irrigation scheme is one of the 21 irrigation schemes targeted for climate proofing under the project. The scheme has a net irrigated area of 85 hectares(comprising of 20ha extension under pivot/sprinklers + 45ha existing under drip - to be supported by constructing additional PV solar system to power drip + 20ha existing surface system - to be supported with training and other water scheduling practices). Climate proofing of the proposed new scheme area will be achieved by the installation of a highly efficient center pivot system coupled with a semi-portable sprinkler system in areas that falls out of the circle coverage of the center pivot, extending PV solar field for the drip section and installing soil moisture sensors for the 20ha exisitng surface sytem. The proposed irrigation scheme will complement the already existing 20-hectare irrigation scheme currently operating under surface irrigation and 45-hectare scheme operating under drip irrigation. The existing scheme was developed by CESVI through an Italian Agency for Development Cooperation (IADC) project - A Resilient Community for Sustainable Development. The targeted area to be developed for the scheme measures 94 hectares. This area will be operated under a modified combined irrigation model. The scheme is expected to benefit approximately about 250 beneficiaries.

2.5.1 Project location

Chizumba irrigation scheme is situated in ward 7 of Mwenezi district in Masvingo Province, and the site lies at UTM Zone 36 coordinates 245459.57 m E and 7657751.82 m S. The site can be accessed by travelling about 20km South of Neshuro Growth Point from a turn off at approximately 120km from the City of Masvingo along the Masvingo-Beitbridge highway. Figure 14 shows the location of the project area on a satellite image and Figure 15 shows the topographic map of the site.

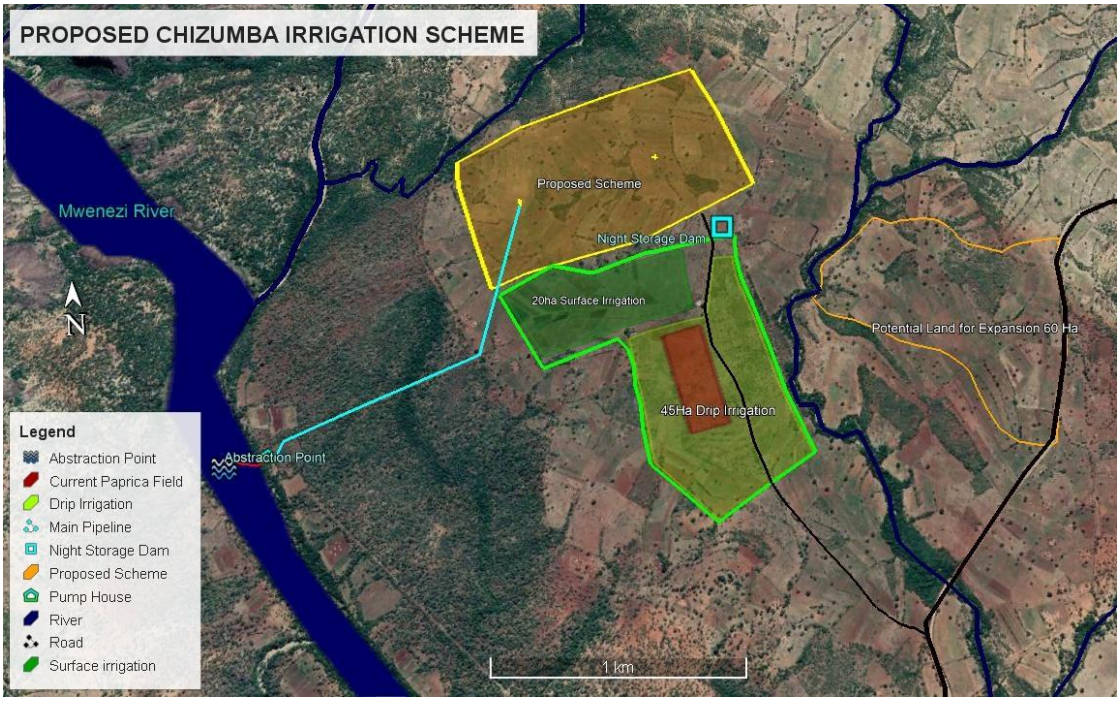

Figure 14: Proposed project site

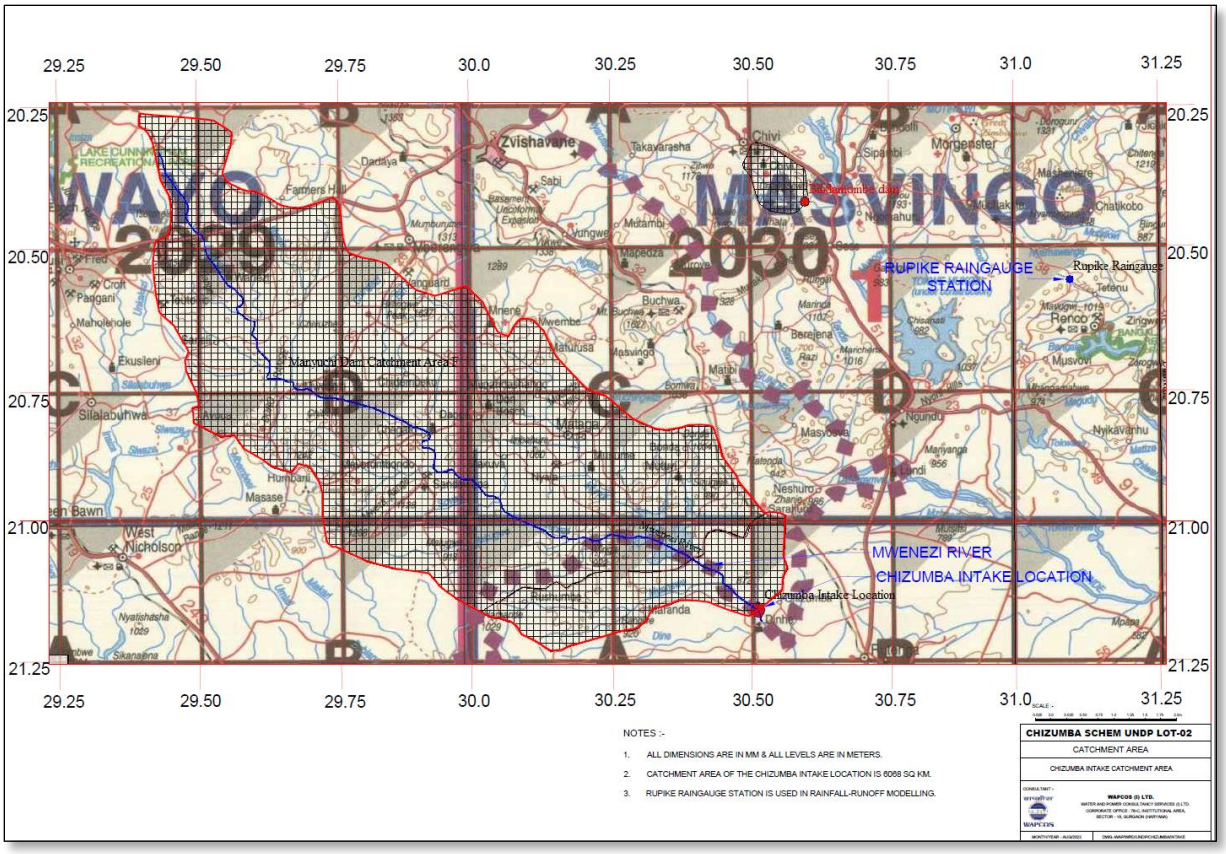

Figure 15: Topographic Map of the proposed site

2.5.2 Existing Infrastructure

There is existing intake infrastructure at an existing weir along Mwenezi River downstream of Manyuchi Dam as shown in Plate 6. This is supplying water to the drip and surface irrigation schemes currently operating at the existing scheme. The infrastructure has the capacity to adequately supply the proposed site too, hence water shall be withdrawn from that existing intake without new construction. There is an existing Rural Electrification Agency (REA) hydro-electricity transformer and a pump house about 200m from the intake as illustrated in Plate 7.

Plate 6: The weir and abstraction point (July 2022)

Plate 7: Pump house (June 2022)

2.5.3 Climate Proofing and Revitalization activities

Water will be withdrawn from an existing intake using three submersible pumps (2 working and 1 standby) of 25 Kw. The pump design summary is provided in Table 7. The pumps have been designed for the static head difference between lowest water level i.e. 540 m and nearest RL on field of 562 m. Static head is 32 m, residual head for sprinkler operation is 35 m including conveyance losses. Rising/Pumping mains conveys irrigation

water from intake facility to command area irrigation system. The length of pumping / rising that will deliver irrigation water to the command area would be 1.4km. An existing intake facility will be used for water withdrawal.

It was noted that among other irrigation systems, center pivot irrigation systems had been shown to be water and labor efficient and can easily irrigate relatively flat land and wide areas which is typical of the Chizumba irrigation scheme. However, there are gaps that are left out in between the circles. The teams suggested the use of a semi-portable system to cover the gaps to maximize the use of the available land. Hence, a highly efficient center pivot system covering 58.5 ha coupled with a semi-portable sprinkler system covering 15.5ha shall be installed in the scheme. The center pivot system layout is shown in Figure 16. Hydropower source of energy shall be used to power the irrigation scheme. There is also an opportunity to put in place a hybrid energy supply at the main booster pump station, whereby solar and grid electricity can be connected as a hybrid system. In this way farmers can alternate solar system during the day and use grid system during the evening. Farmers will be trained on efficient water management, capacity building of Irrigation Management Committees, and strengthening access to climate, weather and hydrological information.

Table 7: Pump design Summary

Sr. No.	Description	Symbol / Formula	Pumping Station (One Rising Main)
1	Design Capacity Peak flow in MLd	Q	3.84
2	No. of working hours	Hr.	22
3	Average discharge (peak) in MLd	Aq = Q x 24 / Hr.	4.19
4	Configuration of Pump Provided (3 Nos.)	Tp	3
	a) Working	Np	2
	b) Standby	-	1
5	Design Flow per pump in MLD	Qd	1.80
6	Static Head on pump in meters	Hs = R2 - R1	67
7	Length of Rising /Pumping Main in Meters	L1	1450
8	Total KW Requirement for each pump	KW	25

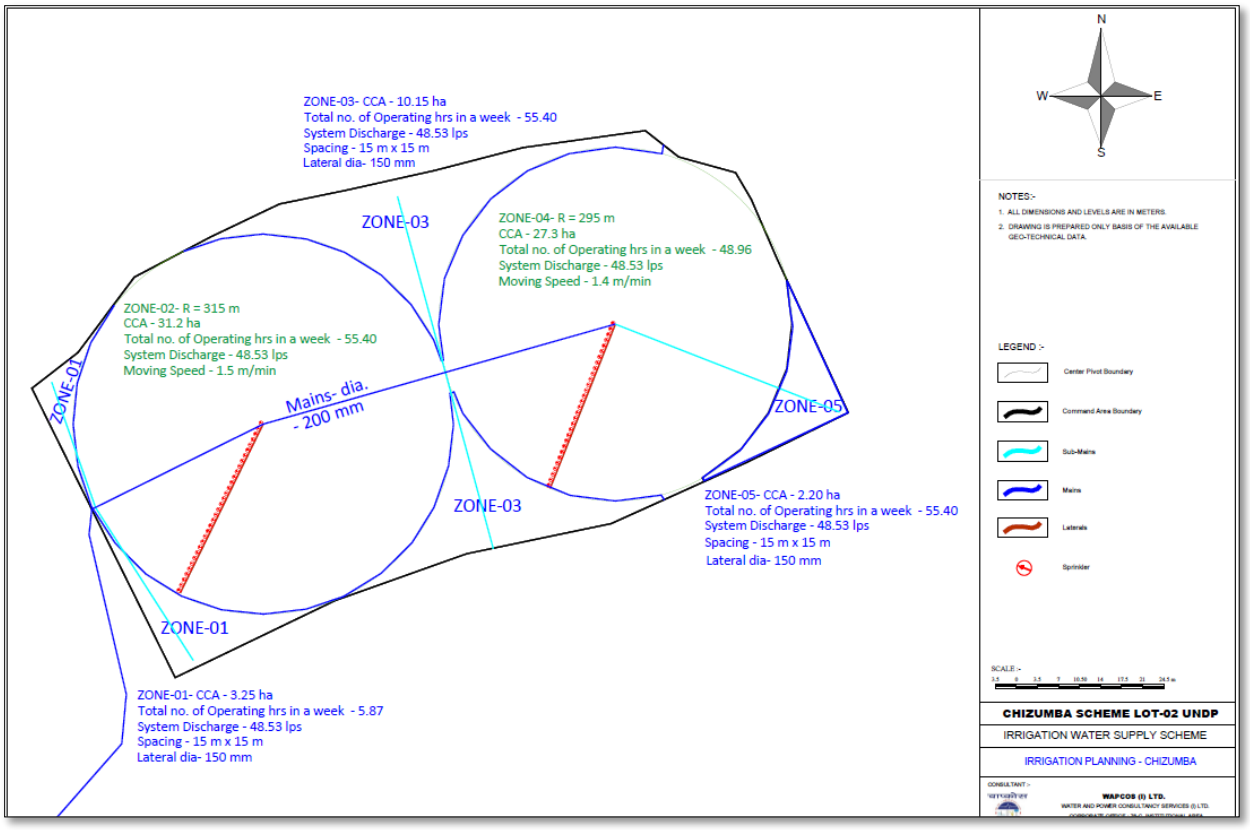

Figure 16: Centre Pivot system layout

2.5.4 Current land use

The land targeted for irrigation is currently under dry-land farming. The land is urgently bare. Adjacent to it, there are existing irrigation blocks of 45 ha under drip irrigation (Plate 8) and 20ha under flood irrigation (Plate 9)

Plate 8: Current land use

Plate 9: Adjacent land under a surface irrigation system

The crops mainly grown include maize. Beans, paprika, traditional grains and groundnuts are also grown. Plate 10 shows paprika and maize residues in the area.

Plate 10: Standing Paprika crop and harvested maize residues

Cotton is also grown in Chizumba as illustrated in Plate 11 which is showing a truckload of cotton bales that was captured passing through the site during data collection for the preparation of the ESMP.

Plate 11: Truck load of cotton bales harvested in the area (July 2022).

2.6 Bindamombe Irrigation Scheme

The Bindamombe irrigation scheme is one of the existing schemes targeted for revitalisation and climate proofing under the project. The scheme was commissioned in 2016 by the Department of Irrigation through funding from the Department for International Development (DFID) under the pilot projects for climate resilience. The scheme is currently not functional. Upon commissioning, water failed to reach the field adequately. It has a net irrigated area of 38.8 hectares (ha). About 300 farmers (244 females and 56 males) are current plot holders. Each farmer holds a plot size of 0.1ha.

2.6.1 Project location

The scheme is located in Ward 18 of Chivi District in Masvingo Province. It lies at UTM Zone 36 coordinates 251651.58mE and 7739442.42mS. The scheme is located approximately 50km from the City of Masvingo along the Masvingo-Beitbridge highway. Figure 17 shows the location of the project area on a satellite image and Figure 18 shows the location on a 1:50000 topographic map.

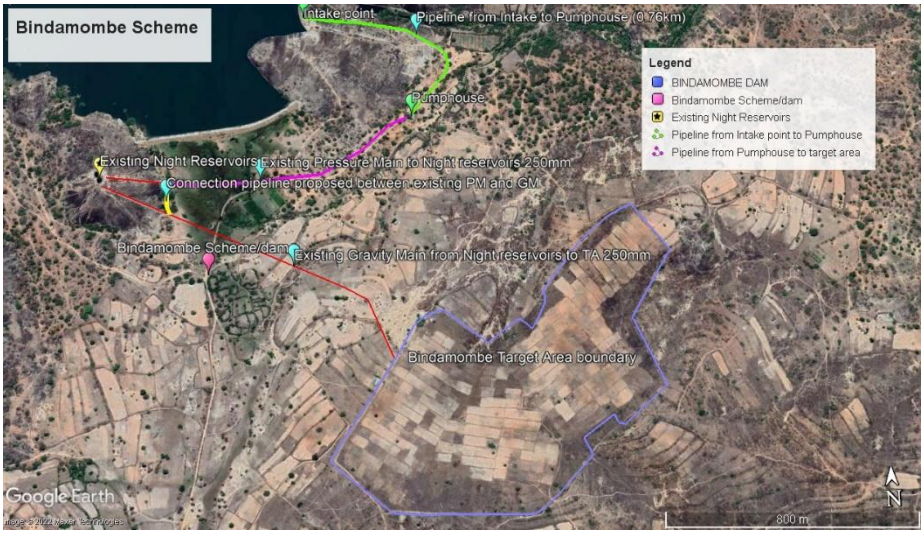

Figure 17: Project site

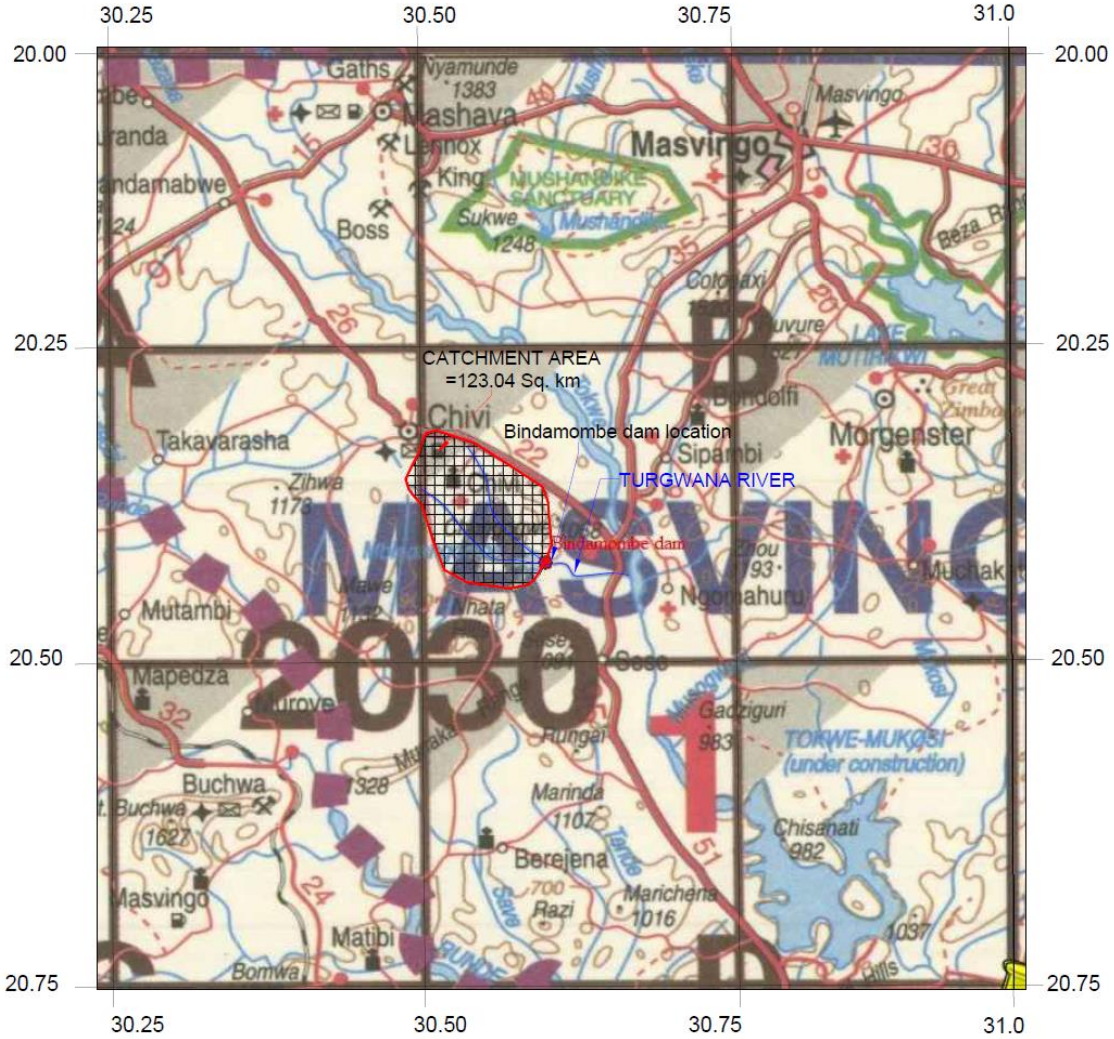

Figure 18: Location on a Topographic Map

2.6.2 Existing infrastructure

The scheme draws its water from Bindamombe Dam that sits on Tugwana River at UTM Zone 36 coordinate 251740.00 m E and 7739924.35 m S. The intake point of the scheme is from a pipeline through the wall of Bindamombe dam as shown in Plate 12.

Plate 12 The dam and abstraction point (May 2022)

There is an existing Rural Electrification Agency (REA) hydro-electricity transformer and a pump house about 760m from the intake as illustrated in Plate 13.

Plate 13 Pump house and dam (May 2022)

The irrigation system existing in the field is drag hose sprinkler system. The pictures of the existing drag hose system set are shown in Plate 14.

Plate 14 : Existing Drag hose system (March 2022)

2.6.3 Other existing facilities

There is a storage shed that is on good condition and well as ablution facilities which can be used by the farmers as shown in Plate 15.

Plate 15: Storage shed and blair toilets at the scheme

2.6.4 Climate Proofing and Revitalization activities

Climate proofing will be achieved by rehabilitating the scheme to supply enough water throughout the scheme using a sprinkler system. After examining the condition of the existing infrastructure and irrigation system, the following measures are proposed.

i. Water will be withdrawn from Bindamombe dam using a 45KW pump and the proposed intervention is to pump directly to field bypassing the existing night reservoirs
ii. Water will be pumped directly to the field by coupling the existing gravity and pressure mains with a 105m long pipeline. It is also checked that the capacities of the installed pumps support direct pumping.
iii. Some ancillary equipment viz., tripod complete set with riser pipe and sprinklers, garden taps and new hoses will be provided to all the farmers.
iv. A 45KW solar system is also proposed as backup.

The cost of rehabilitation works of the scheme is estimated at US$242,817.00 for the 34ha which translates to about $7141.67 per hectare

2.6.5 Current land use

The land to be used for irrigation is currently under dry-land farming as illustrated in Plate 16.

Plate 16 Current land-use (July 2022)

The crops mainly grown include maize, beans, groundnuts and roundnuts. Plate 3 shows groundnuts and maize during the rainy season. However, due to poor rains, the maize is showing signs of depression.

2.7 Rusununguko Irrigation Scheme

The proposed Rusununguko irrigation scheme is one of the 21 irrigation schemes targeted for climate proofing under the project. The proposed area to be developed measures 59 hectares. This area will be operated under a modified combined irrigation model. A Semi-portable type sprinkler system will be the method used for irrigating the area. The scheme is expected to benefit approximately 295 beneficiaries.

2.7.1 Project location

Rusununguko irrigation scheme is located in Ward 11 of Bikita District in Masvingo Province. The site lies at UTM Zone 36 coordinates 341833.50 m E and 7797292.81 m S. The site can be accessed by traveling about 70km East of the City of Masvingo along Masvingo-Mutare highway to Bikita minerals and travel about 11km North of Bikita minerals. Figure 26 shows the location of the project area on a satellite image and Figure 27 shows the location of the target area on 1:50000 topographic map.

Figure 19: Proposed project site.

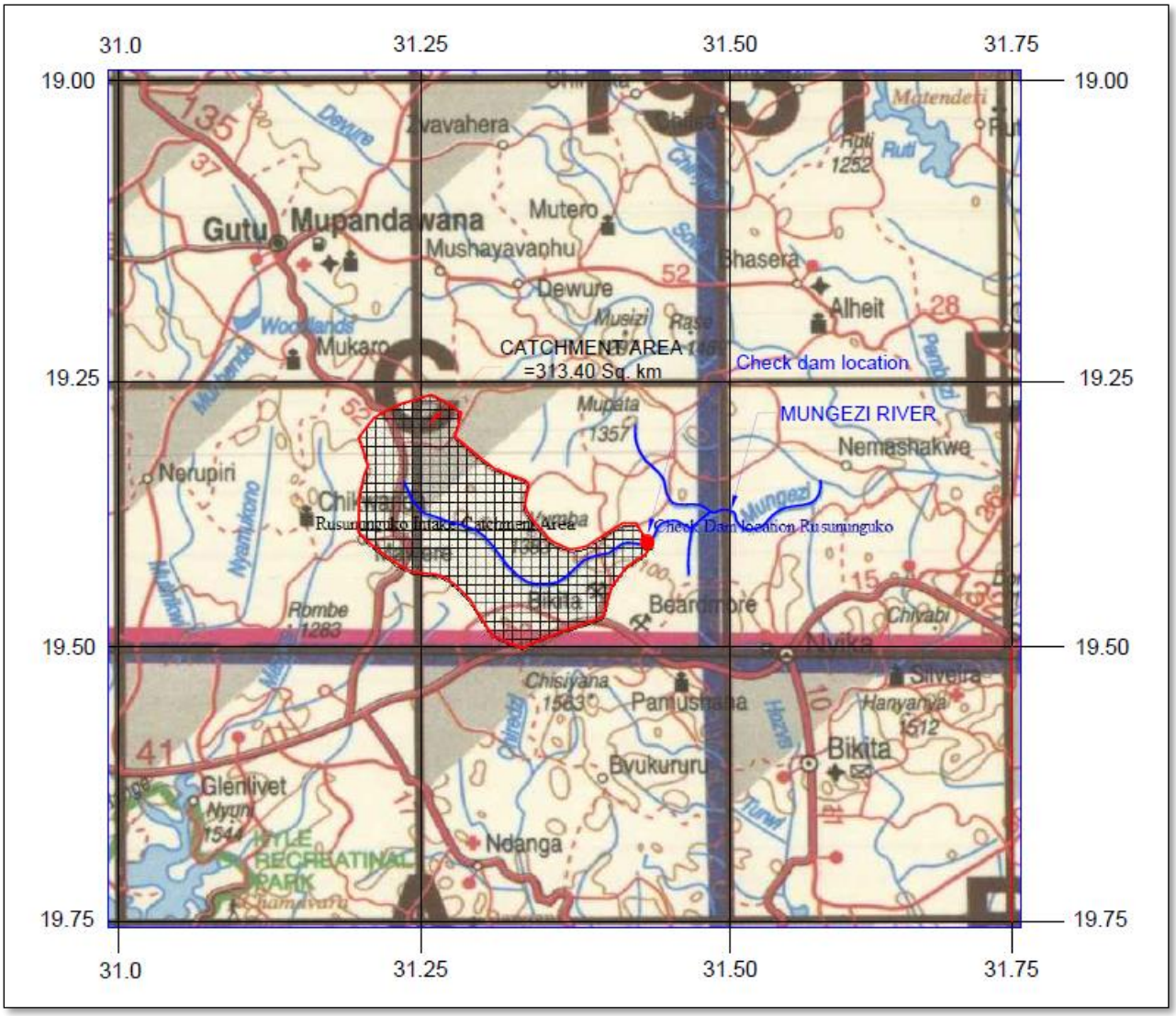

Figure 20: Topographic Map of the proposed site

2.7.2 Climate Proofing and Revitalization activities

A masonry check dam was proposed at the suitable location on Mungezi River and for water withdrawal and an intake sump well was proposed on the upstream side of check dam. The abstraction point location is shown in Plate 20.

Plate 17: Abstraction point

Water will be withdrawn from a selected intake point using three submersible pumps (2 working and 1 standby) of 30 Kw. The pumps have been designed for the static head difference between lowest water level i.e. 1060 m and nearest RL on field of 1092 m. Static head is 32 m, residual head for sprinkler operation is 35 m including conveyance losses. Table 8 show the pump design Summary for the irrigation scheme

Table 8: Pump design summary for Rusununguko irrigation scheme

Sr. No.	Description	Symbol / Formula	Pumping Station
1	Design Capacity Peak flow in MLd	Q	3.68
2	No. of working hours	Hr.	22
3	Average discharge (peak) in MLd	Aq = Q x 24 / Hr.	4.01
4	Configuration of Pump Provided (2 Nos. in caisson)	Tp	3
	a) Working	Np	2
	b) Standby	-	1
	Design Flow per pump in MLD	Qd	2.00
5	Static Head on pump in meters	Hs = R2 – R1	32
6	Sprinkler system head in meters		35
7	Length of Rising /Pumping Main in Meters	L1	1642
9	Total KW Requirement of 2 working pumps	KW	60

Rising/Pumping mains conveys irrigation water from intake facility to command area irrigation system. The length of pumping / rising that will deliver irrigation water to the command area would be 1.4km. A weir will be built at the point where water will be drawn.

A highly efficient semi-portable sprinkler system shall be installed in the scheme. Electricity shall be used to power the irrigation scheme. There is also an opportunity to put in place a hybrid energy supply at the main booster pump station, whereby solar and grid electricity can be connected as a hybrid system. In this way farmers can alternate solar system during the day and use grid system during the evening. Farmers will be trained on efficient water management, capacity building of Irrigation Management Committees, and strengthening access to climate, weather and hydrological information.It was noted that among other irrigation systems, the semi-portable irrigation system best suited the shape, size and topography of the land. It is also water efficient for the irrigation scheme. The layout of the proposed irrigation system is shown in the Figure 21.

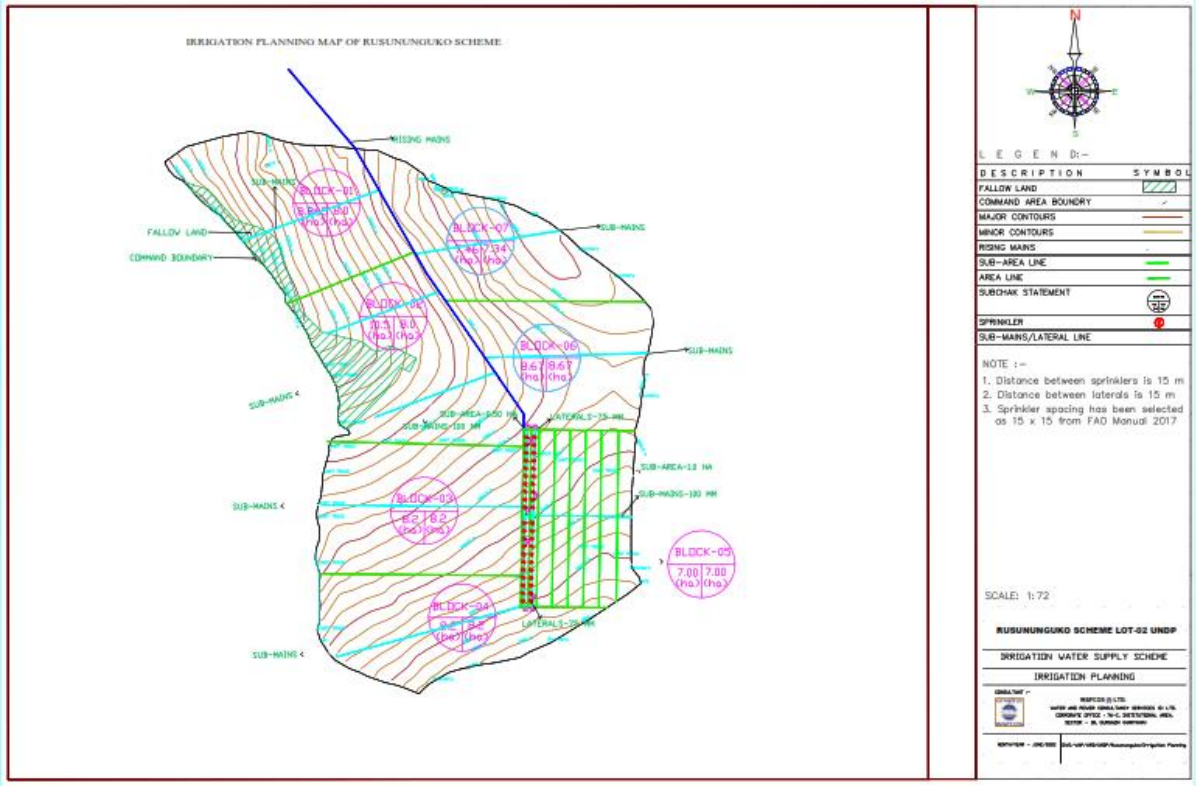

Figure 21: The semi-portable sprinkler system layout

2.7.3 Current land use

The land to be used for irrigation is currently under dry-land farming. The land is largely bare as illustrated in Plate 18.

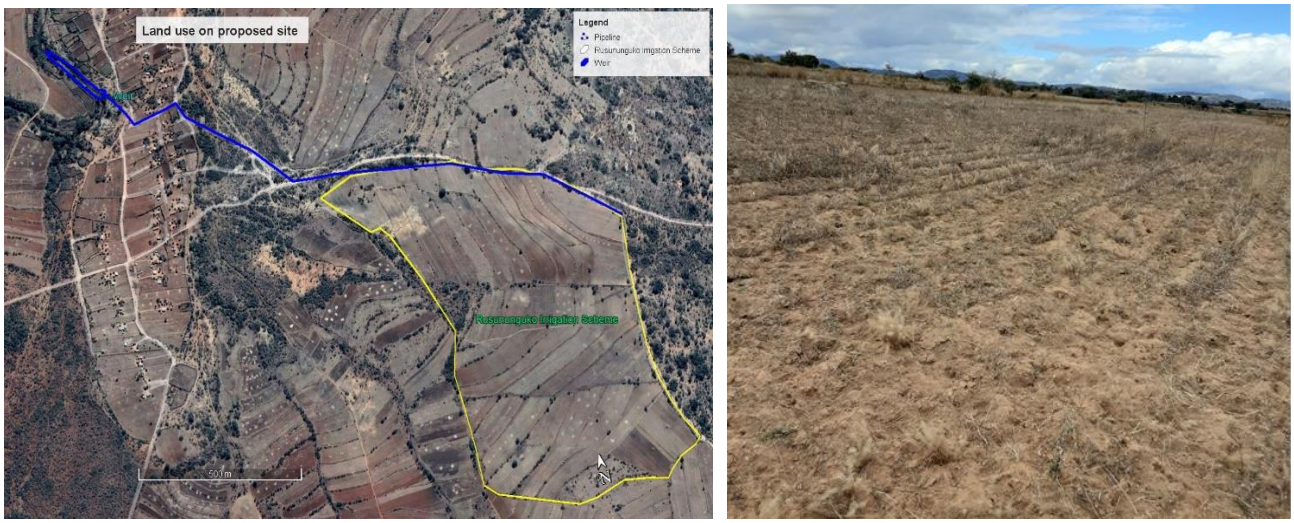

Plate 18: Current land use (June 2022)

The crops mainly grown in the area include maize, millet, rapoko and sorghum, beans, round nuts, pumpkins, sunflowers and groundnuts.

2.8 Bwanya Irrigation Scheme

Bwanya irrigation scheme is one of the 21 irrigation schemes targeted for climate proofing under the project. The proposed area to be developed measures 156 hectares. This area will be operated under a modified combined irrigation model. The center pivot system will be covering 46% of the land whilst the remaining 54% will be commanded by a semi-permanent type sprinkler system. The scheme is expected to benefit approximately about 300 beneficiaries both directly and indirectly.

2.8.1 Project location

The proposed irrigation scheme is situated in Ward 3 of Chivi District in Masvingo. The site can be accessed by traveling about 10km North-West of Mashava from a turn off at approximately 40km away West of the City of Masvingo along the Masvingo-Bulawayo highway. Figure 22 shows the location of the project area on a satellite image and Figure 23 shows the topographic map of the site.

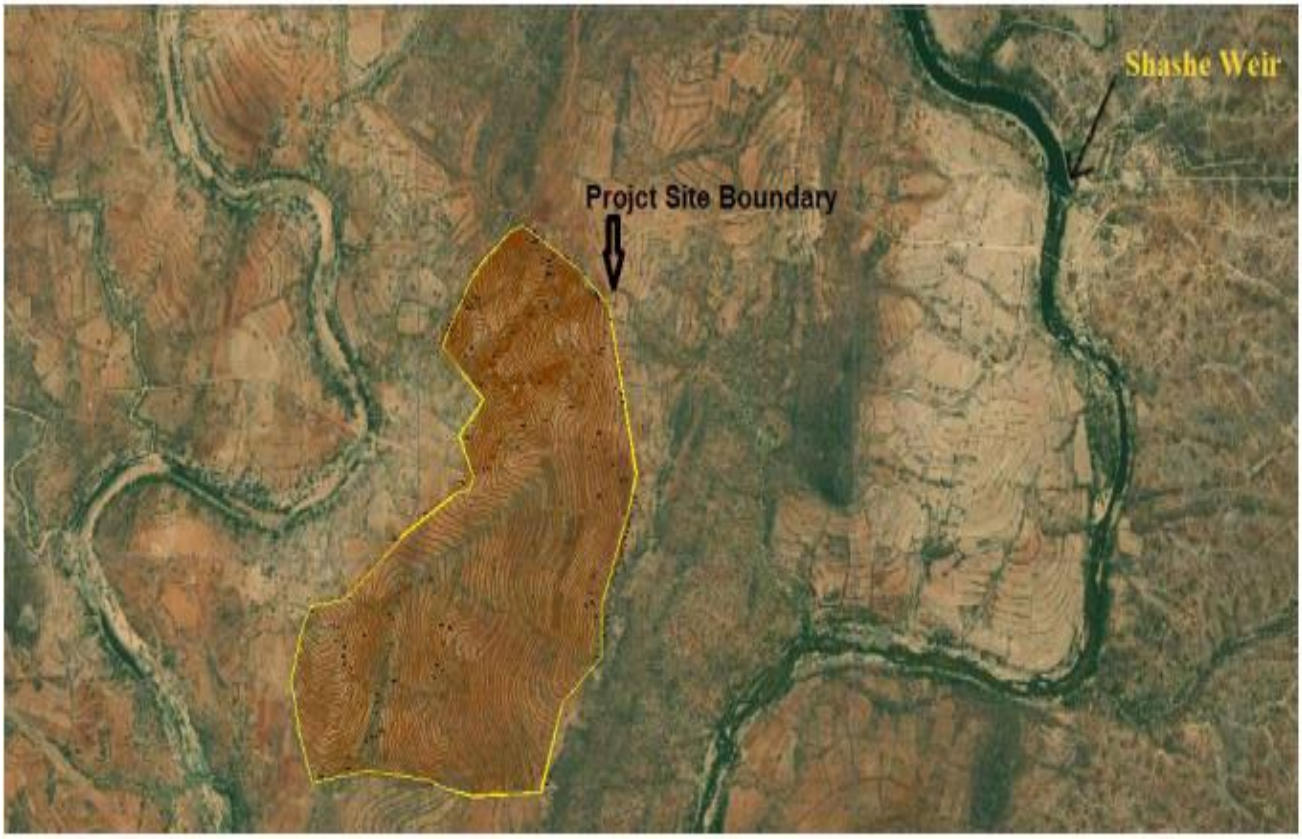

Figure 22: Proposed project site.

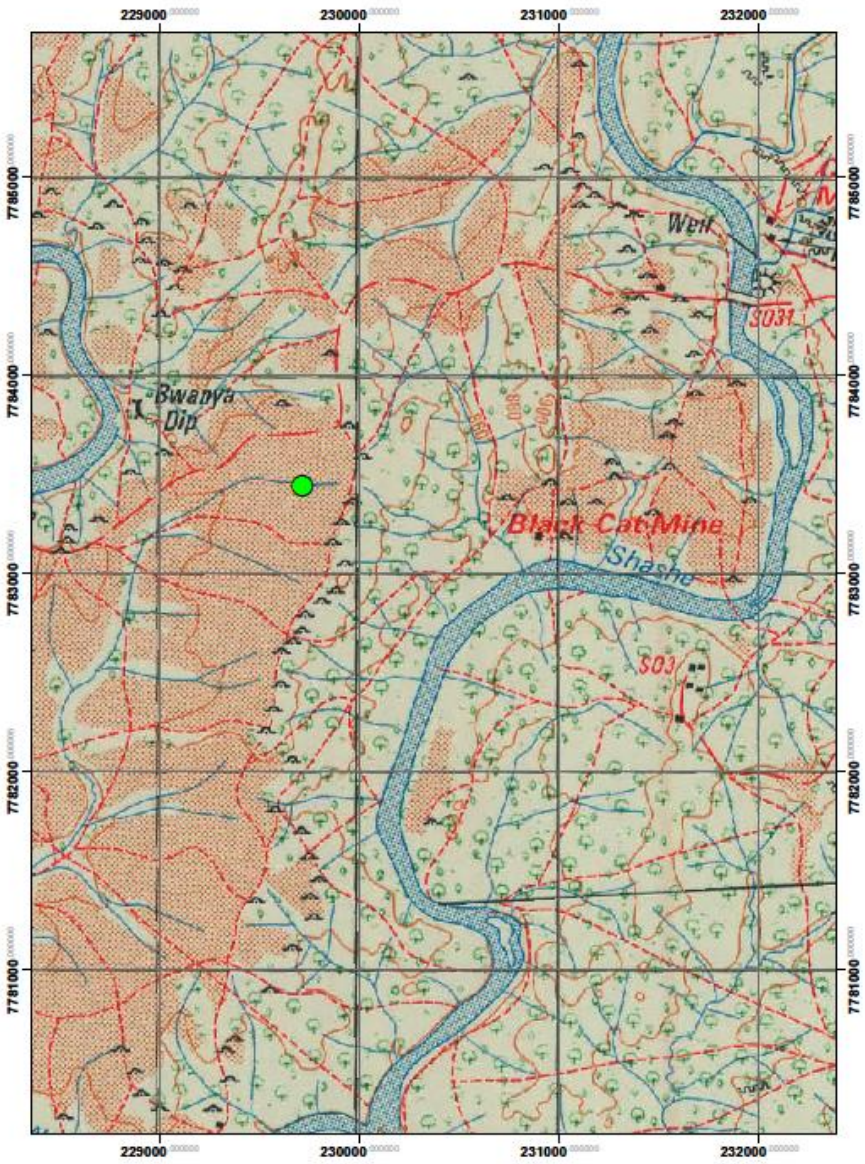

Figure 23: Topographic Map of the proposed site

2.8.2 Climate Proofing and Revitalization activities

An intake sump well is proposed at 500m upstream of Shashe weir having depth of 4m and a floor level of 950m. There will be two retaining walls securing two parallel sides of sump well. The top level of retaining wall i.e., 955 m has been taken as 1m higher from the top level of Shashe weir i.e. 954 m. For repair & maintenance of 3 working and 1 standby pump-pipe system, pulley winch arrangement has been provided for each pump-pipe. Water will be withdrawn from a selected intake point using three submersible pumps of 70 Kw. The pump design summary is provided in Table 9. The pumps have been designed for the static head difference between lowest water level i.e. 948 m and nearest RL on field of 994 m. Static head is 46 m, residual head for sprinkler operation is 35 m including conveyance losses.

Table 9: Pump design summary

Sr.No.	Description	Symbol / Formula	Pumping Station (Three Rising Mains)
1	Design Capacity Peak flow in MLd	Q	9.93
2	No. of working hours	Hr.	22
3	Average discharge (peak) in MLd	Aq = Q x 24 / Hr.	10.83
4	Configuration of Pump Provided (4 Nos.)	Tp	4
	a) Working	Np	3
	b) Standby	-	1
	Design Flow per pump in MLD	Qd	3.60
5	Static Head on pump in meters	Hs = R2 - R1	81
6	Length of Rising /Pumping Main in Meters	L1	2200
7	Total KW Requirement for each pump	KW	70

Rising/Pumping mains conveys irrigation water from intake facility to command area irrigation system. The length of pumping / rising that will deliver irrigation water to the command area would be 2.2km. A sump facility will be used for water withdrawal. A highly efficient center pivot system coupled with a semi-portable sprinkler system shall be installed in the scheme. A centre pivot irrigation system shall cover about 72 ha and the remaining 84 ha shall be irrigated using a semi-permanent sprinkler system. Electricity shall be used to power the irrigation scheme. There is also an opportunity to put in place a hybrid energy supply at the main booster pump station, whereby solar and grid electricity can be connected as a hybrid system. In this way farmers can alternate solar system during the day and use grid system during the evening. Farmers will be trained on efficient water management, capacity building of Irrigation Management Committees, and strengthening access to climate, weather and hydrological information. The layout of the proposed hybrid system is shown in Figure 24.

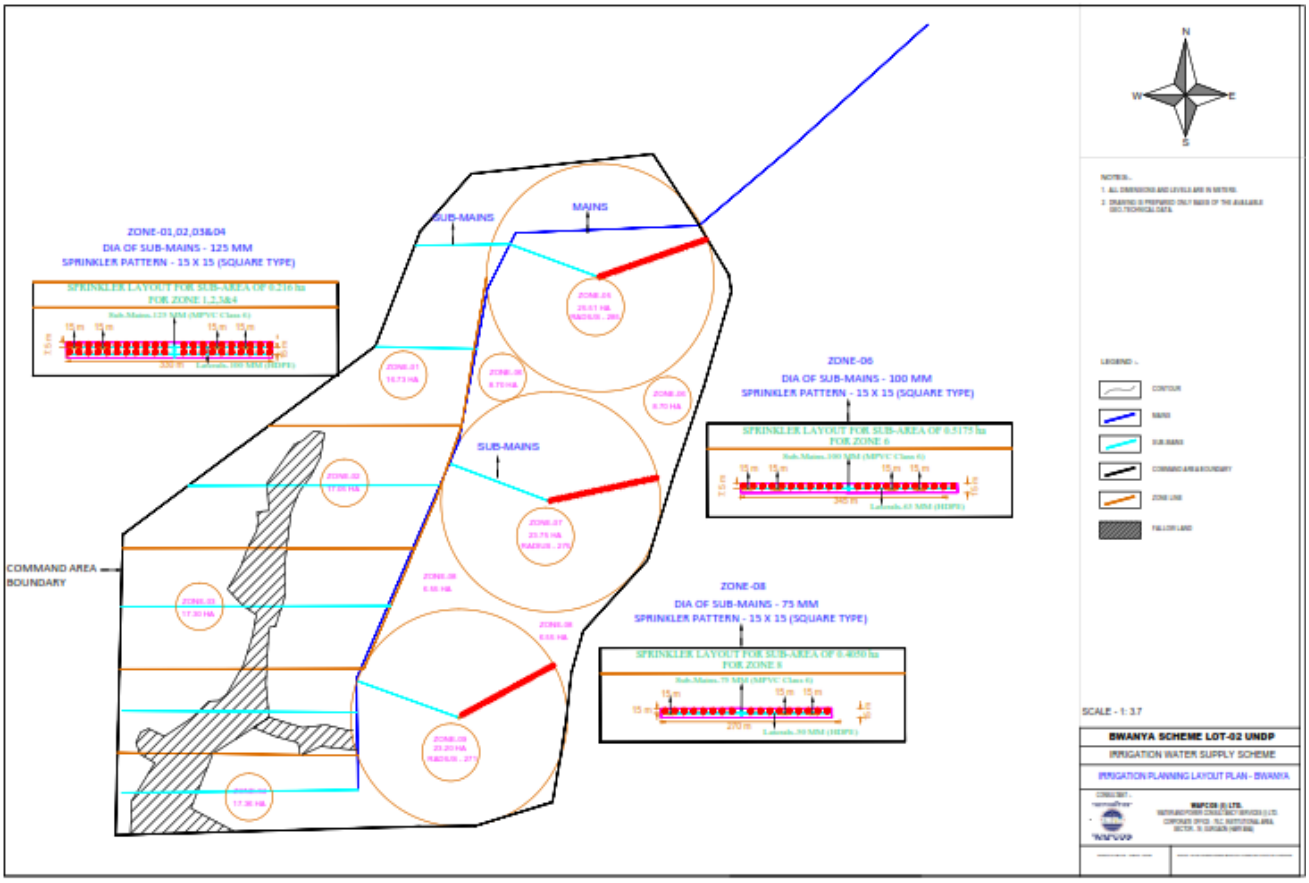

Figure 24: The Hybrid system layout

2.8.3 Current land use

The land to be used for irrigation is currently under dry-land farming. The land is urgently bare as illustrated in Plate 19.

Plate 19: Current land use (April 2022)

The crops mainly grown include maize, sunflower, traditional grains (millet, rapoko, sorghum), beans, round nuts, pumpkins and groundnuts.

2.9 Sub-project Justification

Masvingo is one of the driest Provinces in Zimbabwe and it experiences arid to semi-arid climatic conditions that have promoted a continuous failure of crops under rain-fed agriculture. The detrimental effects of climate change continue to be felt through persistent droughts and floods, leading to hunger and general impoverishment of communities. Irrigated agriculture is the panacea to unlocking the potential for food security. The dams in Masvingo such as Muzhwi, Manyuchi, Bindamombe and Matezva provide vast opportunities for communities that are located downstream of these reservoirs through irrigated agriculture. Irrigated crop production enhances income from sale of surplus yields and off-season premiums and also provides employment through additional on-farm and off farm labor. All this brought together, contribute to improved food security, enhanced livelihoods and increased resilience and well-being for vulnerable smallholder communities. Moreover, smallholder farmers will also benefit from access to more accurate, dependable and tailored information on weather, climate and hydrological resources, which will allow them to plan agricultural tasks and manage crops, soil and water to reduce water stress or take advantage of rain or irrigation potential to reduce water stress. The proposed Irrigation Schemes comes in as an opportunity to managing climate risks and hazards.

2.10 Stage in project cycle

The sub-project is currently at the feasibility stage as shown in Figure 25.

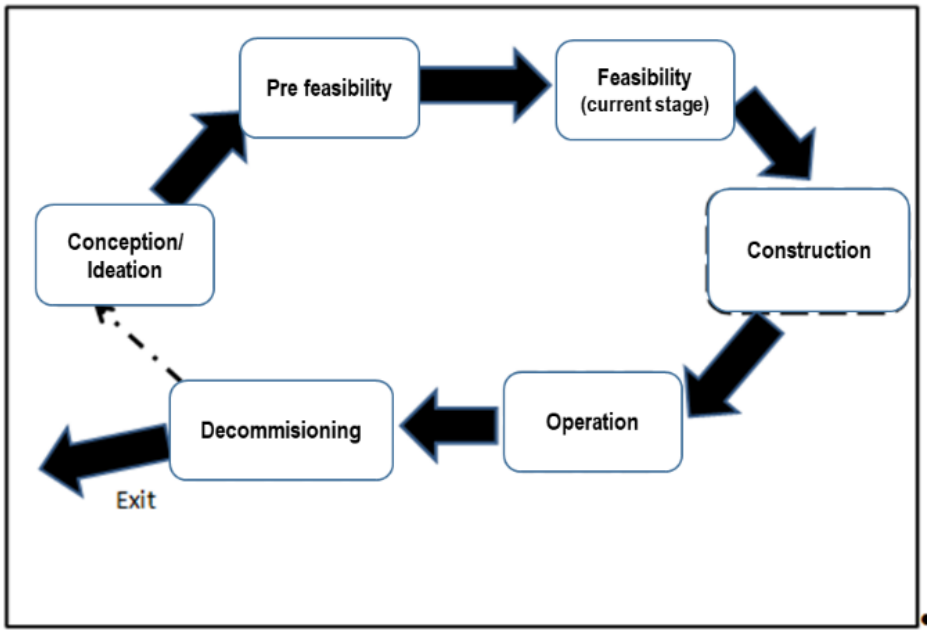

Figure 25: Current status in the project cycle

2.11 Estimated project cost

The estimated cost for developing each scheme is provided in Table 10.

Table 10: Cost for developing each scheme

Name of Scheme	Cost (USD)	Cost per Ha (USD)
Zvinyaningwe	591,001.75	12847.86
Nyahombe	1,063,202.69	10653.33
Pikinini-Jawanda	1,565,591.13	10035.84
Chizumba	720,157.44	9731.85
Bindamombe	242,817.00	7141.67
Rusununguko	696,563.61	11806.16
Bwanya	1,607,112.25	10302

3.0 POLICY LEGAL AND ADMINISTRATIVE FRAMEWORK

The construction and revitalization of the irrigation schemes under Lot 2 will be subject to various pieces of e environmental and social policies, legislation, standards, guidelines, conventions. The Ministry of Lands, Agriculture, Water, Fisheries and Rural Development (MoLAWFRD), contractors and the partners shall ensure that the sub-projectivities are aligned to the national development policies, strategies and plans of the country while ensuring that all operations comply with the national laws and regulations.

3.1 National Policies, Plans and Strategies

Zimbabwe has developed various policies, plans and strategies which directly and indirectly affects the agricultural sector. It is to the duty of the MLAWFRD and its partners including contractors to ensure that national policies, plans and strategies are mainstreamed in sub-project implementation processes. The national polices, plans and strategies relevant to the sub-project are provided in Table 11.

Table 11: National policies, plans and strategies relevant to the sub-project

Policy / Plan / Strategy	Principles, strategies, and elements relevant to the project
Zimbabwe National Development Strategy (2021-2025)	The strategy aims to strengthen macroeconomic stability, characterized by low and stable inflation, as well as exchange rate stability, to promote new enterprise development, employment and job creation and ensure sustainable environmental protection and resilience
National Environmental Policy & Strategies (2009)	Promotes principles of resource efficiency, Integrated pollution Control, polluter pays principle, sustainable development, environmental education, and access to environmental Information. Ministry of Lands, Agriculture, Fisheries, Water, and Rural Development and its partners are expected to mainstream these principles in project implementation
National Gender Policy	The policy goal is to eradicate gender discrimination and inequalities in all spheres of life and development. The policy also advocates for gender mainstreaming in all projects and plans. Encourages research that highlight environmental challenges and inequalities among women and men and recommend gender responsive strategies.
National Climate Policy (2017)	The policy calls for the reduction of greenhouse gas emissions. Calls for mainstreaming of climate issues in all sectors of the economy including energy, agriculture, industrial processes, waste, land use land cover and forestry. Promotes principles of sustainable development, prevention of pollution and ecological degradation and inclusive participation

Policy / Plan / Strategy	Principles, strategies, and elements relevant to the project
Occupational Health and Safety Policy (2021)	Encourages Occupational Health and Safety Promotion at workplaces; to ensure the safe handling, storage and transportation of hazardous substances, including chemicals; to ensure the proper use of OSH protection systems, including PPE and to report all reportable accidents to the relevant authorities
National Renewable Energy Policy (2019)	Promotes uptake of Renewable Energy Technologies (RETs) in all sectors resulting in reduced GhG emissions
Vison 20230: Towards an Upper-Middle Income Economy by 2030	Capacitation of local authorities and environmental authorities to management pollution and waste. Promotes cooperation among stakeholders towards environmental management
National Climate Change Response Strategy (2014)	Promotes the principle of sustainable development, resource efficiency, implementation of emission standards; providing incentives for GHG reduction and waste minimization; technology transfer. Promotes integrated waste management including education and awareness; as well as access to environmental information. Encourages partnerships for environmental sustainability
Zimbabwe National Agriculture Policy Framework (2018-2030)	The Policy Framework provides guidance and direction on how to promote and support the sustainable flow of investments to transform the agricultural sector through increased and sustained agricultural production, productivity and competitiveness. Its goals are to ensure national and household food and nutrition security, increase agriculture's contribution to the gross domestic product (GDP) and improve agricultural market access and competitiveness.
National Biodiversity Strategy and Action Plan (2014)	The Plan proposes measures to prevent pollution of ecosystems through monitoring and enforcing national quality standards for water, air and solid waste; reviewing environment fines and mechanisms for enforcement; upgrading waste dumpsites and promoting recycling and reuse of waste. The Plan also describes measures for promoting increased consumer consciousness and demand for environmentally sustainable production and services; as well as conducting assessments on the impacts of chemical use on water bodies

3.2 Framework Legislation and Regulations

Several laws and regulations relevant to the sub-project have been developed in the country. The relevant legislation include the Environmental Management Act (Chapter 20:27), Water Act (Chapter 20:24), Public Health Act (Chapter 15:17), Labour Act (28:01), Forestry Act (Chapter 15:09), Parks and Wildlife Act (Chapter 20:14), Traditional Leaders Act (Chapter 29:17), Farm Feeds, Fertilizer and Remedies Act (Chapter 18:12), Factories and Works Act (14:08), Rural District Councils Act (Chapter 29:13), The Communal Lands Act (Chapter 20:04) and their applicable regulations. These laws and the compliance mechanism are discussed in Appendix 1.

3.3 International Commitments

Zimbabwe is a signatory to a number of international and regional agreements and conventions, which are related to the project. Notable agreements and conventions relevant to the project include:

- 1995 Protocol on Shared Watercourse Systems to the Treaty of the Southern African Development Community.

  Muzhwi Dam is part of a shared watercourse – the Save river. The protocol considers that the utilisation of shared watercourse systems within the SADC region be open to each riparian or basin State, in respect of the watercourse systems within its territory and without prejudice to its sovereign rights, in accordance with the principles contained in this Protocol. The utilisation of the resources of the watercourse systems include agricultural, domestic, industrial, and navigational uses.

- 1971 Ramsar Convention on Wetlands

  This is an international treaty that provides a framework for the conservation and sustainable use wetlands as a contribution towards achieving sustainable development throughout the world. Shashe River is considered as a wetland under the Ramsar Convention and hence Scheme should not lead to the degradation of the riverine environment.

- 1992 United Nations Framework Convention on Climate Change and Kyoto protocol

  The United Nations Framework Convention on Climate Change (UNFCCC) is an international environmental treaty aimed at stabilizing greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. The Convention therefore provides the basis for global action "to protect the climate system for present and future generations". Zimbabwe ratified the Convention in 1992. The Kyoto Protocol is linked to the UNFCCC to prevent anthropogenic interference with the climate system. The Protocol establishes legally binding commitments for the reduction of greenhouse gases and fluorocarbons. The revitalization project will need to understand its contributions to greenhouse gas emissions relative to that of the country and if relevant include related mitigation measures for on-going monitoring and assessment. Greening from all season cropping means increased carbon sequestration and mitigation contribution

- 1994 United Nations Convention to Combat Desertification

  The objective of the United Nations Convention to Combat Desertification is to combat desertification and mitigate the effects of drought in countries experiencing serious drought and/or desertification through effective action at all levels and supported by international cooperation. The Convention was established in 1994 and ratified by Zimbabwe in 1997. Irrigation projects are associated with salinization of the soil an environmental problem which leads to desertification. The proposed sub-project activities should be planned, developed and operated in such a manner that promotes organic fertilizers. Should also consider designs that minimize erosion from excess runoff or storm water drainage from the scheme given the gentle falling topography.

- 1992 Convention on Biological Diversity

  The Convention on Biological Diversity is the first global agreement on conservation and sustainable use of Biological Diversity. Its objectives are to conserve biodiversity, promote the sustainable use of bio-diversity components and to promote fair and equitable sharing of benefits arising from the use of resources. Zimbabwe ratified the Convention in 1994. The convention

requires Zimbabwe to prepare a national biodiversity strategy and to ensure that it is mainstreamed into the planning and activities of all sectors that have an impact on biodiversity. In line with this provision, the contractor who is going to carry rehabilitation works should ensure that the project is planned, developed and operated in a manner that is in compliance with the recommendations of the National Biodiversity Strategies and Action Plans (NBSAP).

- 1979 Convention on the Elimination of all forms of Discrimination against Women
  By signing the Convention, Zimbabwe commit itself to undertake a series of measures to end discrimination against women in all forms, including: to ensure elimination of all acts of discrimination against women by persons, organizations or enterprises.

- 1989 Convention on the Rights of the Child
  The convention stipulates how governments, the United Nations – including the Committee on the Rights of the Child and UNICEF - and other organisations work to make sure all children enjoy all their rights. Zimbabwe is committed to ensure children rights. The scheme shall not violet the rights of children.

Other protocols and treaties

- 1996 Protocol on Energy to The Treaty of the Southern African Development Community
- 1997 International Plant Protection Convention
- 1999 Protocol On Wildlife Conservation and Law Enforcement to the Treaty of the Southern African Development Community
- 2001 International Treaty on Plant Genetic Resources for Food and Agriculture
- 2001 Stockholm Convention on Persistent Organic Pollutants
- 2002 Protocol On Forestry to The Treaty of the Southern African Development Community
- 2003 African Convention On the Conservation of Nature and Natural Resources
- 2015 Paris Agreement under the United Nations Framework Convention on Climate Change

3.4 UNDP's Social and Environmental Standards (2015)

This ESMP was developed based on considerations of the guidance of UNDP's Social and Environmental Standards to achieve environmental and social benefits and minimize of any potential environmental and social risks. These Standards underpin UNDP's commitment to mainstream social and environmental sustainability in its programs and projects to support sustainable development and are an integral component of UNDP's quality assurance and risk management approach to programming. Through the SES, UNDP meets the requirements of the GCF's Environmental and Social Safeguards Policy.

UNDP screens and reviews its activities to identify opportunities to advance the principles that are founded on human rights, gender equality and women's empowerment and environmental sustainability and to identify potential risks that may require measures to avoid, minimize, and/or mitigate potential impacts. At the Project level, UNDP has developed seven (7) operational safeguards Standards which further support implementation

of UNDP's commitments to promote respect for human rights, gender equality, and environmental sustainability. UNDP's Project-level Standards relate to the following areas:

- Standard 1: Biodiversity Conservation and Sustainable Natural Resource Management
- Standard 2: Climate Change Mitigation and Adaptation
- Standard 3: Community Health, Safety and Working Conditions
- Standard 4: Cultural Heritage
- Standard 5: Displacement and Resettlement
- Standard 6: Indigenous Peoples
- Standard 7: Pollution Prevention and Resource Efficiency

The Standards set out specific requirements relating to different social and environmental issues. Application of the Standards is determined during UNDP's social and environmental screening and categorization process. Where it is determined that a Project may present certain risks and/or impacts, requirements of the relevant Standard(s) are triggered. The screening carried out during project development indicate human rights principle and (5) of the project-level social and environmental standards have been triggered across the project components. This programming principle and the operational standards are described in Table 12.

Table 12: Operational standards triggered under the sub-project

Principle/ Project-Level Standard	**Safeguard Details**	**Applicable to the Project**	
		Yes/No	**Basic Details**
Principle 1. Human Rights	UNDP recognizes the centrality of human rights to sustainable development	**Yes**	There is a risk that duty-bearers (e.g., government agencies) may not have the capacity to meet their obligations in the project
OS 1	Biodiversity Conservation and Sustainable Natural Resource Management	**Yes**	This standard has been triggered because the sub-project may generate potential biodiversity impacts through habitat loss or hydrological changes. Further biodiversity impacts may be experienced during the operational phase of the project due to soil and water pollution
OS2	Climate Change Mitigation and Adaptation	**Yes**	This standard has been triggered because the sub-project will involve activities that generate greenhouse gas emissions such as vehicular transport. GhG emissions can also be released during handling of crop residues.
OS 3	Community Health, Safety and Working Conditions	**Yes**	This standard has been triggered because the sub-project will involve construction of civil works which may pose a threat to human and animal life during the construction and operational phase. There is also potential risk of child labour and poor working conditions including occupational health and safety risks during the construction phase of the project.
OS 4	Cultural Heritage	**Yes**	This standard has been triggered because, tangible cultural heritage may be unexpectedly encountered during the construction phase. As such, risks and impacts to tangible cultural heritage, and in particular, archaeological material, that may arise from Project activities

Principle/ Project-Level Standard	Safeguard Details	Applicable to the Project	
		Yes/No	Basic Details
			need to be managed
OS 5	Displacement and Resettlement	**No**	This standard has not been triggered because the sub-project will not result in physical or involuntary resettlement of persons during the implementation of sub-project activities.
OS 6	Indigenous Peoples	**No**	This standard has not been triggered because there are no Indigenous Peoples situated within the sub-project area of influence
OS 7	Pollution Prevention and Resource Efficiency	**Yes**	This standard has been triggered because the sub-project will result in the use of chemicals e.g. (petroleum-based fuels, fertilizers and pesticides) which may result in pollution of water, soils and air. The project will also result in water abstraction which necessitates its efficient use and management

3.5 ESMP implementation Modalities

The sub-projects will be implemented through the Department of Irrigation, the Department of Agricultural Extension (AGRITEX), Zimbabwe National Water Authority (ZINWA) and Meteorological Services Department (MSD). UNDP will oversee the day-to-day implementation of the sub-projects. In addition, collaboration with local government, existing NGOs and local communities is expected.

3.6 Licenses/permits required for the sub-projects

The project shall be required to have requisite permits and licenses for it to comply with laws and regulations. The licenses required in Table 13.

Table 13: Licenses or Permits required for the project

ITEM	LICENSE or PERMIT	STAGE	REGULATORY AUTHORITY
1.	ESMP License	Planning	EMA
2.	Water Permit (for abstraction)	Operational	ZINWA

4.0 BASELINE ENVIRONMENTAL AND SOCIO-ECONOMIC SETTING

Baseline data forms the basis on which environmental and social impacts can be monitored against. Both socio-economic and biophysical data of the project site and its environs was collected. This was done in-order to determine the status quo before the implementation of the project. Socio-economic, climatic data, soils, land tenure, hydrology, hydrogeology, biodiversity, water and air quality, land use, land cover, archeological data, etc. were collected.

4.1 Climate

The irrigation schemes fall within agro-ecological zone VI and V according to the natural regions classification of Zimbabwe. The climate is predominantly arid making the area is too dry for crop production. Weather data was obtained from Rupike, Makoholi and Masvingo airport meteorological stations. The rainfall is less than 650 mm/year and highly erratic. The annual maximum and minimum temperature is 28.6ºC and 6.2ºC respectively. Annual mean wind speed is 112 km/hr.

Drought (Meteorological and Agricultural) is the most common and high-impact natural hazard occurring in Zimbabwe, both in terms of frequency of occurrence and the number of people affected, with droughts accounting for 7 out of the 10 top major natural hazards since recorded 1990. Due to increasing climatic uncertainty, and reduced coping capacity, the risk of drought has spread to all areas of the country including the sub-project implementation areas and is affecting a broader range of people. The impacts of droughts are predicted to increase, with the World Bank Group Climate Change Knowledge Portal, predicting the annual likelihood of Zimbabwe encountering severe drought to increase by 21% in 2040 to 2059 and by 47% in 2080 to 2099 compared to the baseline period of 1986 to 2005 scenario.

4.2 Hydrology and hydrogeology

Zvinyaningwe irrigation scheme: The scheme is supplied by water from Muzhwi Dam, along Shashe river. It is within the dam catchment with the tail end of the proposed field at 150m from the highest flood level. The proposed scheme complies with the Zimbabwe National Water Authority (ZINWA)'s buffer zone set at 100m from the highest crest level for large dams and the Environmental Management Agency (EMA)'s water course buffer zone which is at 50m from the highest flood level. Water is abstracted using submersible pumps mounted on a floating pontoon type intake. The hydrology is indicated in Figure 26. The ground water of the area is linked to the base flow from Muzhwi dam.

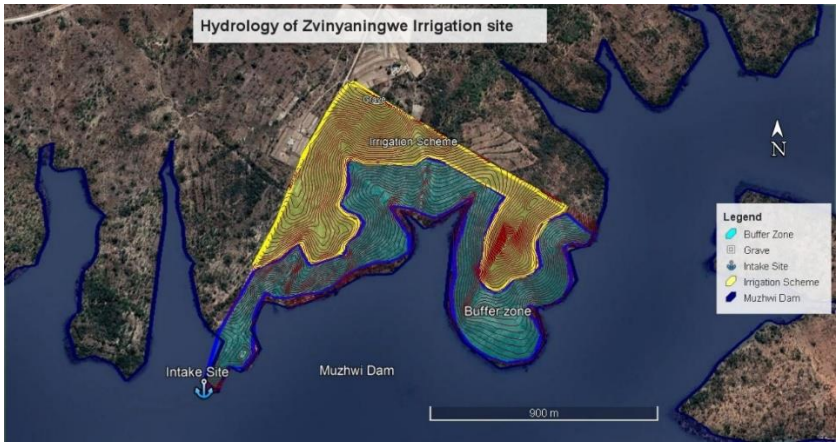

Figure 26: Hydrology of Zvinyaningwe irrigation scheme

The water demand of Zvinyaningwe irrigation scheme will be met from the releases of Muzhwi dam. The unallocated water of the dam is 5 MCM (5000 ML) which is significantly higher (13 times) than present demand of Zvinyaningwe irrigation scheme which is 0.38 MCM.

Nyahombe irrigation scheme: Nyahombe irrigation scheme will be supplied with water from Tugwi Mukosi Dam along Tugwi River at UTM Zone 36 coordinates 281282.72m E and 7706823.76 m S as illustrated in Figure 27. The abstraction point is from the right bank of Tugwi river, at a weir which is 16km downstream of Tugwi Mukosi Dam. The proposed scheme is at a crest and is surrounded by small streams. The water demand of Nyahombe irrigation scheme will be met from the releases of Tugwi Mukosi dam. The unallocated water of the dam is 10.704 MCM (10704 ML) which is significantly higher (16 times) than present demand of Nyahombe Irrigation scheme which is 0.67 MCM.

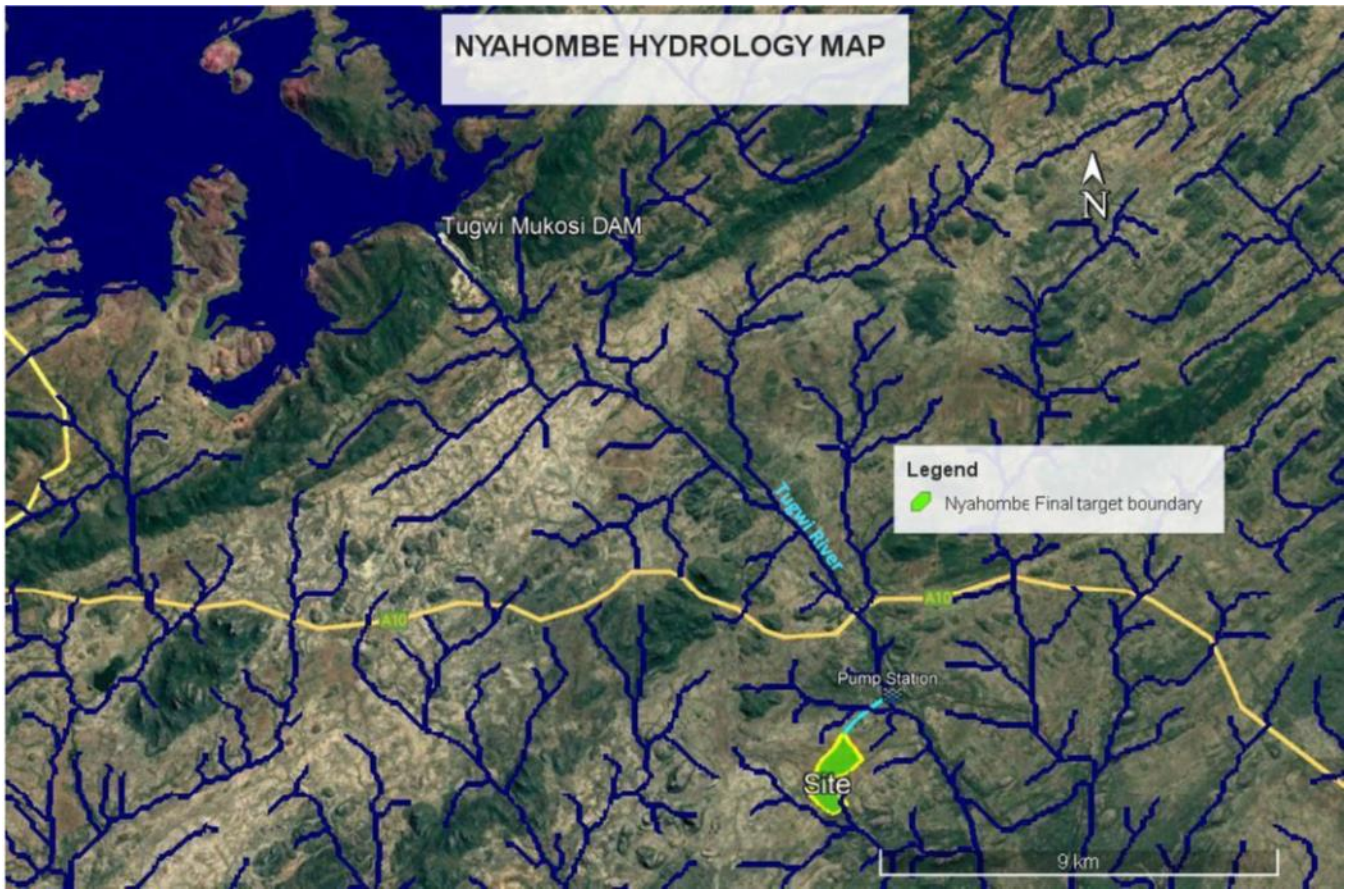

Figure 27: Hydrology of Nyahombe

Pikini-Jawanda irrigation scheme: The scheme will be supplied with water from Manyuchi dam along Mwenezi River at UTM Zone 36 coordinates 232447.00mE and 7672879.00mS. Water is abstracted using submersible pumps on floating pontoon type intake. There are streams that pass through the site as indicated in Figure 28. There is no known aquifer in the area. The water demand of Pikinini-Jawanda irrigation scheme is proposed to be met from the Manyuchi Dam reservoir.

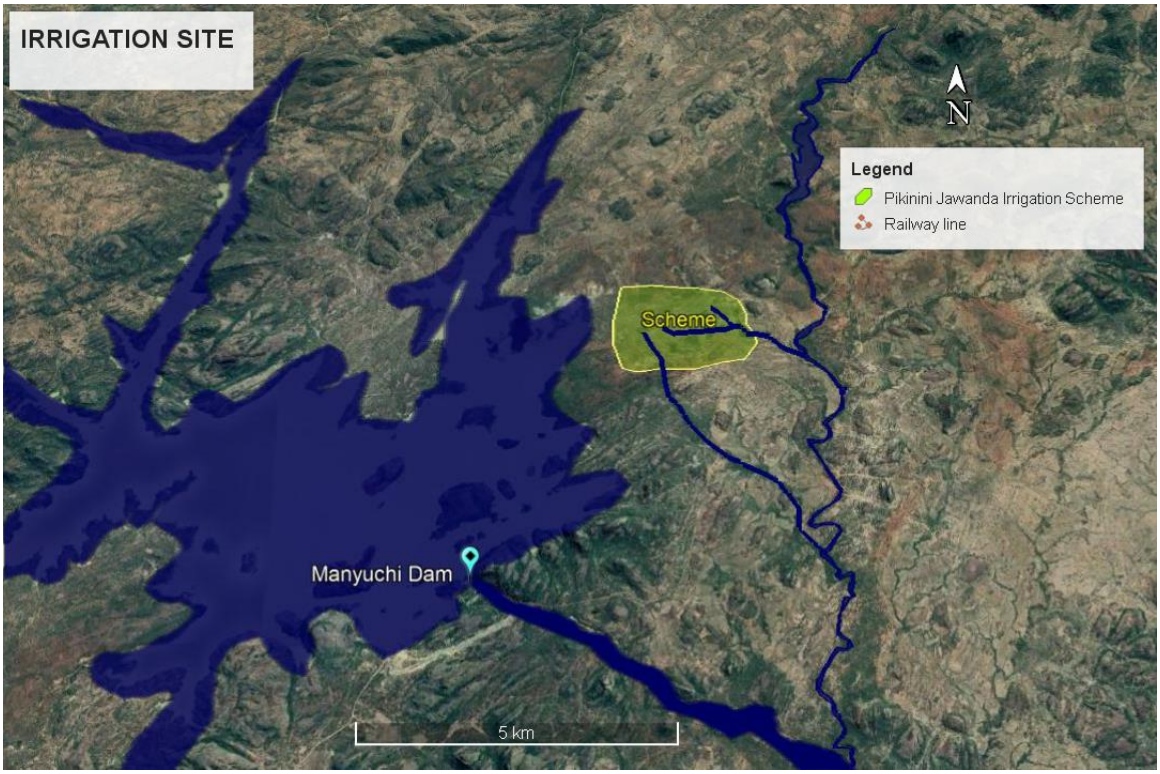

Figure 28: Hydrology of Pikinini-Jawanda Scheme

Chizumba irrigation scheme: The scheme is supplied with water from Manyuchi Dam along Mwenezi River at UTM Zone 36 coordinates 229323.25 m E and 7668627.33 m S as illustrated in Figure 29.

Figure 29: Hydrology of Chizumba

The abstraction point is at an existing weir about 20km downstream of the Dam. The proposed scheme is surrounded by three rivers. The rivers are Mwenezi River, a major river which is about a kilometer away from the scheme in the Western direction and two seasonal rivers namely Mwenezana and Gachizumba as shown in Figure 30. There is no known aquifer in the area.

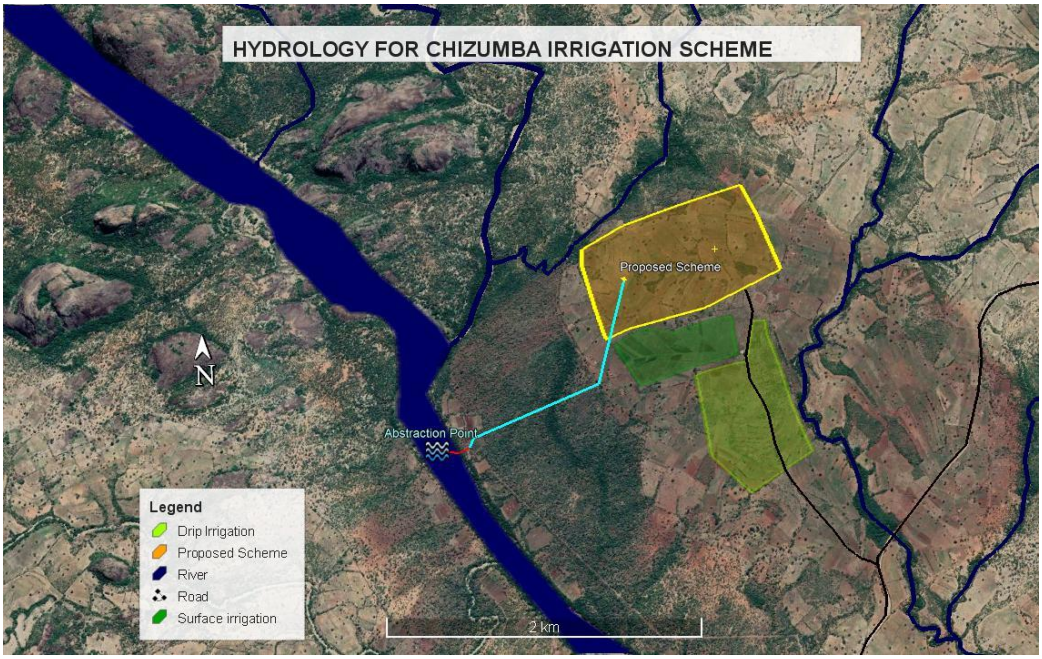

Figure 30: Hydrology for Chizumba Irrigation Scheme

The water demand of Chizumba irrigation scheme will be met from the releases of Manyuchi dam. The unallocated water of Manyuchi dam is 2.8 MCM (2880 ML) which is significantly higher (5 times) than present demand of Chizumba Irrigation scheme i.e. 0.54 MCM.

Bindamombe Irrigation Scheme: The water source for Bindamombe irrigation scheme is Bindamombe Dam along Tugwane River at UTM Zone 36 coordinates 251965 m E and 7740348.85 m S. Water is abstracted through a pipeline outlet. Rivers close to the scheme are Tugwana to the North and Hanyanisi river to the West as shown in Figure 31. There is no known aquifer in the area. The water demand of Bindamombe irrigation scheme is proposed to be met from the Bindamombe reservoir.

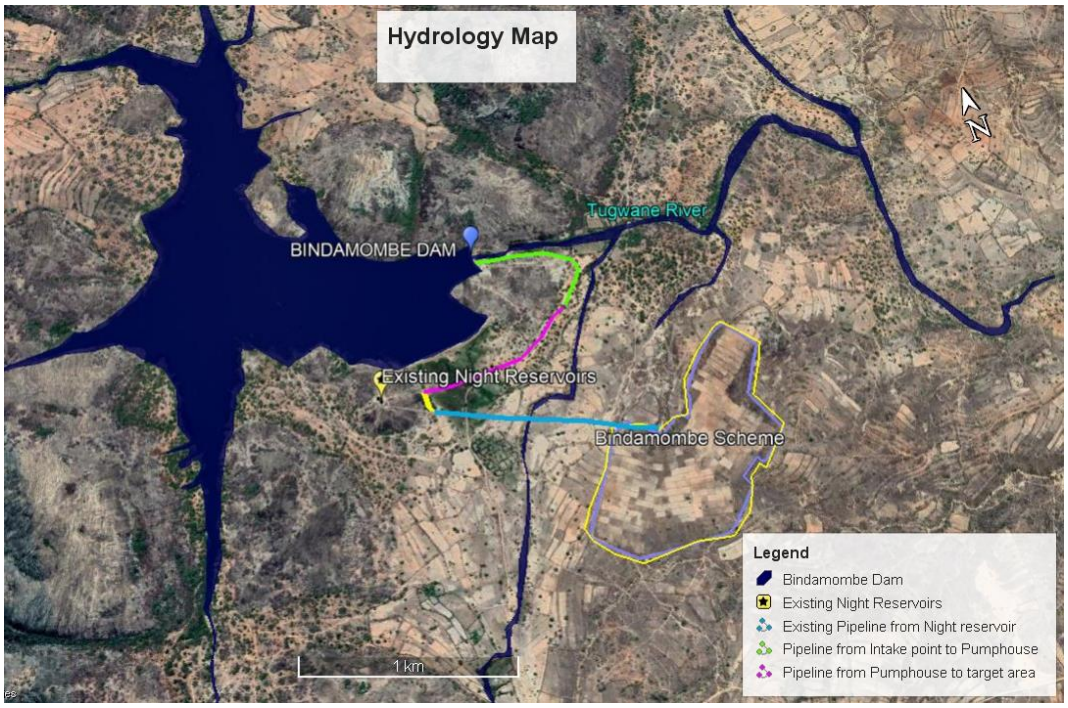

Figure 31: Hydrology of Bindamombe

Rusununguko irrigation scheme: The scheme lies about 830m South West of Mungezi river which drains into Devure River, which ultimately drains into Save river. The scheme draws water from Matezva Dam. The water is released from the dam into Mungezi river and it flows for about 8.47km to a proposed site of a pick-up weir for the scheme. There is an ephemeral small water drain and small floodplain that originates within the scheme as illustrated in Figure 32. There is no known aquifer in the area. The water demand for Rusununguko irrigation scheme is proposed to be met from the releases of Matezva dam. The unallocated water of Matezva dam is 6.175 MCM (10704 ML) which is significantly higher (12 times) than the present demand of the scheme which is 0.49 MCM.

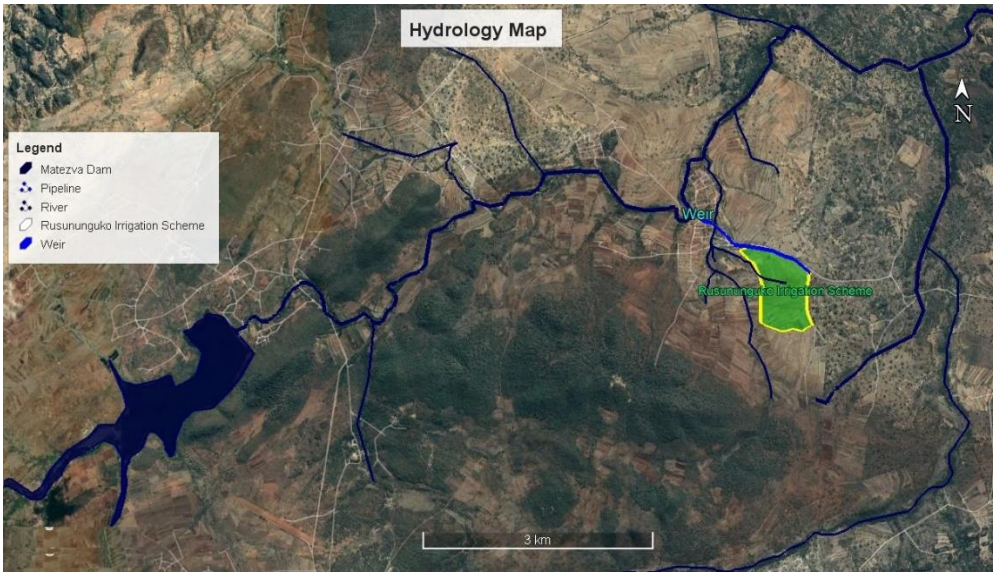

Figure 32: Hydrology of Rusununguko Irrigation Scheme

Bwanya irrigation scheme: The scheme lies between Tugwi River to the West, Shashe River to the East and Ngezi River to the North. The proposed scheme will draw water from Muzhwi Dam through an existing weir across Shashe River at UTM Zone 36 coordinates 19°57'34.42"S and 30°28'9.60"E. There is a drainage network within the scheme towards the western side of the scheme as illustrated in Figure 33.

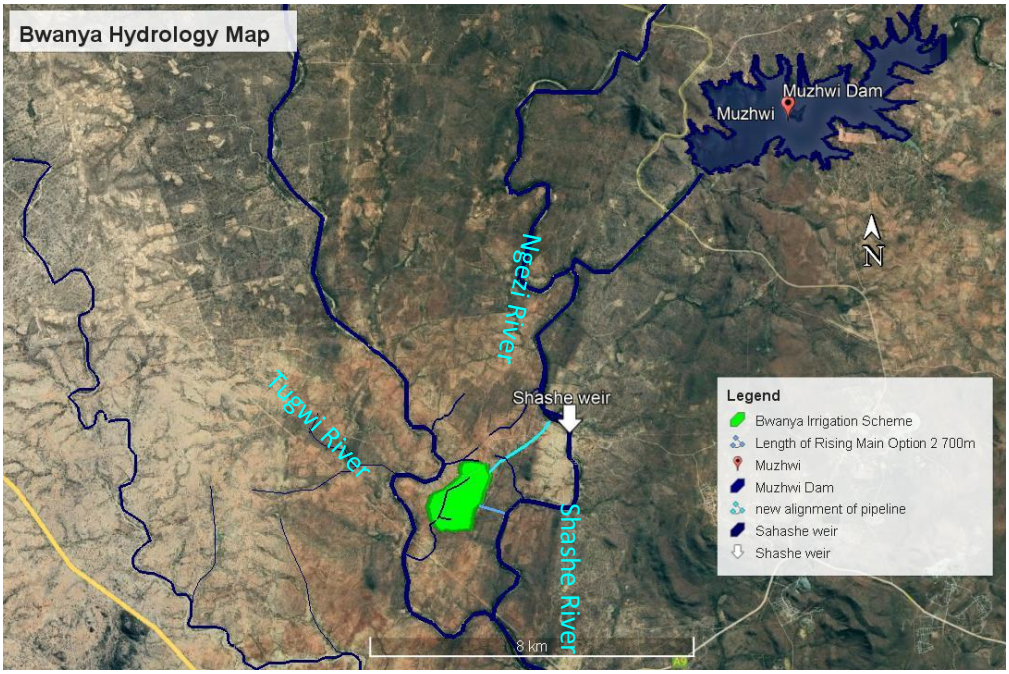

Figure 33: Hydrology of Bwanya Irrigation Scheme

There is no known aquifer in the area. The water demand of Bwanya irrigation scheme during is proposed to be met from the releases of Muzhwi dam. The unallocated water of Muzhwi dam is 4.62 MCM (4620 ML) which is significantly higher (3.5 times) than the demand of Bwanya Irrigation scheme which is 1.26 MCM.

4.3Topography

A topographic survey for the seven irrigation schemes was carried out in 20 m grid over the proposed area relating it to the properly sited bench-marks with (+ or -) 5 cm maximum tolerance using a DGPS and Total station. This section provides topographical information peculiar to each site.

Zvinyaningwe Irrigation scheme: As per the topographical survey, the gross command area of the scheme is 88 ha. However, net command area proposed for irrigation scheme development was reduced to 46 ha due to the Zimbabwe National Water Authority (ZINWA) guidelines which state that there should be at least offset distance from dam crest level which caters for the highest flood level of the reservoir. The contour map based on a topographical survey made in the field, with 1m interval, showing elevation between 1003 m to 1027 m inside the project area is depicted in Figure 34. The proposed site is found to be gently undulating. The area is surface drained by Muzhwi reservoir along Shashe river. The soils are moderately shallow reddish brown top sandy loam soils over sandy clay loams to medium sandy clay subsoils. They are well drained with good permeability. The soils are suitable for most crops using any irrigation systems.

Figure 34: Topography of the command area

Nyahombe Irrigation scheme: The slope is generally flat to gently undulating. The site is drained by small streams that feed into Tugwi river downstream of the abstraction point. The land topography is quite ideal for all irrigation systems. The soils are generally medium textured yellowish red top soils and reddish brown and dark grey subsoils and, in some parts, well drained and moderately well drained. The topography of the command area is provided in Figure 35.

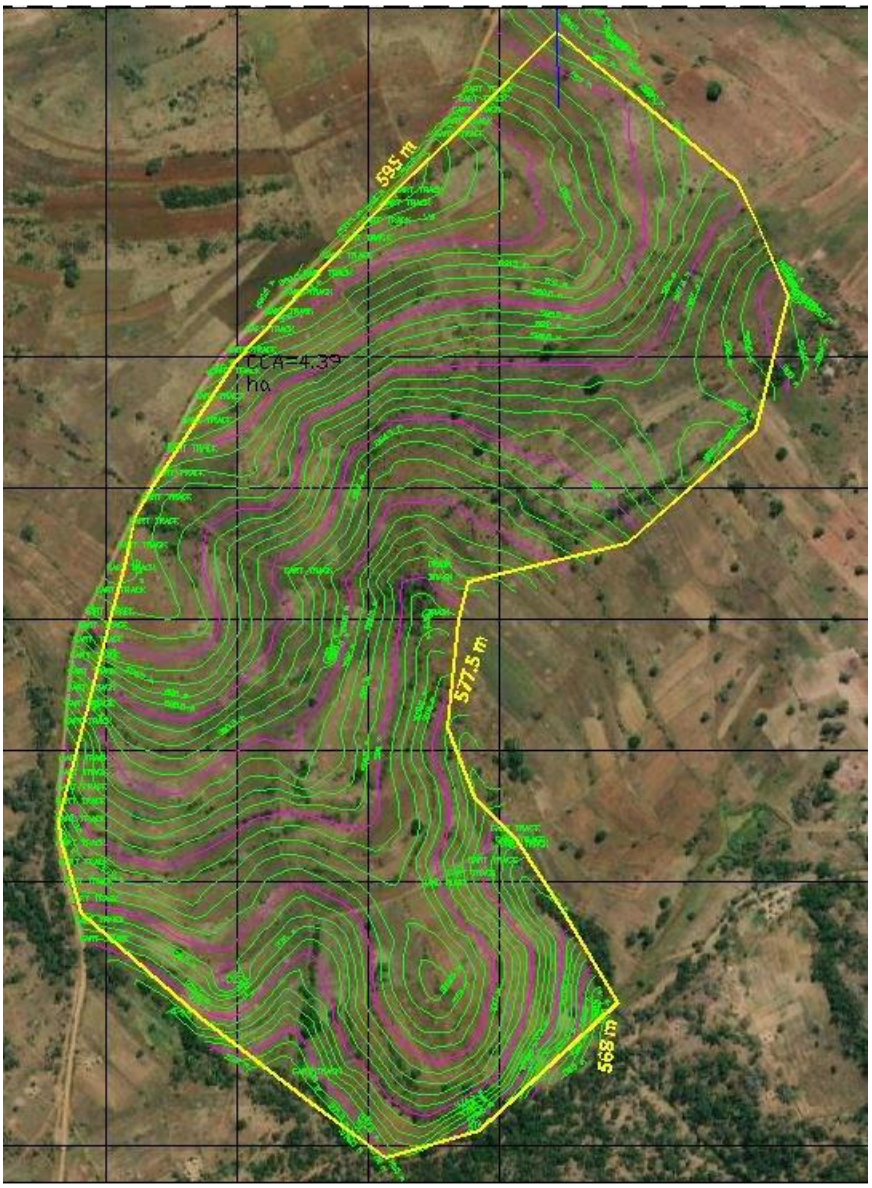

Figure 35: Topography of the command area

Pikinini-Jawanda Irrigation scheme: The contours based on topographical survey, with 1m interval, showing elevation between 610 m to 640.5 m inside the project area is depicted in Figure 36. The land topography is quite ideal for all irrigation systems.

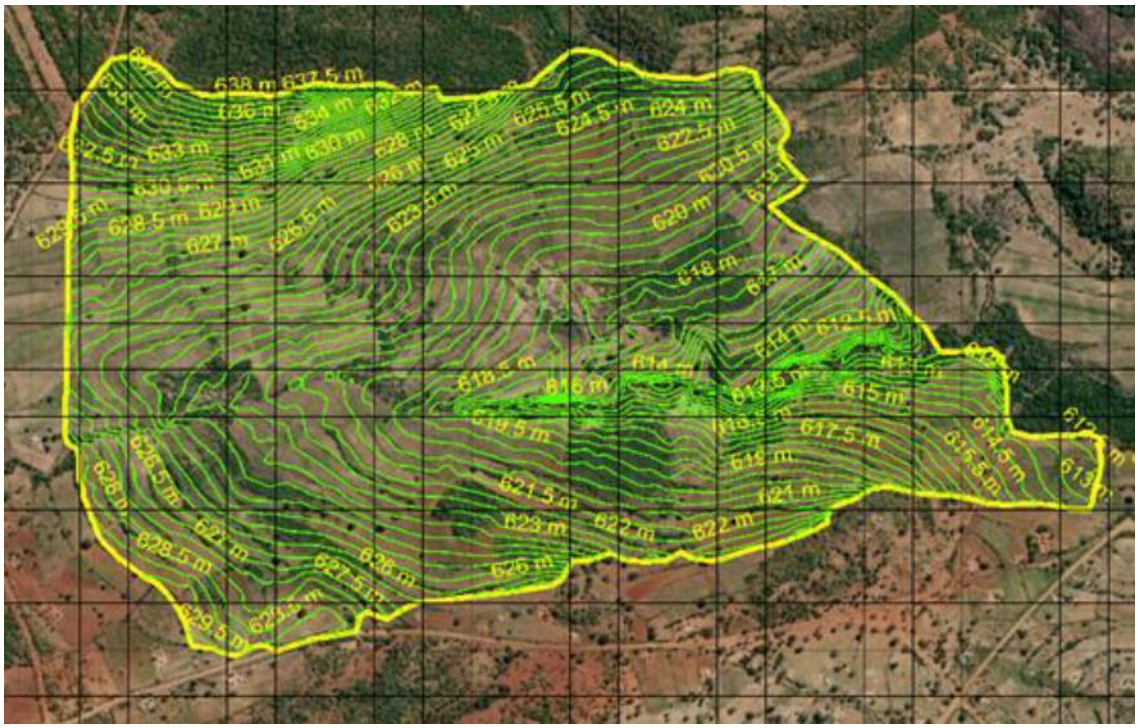

Figure 36: Topography of the command area

Chizumba Irrigation Scheme: The contours based on topographical survey, with 1m interval, showing elevation between 540 m to 562 m inside the targeted area is depicted in Figure 37 and Figure 38. The area is a consolidated block developed on a relatively flat land with average slopes ranging between 0.5 and 2%. The land topography is ideal for all irrigation systems. The soils are clay loams, deep with high water holding capacity and good potential for irrigation.

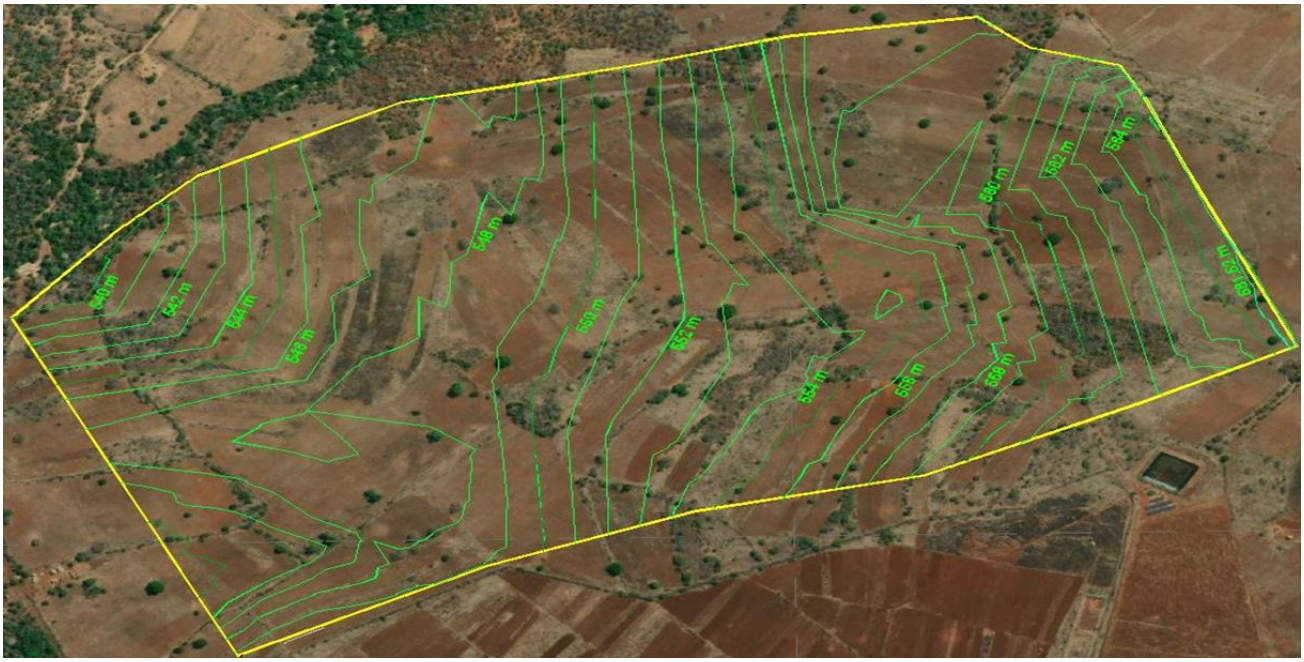

Figure 37: Topography of the command area

Figure 38: Topographical map of the command area

Bindamombe Irrigation Scheme: The contours based on topographical survey, with 1m interval, showing elevation between 825 m to 844.5 m inside the proposed area is depicted in Figure 39. The land topography is quite ideal for all irrigation systems.

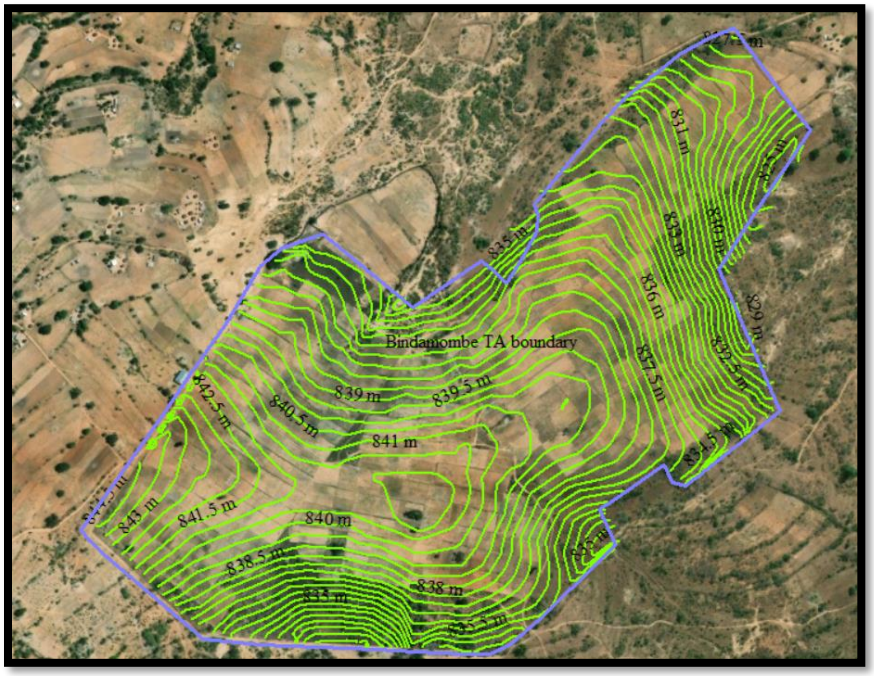

Figure 39: Topography of the command area

Rusununguko Irrigation Scheme: The contours based on topographical survey, with 1m interval, showing elevation between 1050 m to 1100 m inside the proposed area is depicted in Figure 40. The land topography was found to be ideal for a semi-portable type of sprinkler irrigation system.

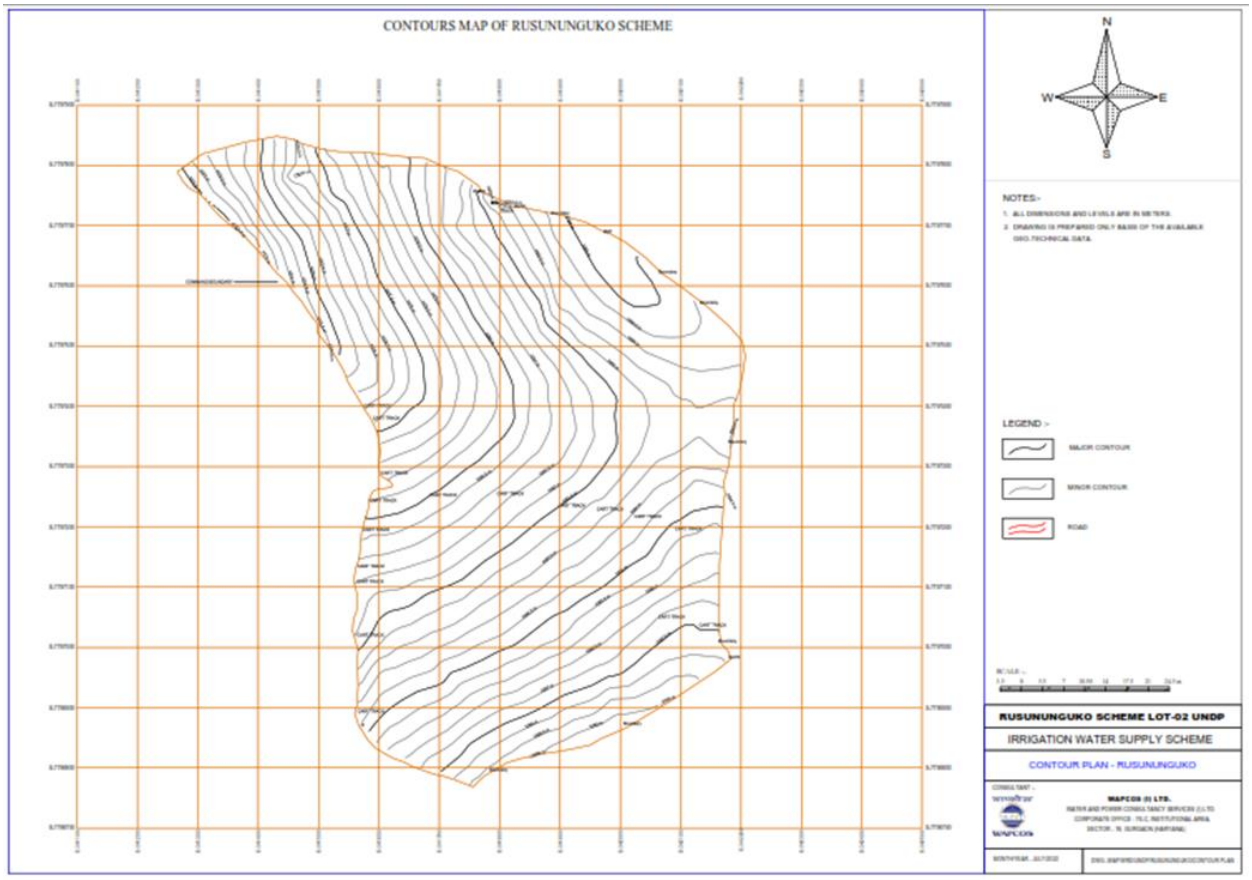

Figure 40: Topography of the command area

Bwanya Irrigation Scheme: The contours based on topographical survey, with 1m interval, showing elevation between 969.2 m to 992.5 m inside the project area is depicted in Figure 41. The area is a consolidated block developed on a relatively flat land with average slopes ranging between 0.5 and 2%. The land topography is quite ideal for all irrigation systems. The soils are clay loams, deep with high water holding capacity and good potential for irrigation.

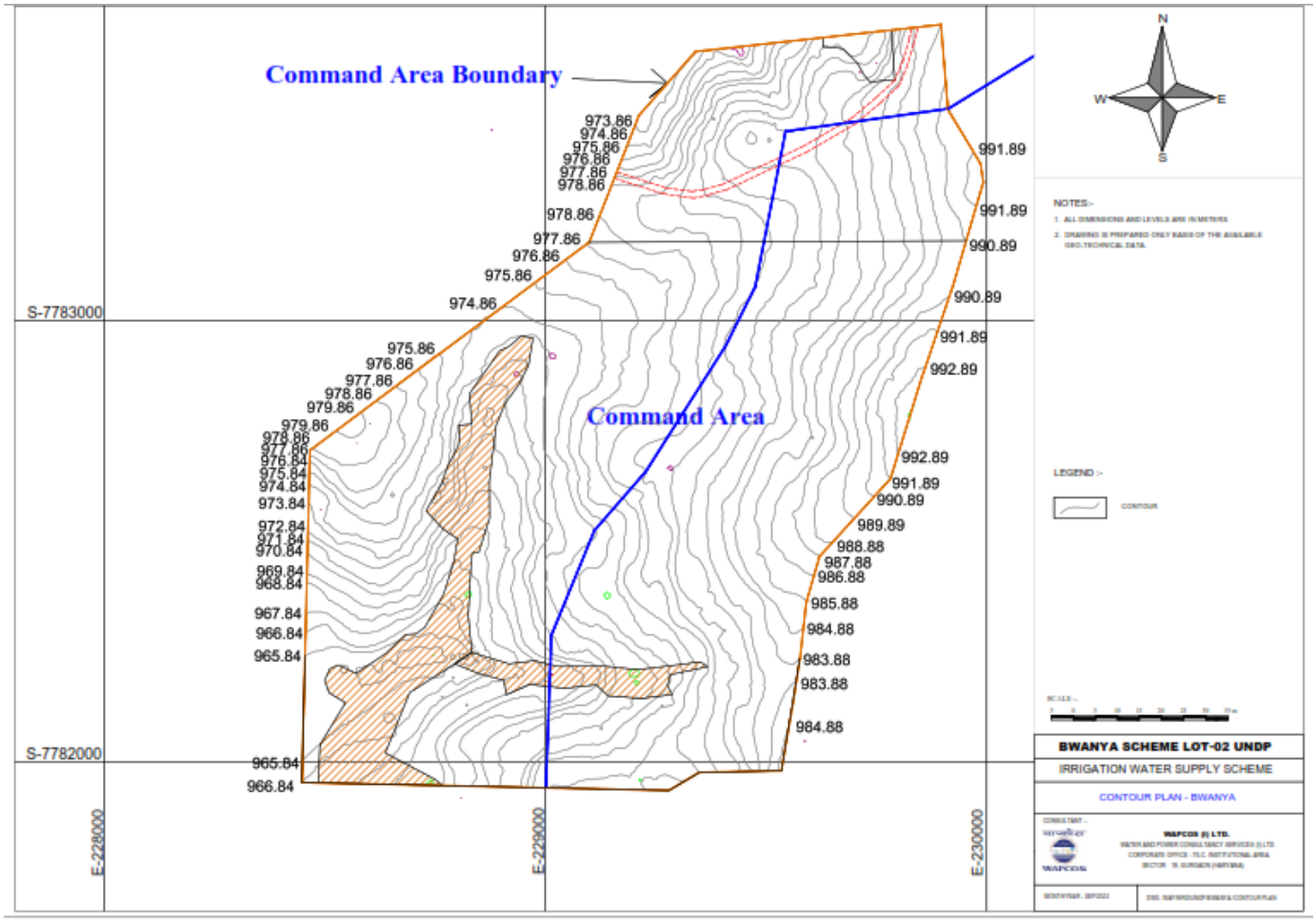

Figure 41: Topographical map of the command area

4.4 Soil resources

A soil survey of the command area was conducted for each irrigation scheme. Table 14 shows the description of the soils and the associated irrigability class at each of the seven irrigation schemes.

Table 14: Soil type and irrigability class

Irrigation Scheme	Soil description and irrigability class	General conclusion
Zvinyaningwe	soils are basically divided into two categories, G1 and G2 with irrigability class B & A respectively. A major part of this scheme falls under irrigability Class B and suitable for all crops.	Soils are suitable for irrigated agriculture.
Nyahombe.	Soil are basically divided into two categories, G1 and G2 with irrigability class A & C respectively. A major part of this scheme falls under irrigability Class A and suitable for all crops.	Soils are suitable for irrigated agriculture

Irrigation Scheme	Soil description and irrigability class	General conclusion
Pikinini-Jawanda	Soils are basically divided into 3 main categories G1,G2 and G3 with irrigability class B, B & A respectively.	Soils are suitable for irrigated agriculture.
Chizumba	Soils are basically divided into two categories, G1 and G2 with irrigability class A & C respectively. A major part of this scheme falls under irrigability Class A and suitable for all crops.	Soils are suitable for irrigated agriculture.
Bindamombe	Soil are basically divided into two categories G2 and G1 with irrigability class A & B respectively.	Soils are suitable for irrigated agriculture.
Rusununguko.	The soils are sandy clay loams, with good water holding capacity and good potential for irrigation. They are well drained and are divided into two categories G1 and 8N with irrigability class B & C respectively. A major part of this scheme falls under irrigability Class B and C which are suitable for all crops.	Soils are suitable for irrigated agriculture.
Bwanya	Soil in the command area are basically divided into two categories G1 and G2 with irrigability class A & B respectively. A major part of this scheme falls under irrigability Class B and suitable for all crops.	Soils are suitable for irrigated agriculture.

4.5 Biodiversity

The targeted irrigation sites fall predominantly in a savanna woodland. Trees commonly found in the proposed areas are provided in Table 15. Typical vegetation in the proposed areas is shown in Plate 20.

Table 15: Tree species commonly found in the proposed irrigation scheme areas

SCIENTIFIC NAME	LOCAL/ SHONA NAME	COMMON NAME
Acacia albida	Mumhuwa	Robust acacia
Acacia ataxacantha	Musavanhanga	Flame acacia
Acacia borleae		Sticky acacia
Acacia exuvialis		Flaky bark thorn
Acacia galpinii		Monkey Acacia
Acacia gerrardii		Red thorn
Acacia Nigrencesis	Muguunga / Muguwunga	Knobby thorn
Acacia nigrescens		Knobb thorn
Acacia robusta subsp. clavigera		River Thorn
Acacia senegal var. leiorhachis		Slender 3 hook thorn
Acacia tortilis subsp. heteracantha	Mumhuwa	Umbrella thorn
Acacia welwitschii subsp. delagoensis	Munhanga	Delagoa thorn

SCIENTIFIC NAME	LOCAL/ SHONA NAME	COMMON NAME
Adansonia Digitata	Muuyu	Baobab
Adenium multiflorum	Chisvosve	Sabi star
Afzelia Quanzensis	Mukamba	Pod-mahogany
Albizia anthelmintica		Worm cure Albizia
Albizia antunesiana	Muriranyeze	Purple leaved Albizia
Albizia harveyi	Muriranyenje	Sickleaf albizia
Albizia petersiana subsp. evansii		Many stermmed albizia
Albizia tanganyicensis	Mupepe	Paperback albizia
*Aloe tauri**	-	Bullock's bottle brush aloe
Androstachys johnsonii	Musimbiti/muzimbiti	Iron wood
Azanza Garkeana	Mutohwe	Snot apple
Bauhinia tomentosa	Mupondo/ Chisinze	Yellow bauhinia
Besama Abisinia	Mushanje	Winged Besama
Boscia Angustifolia	Mubaribari/ Mupama	Shepherds Tree
Boscia angustifolia var. corymbosa	Mubaribari	Roughleaf spherdes-tree
Bridelia mollis	Muhumbakumba/mukumbakumba	Velvet bridelia
Bridelia mollis Hutch.	Mufukusi	Velvet sweetberry
Cephalocroton mollis		
Colophospermum mopane	Mupani/ Musharu	Mopane
Combretum paniculatum	Mupfurura	Forest flame creeper
Combretum apiculatum subsp. apiculatum	Mubhondo/mudziyavashe	Glossy combretum
Combretum apiculatum subsp. leutweinii		
Combretum celastroides subsp. orientale		Limpopo Jesse bush
Combretum collinum	Muhwezha/mupwezha	Variable compretum
Combretum erythrophyllum	Mudiki	River combretum
Combretum hereroense	Murovamhuru	Mouse-ear compretum
Combretum Imberde	Mutsviri	Bastard yellowwood/ leadwood
Combretum padoides		Thicket combretum
Commiphora africana var. africana	Mugugudu/mukwendekwende	Poisongrub corkwood
Commiphora tenuipetiolata	Mutsvedzagudo	White-stemmed corkwood
Commiphora Marlothii	Mupepe	Paperback Corkwood
Commiphora marlothii	Chiwirowiro/mukuhunu	Paperbark corkwood
Crotalaria laburnifolia subsp. australis		Oldland rattlepod
Croton pseudopulchellus		Small lavender cotton
Dalbergia martinii	-	Zambezi Dalbergia
Dalbergia Melanoxylon	Muhwiti/ Muhweti	Zebrawood
Dichrostaychs cinerea	Mupangara	Sickle bush
Diospyros lycioides subsp. sericea	Mushumadombo/musumadombo	Red star-apple
Diospyros Mespiliformis	Mushuma	African Ebony/
Diospyros mespiliformis	musumha	jackalberry
Dombeya Burgessiae	Mupfununu	Pink Dombeya
Euclea natalensis	Chipambati/ Nyakabvuri	Hairy leaved guarri

SCIENTIFIC NAME	LOCAL/ SHONA NAME	COMMON NAME
Euclea schimperi var. daphnoides		River guarri
Euphorbia ingens	Chikondekonde/muonde	Candelabra tree
Euphorbia tirucalli	Hejiyemukaka	
Faidherbia albida	Mupumbu	Albida
Ficus spp.	Muonde	Fig tree
Fluggea	Mudyagahuwe	snowberry
Fluggea virosa	Musososoti	Snowberry
Fuirena ciliaris		
Fuirena pachyrrhiza		
Gardenia imperialis	-	Large pink Gardenia
Gisekia 63fricana var. africana		Gisekia
Grewia flavascens	Mubhubhunu	Donkey berry
Grewia lepidopetala		Greenhair grewia
Grewia monticola	Muhwana	Grey grewia
Grewia Pachycalyx	Chiwanichinuna	Large Flowered White Raisin
Guibourtia conjugata		Small false mopane
Kigelia africana	Mumveva	Sausage tree
Kirkia accuminata	Mubvumira/ Mutuva	White syringa
Lemna aequinoctialis		
Nuxia oppositifolia	Rutsanzuti	Water elder
Otoptera burchellii		
Philenoptera violacea	mupanda	raintree
Pterocarpus angolensis	Mubvaropa	Mukwa/ Teak/ Bloodwood
Pterocarpus brenanii		Round leaved Blood wood
Pycreus polystachyos var. laxiflorus		
Schotia brachypetala	Mugugunanzvi/MutondosHungu	Fuchsia tree
Sclerocarya Birrea	Mupfura	Marula
Sesbania bispinosa var. bispinosa		
Sesbania sesban subsp. Sesban var. nubica		Sesban
Spirostachys africana	Munhiti/mutivoti/mutovoti/mutuvuti	tamboti
Strychnos Cocculoides	Mutamba	Corky Monkey-Orange
Strychnos decussata		Cape teak
Strychnos Madagascalensis	Mukwakwa	Black Monkey-Orange
Strychnos potatorum	Mudyagudo/mudyahudo	Grape bitterberry
Stylochaeton natalensis subsp. Maximus		
Syzgium guineense guineense	Mukute/ Muhute	Water berry
Terminalia prunioides		Lowveild terminalia
Terminalia sericea	Mususu	Assegai wood
Terminalia sericea	Mususu	mangwe
Terminalia stenostachya	Mususu	Rosette terminalia
Trichilia emetica	Mutsikiri	Natal-mahogany
Ximenia caffra	Munhengeni/Mutsvanzva	Large sourplum

SCIENTIFIC NAME	LOCAL/ SHONA NAME	COMMON NAME
Wolffia globosa		
Ziziphus Mucronata	Checheni	Buffalo-thorn
		Jackal Berry

Plate 20 Vegetation in the area (July 2022)

Animals present in the area include, mhene (antelope, *Raphicerus campestris*), mhembwe Duiker (*cephalophinae*), rabbits , mapere (hyenas), makava (jackals), nhoro - Southern African antelope (*Strepsiceros kudu*)maherani, baboons, springhar*e (pedetes capensis),* Magwizhu, shindi (squirrels) and hovo *(galerella sanguinea*). Muzhwi and Manyuchi dams are also home to Crocodiles *(Crocodylus niloticus),* Hippopotamus, Pelomedusa sp, *pyxicephalus adspersus,* frogs, Gastropods. Several birds' species were also spotted in the area. These include doves *(columbidae*), *pytilia melba pycnonotus tricolor, excalfactoria adansonii, corvus albus, corythaixoides concolor, scopus umbretta,* and Pied crows. ***No rare, endangered nor threated species were identified in the area.***

4.6 Water quality

Water samples from all the potential sources such as Muzhwi dam, Manyuchi dam, Bindamombe Dam Shashane river, Mungezi river were collected and tested for water quality. The water quality results show that the water is suitable for irrigation purposes. Table 16 show some water quality data for Mungezi river.

Table 16: water quality data for Mungezi river

PARAMETER	UNITS	Tested 13-06-2022
pH@25^{0}C	-	7.1
Conductivity @25^{0}C	uS/cm	331.0
Total SS	mg/l	<0.01
TDS	mg/l	231.7
Turbidity	Ntu	0.1
Total Solids	mg/l	-
Total Hardness	mg/L($CaCO_3$)	89.39
Total Alkalinity	mg/l	160.00
Sulphate	mg/l(SO_4)	4.42
Faecal Coliforms	Per 100ml	30
Calcium	mg/l (as Ca)	15.30
Magnesium	mg/l(as Mg)	12.40
Manganese	mg/l(as Mn)	0.05
Nitrates	mg/l	2.69
Chloride	mg/l	8.0
Copper	mg/l(as Cu)	0.01
Sodium	mg/l(as Na)	7.20
Zinc	mg/l(as Zn)	0.04
Phosphate	mg/l	0.44
Iron	mg/l (as Fe)	0.50
Potassium	mg/l (as K)	13.40
BOD	mg/l(as Pb)	22
DO	mg/l	42.23
COD	mg/l	78.00
Taste		No Taste
Odour		No odour
Colour	Cu/L	<5
Temperature	Degrees Celsius	18.5

4.7 Air quality

There are currently no major human activities that generate air pollutants in or around all the proposed seven irrigation schemes. There are fugitive dust emissions that are as a result of traffic movements in dust/ gravel roads and from agricultural operations.

4.8 Noise and Vibration

There are no activities or machinery that generate noise and vibration in the area except for very few vehicles that pass by. However, there is need to monitor employee exposure levels to noise and vibration during the construction phase of the Project.

4.9 Archaeology and cultural heritage

A qualified and experienced independent expert was engaged to assess the project's potential impacts on cultural heritage using, among other methodologies, field-based surveys and involving meaningful, effective, and informed stakeholder consultations as part of the social and environmental assessment process. No tangible forms of cultural heritage or archaeological importance were found in all the proposed schemes. However, some peculiarities exists at Zvinyaningwe and Pikini-Jawanda Irrigation scheme which are highlighted below:

Zvinyaningwe irrigation scheme: A grave was identified at UTM Zone 36 coordinate 238514.24 m E and 7794173.32 m (shown in Plate 21) through an archaeological survey. It was established through the survey that family members to the deceased had relocated probably more than 30 years ago. The identified grave is at the end of the field where it will not be disturbed by any activities in the scheme. The local leadership proposed that the grave be fenced off. Focus group discussions and presentations during a stakeholder meeting at Lees-in hotel in the City of Masvingo endorsed the decision by the relatives and the local leadership to fence the off the grave. Moreover, the proposed sprinkler system to be adopted at the scheme will not interfere with the grave.

Plate 21 The grave at the end of the scheme (June 2022)

There is another old grave about 15m from the abstraction point whose family was also displaced during the time of construction of the dam several years ago. There will not be any disturbance to the grave since the abstraction will take place in the lake on an anchored floating pontoon. No infrastructure shall be put at the site

other than a transformer which will be about 10m away. This grave is within the servitude of the dam and outside the irrigation scheme. Hence planned irrigation activities will not interfere with the grave site.

Pikinini-Jawanda Irrigation Scheme: There are four (4) graves that were identified in the area through an archaeological survey as well as public and stakeholder consultations. The family members to the deceased persons and the local leadership proposed that the graves be fenced off and remain within the scheme. Focus group discussions and presentations during a stakeholder meeting at Neshuro Growth point endorsed the decision by family members and the local leadership to fence the area. The method of irrigation was to be compatible with the grave sites. Centre pivot was to be avoided, as it would interfere with the graves. Sprinkler system was to be adopted which will not have an impact on the graves

No other archaeological or cultural materials were found during the study. The project proponent is strongly advised that if any suspected archaeological and cultural material is discovered during the site development process, the Chance Find Procedure attached in Appendix 2 should be activated.

4.10 Socio-economic data

The socio-economic data was collected in the sub-project areas through primary and secondary sources. Primary data sources comprised in-depth interviews, questionnaires, focus group discussions and meetings. Field visits were conducted to observe and gather data on the land uses, socio-economic activities within the area, infrastructure, agronomic practices in and around the irrigation sites, sources of livelihoods, culture and beliefs and social structures, In-depth interviews were done with the IMC chairman and members, Rural District councils CEO, District Development Coordinators, Provincial and district irrigation officers, AGRITEX officers, local leadership and beneficiaries. A group discussion was also carried out with all intended beneficiaries at each of the proposed irrigation sites. An invitation to attend a meeting was extended through the AGRITEX officer and information was obtained from all the villagers who came to the meetings. Secondary data from the EIA prospectuses, project feasibility study report, UNDP reports, FAO reports, World Bank reports and other reports from different actors were consulted. The relevant and useful information applicable to each irrigation project was extracted from the primary and secondary data sources and assessed within the context of sub-project life cycle. A group discussion was also carried out with all intended beneficiaries at each of the proposed irrigation sites. Plate 22 show consultations with targeted beneficiaries

Plate 22: Consultations at Zvinyaningwe irrigation site (April 2022)

4.10.1 Target Beneficiaries

Zvinyaningwe irrigation scheme: The scheme is targeting about 300 beneficiaries. These beneficiaries are from 6 villages namely; Muzhwi, Manyerekete, Takawira, Mushandira, Batanai and Zimbabwe, all under Ward 4, Masvingo District. The selection of scheme members was done by calling those who were willing. Currently, the scheme has 59 farmers who indicated that they were willing to participate in the scheme as plot holders. There are more elderly male household representatives in the scheme. Middle aged women who come as representatives have their husbands in towns and others migrated to South Africa. The elderly women present at the irrigation scheme are mostly widowed or divorced. Most of the elderly have minors whom they are taking care of due to the passing on of their parents.

Nyahombe irrigation scheme: Nyombe area is an old resettlement area (pre-1985). The scheme is targeting about 300 beneficiaries from Villages 3A, 3B, 3C and 3E. The beneficiaries will have 0.5 hectare plots (except for those who have donated their land, who upon agreement going to have to have more land depending on the size of the land that they would have donated). Most of the members are above the age of 40. Household heads are registered as members making dependents direct beneficiaries to the plots. There are more elderly male household representatives in the scheme than women. Middle aged women who come as representatives have their husbands in towns. The elderly women present at the irrigation scheme are mostly widowed or divorced. Most of the elderly have minors whom they are taking care of due to deaths of their parents.

Pikinini-jawanda irigation scheme: The development of the scheme is targeting about 300 beneficiaries from twelve (12) villages of Ward 4. The beneficiaries will have 0.5 hectare plots each in the 156 hectares irrigation scheme except for the land donors who shall have more. Household heads are registered as members making dependents direct beneficiaries to the plots. Most youths have migrated to towns and other have crossed the boarder to South Africa in search for employment. There are more elderly female household representatives in the scheme. Middle aged women who come as representatives have their husbands in towns or South Africa. The elderly women present at the irrigation scheme are mostly widowed or divorced. Most of the elderly have minors whom they are taking care of due to rural-urban migration and or deaths of their parents.

Bindamombe irrigation scheme: The scheme is targeting about 300 beneficiaries from Shangwa, Maoneke, Mufara, Gozo, Matondo, Virimai, Zimani and Gwitima villages of Ward 18. Currently, the existing irrigation schemes with a total of 34ha has 300 beneficiaries. The beneficiaries have 0.1 hectare plots each in the 34 hectare irrigation scheme. Household heads are registered as members making dependents direct beneficiaries to the plots. Most youths migrated to towns in search for employment. There are more elderly female household representatives in the scheme. Middle aged women who come as representatives have their husbands in towns and or South Africa. The elderly women present at the irrigation scheme are mostly widowed or divorced. Most of the elderly have minors whom they are taking care of due to rural-urban migration and deaths of their parents.

Rusununguko irrigation scheme: The scheme is targeting more than 200 beneficiaries from the 65 households of Rusununguko resettlement area. Plot holders will be allocated 0.5 ha each. Household heads are registered as members making dependents direct beneficiaries to the plots. It was agreed that land donors be allocated more land and the sizes will vary with the sizes of the land donated. There has been an exodus of youths to towns and cities leaving their wives and elderly parents to be in the scheme. There are more elderly male household representatives in the scheme because of the patriarchal nature of the Rusununguko community. Middle aged women who come as representatives have their husbands in towns and out of the country. The elderly women

present at the irrigation scheme are mostly widowed or divorced. Most of the elderly have minors whom they are taking care of due emigration and premature deaths of their parents.

Bwanya irrigation scheme: The scheme is targeting about 372 beneficiaries from the 21 villages of the ward. Hwarekware, Ngondoma, Muchini, Chidhume, Taruberekera, Gwatinyanya, Mamvura and Murove are the villages whose people got plots within the scheme. Plot holders will be allocated 0.5 ha each. Household heads are registered as members making dependents direct beneficiaries to the plots. It was agreed that land donors be allocated 1.5ha each and have 2 of their children be beneficiaries in the scheme too. Most of the youthful population is currently engaged in artisanal gold mining. There is also an exodus of youths to towns and cities leaving their wives and elderly parents to be in the scheme. There are more elderly male household representatives in the scheme because of the patriarchal nature of the Bwanya community. Middle aged women who come as representatives have their husbands in towns and or South Africa. The elderly women present at the irrigation scheme are mostly widowed or divorced. Most of the elderly have minors whom they are taking care of due emigration and premature deaths of their parents.

Chizumba irrigation scheme: The scheme is targeting about 250 beneficiaries from Mangwau, Muribhani, Chitafele, Musiyachaoma, Madlome, Madhobhi, Zvinonyanya, Ranganai, Halimani, Mashabele, Chirumbwana and Sitimera villages of Ward 7. Currently, the existing irrigation schemes with a total of 65ha has 135 beneficiaries. The beneficiaries have 0.1 hectare plots each in the 20 hectare surface irrigation scheme (except for land donors who have at least 0.2ha each) and 0.2ha each in the 45ha drip irrigation scheme (except for land donors who have plots ranging from 0.4-0.6ha each depending on the size of the land that they had donated). Most of the members are above the age of 40. Household heads are registered as members making dependents direct beneficiaries to the plots. There is an exodus of youths into the neighboring South Africa as legal or illegal emigrants leaving their wives and elderly parents to be in the scheme. There are more elderly male household representatives in the scheme because of the patriarchal nature of the Chizumba community. Middle aged women who come as representatives have their husbands in towns and South Africa. The elderly women present at the irrigation scheme are mostly widowed or divorced. Most of the elderly have minors whom they are taking care of due emigration and premature deaths of their parents.

4.10.2 Vulnerable groups

Vulnerable groups at all the sub-project sites include the widows, people living with disabilities, child headed households and the elderly. The selection of plot holders will give priority to vulnerable individuals so that they are not left behind in the development process. The selection of irrigation technology was also informed by the plight of those vulnerable in the communities.

4.10.3 Water use and availability

Water from the existing dams (e.g. Bindamombe, Muzhwi and Manyuchi) and from rivers such as Shashe, Mungezi and Tugwi is currently being used for various purposes including domestic, mining, fishing, irrigated agriculture, livestock watering and maintaining the natural environment. Non-consumptive uses such as swimming and fishing are also enjoyed by community members. Portable water come mainly from boreholes and protected wells. The various demands on the available water resources were mapped and then a tradeoff was established between requirements of each scheme and general water requirements in the area. This thus informed the maximum irrigable area. Water assessments indicate that there is enough water for irrigated agriculture in all the seven proposed irrigation sites. Hence, no water use conflicts are less likely to occur due to water shortages.

4.10.4 Land tenure system

This section describes the land tenure systems under each of the seven irrigation schemes.

Chizumba irrigation scheme: Land in the proposed Chizumba irrigation scheme is communally owned. The scheme has a total net irrigated area of 85ha. The community has usufruct rights to the land as provided for by the Communal Land Act of 1983. Land is allocated by the Mwenezi Rural District Council on behalf of the State as per the Act. The proposed 94ha for the proposed new irrigation scheme falls within part of the 450ha land that had been identified by the Government as potential irrigation land. There are no homesteads within the targeted area. The targeted area is currently being used for rainfed crop production by community members who already happen to be beneficiaries for the scheme. Current land owners have already witnessed the benefits of irrigation development as land adjacent to the proposed scheme is already under irrigation. Consultations were done with current land owners and they are more willing to give up their land for the development of the scheme (Refer to the voluntary land use agreement forms, Appendix 4). Local traditional leadership, the Rural District Council and the Ministry of Lands, Agriculture, Water, Fisheries and Rural Development were all engaged through consultations, and all are in support of the development of the scheme. The consultation process followed the socio-cultural norms, and it was inclusive as well as gender-sensitive. The development of the scheme will not result in any physical or economic displacement of persons nor will it result in loss of assets but rather uplift the standard of living of the community.

Nyahombe irrigation scheme: The proposed Nyahombe irrigation scheme lies within a resettlement area. Generally, households have dryland plots with an average size of 5 ha. The proposed 99.8ha for the Nyahombe irrigation scheme falls within part of the land that was identified by the Government as potential irrigation land. There are no homesteads within the targeted area. The targeted land is currently being used for crop production under rain-fed. Land adjacent to the proposed scheme is already under irrigation through a centre pivot irrigation system. Hence, most of the land owners have already experienced the gains of irrigation development. Proper consultations were done with the current land owners and they all expressed willingness to give up their land towards the development of the scheme (*voluntary land use agreement forms, are available upon request*). Local traditional leadership, the Rural District Council and the Ministry of Lands, Agriculture, Water, Fisheries and Rural Development were all engaged through consultations, and all are in support of the development of the scheme. The process also considered the socio-cultural expectations and it was inclusive and gender-sensitive too. The development of the scheme will not result in any physical or economic displacement of persons nor loss of assets.

Pikinini-Jawanda irrigation scheme: Land surrounding the Pikinini-Jawanda irrigation scheme is communally owned as provided for by the Communal Land Act of 1983. Land is allocated by the Mwenezi Rural District Council on behalf of the State as per the Act**.** The targeted land is currently being used for rainfed crop production by community members who already happen to be beneficiaries for the scheme. Proper consultations were done with the current land owners and they all expressed willingness to give up their land towards the development of the scheme *(voluntary land use agreement forms, are available upon request)*. There are no homesteads within the targeted area. Local traditional leadership, the Rural District Council and the Ministry of Lands, Agriculture, Water, Fisheries and Rural Development were all engaged through consultations, and all are in support of the development of the scheme. The development of the scheme will not result in any physical or economic displacement of persons nor will it result in loss of assets but rather uplift the standard of living of the community.

Bindamombe irrigation scheme: The Land (34ha) targeted for Bindamombe Irrigation Scheme is communally owned as provided for by the Communal Land Act of 1983. Land is allocated by the Chivi Rural

District Council on behalf of the State as per the Act. The targeted land is currently being used for rainfed crop production by community members who already happen to be beneficiaries for the scheme. Proper consultations were done with the current land owners and they all expressed willingness to give up their land towards the development of the scheme *(voluntary land use agreement forms, are available upon request)*. There are no homesteads within the targeted area. Local traditional leadership, the Rural District Council and the Ministry of Lands, Agriculture, Water, Fisheries and Rural Development were all engaged through consultations, and all are in support of the development of the scheme. The development of the scheme will not result in any physical or economic displacement of persons nor will it result in loss of assets but rather uplift the standard of living of the community.

Rusununguko irrigation scheme: The proposed Rusununguko Irrigation Scheme falls within a resettlement area. The area is administered by the Bikita Rural District Council which is head quartered at Nyika Growth Point. Each household owns 45ha of land. This land includes pastures, crop fields and settlement plots. Generally, households have crop fields measuring from 5 ha. The proposed 59ha for the irrigation scheme falls within part of the land that had already been identified by the Government as potential irrigation land. There are no homesteads within the area earmarked for the development of the scheme. The land is currently being used for rain fed crop production. Some of the members who own land along Mungezi river are already practicing irrigated agriculture using drip irrigation. Other farmers are irrigating using solar powered boreholes. These farmers are already enjoying the benefits of irrigation development. Now that the Government have secured funding to develop the Rusununguko irrigation scheme, the community is looking forward to the development of the scheme. Consultations were made with the local community, and the land owners donated their land willingly for the development of the scheme (*voluntary land use agreement forms, are available upon request).* The community has experienced successive years of crop failure under dryland agriculture, and the development of the scheme will transform their livelihoods for the better. The Department of Lands, Bikita RDC, local leadership and community members were involved in the process. The process also considered socio-cultural issues. It was inclusive and gender-sensitive too. The development of the scheme will not result in any displacement of persons nor loss of assets.

Bwanya irrigation scheme: Land targeted for the development of Bwanya Irrigation Scheme is communally owned. Generally, households hold plots with the sizes ranging from 4-5 ha. The community have usufruct rights to the land as provided for by the Communal Land Act of 1983. Land is allocated by the Chivi Rural District Council on behalf of the State as per the Act. The proposed 156ha for the irrigation scheme falls within part of the land that had already been identified by the Government as potential irrigation land. There are no homesteads within the proposed area. The land is currently being used for rainfed crop production. Some of the members who own land along Shashe and Tugwi rivers are already involved in irrigated agriculture. These farmers are already enjoying the benefits of irrigation. Now that the Government have secured funding to develop the identified potential land, there has been a reallocation of the identified land into small plots to increase the number of beneficiaries. Consultations were made with the local community, and the land owners donated their land willingly for the development of the scheme (*voluntary land use agreement forms, are available upon request)*. The community has experienced successive years of crop failure under dryland agriculture, and the development of the scheme will transform their livelihoods for the better. The Department of Lands, Chivi RDC, local leadership and members were involved in the process. The process also considered socio-cultural issues. It was inclusive and gender-sensitive too. The development of the scheme will not result in any physical or economic displacement of persons nor loss of assets.

Zinyaningwe irrigation scheme: The land targeted for the development of Zvinyaningwe Irrigation Scheme is state land. The farms were purchased in 1957. The land targeted for the development of the scheme was allocated by the Masvingo Rural District Council on behalf of the State. The land is just idle and is not being used for any productive purpose. It is completely covered with thick bushes. There are no homesteads within the targeted area, the development of the scheme will not result in any displacement of persons nor loss of assets.

4.10.5 Irrigation scheme management

The irrigation schemes will be management by an Irrigation Management Committee (IMC) which comprises of the Chairperson, Secretary, Vice Chairperson, Vice Secretary, Treasurer and other committee members. The selection of IMC members is mostly guided by a constitution. Members were nominated and those who were willing were voted for. Paid up members are eligible. Joining fee is also expected from new members. All members make monthly contributions in the currency of that period.

4.10.6 Training

The Ministry of Small and Medium Enterprises and Cooperative Development is currently running training programmes in the country on how to run agricultural cooperatives. Farmers also receive different types of training from the Department of Irrigation and AGRITEX. However, farmers still lack the skills to apply some principles to crop choices, marketing, cost calculations and overall profitability calculation. It is imperative that once the schemes are established and revitalized, farmers be trained on these principles.

4.10.7 Education

In all the project sites, the children have access to primary and secondary education. Parents whose livelihoods are mainly derived from agricultural activities wish to see the irrigation schemes developed so that they can increase their yields and be able to get income to be able to send their children to school.

4.10.8 Access to Agriculture Extension Services

Members of the irrigation schemes have access to extension services regardless of gender, social standing, age and physical abilities. Once operational, the schemes will be supported by an Agricultural Extension Officers (AEOs) assigned through the Ministry of Agriculture, Lands, Water, Fisheries and Rural Development. The District Extension Officer is also available to support the AEOs.

4.10.9 Labour

Currently, farmers provide labour for their irrigation plots and in their rain fed plots. Management of the schemes shall follow the ARDA model. However, members propose to use their family labour at the onset of the proposed scheme and then raise enough funds to be able to hire labor in the preceding seasons. Farmers are willing to help with manual labour if required during construction of the irrigation schemes.

4.10.11 Financial issues

Most farmers in the area lack financial resources to fend for the families as most of them are self-reliant. Farmers do not have access to loan schemes. Yields are very limited due to the effects of climate change such as prolonged dry spells. Most households within the sub-project areas raise income through selling produce from agriculture, remittances, fishing and sometimes mining. However, their limitations come with repeated crop failure due to poor rainfall patterns as a result of climate change.

4.10.12 Ethnicity/language

The people living in project sites are mainly “shona” speaking, broadly from the Karanga, Manyika and Mandau dialects. There are Ndebele minority who came from Matabeleland in the area.

4.10.13 Livelihoods

Agricultural production in the form of subsistence crop production and animal husbandry is the main source of livelihoods in all the targeted areas. Dry land crop farming is practiced the most. However, the continuous failure of crops due to the effects of climate change make their livelihoods vulnerable. Livestock rearing is mostly in the form of cattle and goat farming. Livestock production is challenged by the prevalence of terminal diseases such as January disease and droughts that destroy fodder and pastures. Other people are engaged in small scale gold mining. Most youths migrate to towns to seek employment. Other community members are gainfully employed as teachers, nurses, shopkeepers etc. The proposed sub-projects will guarantee improved crop yields and improve the standards of living of the people.

4.10.14 Sales and marketing of produce

Local markets exist within the communities. Marketing is always done as individuals and collectively in groups. Local market exist in surrounding townships, nearby towns, schools, mining companies, etc.

Market linkages

Members of the schemes are linked to the markets through roads that lead to local business centres, growth points, schools, small scale miners, mining companies and towns (Masvingo, Zvishavane, Bulawayo and Harare). The Government of Zimbabwe through the Ministry of Lands, Agriculture, Fisheries, Water and Rural Development and its partners have developed a Kurima Mari App which comes in handy as it gives farmers contact details of agricultural inputs suppliers, agro-dealers dealers who buy or who can help in selling the farmer’s produce and livestock. This app will be very useful in value chain development and marketing for the uplifting of marginal farmers. There is no need for internet or mobile data to use most of the functions on the app. The app can be used by anyone anywhere even in the most remote areas where there is no network coverage. The phone just needs battery to access all that vital information. Videos and podcasts can also be downloaded and viewed in the Kurima Mari App shown in Figure 42.

Figure 42: Kurima mari App

Crop selected

Farmers were given a platform to choose the crops that they were willing to grow. The AGRITEX officer participated in every group to provide guidance. An irrigation engineer and an Economist from the Ministry of Finance were also part of the group. Farmers were helped with crucial information that could guide in the choice of the crops that are shown in Figure 43. The reasons considered included, growing seasons, potential yields, pest and disease management needs, demand and availability of markets, market prices, handling, processing, contribution towards food security, water requirements, labour requirements, nutritional value, cultural considerations, Government policies, priorities and environmental considerations. The priority goes to "food security and generating income through high value crops and improved cash flow".

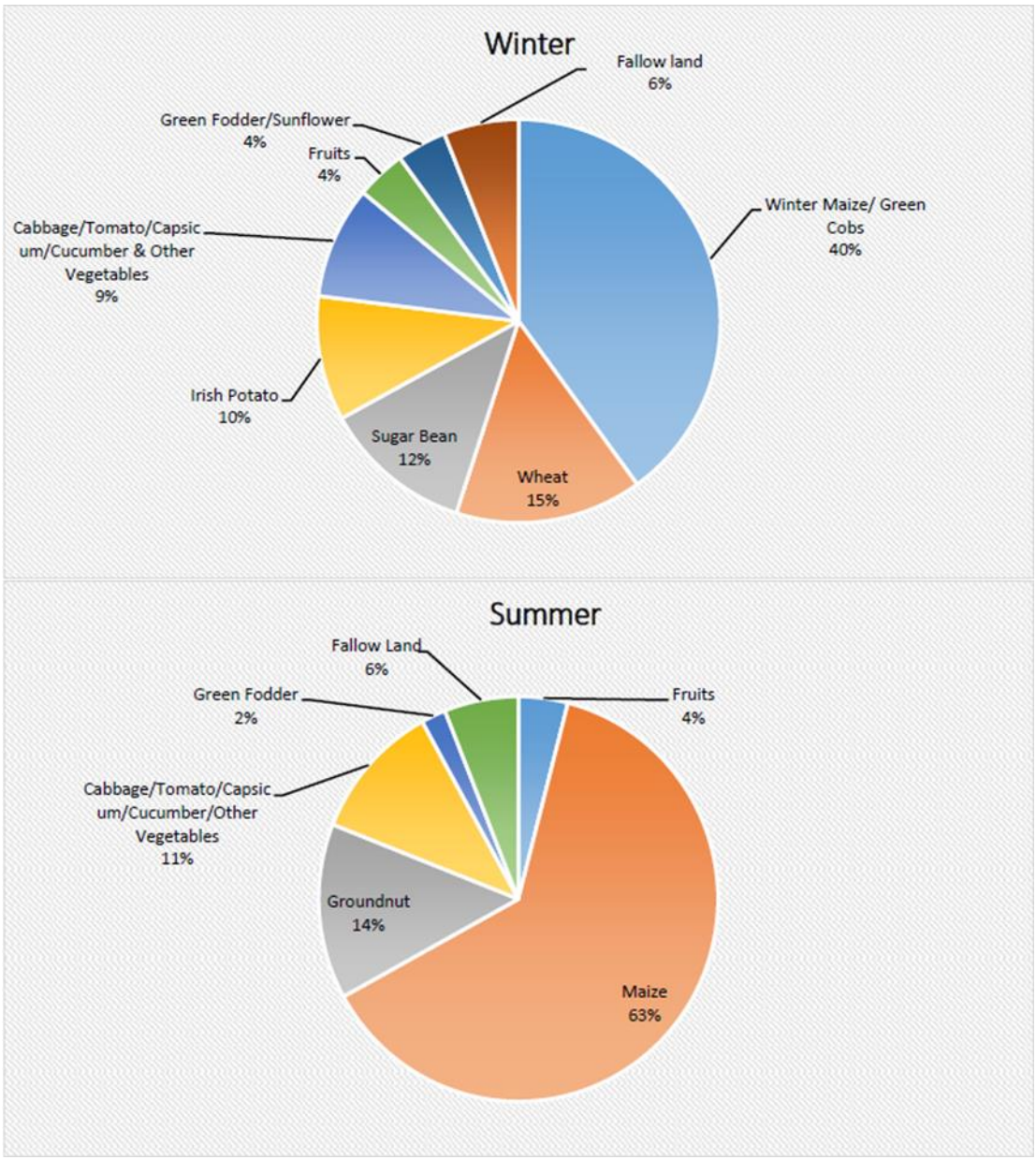

Figure 43: Selected crops by Farmers

4.10.15 Health status and facilities

The sub-project sites are close to hospitals which provide medical care. Viral infections including flue and COVID-19, diarrhoea, HIV and sexually transmitted infections (STIs) are some of the diseases that are common in the area. Tuberculosis is also another common disease in the area. There are no incidences of malaria infections except for those whom would have visited malaria prone areas.

4.10.16 Transport and communication

Road is the main mode of transport in the project sites. Public buses, passenger vehicles, carts, motorbikes and bicycles are the road users. Sleighs are also used. Donkeys are widely used to carry goods and people too. ICTs are being embraced in the project area. There is a good coverage of telecommunication networks (Netone, Econet

and Telecel) through which the public can access information from internet based platforms. Social media is playing a pivotal role in information movement. Farmers get information through group communications. Television and radio broadcasts are other forms of communication in the area, and interpersonal channels are being used i.e. communicating through community leaders, farmer representatives and extension workers. It can be said that most important communication tools presented today is mass media because it is more effective and powerful on farmers for providing the new agricultural information. The Government of Zimbabwe undertake telecasting programmes designed and produced for current affairs like disease affecting crops and their remedies, requirement of fertilizers and pesticides, new techniques of harvesting of crops, market value of input and output of agro-products as well as machinery which affect agriculture and the farmers. Poor road network

4.10.17 Gender Based Violence

Gender based violence data was collected through interviews, group discussions and document review. The aim was to identify knowledge, attitudes and practices around GBV, services available, referrals, access challenges and prevalence rate of gender-based violence. Targets were community members and key informants, including multi-sectorial service providers, traditional and religious leaders. The target communities are well aware of Gender Based Violence (GBV) including Sexual Exploitation, Abuse and Harassment. It was noted that Government Departments and NGOs offer training and awareness campaign initiatives amongst farmers. The Department of Social welfare, Musasa Project and the Department of Women affairs have a record of providing training and awareness creation. Amongst other responsibilities, they monitor vulnerable women and children.

Gender based violence issues are handled differently by different players in the area. Some players provide awareness of gender responsive laws and services; the provision of health care, psychosocial support and legal aid to survivors of GBV; mobilizing men and young people to support gender equality; GBV prevention through community mobilization; and supporting GBV referral and coordination mechanisms at district and community level. The Musasa Project, Ministry of women affairs, and the Department of Social Welfare are working in area to prevent gender-based violence, to offer counselling and social and psychological support. Ward CCW officers deal with issues of GBV that affect children. Health facilities treat patients who are victims of GBV. They also offer counselling services. Community leaders, IMC offer support at the grass root level. Support groups also exist in the area. Churches play a role in behavioural moulding, counselling, and other support systems. Zimbabwe Republic Police (ZRP) offer policing services. They also have a section that deals with abuse and gender based violence.

5.0 POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACTS

5.1 Introduction

The various components of the biophysical and socio-economic environment as described in previous sections are likely to be impacted upon as a result of the implementation of the sub-projects. The development of the irrigation schemes is expected to bring both positive and negative impacts of different magnitudes at different phases of development. This section identifies and analyses the likely adverse impacts and proposes the management options to avoid, minimize, mitigate and offset such impacts. The likely impacts are identified and analysed under four phases of development namely pre-construction, construction, operation and decommissioning. Impacts were analysed using the UNDP risk matrix (Table 3) which considers the following:

- Impact (e.g. consequences if the risk were to occur)
- Likelihood (e.g. the chance of the risk occurring)

5.2 Biophysical Impacts during the Pre-construction Phase

The pre-construction phase will generate few negative impacts on the biophysical environment as shown in Table 17. The activities to be undertaken at the sites during the pre-construction phase are:

- topographic surveys
- geotechnical surveys
- soils surveys
- water quality sampling
- ecological assessments

The surveys could result in minor clearance of vegetation in cases where vegetation occurs along the line of sight and for placement of beacons. Localised digging would take place for sampling.

Table 17: Potential biophysical impacts during the pre-construction phase

Activity	Aspect	Impact	Likelihood rating	Level of impact Rating	Score	Significance of risk
Topographic surveys,	Vegetation clearance	Loss of biodiversity	5	2	10	Moderate
		Loss of habitat	5	2	10	Moderate
	Digging during pegging	Loss of archaeological artefacts	2	1	2	Low
		Animal/ huma injuries	2	1	2	Low
Geotechnical surveys and soils surveys,	Generation of dust	Air pollution	2	1	2	Low
	Digging of pits	Injuries/death to animals traps	2	3	6	moderate
Water quality sampling	Collection of water samples	Disturbance of aquatic life	2	1	2	low
Collection of vegetation data	Reduction of the canopy cover of vegetation	By cutting out branches and leaves for identification	2	1	2	Low
Vehicle and machinery use	Generation of noise	Noise pollution	2	2	4	low
	Fuel usage	Resources depletion	5	1	5	Low
	Oil spills and leaks	Land/water pollution	2	2	4	Low
	Vehicle use leading to air emissions	Air pollution	5	1	5	Low

5.3 Biophysical Impacts during the Construction Phase

Most of the biophysical impacts will be experienced during the construction phase and operational phase. During the construction phase there is a lot of movement to and from the site. The major activities associated with this phase which gives rise to biophysical impacts are as follows:

- Land clearing for setting up the irrigation equipment
- Upgrading of the access roads
- Setting up of a site construction camps
- Haulage of construction materials and their storage
- Excavation for rising / pumping mains
- Borrowing of sand and gravel from borrow pits
- Extraction of river sand for construction
- Setting out and installation of the irrigation infield infrastructure and pipe network.
- Generation of waste materials from construction and domestic activities
- Movement of vehicles and operation of machinery
- Compaction of the soil

Table 18 provide the anticipated biophysical impacts during the construction stage.

Table 18: Potential biophysical impacts during the construction phase

Activity	Aspect	Impact	Likelihood Rating	Impact Rating	Significance Rating	Significance Rating
Setting out and determination of property boundaries	• Clearing of vegetation during surveying and setting out of the construction zones and property boundaries	• Biodiversity loss	5	1	5	Low
Collection of soil data- soil auguring and profiling	• By digging pits for profiling and by auguring • Geotechnical surveys	• Injury or death to animals	5	1	5	Low
Archaeological impact assessment	• Trenching	• Injury or death to animals	5	1	5	Low
Siting of the proposed irrigation infrastructure	• Land clearing	• Vegetation loss	4	2	8	Moderate
	• Movement of labour	• Soil compaction	2	2	4	Low
Creating access roads	• Clearing of vegetation to	• Biodiversity loss	5	2	10	Moderate
	• Movement of vehicles	• Compaction of soil	3	2	6	low
Setting up of construction camps	• Opening of site to make way for structures	• Biodiversity loss	2	2	4	Low
Extraction of course aggregates, pit and river sand for use during construction	• Scarring of the land	• Land and river bank degradation • Unsightly landscape mutation	5	2	10	Moderate
	• Destabilisation of the soil	• Water quality degradation	2	2	4	Low
	• Creation of borrow pits	• Injuries to animals and human beings	5	2	10	Moderate
	• Creation of borrow pits	• Land degradation	5	2	10	Moderate

Activity	Aspect	Impact	Likelihood Rating	Impact Rating	Significance Rating	Significance Rating
	• Increased water runoff	• Water pollution	5	2	10	Moderate
Digging and laying out of the water supply and pipe network	• Digging • Vegetation clearing	• Soil erosion • Vegetation loss	5	2	10	Moderate
Domestic activities at the camp	• Use of fire in cooking, lighting cigarette	• Fire outbreaks resulting in loss of biodiversity, destruction of life and property due to fire breakouts	3	3	9	Moderate
	• Open defecation	• Increased spread of diseases	2	4	8	Moderate
	• Improper disposal of solid waste	• Land pollution	2	1	2	Low
Movement of vehicles and construction equipment	• Movement of vehicles • Use of diesel and petrol	• Contamination of surface and ground water from fuel leaks • Loosening of soil and its subsequent washing away into streams • Air pollution • Water pollution	3	3	9	Moderate
Solid waste generation and disposal	• Disposal of putrescible (biodegradable) domestic waste • Disposal of non-putrescible construction waste especially paper and rubble • Disposal/ spillage of hazardous waste such as paints	• Littering, effect on aesthetics • Pollution of soil and water resources	3	2	6	Moderate
Hazardous substances releases	• Release of hazardous substances during construction (e.g. accidental	• Water and soil pollution	3	2	6	Moderate

Activity	Aspect	Impact	Likelihood Rating	Impact Rating	Significance Rating	Significance Rating
	spills and leaks) leading to soil, surface or groundwater contamination.					
Excavation of trenches for irrigation infrastructure	• Excavations • Movement of construction vehicles and equipment	• Soil disturbances, loosening of soils and their exposure to erosion • Disturbing the soil profile. • Loss of archaeological artefacts • Dust and noise	5	2	10	Moderate
Construction of the irrigation infrastructure and ablution facilities	• Vegetation clearing to make way for irrigation infrastructure. This will also result in the loss of habitats particularly for snakes and other small mammals in the area • Creation of artificial surfaces • The presence of artificial structures	• Loss of vegetation and habitats • Increase in storm water runoff • Loss of aesthetic aspects associated with artificial structures	3 4 2	2 2 2	6 8 4	Moderate Moderate Moderate
Land preparation and landscaping	• Soil disturbances • Vegetation clearance	• Soil erosion • Loss of vegetation	5	2	10	Moderate
Construction and maintenance	• Dust and emissions from construction and maintenance activities could affect human health, vegetation and wildlife.	• Air pollution	2	1	2	Low
Construction and maintenance	• Noise and vibration from construction and maintenance equipment, traffic and activities, may disturb sensitive noise receptors (human, fauna).	• Noise and Vibration	2	1	2	Low

5.4 Biophysical Impacts during the Operational Phase

Most of the project's biophysical impacts are confined to the construction phase. The anticipated biophysical impacts associated with the operation phase will emanate from the following activities

- Land preparation - land levelling, tillage
- Irrigating
- Application of natural and synthetic fertilisers
- Application of agrochemicals
- Weeding
- Harvesting
- Post-harvest processing
- Storage
- Transportation of inputs and produce

Table 19 summarises the anticipated biophysical impacts associated with the operation phase of the sub-projects.

5.5 Biophysical impacts during the decommissioning phase

Decommissioning of the scheme is anticipated to take place when there is serious breakdown of critical systems and irrigation infrastructure. Table 20 summarises the anticipated biophysical impacts associated with the decommissioning phase of the sub-projects.

5.7 Socio-economic impacts during all phases of Project development

Table 21 show the socio-economic impacts at all development phases of the sub-projects

Table 19: Potential biophysical impacts during the operational phase

Activity	Aspect	Impact	Likelihood	Impact rating	Score	Significance of risk
Land preparation & Land leveling	• Loosening of soil by use of machinery	• Soil erosion • Sedimentation and siltation of rivers	5	2	10	Moderate
Land tillage	• Loosening of soil.	• Soil erosion • Sedimentation and siltation of rivers	5	2	10	Moderate
Soil fertility management	• Altering chemical components of the soil due to fertilizer application	• Soil pollution • Salinization • Water pollution	5	2	10	Moderate
Surface water management	• Tilling and land utilisation	• Sedimentation & siltation of dams • Pollution of surface water from agricultural activities	5	2	10	Moderate
Irrigation of crops	• Water use • Excessive irrigation	• Depletion of water resources • waterlogging	4	2	8	Moderate
	• poor-quality water	• Salinization of soils	3	3	9	Moderate
Weeds, pest and disease control	• Application of pesticides, • herbicides, • weedicides and insecticides	• Soil pollution, • Water pollution • Destruction of biodiversity • Chemical exposures • Generation of aerosols	3	3	9	Moderate
Waste management	• Generation Disposal of plastic waste, packaging material for fertilizers, seeds, agrochemicals and • Disposal of decomposed farm produce • Burning of crop residues	• Land pollution • water pollution • soil pollution • biodiversity loss	3	2	6	Low

Activity	Aspect	Impact	Likelihood	Impact rating	Score	Significance of risk
Transportation of materials	• Use of vehicles	• Air pollution	3	2	6	Low
Land tillage and transportation of materials	• Use of machinery	• Noise and vibration	3	2	6	Low
	• Use of vehicles and machinery	• Soil and water pollution from oil leaks	3	2	6	Low
	• Use of vehicles and machinery	• Accidents	3	2	6	Low
Land clearing	• Clearing of vegetation may result in introduction of invasive alien species	• Introduction of invasive species	5	2	10	Moderate

Table 20: Biophysical impacts at decommissioning phase

Activity	Aspect	Impact	Likelihood	Impact rating	Score	Significance of risk
Demolition of structures	• Generation of debris • Noise generation	• Land pollution • Noise Pollution	1 3	1 1	1 3	Low Low
Vehicle movement	• Vehicles emissions, noise generation • Dust generation • Fuel usage	• Air, water and noise pollution • Depletion of natural resources	3 4	1 1	3 4	Low Low
Removal of irrigation equipment	• Excavation to remove buried pipes • Loosening of soils • Generation of dust	• Accidents and Incidents • Air pollution • Soil erosion	3	1	3	Low

Table 21: Socio-economic impacts at all phases of development

Activity	Impact	Impact rating	Likelihood	Score	Significance
Construction or agricultural development	• Displacement or damage to cultural heritage by construction activities, harm to local setting, amenity value, etc. due to construction or agricultural development e.g. the damage to graves at Zvinyaningwe and Pikini-Jawanda Irrigation Schemes	4	2	8	Moderate
	• Change to intangible cultural heritage due to increased access, and interaction with workforce	2	2	4	Low
Labour Influx resulting in Interaction between workforce and local communities	• Labour influx may lead to sexual exploitation, abuse and harassment (SEAH) of women and girls	5	2	10	Moderate
	• Increased occurrence of communicable diseases, including HIV/AIDS and sexually transmitted Infections (STDs) and COVID-19 infections	3	2	6	Low
Employment creation and increased productivity	• An increase of women's income (through project-sponsored activities) and other empowerment interventions may result in gender-based violence in some households.	3	3	9	Moderate
Construction and maintenance	• Poor construction management practices may lead to adverse effects on safety, human health and wellbeing.	3	3	9	Moderate
Water irrigation	• Changes in exposure to water borne and water related diseases, especially those associated with water dwelling disease vectors (new areas of standing water created) or poor sanitary conditions.	3	3	9	Moderate
Poor working conditions	• Poor management of occupational health and safety leading to accidents, injuries and illnesses among workers (e.g. risks of working close to water); mental health issues due to remote or enclosed living.	3	3	9	Moderate
	• Differences in nationality, ethnicity, religion, etc. may lead to discrimination and harassment, and differences (perceived or real) in working conditions between workers may lead to resentment.	5	2	10	Moderate

Activity	Impact	Impact rating	Likelihood	Score	Significance
In-migration	• Individuals are likely to migrate into the area which may cause conflict with resident communities and put pressure on resources and infrastructure.	2	2	4	Low
Workforce-Community Interactions	• Real or perceived disruption to normal community life, through the physical presence of a workforce; in particular, potential for conflicts to occur over water use.	3	2	6	Low
Economic Development and Employment	• Direct employment of local population in workforce, and stimulation of local economy through demand for goods and services will enhance livelihoods and economic activity in local communities; potential for adverse effects if expectations not met and community relations are not well managed.	2	2	4	Low
Impoverishment of land donors	• As land is acquired, some affected members lose part or all of their land to irrigation	5	2	10	Moderate
Conflicts	• Conflicts over land allocation	3	3	9	Moderate
	• Conflict with non-irrigation scheme members over water for livestock and domestic uses	3	3	9	Moderate
	• Conflict over irrigation management leadership selection (Irrigation Management Committee appointment)	2	3	6	Low
	• Inequality and competition over water sharing among irrigation members	3	3	9	Moderate
	• Conflicts from allocation of inputs amongst members	3	3	9	Moderate
	• Conflicts between upstream and downstream users over water use.	3	3	9	Moderate
Theft of agricultural products and irrigation equipment	• Loss of agricultural produce • Disruption of operations leading to poor yields	2	2	4	low
Human animal conflicts	• Destruction of crops by animals in the scheme	2	2	4	low

5.8 Positive Environmental and Social impacts

The identified positive environmental and social impacts are presented in Table 22.

Table 22: Positive Environmental and Social Impacts

Impact	Source of Impact	Enhancement Measure	Responsible Agent
Enhanced Agricultural Production	Irrigated agriculture improves crop water availability leading to crop success.	• Practice crop diversification • Improve access to inputs • Provide training on agribusiness • Enhance access to markets	• FARMERS • AGRITEX • DOIR
Increased food and nutrition security and income	Farming throughout the year, high yields.	• Practice crop diversification • Improve access to inputs • Provide training on agribusiness • Enhance access to markets	• FARMERS • AGRITEX • DOIR
Creation of employment opportunities	During construction During the operational phase	• Prioritize employment of locals • Competitive salaries • Better working conditions	• Contractor • DOIR • AGRITEX • FARMERS
Increased water availability for agricultural development	climate proofed optimizes the use of water	• System maintenance • Promote water conservation methods of farming to ensure that enough water is available all the time.	• FARMERS • DOIR
Reduced pressure on grazing land, improved animal health	Increased fodder production will result in reduced pressure on grazing land	• Provide relevant training • Provide equipment maintenance support	• DOIR • AGRITEX
Enhanced knowledge and skills on better agronomic practices	Training from DOI, AGRITEX, MUSASA PROJECT	• Periodic training	• Musasa project. Social services department • AGRITEX • DOIR

Impact	Source of Impact	Enhancement Measure	Responsible Agent
Improved knowledge base of the beneficiaries	Training of beneficiaries may lead to enhanced capacity in the deployment of the technologies required to improve production and support project management	• Periodically review and implement the capacity building plan	• DOIR • AGRITEX • EMA

6.0 ENVIRONMENTAL & SOCIAL IMPACT MANAGEMENT PLAN

This section describes the mitigation and management measures to be implemented during the sub-project development to manage and prevent where possible the environmental and social impacts. These mitigation measures are outlined in this report according to their phase of implementation to allow for ease of reference and prioritisation of actions. Table 23 provides a summary of these impacts and mitigation measures.

Table 23: Environmental and Social Management Plan

Environmental & Social Domain	Aspects and Impacts	Proposed Mitigation Measures	Timing of management actions		Responsibility	Cost (USD)
			Start	End		
PRE-CONSTRUCTION & CONSTRUCTION PHASE						
Aesthetics	Loss of aesthetics as most areas will be opened up due to clearance of vegetation.	• Only vegetation in areas directly affected by proposed Irrigation Schemes activities will be cleared. • Revegetation of disturbed areas	2023	2024	• Contractor • Farmers	1000.00
Land	Cleared vegetation will expose soils to erosion processes	• Confine clearing to project site • Careful planning of phasing and timing of construction activities. • Clearing shall be restricted to the proposed work site and routes only to allow smaller birds, mammals, reptiles an opportunity to migrate into undisturbed areas close to their similar habitats.	2023	2024	• Contractor • Farmers	0.00
	Leaks of oil, fuel, hydraulic fluid from the construction machinery may contaminate soils	• Servicing of vehicle to be done at approved dealers with proper containment facilities • Regular inspections of vehicles, mobile equipment and machinery to check for oil and fuel leaks • Provide drip trays to stationary vehicle and machinery to prevent drips and small leaks onto the ground. • Develop and implement the spill prevention control procedure	2023	2024	• Contractor	5000.00
Land	Waste from camp sites and irrigation scheme leading to land pollution	• Apply the waste management hierarchy (Avoid, Reduce, Re-use and Recycle) • Encourage waste segregation and provide designated waste bins • Use construction waste such as rubbles to rehabilitate any open pits created during the construction period;	2023	2024	• Contractor • Farmers	2000.00

Environmental & Social Domain	Aspects and Impacts	Proposed Mitigation Measures	Timing of management actions		Responsibility	Cost (USD)
			Start	End		
		• Provide training on waste management • Erect waste management signage at suitable sites				
Surface and Ground Water	Leaks of oil, fuel, hydraulic fluid from the construction machinery may contaminate local watercourses	• Use of machines which are in good condition • Maintenance of vehicles to be done by approved dealers with proper facilities • Servicing of equipment to be done on facilities that are contained (oil interceptors and lining)	2023	2024	• Contractor	5000.00
Air Quality	Movements of machinery around the cleared sites will generate dust and exhaust fumes.	• Application of dust control measures such as reducing traffic movements and water sprinkling on exposed areas to reduce dust. • Land clearing, removal of topsoil and excess materials, location of haul roads, tips and stockpiles should be planned with due consideration to meteorological factors (e.g. precipitation, temperature, wind direction, and speed) and location of sensitive receptors. • Conduct personal dust monitoring at all working sites • Vehicles should be in good working condition and be regularly serviced to reduce on exhaust fumes. • Avoid operations during heavy winds • Provide employees with adequate Personal Protective Equipment (PPE) • Implement speed controls	2023	2024	• Contractor	5000.00
Flora and Fauna	Impacts on habitats and species from habitat alteration and degradation	• Only vegetation in areas directly affected by proposed scheme infrastructure and activities will be cleared. • Habitat rehabilitation and ecosystem restoration of areas no longer required to occur as soon as possible after construction.	2023	2024	• Contractor • Farmers	5000.00

Environmental & Social Domain	Aspects and Impacts	Proposed Mitigation Measures	Timing of management actions		Responsibility	Cost (USD)
			Start	End		
		• Put in place wildlife management initiatives in the buffer zone such as CAMPFIRE for the communities to preserve wildlife whilst earning income from tourist activities. • Incentivize the protection and conservation of natural forests and their ecosystem services, and enhance other social and environmental benefits • Clear all the invasive species in line with national guidelines for the control of invasive species				
Noise and Vibrations	Earthmoving machinery operations will cause increased noise and vibrations.	• Natural vegetation and topography will be maintained to prevent any unwanted noise from reaching the nearby communities. • Vehicle and machinery must be well serviced • Road route selection and siting of construction facilities accompanied where necessary by noise attenuation measures. • Conduct risks assessments prior to any possible blasting operations during excavation and trenching. • Implement speed limit controls • Stationary vehicles and machines must be switched off at all times • Provide adequate PPE such as ear muffs	2023	2024	• Contractor	3000.00
Cultural Heritage	Impact on graves at Zvinyaningwe and Pikini-Jawanda irrigation schemes Displacement or damage to cultural heritage sites	• Identified graves at Zvinyaningwe and Pikinini-Jawanda Irrigation schemes must be fenced off during construction as was proposed by the relatives and traditional leaders, Masvingo RDC, farmers and other local authorities. • Careful site selection and siting of all project components, taking account of community consultation/specialist	2023	2024	• MLAWFRD	2000.00

Environmental & Social Domain	Aspects and Impacts	Proposed Mitigation Measures	Timing of management actions		Responsibility	Cost (USD)
			Start	End		
	by construction activities, harm to local setting, amenity value, etc. due to construction Change to intangible cultural heritage due to increased access, and interaction with workforce	surveys i.e. the design of the irrigation technology shall ensure that that the graves are not tempered with				
	The loss of tangible forms of cultural and archaeological importance during site clearance.	• Newly discovered forms/material of cultural and archaeological importance will be reported following the chance find procedure provided as Appendix 4	2023	2024	• Contractor • Ministry of Lands, Agriculture, Fisheries, Water and Rural Development	0.00
Health and Safety	Injury or death to contract worker(s) or local community member (s) at construction site Road traffic accidents	• Conduct Hazard Identification and Risk Assessment for all work sites and implement suitable management controls following the risk mitigation hierarchy (e.g. elimination, substitution, engineering control, administrative control, and PPE) • Implement good “housekeeping” and management procedures; • Implement Emergency Preparedness and Response Plan which include provision of first aid response equipment and the related trainings • Provide training and regular maintenance of machinery and equipment;	2023	2024	• Contractor	1000.00

Environmental & Social Domain	Aspects and Impacts	Proposed Mitigation Measures	Timing of management actions		Responsibility	Cost (USD)
			Start	End		
		• Provide training on road safety				
	Increased spread of STIs and HIV & AIDS	• Implementation of a health management system for the construction workforce, to ensure it is fit for work • Development of workplace policy on HIV & AIDS in line with the national policy and legislation and making it known to all. • Training and awareness raising for workforce on HIV/AIDS and other STDs, and communicable diseases; health awareness raising campaigns for communities on similar topics. • Promoting condom use and respect for sexual rights. • Provision of voluntary counselling and testing and treatment services.	2023	2024	• Contractor • PMU • MLAWFRD	1000.00
	Increased spread of Covid 19 infections	• Practising social distancing • Improved personal hygiene • Wearing of face masks • Daily temperature screening • Providing COVID-19 awareness training to contractors and famers	2023	2024	• Contractor • PMU • MLAFWRD	1000.00
	General Safety	• Erect warning signposts around the proposed irrigation schemes construction sites. • A perimeter security fence will be erected around the proposed scheme for protection against unauthorised entry. • Security personnel will be employed for protection against unauthorised entry. • Flood light provision for night work lighting and security	2023	2024	• Contractor • MLAFWRD	50000.00
Procurement Activities	Procurement of local goods and services for	• Procedures for sustainable local procurement, in consultation with local authorities and community leaders.	2023	2024	• Contractor • PMU	0.00

Environmental & Social Domain	Aspects and Impacts	Proposed Mitigation Measures	Timing of management actions		Responsibility	Cost (USD)
			Start	End		
	development of irrigation system and workforce could deplete resources available for local communities.	• Local capacity building to foster community resilience. • Monitoring of local prices; exploration of corrective measures (e.g. alternative sourcing) if appropriate.				
Sexual Misconduct	Influx of workers to the project implementation areas and their potential interaction with women and girls may lead to Sexual Exploitation, Abuse and Harassment (SEAH) of women and girls	• Implement the code of conduct on SEAH to be signed by Project personnel and contractor workers • Awareness training on the issues associated with sexual exploitation shall be provided with the help of Ministry of Woman Affairs. • Formulation and operation of project GRM • Empower women and girl child with more responsibilities in the irrigation scheme. • Encourage counselling and support group sessions • Report any act of sexual misconduct to project disciplinary committee and to the police. • Investigation any sexual exploitation cases reported.	2023	2024	• Contractor • PMU	1000.00
Gender Based Violence	An increase of women's income (through project-sponsored activities) could lead to gender-based violence in some households.	• Conduct awareness and sensitization sessions through platforms such as Farmer Field Schools (FFS) • Implement the Project GRM • Investigation of GBV cases reported	2023	2024	• Contractor • Victim, • PMU • ZRP	1000.00
Labour and Working Conditions	• Poor management of occupational health and safety leading to accidents, injuries and illnesses among workers (e.g. risks of	• Employment practices and working conditions should conform to International Labour Organisation (ILO) Standards and national regulations. • Reduce labour influx by tapping into the local workforce; • Promotion of fair and equitable labour practices for the fair treatment, non-discrimination, equitable worker	2023	2024	• Contractor- • Labour Officer	1000.00

Environmental & Social Domain	Aspects and Impacts	Proposed Mitigation Measures	Timing of management actions		Responsibility	Cost (USD)
			Start	End		
	working close to water); mental health issues due to remote or enclosed living. • Differences in nationality, ethnicity, religion, etc. may lead to discrimination and harassment, and differences (perceived or real) in working conditions between workers may lead to resentment.	opportunities, minimum wage and prohibition of employment of children in line with the Employment Act; • Ensure work contracts provide terms and conditions of employment which stipulate among other things working hours, rest hours, remuneration, intervals at which remuneration will be paid, working hours, provision of termination and disciplinary rules applicable to employees in line with national labour laws • Establishment, management and promotion of a healthy, management-worker relationship; • Promotion of health, safe, secure and comfortable accommodation that does not impact negatively on the employees and the communities in the surrounding areas; and • Protection of workers' rights including migrants and third-party workers in line with Labour Laws • Clear and comprehensive health and safety reporting and grievance procedure system should be established, and be freely available to all of the workforce • Ensure that worker organisations/representatives are established				
Child Labor & Safety	Construction activities may result in risk of child labor	• Implement recruitment Policy in line with labour laws and international standards • Conduct risk assessment of all construction activities and identify risks management options • Child safety training • Reference Checking & Pre-screening interviews • Criminal History checks • Working with children checks • Probation period & Code of Conduct • Implement Project GRM	2023	2024	• Contractor • PMU	1000.00

Environmental & Social Domain	Aspects and Impacts	Proposed Mitigation Measures	Timing of management actions		Responsibility	Cost (USD)
			Start	End		
Workforce-Community Interactions	Real or perceived disruption to normal community life, through the physical presence of a workforce; in particular, potential for conflicts to occur over water use.	• Adoption of a Stakeholder Engagement Plan, as a framework for early and ongoing community consultation. • Implementation of a Grievance Procedure (see Grievance Procedure and Redress Mechanisms • Works procedures, defining a Code of Appropriate Conduct for all workers, including acceptable behaviour with respect to community interactions. • Adoption of a Sustainable Water Management Plan, which takes existing community usage into consideration.	2023	2024	• Contractor	1000.00
OPERATIONAL PHASE						
Soil and Water	Application of fertilizers, herbicides and insecticides leading to soil and water pollution	• Practice integrated pest/vector management programme • Avoid use of products that fall in Classes Ia (extremely hazardous) and Ib (highly hazardous) of the WHO Recommended Classification of Pesticides by Hazard • Use only approved pesticides and avoid the use of banned pesticides • Ensure that pesticides are handled, stored, applied and disposed of in accordance with FAO International Code of Conduct on the Distribution and Use of Pesticides • Training of farmers on safe handling, storage, use and disposal of agrochemicals • Testing the soil for pesticides residues • Chemical warehouses/stores should be situated from water sources as well as livestock and food storage areas. • Ensure products are stored in their original packaging; • Regular inspection of stored products to ensure their condition • Keep SDS at appropriate locations in storage facilities • Ensure chemical stores have appropriate ventilation	2023	2080	• IMC • MLAFWRD • FARMERS • AGRITEX	2000.00

Environmental & Social Domain	Aspects and Impacts	Proposed Mitigation Measures	Timing of management actions		Responsibility	Cost (USD)
			Start	End		
		• Use of mechanical weed control such as ridging, hand hoes. • Good crop husbandry methods including early planting, early harvesting.				
	• Vegetation clearing leading to soil erosion.	• Confine clearing to project site • Careful planning of phasing and timing of construction activities. • Clearing shall be restricted to the proposed work site and routes only to allow smaller birds, mammals, reptiles an opportunity to migrate into undisturbed areas close to their similar habitats.	2023	2080	• IMC • MLAFWRD,	0.00
	• Physical and Chemical degradation of the soil.	• Incorporate nitrogen-fixing legume crop plants and cover crops in the cropping cycle • Draw up balanced fertilizer programs for each soil management unit based on soil fertility results. • Conduct periodic soil analysis to detect changes in soil fertility. • Provide farmers with training in nutrient management.	2023	2080	• Farmers • AGRITEX	5000.00
Fauna and flora	• Loss, fragmentation and degradation of habitat, and severance of animal migration routes and pathways	• Careful siting of all project components, with advice from biodiversity authorities/wildlife specialists. • Rehabilitation of cleared areas with native species, and ecosystem restoration in habitats of conservation value, using specialist advice and input so as to maintain the integrity of the habitat, backed up by a long-term monitoring programme and corrective actions as necessary. • Clearing shall be restricted to the proposed work site and routes only to allow smaller birds, mammals, reptiles an	2023	2080	• MLAFWRD • Forestry Commission • FARMERS	1000.00

Environmental & Social Domain	Aspects and Impacts	Proposed Mitigation Measures	Timing of management actions		Responsibility	Cost (USD)
			Start	End		
		opportunity to migrate into undisturbed areas close to their similar habitats.				
	• Introduction of invasive species leading to biodiversity loss	• Use of certified seeds • Sourcing planting material from reliable suppliers • Clear invasive species using mechanical or physical means	2023	2080	• Farmers • MLAFWRD	1000.00
Surface Water	• Sedimentation and siltation of Dams	• Ensure schemes are developed outside the permissible servitude or buffer zone of the dams i.e. observe the ZINWA buffer zone for large dams which is set at 100m from the highest dam crest level • No cultivation within the buffer zones. • Implement proper stormwater management • Collaboration with other partners with watershed management scope e.g. Global Environmental Facility 7 implemented by FAO. • Afforestation program of the catchment areas • Encourage use of gabions and sand traps • Use of water efficient irrigations systems to reduce the risk of erosion • Avoiding disturbing riverine vegetation.	2023	2080	• FARMERS • Project Manager • ZINWA • EMA • Parks and Wildlife • DOIR • PMU • IMC • MLAFWRD • AGRITEX	2000.00
	Depletion of water resources	Promote water use efficient practices e.g. • Determine crop water requirements based on local and internationally recognized guidelines to avoid over irrigation	2023	2080	• IMC • FARMER • ZINWA	5000.00

Environmental & Social Domain	Aspects and Impacts	Proposed Mitigation Measures	Timing of management actions		Responsibility	Cost (USD)
			Start	End		
		• Develop an appropriate irrigation plan and schedule, and monitor consumption and compare regularly with set targets based on available supplies of water • Adopt soil and water conservation practices such as mulching • Adopt climate proofed water irrigation systems • Conduct inspections of water irrigation infrastructure to detect any possible leakages and attend to them promptly • Provide training on irrigation operation and maintenance • Conduct periodic environmental flow analysis				
	• Leaks of oil, fuel, contaminate local watercourses	• Servicing of vehicle to be done at approved dealers with proper containment facilities • Regular inspections of vehicles, mobile equipment and machinery to check for oil and fuel leaks • Implement the spill prevention and control procedure in the event of accidental leakages	2023	2080	• MLAFWRD • Contractor	500.00
Ground water pollution	• Contamination of ground water due to farming operations	• Practice integrated pest/vector management programme • Avoid use of products that fall in Classes Ia (extremely hazardous) and Ib (highly hazardous) of the WHO Recommended Classification of Pesticides by Hazard • Use only approved pesticides and avoid the use of banned pesticides • Ensure that pesticides are handled, stored, applied and disposed of in accordance with FAO International Code of Conduct on the Distribution and Use of Pesticides • Training of farmers on safe handling, storage, use and disposal of agrochemicals.	2023	2080	• EMA • MLAFWRD	5000.00

Environmental & Social Domain	Aspects and Impacts	Proposed Mitigation Measures	Timing of management actions		Responsibility	Cost (USD)
			Start	End		
		• Testing the soil for pesticides residues • Early detection of pollution by routine ground water monitoring.				
Air pollution	• Burning of crop residues leading to air pollution	• Avoid burning of crop residues • Consider using crop residues as animal feed • Prohibit burning of pesticide-treated agricultural wastes and by-products • Reduce the risk of fire by minimising the build-up of potential fuel sources and controlling weeds and invasive species • Provide training on the impacts of burning pesticides containers on human health	2023	2080	• MLAFWRD • EMA	500.00
Land	Land acquisition for the development of the schemes may lead to impoverishment of land donors	• Ensure that land donors are given the first priority and that they are primary beneficiaries during the process of plot allocation as agreed during the consultations. • Ensure that the land donors get double the plot size as compared to other beneficiaries. This position has been agreed by all stakeholders during the consultative meetings	2023	2024	• MLAWFRD • IMC • RDC	0.00
	• Inefficient waste management during construction, operation • and maintenance leading to excess consumption of	• Examine alternative product formulations and packaging (e.g., biodegradable material). • Promote plastic waste reusing • Dispose waste at designated dumping sites • Promote waste minimisation through efficient application of fertilisers • Provide waste bin for the temporary storage of empty pesticides and herbicides containers.	2023	2080	• Farmers	1000.00

Environmental & Social Domain	Aspects and Impacts	Proposed Mitigation Measures	Timing of management actions		Responsibility	Cost (USD)
			Start	End		
	materials, generation of wastes/emissions, pollution of soils and water.	• The containers should be disposed at designated places agreed by the Rural District Councils • Do not burn or bury empty packaging • Empty pesticide containers, foil seals, and lids should be triple rinsed, and washings must be used sprayed back onto the field or disposed of as hazardous waste				
Community Health	• New standing water created can increase the risk of spread of waterborne diseases	• Implement environmental management measures for vector control: e.g. monitoring for key vectors; contact avoidance via site selection; focal insecticide and molluscicide application. • Facilitate programmes/measures to ensure appropriate sanitary and medical facilities are available	2022	2023	Ministry of Health and Child Care	1000.00
Cultural Resources	• Disturbance to graves • Change to intangible cultural heritage due to increased access, and interaction with workforce.	• Ensure that the erected fence is well maintained • Implement the chance find procedure (Appendix 4)	2023	2080	• IMC • Community leaders • Farmers	5000.00
DECOMMISSIONING PHASE Closure Plan activities during decommissioning of the Proposed Irrigation Schemes						
Soils	Exposed surfaces are prone to erosion.	• Re-vegetation will be done on proposed Irrigation Scheme sites and access roads. • Loose soil will be compacted.	2080	2085	• IMC • MLAFWRD • EMA	1000.00

Environmental & Social Domain	Aspects and Impacts	Proposed Mitigation Measures	Timing of management actions		Responsibility	Cost (USD)
			Start	End		
	Contaminated surfaces may contaminate surrounding soils through runoff	• Removal of contaminant through physical/chemical/biological treatment processes	2080	2085	• MLAFWRD • EMA	1000.00
Fauna and flora	Loss of terrestrial habitat and biodiversity in indigenous trees	• Re-vegetation with indigenous trees and grass. • Practice Apiculture in the buffer zone • Put in place wildlife management initiatives in the buffer zone such as CAMPFIRE for the communities to preserve wildlife whilst earning income from tourist activities.	2080	2085	• MLAFWRD • National Parks and Wildlife Authority	1000.00
Surface water	Erosion and sedimentation of the dam	• Proper maintenance of diversion drains around proposed irrigation schemes	2080	2085	• MLAFWRD • FARMERS	2000.00
Ground water	Contamination of groundwater	• There will be low contamination levels to groundwater, hence ensure monitoring	2080	2085	• EMA	500.00
Health and Safety	The safety of the public may be affected by inadvertent access to the irrigation sites	• Ensure safe removal and keeping of all valuable equipment and machinery • Warning signposts will be erected around the electricity transmission line area and transformer areas.	2080	2085	• MLAFWRD • IMC	500.00
Water transmission line stability	The erosion of soil will occur on exposed surfaces.	• Land will be re-vegetated with grass and indigenous trees • Monitoring of decommissioned water transmission line as per the updated scheme closure plan	2080	2085	• EMA, • MLAFWRD	1000.00
	Slope failure	• Monitoring of water supply pipeline slope and re-vegetation of the slopes.	2080	2085	• MLAFWRD	1000.00

7.0 ENVIRONMENTAL AND SOCIAL MONITORING PLAN

7.1 Introduction

This section provides an environmental monitoring plan for the project. The proposed monitoring plan will be implemented in its entirety in order to (1) properly assess the performance and effectiveness of the adopted mitigation measures, (2) identify the extent of environmental impacts predicted, (3) determine project compliance with regulatory requirements and to assist in adopting remedial action and further mitigation measures if found to be necessary. The proposed monitoring plan for the sub-projects covers several elements including:

- Water and soil quality
- Air quality
- Waste management
- Soil erosion
- Working conditions including Health and Safety
- Conflicts over resource use
- Child labor and forced labor
- Gender Based Violence and its different forms

7.2 Monitoring plan

The monitoring plan is based on the specific impact areas that are identified and includes a detailed description of the monitoring parameter(s), method (s), frequency of monitoring and the monitoring agent. For certain parameters, sampling and analysis are necessary to assess the extent of the impact, while for other parameters, surveys, visual inspection and photographic documentation by experienced personnel are required. Monitoring efforts however, would be in vain in the absence of an organized record keeping practice. Table 24 provide the environmental and social monitoring plan.

Table 24: Environmental and Social Monitoring Plan

Social/Environmental Issue	Monitoring Indicator	Monitoring tools and techniques	Monitoring Frequency	Monitoring Agent	Estimated cost (USD)
GBV and its different forms of manifestations e.g., Sexual exploitation, abuse and harassment	• # Of GBV cases received • # Of health care provider trained on clinical management and psychological support • Existence of written protocols for the assistance and care of GBV cases • Number of institutions (public/ NGOs/CBOs) providing psychological or cancelling services related to GBV	• Interviews • Document reviews e.g., Complaints register & reports	Quarterly	• Ministry of Health and child care • Ministry of women affairs, gender and community development • NGOs	$1000
Child labor & forced labor	• Number of cases reported • Company polices on health and safety	• Observations • Review of records • Complaints registers	Quarterly	• Ministry of Labour • MLAFWRD, IMC, Traditional leadership • NGOs, ZRP	$1000
Poor working conditions	• # Of Accidents/incidences reported • Levels of occupational health stressors (dust, noise, vibration, etc) • Adequacy of PPE • Dangerous equipment • Work contracts	• Field Measurements • E&S monitoring & audit reports • Site visits & inspections • Document review (e.g., accident register, work contracts)	Periodically	• PMU • MLAWFRD	3000.00
Impoverishment of land donors	• Size of land holding • Total yields	• Interviews • Measurements and observations	Monthly	• PMU • DoI	$500
Water and land use conflicts	• # Of complaints received	• Document reviews	Quarterly	• IMC • MLAWFRD	$300

Social/Environmental Issue	Monitoring Indicator	Monitoring tools and techniques	Monitoring Frequency	Monitoring Agent	Estimated cost (USD)
		(Complaints registers)		• Traditional leadership	
Health and Sanitation problems	• Condition of portable water and sanitation facilities	• Inspections	Quarterly	• MoHCC • PMU • DoI	1000.00
	• Prevalence of water related diseases	• Document review • Interviews	Quarterly	• MoHCC	$1000
	• Number of cases recorded	• Document review e.g. clinical records & complaints registers	Daily	• Ministry of Health and Child Care, • UNDP PMU	$1000
Theft of agricultural products and irrigation equipment	• # Of theft cases reported	• Inspections & audits • Document reviews	Monthly	• IMC • MLAWFRD	$1500
Human/animal conflicts	• # Of cases recorded	• Document reviews	Quarterly	• UNDP PMU • Parks and wildlife	$300
Loss of biodiversity	• Biodiversity indices • Area of land cleared.	• Quarterly	Observations	• EMA • Forestry commission • Parks and wildlife Authority	$100.00
Loss of archaeological artefacts during excavation and trenching	• # Archaeological/ heritage sites damaged	• Quarterly	Observations Document reviews	• NMMZ • Farmers • Traditional leaders	$100.00
Waste management	• Types and volume of waste generated/disposed • Availability and use of waste bins	• Monthly	Document review Field measurements & estimations	• Contractors • EMA • IMC	$100.00

Social/Environmental Issue	Monitoring Indicator	Monitoring tools and techniques	Monitoring Frequency	Monitoring Agent	Estimated cost (USD)
Fossil fuel combustion	• Carbon footprint	• Quarterly	Observations Measurement of carbon footprint	• MLAFWRD • EMA	$500.00
Land/water pollution from fuel and oil spills	• Oil & grease	• Daily	Sample analysis	• EMA	$200.00
Soil erosion	• Gully formation • Siltation of dams and rivers • Vegetation cover	• Monthly	Observations	• MLAFWRD • EMA • IMC	$200.00
Soil and water pollution for chemical use (pesticides & fertilizers)	• Pesticides residues in soil & water • Soil and water quality (full chemical analysis)	• Quarterly	Laboratory analyses	• IMC • EMA	$2000.00
Air pollution from vehicle and machinery use	• Air quality parameters (e.g. PM5, PM10, TSP, GhG Emissions)	• Field equipment	Field measurements (PM5, PM10)	• Contractors • NSSA	$1000.00
Noise pollution from machinery use	• Noise levels (dBA)	• Quarterly	Sound Level Meter	• Contractor • NSSA	$1000.00
Water depletion	• Dam water levels • # of cases of water use conflicts reported	• Weekly	Observations & Measurements	• FARMERS • ZINWA	$3000.00
Water loses	• Quantity of water used (ML) • Condition of irrigation equipment	• Monthly	Inspections	• ZINWA • MLAFWRD • Farmers	$2000.00
Agro-chemical use	• Type and quantity of agrochemicals used by farmers • weed and pest management practices implemented;	• Weekly	Measurements Observations	• MLAFWRD Farmers • EMA	$500.00

8.0 CAPACITY DEVELOPMENT AND TRAINING

8.1 Introduction

Environmental and Social Safeguards (ESS) have globally become the "gold standard" for environmentally and socially sound development. ESS aim to prevent and mitigate undue harm to people and their environment in the implementation of specific development projects, and to ascertain that project benefits reach the target population. International donors such as the Green Climate Fund (GCF) and international development agencies such as the UNDP have made Environmental and Social Safeguarding a mandatory and non-negotiable requirement in project implementation processes. In this regard, building capacity towards safeguards implementation through providing the related trainings is essential to impart safeguards related knowledge and skills to Responsible Parties (RPs) in order improve project performance and enhance sustainable development outcomes.

8.2 Training and Capacity Building

The Project through the PMU has developed the training plan (Table 25) which provides a series of training and awareness raising events on environmental and social safeguards to various stakeholders involved in the implementation of the sub-project activities. The trainings are intended to strengthen institutional and individual capacities of the stakeholders involved in implementing the sub-project activities. Participants will be drawn from different institutions and organizations including the PMU, Responsible Parties (RPs), farmers, partners and other stakeholders. The trainings will focus primarily on raising awareness and increasing the common understanding around the environmental and social safeguards and other sub-topics which are relevant to successfully implement the Environmental and Social Management Plan (ESMP). The training plan is intended for use by the PIU, and RPs to deliver successful training programmes on various safeguards topics. The training plan contains 11 modules which are:

- The Concept and Practice of Environmental and Social Safeguards
- Contractor Management – E&S Principles
- Environment, Social, Health and Safety Management for Contractors
- Implementation and Monitoring of the Environmental and Social Management Plan (ESMP)
- Grievance Redress Mechanism (GRM)
- Stakeholder Engagement
- Gender Related Impacts including Sexual Exploitation, Abuse and Harassment (SEAH)
- Emergency Preparedness and Response
- Road Traffic Safety
- Integrated Production and Pest Management
- Chemicals Risk Reduction

Table 25: Environmental and Social Safeguards Training

S/N	Training Module	Content	Learning Objective	Target Audience	Pedagogic Methods	Duration (Hrs)	Facilitator (s)
1	The Concept and Practice of Environmental and Social Safeguards	This module focuses on the concept of environmental and social safeguards, their significance and relevance. Special topics to be covered include: • National and UNDP safeguards policies and standards • Tools and techniques on risk identification, prediction and management • Structure and content of the Bank's E&S quarterly progress Report • Identification of E&S safeguard plans and their relevance • Challenges in implementing E&S measures	• Participants to gain knowledge Bank's policies and procedures and be able to identify E&S issues through the concept of safeguards.	• PMU • RPs	• Presentations & Discussions • Interactive questions – answer sessions • Brainstorming sessions • Case studies	8hrs	• E&S Specialist (PMU)
2	Contractor Management – E&S Principles	The Module will cover key aspects which include: • Key Definitions • Role of contractors in promoting health and safety in work sites • Selected high risk tasks requiring control • Contractor labour standards requirements • Tools for monitoring contractor performance	• Participants to understand the importance of managing contractors to promote Health and Safety in workplaces	• PMU • RPs	• Presentation, discussions • Case studies	2hrs	• E&S Specialist (PMU)
3	Environment, Social, Health and Safety Management for Contractors	The Module will train and create awareness to contractors on E&S issues that result from their works and their reporting obligations. Special topics to be covered include:	• Enhance understanding of the Project E&S risks and working tools	• Contractors • Supervising Engineers	• Presentations on concepts, and international standards • Case studies	8Hrs	• E&S Specialist

S/N	Training Module	Content	Learning Objective	Target Audience	Pedagogic Methods	Duration (Hrs)	Facilitator (s)
		• Hazard Identification and Risk Analysis (HIRA) • Development of Aspects and Impacts Registers • Accident investigation, Root Cause analysis and Accident reporting • Emergency Preparedness and Response • First Aid • Complaints Handling • E&S Contractual Obligations during Project Implementation	• To broaden their understanding on E&S obligations including reporting aspects in line with Bank Requirements		• Presentations on reporting tools		
4	Implementation and Monitoring of the Environmental and Social Management Plan (ESMP)	The module will focus on special topics which include: • E&S risks & Management Measures • Roles and Responsibilities in ESMP Implementation • E&S Monitoring & Expected Outcomes	• To understand project E&S risks, and how to manage and monitor them	• PIU • RPs • Contractors • Beneficiaries	• Presentations on concepts, and international standards • Case studies • Presentations on reporting tools	2hrs	• E&S Expert
5	Grievance Redress Mechanism (GRM)	The module focus on special topics which include: • Structure of the Project Level GRM • Procedure for handling, submitting and responding to grievances • Establishing Grievance Redress Committees • Roles and Responsibilities of GRM Implementers • AfDB's Independent Recourse Mechanism	• To inform learners about the GRM and its intended purpose • Inform learners about the different types of grievances • To inform learners about the present arrangements for grievance handling • To describe procedures for submitting complaints • To educate learners on how to	• PIU • RPs • Contractors	• Presentation, discussions • Brain storming • Case studies	8hrs	• Safeguards Expert

S/N	Training Module	Content	Learning Objective	Target Audience	Pedagogic Methods	Duration (Hrs)	Facilitator (s)
			fill the complaint form • To inform learners on the process of establishing Grievance Redress Committees and the functions of those committees • Procedure for handling grievances of Sexual Exploitation and Abuse (SEA)				
6	Stakeholder Engagement	The module focus on special topics which include: • Stakeholder engagement – definitions • Objective and requirements for engagement • Stakeholder engagement during implementation • Key factors for effective stakeholder engagement	• To understand who and how to engage stakeholders, and key factors to consider during stakeholder engagement	• PMU • RPs • Contractors	• Presentation, discussions • Brain storming • Case studies	2hrs	• E&S Specialist
7	Gender Related Impacts	The Module will create awareness and train stakeholders on how to prevent and mitigate cases of Sexual Exploitation, Abuse and Harassment (SEAH). Special topics will include: • Background to SEAH in Bank financed operations • Definition of SEAH • SEAH Risk Assessment • SEAH Risk Prevention & Mitigation • Principles of SEAH	• To understand how to prevent and mitigate SEAH • To understand procedures for reporting SEAH cases	• RPs • PIU • Contractors • Project Beneficiaries	• Presentation, discussions • Brain storming • Case studies	2hrs	• E&S Specialist • Ministry of Women, Gender and Community Development

S/N	Training Module	Content	Learning Objective	Target Audience	Pedagogic Methods	Duration (Hrs)	Facilitator (s)
		• SEAH Prevention & Response Mechanisms • Key Data in Reporting SEAH					
8	Emergency Preparedness and Response	The module focus on special topics which include: • Anticipated disasters, emergencies & accidents • Roles and responsibilities emergency control • Emergency preparedness and response procedures e.g. spill prevention and control, trench collapse, fire control, working at heights , flood control, electrical hazards , etc. • First aid • Resources for responding to emergencies • Communicating and reporting on emergencies	To raise awareness to Project staff, contractors and visitors on preparing for and responding to emergency incidents, and to establish a state of readiness which will enable prompt and effective response to possible events	• RPs • PMU • Contractors • Project Beneficiaries	• Presentation, discussions • Brain storming • Case studies	2hrs	• E&S Specialist
9	Road Traffic Safety	The module focus on special topics which include: • Road Traffic Safety and AfDB's Operational Safeguards • Causes of Road Accidents • Typology of actors involved in road traffic accidents • Effective control measures	• Enhancing understanding of safety issues around the use of vehicles and other forms of road traffic	• Project staff and authorized drivers	• Presentation, discussions • Brain storming • Case studies	2hrs	• ZRP • Safeguards Expert, PMU
10	Integrated Production and Pest Management	The module focus on special topics which include: • The terms Integrated, Production, Pest and Management defined • IPPM defined • Shortcomings of Economic Threshold Level	• To be able to define the terms: Integrated, Pest, Production and Management • To name and explain the four principles of IPPM	• Farmers • Extension staff	• Presentation, discussions • Brain storming • Case studies	8hrs	• AGRITEX

S/N	Training Module	Content	Learning Objective	Target Audience	Pedagogic Methods	Duration (Hrs)	Facilitator (s)
		• The difference between an insect and a pest • The differences between pest control and pest management • The transition from Pest control to pest management • Methods of pest management in IPPM The four principles of IPPM • The parameters required to make a pest management decision in IPPM • The steps in pest management decision making in IPPM	• To define Economic Threshold Level (ETL) in conventional pest management • Name the different methods of pest management in IPPM				
11	Chemicals Risk Reduction	The module will dwell on special topics which include: • Classes of agricultural chemicals based on target, mode of action, spectrum of selectivity and formulation • Toxicity of Chemicals • Entry points of chemicals into the body • Pointers to chemical risk reduction	• To classify agricultural chemicals • To explain parameters used to classify toxicity of chemicals • To explain the entry points and ways of chemicals into the body and the environment • To explain the different methods of reducing the risk associated with chemical use	• Farmers • Extension officers	• Presentation, discussions • Brain storming • Case studies	4hrs	• Safeguards Specialist

9.0 COST ESTIMATE IN IMPLEMENTATION OF THE ESMP

9.1 Environmental Budget

As part of good engineering practices in the project, there have been several measures as erosion prevention, rehabilitation of borrow areas, safety, signage, provision of temporary drains, etc., the costs for which will be included in the design costs of specific projects. Therefore, costs of these items have not been included in the ESMP implementation budget. Only those items not covered under budgets for construction are considered in the ESMP budget. The costs of personal protective equipment to construction workers shall be borne by contractor as part of conditions of contract. In addition, the sources of funds for mitigation measures during construction stage including monitoring are also to be borne by the contractor. These are deemed to be included as part of the contract price amount quoted by the contractor for the works.

9.2 Estimated cost for implementing the ESMP

The total cost for implementing the ESMP is US$140 000.00 as illustrated in Table 26

Table 26: Environment and social management plan implementation cost

Management Plan	**Estimated cost (USD$)**
Inspections and audits	US$10500.00
Baseline and monitoring field soil testing	US$7000.00
Ecological Monitoring	US$9100.00
Water Quality Monitoring	US$19600.00
Training	US$35,000.00
Stakeholder Engagement Workshops	US$8,400.00
Waste management	US$7,700.00
Air quality monitoring	US$10,500.00
Erosion, Drainage and Sediment Control	US$9,100.00
Grievance Redress Mechanism	US$14,700.00
Health and safety management including COVID-19, HIV and AIDS	US$8,400.00
Total	**US$140,000.00**

10.0 PUBLIC CONSULTATION AND ENVIRONMENTAL AND SOCIAL DISCLOSURE

10.1 Process for Consultation

Stakeholder consultations were conducted at the proposed irrigation scheme sites. The stakeholders consulted include:

- Department of Irrigation
- Ministry of Women Affairs Community, Small and Medium Enterprises Development
- Rural District Councils
- Ministry of Health and Child Care
- Ministry of Home Affairs (The Zimbabwe Republic Police (ZRP)
- Zimbabwe National Water Authority (ZINWA)
- AGRITEX
- Parks and Wildlife Management Authority
- National Museums and monuments of Zimbabwe (NMMZ)
- Land management and administration -Department of Lands
- Forestry commission
- Rural electrification authority
- Farmers
- The local leadership
- Business Community

The consultations were done through administering questionnaires (Appendix 3) and through interviews and meetings. The stakeholders were informed prior to making the visits for conducting the public consultation meetings. Notifications were done through the Irrigation Management Committee (IMCs) and the AGRITEX officers. Plate 23- Plate 27 show some of the proceedings of the consultation processes.

Plate 23: Stakeholders meeting at Zvinyaningwe site (July 2022)

Plate 24 Stakeholder Consultation Meeting (April 2022)

Plate 25: Stakeholder meeting at Muzhwi Primary School July (2022)

Plate 26: Stakeholder meeting at the Rural District Council (August 2022)

Plate 27: Stakeholder meeting at Lees INN Hotel Masvingo (August 2022)

A summary of the proposed sub-projects was shared with the stakeholders. The explanations about the proposed irrigation systems designs, the project infrastructure development, and the potential benefits and negative negative effects were highlighted. The details about the sub-projects were also summarised on the questionnaire as well as the focus group discussion (FGD) guide that are attached as Appendices. Another meeting was organised and all stakeholder and farmer representatives participated in the public consultation meeting. During public consultations, a summary containing the information about deliberations was made. The filled in consultation forms, deliberations and registers for the meetings are attached in the Appendices.

10.2 Disclosers during the Public Consultation

The discussions solicited for the perceptions and observations by the different stakeholders as well as issues that may be as a result of the development project. The discussions captured the following aspects.

- The details of the project components and the activities involved.
- Infrastructure to be developed for the proposed irrigation scheme.
- Potential negative environmental impacts that may be as a result of the irrigation development
- potential positive impacts that may arise from the irrigation development
- possible ways to avoid, reduce and or mitigate, the negative impacts
- possible ways to enhance the positive impacts
- participation of the local communities in the project development and project management
- Conflict Management - Grievance Redress Mechanism

The description of the project, potential positive and negative impacts of the irrigation development were

given to the participants. The documents for the public consultation for each scheme are attached as Appendices.

From the findings, local communities were in support of the establishment of the irrigation schemes at the proposed sites and they could clearly envisage the multifaceted benefits arising from its execution. The following is a summary of the views raised by local communities and farmers:

- The sub-projects would contribute towards food security for the area and the Province as a whole.
- The sub-projects would contribute towards the stimulation of economic development of the business centres in the area, Masvingo District and Province as a whole.
- The sub-projects will result in the creation of employment opportunities along the whole value chain
- The sub-projects will result in the generation of revenue to farmers, service providers such as the local SMEs, the local authorities, and other stakeholders
- It was noted that the identified graves be fenced off and the grave yard area to be excluded from irrigation and farming activities
- Surveys must ensure that there are adequate water supplies, consistent supply of power, proper drainage, proper agronomic practices and most importantly, implementing the sub-project in an environmentally sustainable manner.
- There were also concerns about the likelihood of environmental pollution arising from the use of agrochemicals such as fertilisers, pesticides, weedicides and herbicides. Stakeholders expressed fear of pollution of the pastures and nearby water sources.
- Concern was raised on the likelihood of land degradation during trenching for burying pipes, movement of construction equipment and agricultural equipment. Harvesting of construction materials like gravel and sand may create a scarred landscape.
- It was suggested that the development will need to have a proper Environmental Management Plans formulated to guide the implementation of the sub-project. This will aid in mitigating negative environmental impacts likely to arise from the project.
- Farmers suggested practice apiculture in the buffer zone.
- Farmers also suggested putting in place wildlife management initiatives in the buffer zone such as CAMPFIRE for the communities to preserve wildlife whilst earning income from tourist activities.
- The establishment of the proposed development was identified as a possible solution to increased security in the area as affluent communities generally have low crime rates.
- Parents feared the issues of prostitution, sexual harassment and improper sexual activity amongst the youth due to influx of people into the area in search for employment, markets for their products and for buying produce from the farmers.
- Due to the limited land size, some aspiring farmers had fears of being excluded during the plot allocation process.
- Those who donated their land wished to have more land being allocated to the than the rest of the farmers.

Institutional stakeholders were consulted in the same manner and appraised about the development. They also completed questionnaires and gave their views and opinions which are summarised in Table 27.

Table 27: Views from Government Departments

Stakeholder Identity	Comment and positive impacts	Anticipated Negative Impacts	Mitigation
Department of Irrigation	• The project improves food security	• Depletion and pollution of water resources	• To install water efficient technologies • Adopt irrigation scheduling
Ministry Of Women Affairs Community, Small And Medium Enterprises Development	• Better food security • Good nutrition in the community • Employment opportunities for youth	• Male jealousy as contractor workforce interact with community women. This can trigger Gender Based Violence • Competition can cause divisions in the community. • Sexual exploitation and harassment of women and girls in the community	• Implement the GBV management Plan • Provide training on sexual exploitation, abuse and harassment
MASVINGO RURAL DISTRICT COUNCIL	• Fully support the project • Improved food security • Enhanced nutrition • Improved income • Employment creation • Beneficiation through downstream industries (coming)	• Biodiversity loss, • Water conflicts • water borne diseases, • Oil spillage from machines	• Employ locals • Make availability of potable water • Ensure that ablution facilities are constructed • Adopt climate proofed irrigation technologies • Implement afforestation programmes
Ministry Of Health And Child Care Masvingo District Hospital	• Supports the establishment of the development. • Rural population, less privileged class to benefit since less income required	• Waterborne diseases	• Ensure proper drainage to avoid standing water

Stakeholder Identity	Comment and positive impacts	Anticipated Negative Impacts	Mitigation
Ministry Of Home Affairs - Zimbabwe Republic Police	• Improved livelihoods • Growth of economy through selling the produce	• Theft of equipment and assets	• Safeguard properties and equipment through employing security personnel
Tokwe Sub-catchment Council	• Agrees with the development • Scheme to apply for abstraction agreements from Zinwa so that they pay for water to Zinwa and relevant sub catchment councils • Improve nutritional status of the community • Improves livelihood • Increases household income	• Reduction in farming area of those owning land around settlement area • Cutting down of trees around project area	• Make sure affected land owners are allocated more irrigable area in the scheme • Afforestation
AGRITEX	• Agrees with the development • Food security and income generation	• Mismanagement of the environment may lead to environmental degradation and disputes	• Collective action plans • Develop and implement best agronomic practices • Integrated pest and vector control
Parks And Wildlife Management Authority	• Economic - improved agricultural output for local and national food security. • Social- improved infrastructure building towards vision 2030	• Increased wildlife human conflicts with species such as Hippos and crocodiles due to extended home ranges	• There is need for increased community engagement and installation of filter screens to reduce movement of animals. • There is need for local community engagement from grassroots level before the project implementation phase
National Museums and monuments of Zimbabwe	• Improved livelihoods for communities in affected areas. • Increased access to water for communities	• Potential destruction of cultural heritage in the development of the scheme	• Project proponent to liaise with National Musiums and Monuments of Zimbabwe in the event

Stakeholder Identity	Comment and positive impacts	Anticipated Negative Impacts	Mitigation
			that cultural heritage sites are identified
LAND management and administration- Department of Lands	• Agrees with the development • Raised production and improved standard of living • Improved food security • Peace of Mind in the benefiting communities	• If not managed well erosion may rise • Accumulation of salts may occur if not properly managed	• Proper soil management must be done • Ensure proper consultations are done with involvement of local communities and traditional leaders
Forestry commission	• Fully supports the development • Improvement of livelihoods • Income generation • Employment creation. • Boosts economy of our country	• Natural environment will be disturbed through construction works • Project might not benefit the targeted needy people, the orphans an old age people	• Proponent must include how the degraded areas will be rehabilitated in the EIA document like planting the trees et cetera • Engage the vulnerable groups • The project must target needy and selection of beneficiaries should be transparent
Rural electrification authority	• Fully supports the development • Improving people's livelihoods and Income	• High initial cost • Negatively affects animals that live in water e.g. Fish	• Proper governance of the scheme
Ministry of Local Government	• Improvement in livelihoods level, improved food production and infrastructure development	• Deforestation • Lack of sustainability	• Afforestation and • Having a sustainability model

10.3 Future Consultation and Information Disclosure

The project shall ensure that stakeholders are continuously engaged as part of the consultation process in relation to sub-project activities involving the development of the irrigation schemes. Key stakeholders include local communities, beneficiaries, relevant government departments, industry groups, civil society organisations, etc. Information to be shared with stakeholders shall among other things include the ESMP and the progress in its implementation. Stakeholders shall be engaged in accordance to the Stakeholder Engagement Plan (SEP) – see section 10.4. This ESMP shall be made available to the public at local, district, provincial and national levels. At local level, a summary ESMP translated into local language (shona) will be made available to the Irrigation Scheme Management Committee (IMC) as well as at a local district office. A full ESMP document will be made available to the public both at EMA provincial and national offices. Furthermore, digital copies of the ESMP will be disclosed through online platforms such as the UNDP country office website and the UNDP transparency portal to enhance public access.

10.4 Stakeholder engagement plan

Stakeholder engagement as stipulated in the UNDP ESS (2015) is an ongoing process that may involve, to varying degrees, the following elements: stakeholder analysis and planning, disclosure and dissemination of information, consultation and meaningful participation, dispute resolution and grievance redress, ongoing reporting to affected communities and stakeholders, and inclusion of stakeholders in monitoring and evaluation. Stakeholder analysis and engagement will be conducted in a gender-responsive, culturally sensitive, non-discriminatory and inclusive manner, ensuring that potentially affected vulnerable and marginalized groups are identified and provided opportunities to participate. Measures will be undertaken to ensure that effective stakeholder engagement occurs where conditions for inclusive participation are unfavourable.

Meaningful, effective and informed stakeholder engagement and participation will be undertaken that will seek to build and maintain over time a constructive relationship with stakeholders, with the purpose of avoiding or mitigating any potential risks in a timely manner. The scale and frequency of the engagement will reflect the nature of the activity, the magnitude of potential risks and adverse impacts, and concerns raised by affected communities.

Meaningful, effective and informed consultation processes will seek to identify priorities of stakeholders and will provide them with opportunities to express their views at all points in the scheme's decision-making process on matters that affect them and allows the affected persons to consider and respond to them. Topics the stakeholders will be able to express their views on will include, but are not limited to: goals and strategies; social and environmental risks and impacts; proposed mitigation measures; sharing of development benefits and opportunities; and implementation issues. The consultation processes will possess the following characteristics:

- Free of external manipulation, interference, coercion, and intimidation.
- Gender and age-inclusive and responsive.
- Culturally appropriate and tailored to the language preferences and decision-making processes of each identified stakeholder group, including disadvantaged or marginalized groups.
- Based on prior and timely disclosure of accessible, understandable, relevant and adequate information, including draft documents and plans.

- Initiated early in the project design process, continued iteratively throughout project life cycle, and adjusted as risks and impacts arise.

- Addresses social and environmental risks and adverse impacts, and the proposed measures and actions to address these.

- Seeks to empower stakeholders, particularly marginalized groups, and enable the incorporation of all relevant views of affected people and other stakeholders into decision-making processes, such as Project goals and design, mitigation measures, the sharing of development benefits and opportunities, and implementation issues.

- Documented and reported in accessible form to participants, in particular the measures taken to avoid or minimize risks to and adverse impacts on the Project stakeholders.

- Consistent with the States' duties and obligations under international law.

The Stakeholder Engagement Plan for the schemes is illustrated in Table 28.

Table 28: Stakeholder Engagement Plan

Objective of Stakeholder Engagement	Engagement Method	Location	Timeline	Stakeholders	Output	Responsibility
• Disseminate information about the project and its components • Identify key environmental and social issues	• Meetings • Workshops	• Irrigation sites • RDC offices • Masvingo City for provincial offices • Harare for Head offices	Year 1 and 2	• Farmers • IMC • Partners • AGRITEX Officers • Traditional leadership • Councillors • RDCs • Other Government Departments	• Project Design Document • Project Implementation plan • Key environmental and social issues	• DOIR • PMU • Contractor's ESMP Team
• Gather information on socioeconomic and environmental baseline settings	• Key Informants Interviews • Direct Observations • Meetings • Focus Group Discussions • Questionnaires	• Respective wards • Irrigation scheme sites • Affected Villages • RDC offices • Masvingo City for provincial offices • Harare for Head offices	Year 1&2	• DOIR staff • Partners • AGRITEX Officers • Traditional leadership • Councilors • RDCs • IMC • Farmers • Other Government Departments	• Minutes • Completed Questionnaires • Baseline information	• PMU • Contractor's SHE officer
Identify environmental and social impacts & associated mitigation measures & develop the ESMP	• Key Informants Interviews • Focus Group Discussions • Questionnaires	• Proposed Scheme sites • RDC offices • Masvingo City provincial offices	Year 1 to 7	• DOIR staff • Partners • AGRITEX Officers • Traditional leadership • Councilor • RDCs	• Minutes • Completed Questionnaires • Baseline reports	• PMU • Contractor's SHE officer

Objective of Stakeholder Engagement	Engagement Method	Location	Timeline	Stakeholders	Output	Responsibility
Review and update ESMP		• Harare for Head offices		• IMC • Farmers • Other Government Departments		
Sharing of Project Information and ESMP among stakeholders	• Meetings • Phone calls • Emails • Social media platforms	• RDC Offices • Irrigation sites • Affected Villages • RDC offices • Masvingo City provincial offices • Harare for Head offices	Year 1 to year 7	• DOIR staff • Partners • AGRITEX Officers • Traditional leadership • Councilor • RDCs • IMC • Farmers • Other Government Departments • Contractors and Consultants	• Minutes • Attendance register	• PMU • Contractor's ESMP Team
• Raising awareness on SEAH prevention and response & GRM on Project Stakeholders	• Stakeholder meetings • Workshops	• Respective wards • Irrigation sites • Affected Villages • RDC Offices • Masvingo City for provincial offices • Harare for Head offices	Year 1 - 7	• DOIR staff • Partners • AGRITEX Officers • Traditional leadership • Councilor • Masvingo RDC • IMC • Farmers • Other Government Departments	• Minutes • Attendance register	• PMU • Contractor's ESMP Team • District's Office

Objective of Stakeholder Engagement	Engagement Method	Location	Timeline	Stakeholders	Output	Responsibility
• Build capacity on key E&S Management	• Workshops	• Respective wards • Irrigation scheme sites • Affected Villages • RDC offices • Masvingo City provincial offices • Harare for Head offices	Year 6 and year 7	• DOIR staff • Partners • AGRITEX Officers • Traditional leadership • Councilor • RDCs • IMC • Farmers • Other Government Departments • Contractors and Consultants	• Minutes • Attendance register	• PMU • Contractor's ESMP Team
• Disseminating project information is continuously shared among stakeholders	• Meetings • Phone calls • Emails • Social media platforms Workshops • Reports	• Respective wards • Irrigation sites • Affected Villages • RDC offices • Masvingo City provincial offices • Harare for Head offices	The lifespan of the project	• DOIR staff • Partners • AGRITEX Officers • Traditional leadership • Councilor • RDCs • IMC • Farmers • Other Government Departments	• Minutes • Progress reports • Attendance register	• PMU • Contractor's ESMP Team

11.0 ENVIRONMENTAL AND SOCIAL COMPLIANCE FRAMEWORK

The PIU and the MoLAWFRD shall ensure that the management measures provided in the ESMP are wholly implemented and monitored to ensure that the operation is in line with national requirements, UNDP safeguard policies and standards and the Project ESMF. In addition, the PIU shall ensure the contractor has adequate technical, human and financial resources to effectively implement and monitor the ESMP.

11.1 Responsibilities for ESMP implementation and Monitoring

Project Management Unit (PMU): The PMU will provide technical oversight in the implementation and monitoring of the ESMP in line with the project ESMF. The Environmental and Social Safeguards (ESS) Specialist under the PMU shall be responsible for monitoring the implementation all aspects of the ESMP. Key responsibilities of the ESS specialist shall include but not limited to the following:

- Review the Contractor's Environment and Social Management Plan (C-ESMP), including all updates and revisions at frequencies specified in the Contractor's contract
- Monitor the Contractor's implementation of, and compliance with, the Environmental and Social Management Plan;
- Review all other applicable contractor's documents related to ESHS aspects including the health and safety plan, Emergency Preparedness and Response Plan, Labor Management Plan, Security Management Plan and Sexual Exploitation, Abuse and Harassment (SEAH) prevention and response action plan;
- Review and consider the Environment, Social, Health and Safety (ESHS) risks and impacts of any design change proposals and advise if there are implications for compliance with ESMP, consent/permits and other relevant project requirements;
- Undertake monthly ESHS audits or supervisions and/or inspections of any sites where the Contractor is undertaking activities under its contract to verify the Contractor's compliance with ESHS requirements (including where appropriate its SEAH obligations). This may include review of the Contractor's accident logs, community liaison records, monitoring records and other ESHS related documentation
- Determine remedial action/s and their timeframe for implementation in the event of a noncompliance with the Contractor's ESHS obligations.
- Ensure representation of stakeholders such as ministry staff, beneficiaries and local communities at relevant meetings including site meetings, and or progress meetings to discuss and agree appropriate actions to ensure compliance with ESHS obligations;

- Ensure that the Contractor's actual reporting (content and timeliness) is in accordance with the Contractor's contractual obligations;
- Review and critique, in a timely manner, the Contractor's ESHS documentation (including regular reports and incident reports) regarding the accuracy and efficacy of the documentation.
- Undertake liaison, from time to time and as necessary, with stakeholders to identify and discuss any actual or potential ESHS issues;
- Operationalize, fine-tune and maintain the Project grievance redress mechanism including types of grievances to be recorded and how to protect confidentiality e.g. of those reporting allegations of Gender Based Violence (GBV)/SEAH; and
- Conduct periodic meetings with the Contractor's designated health and safety personnel and ensure that accident prevention measures are always in place in line with the Contractor ESMP;.and
- Conduct an end of sub-project environmental and social compliance audit and identify any outstanding ESHS issues requiring further attention in order to ensure responsible exit.

Responsible Parties (RPs): The RPs together with the PMU will provide technical oversight in the implementation and monitoring of the ESMP in line with the Project ESMF. The responsibilities of the RPs in relation to the implementation of the ESMP include:

- Monitor the Contractor's implementation of, and compliance with, the Environmental and Social Management Plan;
- Review and consider the Environment, Social, Health and Safety (ESHS) risks and impacts of any design change proposals and advise if there are implications for compliance with ESMP, consent/permits and other relevant sub-project requirements;
- Undertake periodic supervisions and/or inspections of any sites where the Contractor is undertaking activities to verify the Contractor's compliance with ESHS requirements
- Ensure representation of stakeholders such as ministry staff, beneficiaries and local communities at relevant meetings including site meetings, and or progress meetings to discuss and agree appropriate actions to ensure compliance with ESHS obligations;
- Ensure that the Contractor's actual reporting (content and timeliness) is in accordance with the Contractor's contractual obligations;
- Provide the training on Operation and Maintance of agricultural equipment and best agronomic practices to avoid, minimise, mitigate or offset the environmental and social impacts

The Contractor: The contractor shall implement the agreed Contractor ESMP (C-ESMP) to prevent and minimize harm and nuisances on local communities. The duties of the Contractor shall include but not limiting to:

- Comply with relevant and applicable legislative requirements governing the environment, social and public health and safety;
- Work within the scope of contractual agreements and other tender conditions;
- Organize representatives of the construction team to participate in the joint site inspections
- Carry out any corrective actions instructed by the PMU or Supervising Contractor;
- In case of non-compliances/discrepancies, carry out investigation and implement mitigation and remedial measures to reduce environmental and social impacts;
- Propose and carry out corrective actions and implement alternative construction method, if required, in order to minimize the environmental and social impacts;

Government Agencies, local communities & CSOs: The Environmental Management Agency (EMA), other government agencies and CSOs will be responsible for overall external monitoring of the implementation of this ESMP. Government agencies and CSOs will provide technical support and participate in training and sensitization of stakeholders (if requested) to enhance understanding of the national environmental and social safeguard instruments.

Farmers: The farmers will be responsible for implementing the ESMP particularly during the operational phase of the sub-project.

11.2 Compliance with legal and contractual requirements

The civil works activities shall comply not only with contractual environmental protection and pollution control requirements but also with environmental and social protection and pollution control laws of the Republic of Zimbabwe. The PMU shall monitor progress and program of the works to check that relevant environmental and social laws are not being violated, and that any potential for violating the laws can be prevented. The Contractor shall submit all relevant environmental and social documents to the PMU including the updated environmental and social work progress report. The PMU shall also have access, upon request, to the SHE Site log-book and grievance register. After reviewing the documents, the PMU shall advise the contractor of any non-compliance with the contractual and legislative requirements on environmental protection and pollution control for them to take follow-up actions. If the PMU through its audits and supervision mission concludes the Contractor is violating environmental protection and pollution control requirements, the PMU shall advise the Contractor immediately, and may also order temporary cessation of works.

11.3 Corrective Actions and Disciplinary Procedure

Corrective actions and disciplinary procedures will be set out, and where possible, included in contractual agreements. Without disciplinary action there is a risk that environmental and social management measures will not be implemented. Where the PMU finds that the Contractor has violated the environmental and social measures set out in their contractual agreement(s), corrective action, and in extremes, disciplinary action will be taken. If a violation is detected during a site visit, the Project Manager will be notified and the means of rectification communicated in writing. The Contractor will discuss with the PMU and agree on the realistic deadline for rectifying the violation. If the violation is reported to the PMU by some other entity, the PMU will conduct a site visit and, similarly, issue a warning and deadline for implementing corrective actions. The PMU will return to the site on the scheduled deadline to determine progress in implementimg the corrective actions. If no mitigation measure has been implemented, the PMU will notify the Contractor in writing to, inform them of the disciplinary action to be taken with copies of the same notification submitted to the Project Focal Point.

11.4 Reporting Arrangements

A system of reporting of the ESMP commitments is required. This will apply to the contractor and the PMU. Each of these parties will provide reports on the actions taken in the previous reporting period to implement the ESMP as provided in Table 29.

Table 29: Types of reports, Frequency, Content and Distribution

Report	Responsibility	Destination	Content
Weekly H&S register	Contractor's SHE officer(s)	PMU to check when supervising& monitoring	• All daily events related to SHE and follow up on activities
SHE Monthly Report	Contractor's SHE officers	PMU	• Monthly summary of all events • Implementation of the ESMP • Program for the following month • Training progress • Needs identification • Improvement Recommendation
Annual Progress Reports	PMU	GCF	• Monthly summary of all events, compliance and monitoring results should form a major part of the reports to be submitted

12.0 GRIEVANCE REDRESS MECHANISM

The proposed development of an irrigation schemes is aimed at improving the living standards and quality of life of the beneficiaries of the scheme and the community at large whilst maintaining the ecological integrity of its environs. However, conflicts and dissatisfaction may arise at any given time relating to the design, implementation or assessment of the irrigation scheme. Potential grievances could be very broad in scope. They can be environmental issues related to depletion and degradation of resources e.g. land and water, air pollution, noise, etc; social issues e.g. land and water use conflicts, maintenance bill management, theft, GBV, Sexual Exploitation and Abuse (SEA), sexual harassment, etc.) An effective grievance redress mechanism in the irrigation acts as a formal system through which stakeholders can lodge any grievance that arise. The grievance redress mechanism proposed in this section will make complaints be resolved in a free, fair, transparent, timely, efficient and economical manner. Any grievance that may arise need to be effectively redressed to avoid reversing the gains of implementing the irrigation scheme.

Effective grievance redress mechanisms help to:

- ensure accountability by providing a channel through which stakeholders can hold actors accountable for their obligations and commitments
- serve as an early warning system by helping to identify problems and close gaps in a timely and cost-effective manner, thereby avoiding escalation of problems into more entrenched or complex disputes
- identify recurring problems or grievances that may escalate by helping to identify underlying systemic issues that need to be addressed
- ensure respect for rights by providing a channel through which human rights abuses can be detected and redress obtained
- tackle corruption by providing a secure channel for victims and whistle-blowers to seek and achieve redress.

12.1 Grievance Redress Mechanism (GRM)

The Project will set up a Grievance Redress Mechanism (GRM) on traditional conflict-resolution flows as well as administrative and project-based steps to ensure community members or any stakeholders have the opportunity and means to raise their concerns, complaints and suggestions. A four tier redressal structure is proposed to address complaints that may emanate from the implementation of sub-project activities. It represents different stakeholders at the various levels of the conflict resolution process. The overall responsibility for the coordination of the GRM lie with the Safeguards Officer in the Project Management Unit (PMU). All grievances received under the project shall be recorded at the grievance database kept at the PMU (see appendix 4).

First tier of Redress: - Local/Community level GRC

Local/community level Grievance Redress Committees (GRCs) shall be established in each proximate cluster of beneficiary communities and shall comprise of nominated members representing a well spread out demography, including women, girls and youth. The members of the GRC shall be selected following a participatory process. Local interest groups such as relevant Civil Society Organisations (CSOs), community leaders and reputable community associations shall also participate in the selection of the GRC

members or be a part of such committee. A representative of the local traditional authority shall be included as a key member of the GRC.

The community-based GRCs through its secretary shall receive and register grievances and submit the same grievance(s) to the PMU through the Grievance Submission Form. Apart from registering grievance, the committee shall seek to resolve grievances at this level with the support of the PMU when required. However, grievances that are beyond the capacity of the Local GRC to resolve shall be escalated or referred to the District/Province GRC and subsequently the PMU or other appropriate organs such as the Police or the Judiciary.

Second tier of Redress: District level GRC

In a case that a grievance is not resolved at community level GRC to the satisfaction of the complainant, the grievance may be referred to the next tier of redressal, which is at the district level. The GRM focal person at district level and the Safeguards Officer will coordinate with the relevant government departments, in nominating the Committee members depending on the nature of the complaint. The necessary circulars will be issued so that the committee could convene whenever required. The complainant may decide to take the matter to the next level of grievance redress or a legal or any other recourse if s/he is not satisfied with the resolutions at the second tier GRM.

Third tier of Redress: Provincial level GRC

In a case that a grievance is not resolved at District level GRC to the satisfaction of the complainant, the grievance may be referred to the next tier of redressal, which is at the Provincial level. The GRM focal person at Provincial level and the Safeguards Officer will coordinate with the relevant government departments, in nominating the Committee members depending on the nature of the complaint. The necessary circulars will be issued so that the committee could convene whenever required. The complainant may decide to take the matter to the next level of grievance redress or a legal or any other recourse if s/he is not satisfied with the resolutions at the third tier GRM.

Fourth Tier of Redress: Project focal point

The Project focal point will act as the Apex to hear and adjudicate on appeals against all other GRM Committee decisions. Pending cases shall be presented by the Project focal point of each of the Subcommittees to the PSC. The Project focal point will establish an adhoc committee that will review and resolve any appeals against the other GRM Committees. Unresolved grievances by the committee shall be referred to Arbitration or to the court of Law. The committee, while handling a complaint may request any staff for its assistance and/or may constitute a special committee if required.

Grievance Redressal at Arbitration/Court of Law

In the event that there is dissatisfaction from affected parties that cannot be resolved within the project's proposed grievance resolution process, the Project Steering Committee shall refer the dispute or difference to arbitration within 30 days. It should be noted that arbitration only works where the parties to a dispute agree to resolve a difference through arbitration. Where there is no consent, then a court of jurisdiction may be used to resolve a dispute. The Court is the final instrument for the resolution of all grievances that may not have been addressed by the Project GRM. Figure 44 illustrates the GRM.

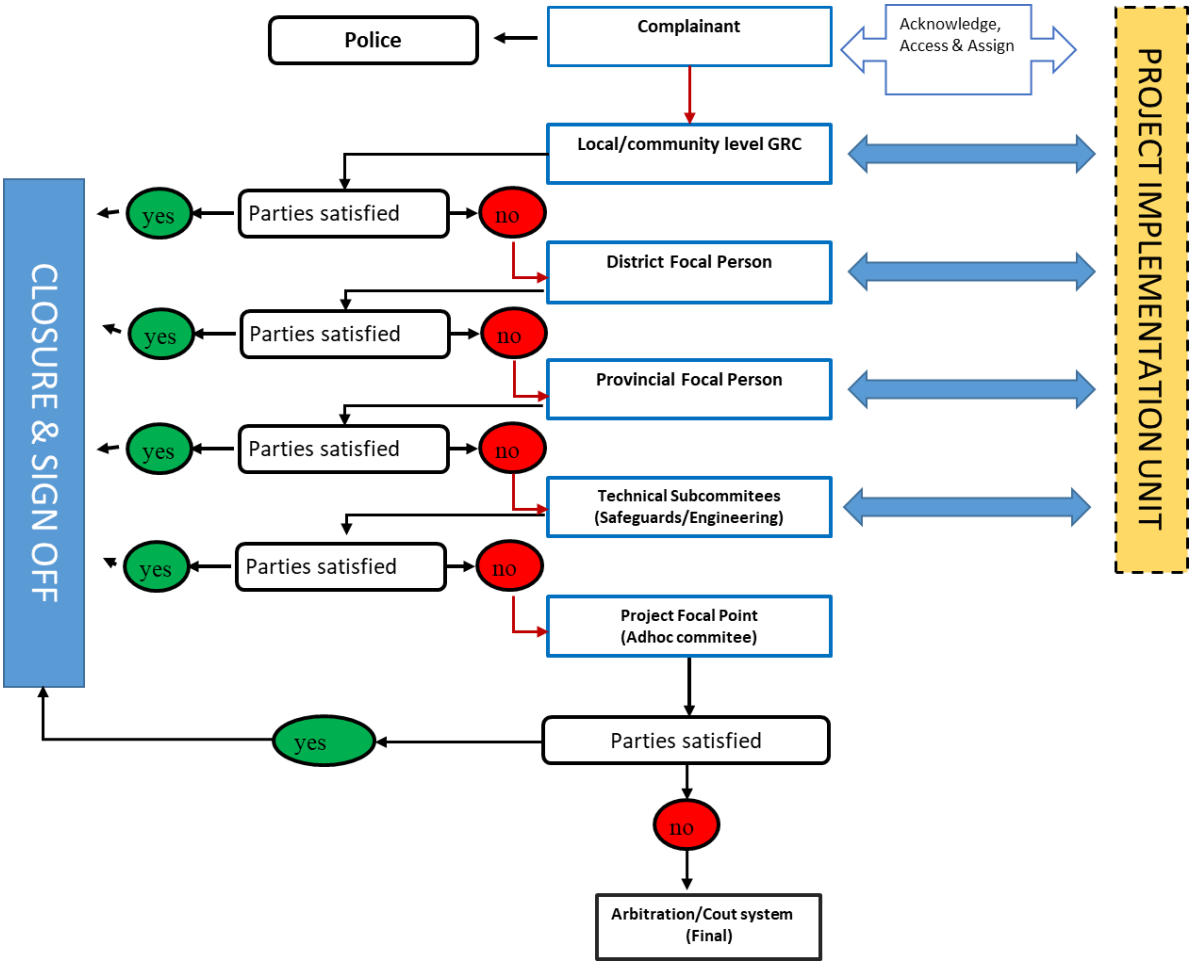

Figure 44: Project Resolution Process

Table 30 presents the suggested timelines for resolving grievances

Table 30: Timelines for resolving grievances

Receiving and Registering grievance	Within1 day
Acknowledge, Assess and Assign	Within 2 days
Develop Response	Within 14 days
Provide Feedback	Within 21 days
Implement Response	Within 21 days
Close Grievance	Within 1 month

12.2 UNDP Accountability Mechanism

In addition to the project-level GRM and national grievance redress mechanisms, complainants have the option to access UNDP's Accountability Mechanism, which include the Social and Environmental Compliance Unit (SECU) and the Stakeholder Response Mechanism (SRM).

Social and Environmental Compliance Unit (SECU)

UNDP established SECU to ensure accountability to individuals and communities. SECU responds to complaints that UNDP may not be meeting its social and environmental commitments. Any person or community who believes the environment or their wellbeing may be affected by a UNDP-supported project or programme may file a complaint. A representative, such as a civil society organization, may also file a complaint on behalf of affected communities. People who file complaints may request that SECU protect their names and identities.

Stakeholder Response Mechanism (SRM)

The Stakeholder Response Mechanism helps project-affected stakeholders, governments and others partners jointly resolve concerns and disputes. It is available when implementing partner and UNDP project-level stakeholder engagement processes have not successfully resolved issues of concern. UNDP Country Office management normally leads in stakeholder response; a headquarters function will also support the SRM.

Any person or community potentially affected by a UNDP-supported project may file a request for a response from the Stakeholder Response Mechanism, if they have raised their concerns with Implementing Partners and/or with UNDP through standard channels for stakeholder consultation and engagement and have not been satisfied with the response.

If a person or community has a concern about the ability of the UNDP Country Office to respond fairly and effectively to the request, they have the option to file the request directly with the Stakeholder Response Mechanism at UNDP Headquarters in New York. Requests can be sent to the SRM through the Internet or through the mail.

Where to File the Request

Aggrieved stakeholders can submit grievances to SECU or requests to SRM through the UNDP Country Office or directly to UNDP Headquarters in New York. Requests can be made through online, email, toll-free telephone hotline (in any language), mail, or an in-person meeting with the Country Office Designee,

- **By phone** Call (costs are incurred by caller) using 001 (917) 207 4285. Skype is an affordable way to place such a call.
- **Submitting a Request by Post (in any language)** to: Attn: SECU/SRM, OAI, UNDP, 1 U.N. Plaza, 4th Floor New York, NY USA 10017
- **Submitting a Request by Email (in any language)** to: secuhotline@undp.org / stakeholder.response@undp.org
- **Social Media Apps**. Grievances can be sent through WhatsApp, Viber and Signal using 001 (917) 207 4285, or through our WeChat account @SECUSRM

12.3 Approach to GRC

Affected person/aggrieved party can approach to GRC for redress of his/their grievances through any of the following modes-

(a) Web based: A separate corner will be developed at the program website so that public / community/ affected person can register their complaint in the online column.

(b) Telecom based: A toll free no. Will be issued by the PICU / PIU so that general public can register their complaint through telephone / mobile phone to the PIU/PICU office.

(c) Through Community Based Prominent Person: The local representative of the CBPP/AEN appointed for the purpose will collect the problems and issues of the community or affected person and pass on the same to PIU / PICU.

12.4 Cost of Implementing the GRM

A budget estimate of USD 2100 is proposed for operationalizing the GRM presented in this report. A summary breakdown is provided in Table 31.

Table 31: Cost of implementing and operating the GRM

TASK	AMOUNT (USD)	PERSON RESPONSIBLE
Preliminary stakeholder engagements/awareness building	$2331.00	• GRM Coordinator • Environmental and Social Safeguards Committee
Orientation and training workshop,	$2240.00	• GRM Coordinator at PMU
Preparation of communication materials (awareness and instructive materials), including complaint boxes	$1631.00	• GRM Coordinator • Communication Consultant
Establish Telephone hotlines, Internet, Email and social platforms (Facebook, WhatsApp)	$1631.00	• GRM Coordinator • Communication Consultant
Set up of GR infrastructure at PMU, including meetings and logistics	$1029.00	• PMU • GRM Coordinator
Logistic support to key community- based GRC members	$4200.00	• GRM Coordinator,
Conduct GRM evaluation	$1631.00	• M&E Specialist
TOTAL	$14683.00	

13.0 CONCLUSION AND RECOMMENDATION

The development of the proposed irrigation schemes is slated to engender significant positive impacts on food production, climate resilience, employment, economic development, livelihoods and quality of life. Marketing and climate smart crop value chain will come with economic expansion and diversification that would lead to stimulation of economic both local and national development. The local economy would be improved. There would be creation of employment to several people in the area and beyond throughout the whole project cycle. There would be improved public accessibility to health and education, knowledge and skills enhancement of agriculture related activities, information exchange and strengthened social capital. That kind of development promotes women and youth empowerment. There will also be increased resilience and improved well-being of vulnerable beneficiaries. With proper management, the irrigation schemes would promote good governance.

Despite these positives, the sub-projects are likely to bring negative environmental and social risks. Biophysical negative impacts include surface and groundwater depletion and pollution; nutrient leaching; waterlogging; degradation of air quality; biodiversity loss, land pollution, soil erosion, noise pollution, sedimentation and siltation of rivers and dams. The anticipated social risks include conflicts related to land, water and scheme management. Influx of a youthful and active population group into the area that may lead to cultural changes and modifications, poor labor conditions, increased crime rates, sexual exploitation and abuse, prevalence of HIV and Sexually Transmitted Infections. Water borne diseases, child labour, gender bias, Sexual harassment and Exploitation (SEA) and Gender Based Violence (GBV) are other problems. There could also be animal-human beings' conflicts, accidents, health and safety incidents.However, these environmental and social risks are likely to be low or moderate and can be addressed through straight forward application of environmental siting, permitting requirements, pollution prevention, design criteria, construction standards, and training and awareness raising.

In spite of the implementation of the safeguards measures articulated in the ESMP, grievances may arise during the course of implementation of sub-project activities. Hence the project Grievance Redress Mechanism shall be rolled out to all the sub-project implementation areas. The aim of the Grievance Redress Management System is to respond to and settle or redress any grievances, complaints, queries or clarifications from stakeholders in a manner that is legitimate, reliable, transparent, cost-effective, accessible and culturally appropriate to all parties. The project GRM represents a multi-tier redressal structure with grievance redress taking place at local/community level, district level and provincial level all the way to the Project Focal Point. The project stakeholders shall be sensitised to take their complaints or grievances to the GRM committees established at each level whenever they feel aggrieved.

We conclude that, if the environmental and social safeguard measures proposed in this ESMP are fully implemented at all phases development, the benefits that the sub-projects will bring to the communities will far outweigh the negative impacts. Therefore, a green light should be given to the development of the Lot 2 Irrigation Schemes.

14.0 APPENDICES

Appendix: 1 Framework legislation and compliance mechanisms

Legislation	Compliance strategy	Permits / License / Certificate / Reporting required	Monitoring agent
The Constitution of Zimbabwe Amendment Act (2013)	The project shall ensure that human rights principles are mainstreamed in sub-project develop processes	ESMP clearance certificate	EMA
Environmental Management Act [Chapter 20:27]	The project will carry out environmental and social studies for the sub-project in line with EMA requirements	ESMP clearance certificate	EMA
SI 7 of 2007 (EIA and Ecosystems protection regulations)	The project will ensure that biophysical studies are conducted to identity any potential impact on natural ecosystems including sensitive ecosystems	ESMP clearance certificate	EMA
	The project shall apply for the renew of an ESMP certificate within six months from the date of expiry (planning and construction phases)	ESMP clearance certificate	
S.I 10 of 2007 (Hazardous Waste Management Regulations)	The project will ensure that all hazardous waste is managed in accordance with the provisions of the ESMP.	ESMP clearance certificate	EMA
S.I 268 of 2018 (Hazardous Substance, Regulations)	The project shall implement the ESMP, and ensure that any potential hazardous waste is managed in a responsible and sustainable manner	ESMP clearance certificate	EMA
Zimbabwe National Water Authority Act (Chapter 20:25)	The project shall apply for water abstraction permits during the construction and operation phases of the project	Water Permit	ZINWA
S.I 206 2001 (Water permits and regulations)	The project shall apply for a water abstraction permit during the construction and operation phases of the project	Water Permit	ZINWA
Factories and Works Act [Chapter 14:08] of 1996	The project will ensure that the ESMP is fully implemented to prevent any forms of workplace related accidents and incidences	ESMP clearance certificate	NSSA /EMA
Statutory Instrument 72 of 2009	The project shall implement the ESMP to control any forms of air pollution from sub-project activities	ESMP clearance certificate	EMA
Statutory Instrument 7 of 2011 (Prohibition and Control of Ozone Depleting Substances)	The project shall implement the ESMP and ensure that no ODSs shall be used during the construction and operational phases of the sub-project	ESMP clearance certificate	EMA
SI 68 of 1990 (Accident Prevention and Workers Compensation Schemes)	The contractors shall implement the C-ESMP to ensure that operations do not harm or present any form of injuries to their employees	C-ESMP	NSSA
Public Health Act [Chapter 15:09]	The ESMP shall be implemented to ensure that nuisances such as dust, noise and waste	ESMP clearance certificate	EMA and Ministry of

Legislation	Compliance strategy	Permits / License / Certificate / Reporting required	Monitoring agent
Revised Edition of 1996	are managed during all phases of sub-project development		Health AND Child Care (MoHCC)
Public health (COVID-19 Prevention, containment and treatment) Regulations, 2020	The project will develop and implement a Covid 19 Management Plan that is compliant to national regulations and WHO Covid 19 protocols	ESMP clearance certificate	MoHCC
National Museum and Monument of Zimbabwe Act [Chapter 25:11]	The project will ensure that the ESMP is implemented to ensure that cultural heritage is protected. A chance find procedure will be activated if any tangible forms of cultural heritage are encountered during construction activities.	ESMP clearance certificate	National Monument and Museum, Zimbabwe
Chiefs and Headmen Act [Chapter 29:01]	The project shall ensure that traditional laws and protocols are observed, and that local leadership is consulted to avoid misusing sacred areas or degrading traditional values.	ESMP clearance certificate	Traditional leadership
Rural District Councils Act (Chapter 29:13)	The project shall implement an ESMP to ensure proper waste management practices are adopted during the implementation of sub-project activities.	ESMP clearance certificate	RDCs
Forest Act (Chapter 19:05)	The project shall implement the ESMP to control any potential destruction of biodiversity and forestry resources due to sub-project activities	ESMP clearance certificate	Forestry commission
Parks and Wildlife Act (Chapter 20:24)	The project shall implement an ESMP to ensure proper management of wildlife resources that include indigenous plants, wild animals, fish, etc	ESMP clearance certificate	Parks and Wildlife Authority
Labour Act (Chapter 28:01)	The project shall implement a labour management plan and ensure that employee rights are respected	ESMP clearance certificate	NSSA
National Museums and Monument Act (Chapter 25:11)	The project shall implement the ESMP and ensure that the chance find procedure is activated in the event that tangible forms of cultural heritage are encountered	ESMP clearance certificate	National Museums and Monuments Department
Pesticides Regulations, SI 144 of 2012	The project shall implement the ESMP and ensure that only registered pesticides are used during the operation phases of the sub-project	ESMP clearance certificate	MoLAWFRD
Communal Land Act (20:04)	The sub-project shall acquire land use rights from the Rural District Councils, and also ensure that stakeholder consultations are properly done with the current land users	Land use rights Voluntary land use agreements	RDCs

Appendix 2: Chance Find Procedure

Purpose of the chance find procedure

The chance find procedure is a project-specific procedure developed specifically for the Project *"Building the climate resilience for vulnerable agricultural livelihoods in Southern Zimbabwe"*. The procedure outlines actions required if previously unknown tangible forms of cultural or archaeological importance are encountered during project construction phase. A Chance Find Procedure is a process that prevents chance finds from being disturbed until an assessment by a competent specialist is made and actions consistent with the requirements are implemented.

Scope of the chance find procedure

This procedure is applicable to all activities conducted by the personnel, including contractors that have the potential to uncover a heritage item/site. The procedure details the actions to be taken when a previously unidentified and potential heritage item/site is found during construction activities. The procedure outlines the roles and responsibilities and the response times required from both project staff, and the National Museums and Monuments of Zimbabwe (NMMZ).

Induction/Training

All personnel, especially those working on excavations and or trenching are to be inducted on the identification of potential heritage items/sites and the relevant actions for them with regards to this procedure during the Project induction and regular toolbox talks.

Chance find procedure

If any person discovers a physical cultural resource, such as (but not limited to) archaeological sites, historical sites, remains and objects, or a cemetery and/or individual graves during excavation or construction, the following steps shall be taken:

1. Stop all works in the vicinity of the find, until a solution is found for the preservation of these artefacts, or advice from the relevant authorities is obtained;
2. Immediately notify the site foreman who will then notify the site Manager and the Safety, Health and Environment (SHE) Officer;
3. The site SHE officer shall record details in Incident Report Form and take photos of the find;
4. The site SHE officer shall ensure the discovered site or area is delineated and secured to prevent any damage or loss of removable objects. In cases of removable relics or sensitive remains, a night guard shall be arranged until the responsible local authorities take over;
5. The SHE officer shall inform the relevant local authority and the NMMZ immediately and in writing within 7 days from the find;
6. The site SHE officer shall provide the NMMZ team with photos, other information as relevant for identification and assessment of the significance of heritage items;

7. The Department of National Museums and Monument shall investigate the find and provide response in writing.
8. Decisions on how to handle the find shall be taken by the NMMZ. This could include changes in the layout (such as when finding an irremovable remain of cultural or archaeological importance) conservation, preservation, restoration and salvage;
9. Construction works shall resume only after permission is granted from the responsible authorities.
10. All records of communication with decision making authorities including conclusions and recommendations/guidance, implementation reports shall be kept.

Additional information

Management options for archaeological site

Site avoidance. If the boundaries of the site have been delineated, attempt must be made to redesign the proposed development to avoid the site. (The fastest and most cost-effective management option)

Mitigation. If it is not feasible to avoid the site through redesign, it will be necessary to sample it using data collection program prior to its loss. This could include surface collection and/or excavation. (The most expensive and time-consuming management option.)

Site Protection. It may be possible to protect the site through the installation of barriers during the time of the development and/or possibly for a longer term. This could include the erection of visibility fencing around the site or covering the site area. The exact prescription would be site- specific.

Management of replicable and non-replicable heritage

Different approaches for the finds apply to replicable and non-replicable heritage.

Replicable heritage

Where tangible cultural heritage that is replicable[1] and not critical is encountered, mitigation measures will be applied. The mitigation hierarchy is as follows:

Avoidance;

Minimization of adverse impacts and implementation of restoration measures, in situ;

Restoration of the functionality of the cultural heritage, in a different location;

Permanent removal of historical and archaeological artefacts and structures;

Compensation of loss where minimization of adverse impacts and restoration not feasible.

[1] Replicable cultural heritage is defined as tangible forms of cultural heritage that can themselves be moved to another location or that can be replaced by a similar structure or natural features to which the cultural values can be transferred by appropriate measures. Archaeological or historical sites may be considered replicable where the particular eras and cultural values they represent are well represented by other sites and/or structures.

Non-replicable heritage

Most cultural heritage is best protected by in situ preservation, since removal is likely to result in irreparable damage or even destruction of the cultural heritage.

Nonreplicable[2] cultural heritage must not be removed unless all of the following conditions are met:

- There are no technically or financially feasible alternatives to removal;
- The overall benefits of the project conclusively outweigh the anticipated cultural heritage loss from removal; and

Any removal of cultural heritage must be conducted using the best available technique advised by the Department of National Museums and Monuments

Human Remains Management Options

The handling of human remains believed to be archaeological in nature requires communication according to the same procedure described above.

EMERGENCY CONTACTS

National Museums and Monuments of Zimbabwe

Address: 107 Rotten Row, Penrose Hill Building Causeway, Harare, Zimbabwe

Tel: +263 24 2774208.

E-Mail: natmus@nmmz.co.zw

Website: http://www.nmmz.co.zw/

[2] Nonreplicable cultural heritage may relate to the social, economic, cultural, environmental, and climatic conditions of past peoples, their evolving ecologies, adaptive strategies, and early forms of environmental management, where the (i) cultural heritage is unique or relatively unique for the period it represents, or (ii) cultural heritage is unique or relatively unique in linking several periods in the same site. Examples of non-replicable cultural heritage may include an ancient city or temple, or a site unique in the period that it represents

Appendix 3: Stakeholder consultation tools

A. FDG Discussion Guide

ENVIRONMENTAL AND SOCIAL DATA FGD TOOL – LOT 2 IRRIGATION SCHEMES

Name of scheme	
Ward No	
District	
Province	
Chief	
GPS Coordinates	
Date of establishment	
Existing status (take photos)	
Irrigation Management Committee Constitution	
Size of scheme (ha)	
Individual plot size (ha)	
Land tenure system	
Current land use	
Challenges at the scheme	
Environmental • Human wildlife conflict • Natural hazards	
Social	
Technical • (Energy, water, conveyancing, pumps, etc)	
Economic • Markets, prices of inputs, etc	
Water Source, availability, and Use	
Water source • (river, dam, borehole)	
Water availability (Quantity)	
Water users (downstream)	
Water users (upstream)	
Potential water conflicts	
Cultural Heritage	
Tangible & intangible forms of cultural herniate	
Sacred sites	
Biophysical setting	
Soils (Susceptibility to erosion)	
Vegetation *Types* *Invasive species*	
Faunal species	
General Air quality	

Geology	
Socio-economic	
Education • Schools • Distance walked	
Health • Clinics • Services provided • Distance walked.	
Vulnerable groups	
GBV service providers and local NGOs	
Economic activities	
Road Network	
Telecommunication	
Language	
Access to labour	
Trainings	
Crop preferences	
Irrigation technology preferences	
Other	

B. HOUSEHOLD QUESTIONNAIRE

INTRODUCTION

The Government of Zimbabwe through the Ministry of Lands, Agriculture, Fisheries, Water and Rural Development (MLAFWRD) in partnership with UNDP is implementing a seven-year project "Building the climate resilience for vulnerable agricultural livelihoods in Southern Zimbabwe". One of the project components focuses on the revitalization of 15 existing irrigation schemes and the establishment of 6 new schemes in 15 priority districts of Manicaland, Masvingo and Matabeleland South Provinces. …….irrigation scheme is one of the schemes in Masvingo Province targeted for construction/ revitalization under the project. As a key stakeholder in the area, we kindly request your views on the project. The information will be used to identify potential environmental and social risks of the sub-project and ways of managing them.

A. RESPONDENTS INFORMATION

1. NAME _____ SEX: ☐ M ☐ F

2. **AGE (YEARS):** 6-20 ☐ 21-25 ☐ 26-30 ☐ 31 and above ☐

3. **MARITAL STATUS:** SINGLE ☐ MARRIED ☐ DIVORCED ☐ WIDOWED ☐ SEPERATED ☐

B. SOCIO-ECONOMIC INFORMATION

4. What is your employment status? EMPLOYED ☐ SELF EMPLOYED ☐

   UNEMPLOYED ☐

   a) Specify occupation

   type_____

   b) What is your estimated monthly income from employment activities?

   $0-19 ☐ $20-50 ☐ $51-100 ☐ $101-$200 ☐ > $201 ☐

5. What is your highest level of education?

6. PRIMARY ☐ SECONDARY ☐ UNIVERSITY ☐ VOCATIONAL ☐ OTHER ☐

   Other / vocational specify

_____

7. What is your current residential address

   _____

8. How long have you been living at this address? 0-5 years ☐ 6-10 year ☐ 10-15 years ☐

   ☐ >16 years

   _____

9. Which diseases are common in the area?

Malaria ☐ TB ☐ Diarrhea ☐ bilharzia ☐ others ☐

10. Do you have access to a hospital near where you live? YES ☐ NO ☐

11. How far is the hospital from where you live? 0-2KM ☐ 2-4KM ☐ 4-10KM ☐ >10KM ☐

b. What type of hospital services do you get?

☐ General ☐ Baby ☐ Clinic ☐ Maternity Surgery Other ☐ ☐

C. GCF PROJECT

12. Are you aware of proposed construction/ revitalisation of the irrigation schemes
Yes ☐ No ☐

13. How did you get to know about the above mentioned project?

_____

14. From your own point of view, does the project bring benefits to the project area and the province at large?
Yes ☐ No ☐

15. If yes, what are the benefits?

_____
_____
_____
_____

16. Since you started staying in this area which plants and animals existed

Species name/English names/Shona names	Uses/benefits

17. Are there any environmental and social impacts you foresee due to this project?

    Yes ☐ No ☐

    Explain:_____
    _____
    _____
    _____
    _____
    _____

18. Do you have any concerns to address to the proponent?

    _____
    _____
    _____
    _____
    _____

Signature _____ Date _____/_____/_____

FOR OFFICIAL USE ONLY

Date of interview: _____/_____/_____

Appendix 4: Voluntary land agreement form – Chizumba Irrigation scheme

Ministry of Lands, Agriculture, Fisheries, Water and Rural Development

Green Climate Fund Project "Building Climate Resilience of Vulnerable Agricultural Livelihoods in Southern Zimbabwe"

VOLUNTARY LAND TRANSFER AGREEMENT

BETWEEN

CHIZUMBA IRR SCHEME

IRRIGATION MANAGEMENT COMMITTEE (IMC)

AND

THE FARMERS

Acknowledging that the farmers specified in Annex 1 have been given land by the Traditional Authority through the Headman or Village Head, under customary law for their use.

Acknowledged that the asset under construction and development (in this case, the asset is the ..... irrigation scheme) is communal and addresses the project's developmental objective of increasing resilience and enhance livelihoods of the most vulnerable rural communities in southern Zimbabwe. The asset will be for public use to ensure that communities using it are resilient to climate change risks and hazards.

Village Head/Headman.....NESHURO.....

WARD.....7.....

DISTRICT.....MWENEZI.....

PROVINCE.....MASVINGO.....

Now both Parties, the CHIZUMBA.....IMC and the communal landowners have agreed to cooperate as specified in this agreement to make use of the asset (herein referred to as '.....irrigation scheme) for their socio-economic development.

The land within the asset (CHIZUMBA.....Irrigation scheme) to be constructed and developed, specified as .....ha, and demarcated on the area layout annexed to this agreement, will be used by the community/ beneficiaries each defined season within the calendar year.

This agreement is signed by the Parties as specified below:

A. Communal Land Owners (See Appendix 1)

B. Irrigation Executive Committee

Position	*Name*	*Signature*	*Date*
Chairperson	ISAAC CHIHIBIRAI		15/10/22
Secretary	BRIGHT SHENGWA		15/10/22
Treasurer	Anastacia Madlome	A Madlome	15/10/22

C. Witnessed by GCF Focal Point- Ministry of Agriculture Ministry of Lands, Agriculture, Fisheries, Water and Rural Development,

MIN. OF AGRICULTURE
Dept. of Irrigation Development
ADMIN. OFFICER
18 OCT 2022
P.O. BOX 1020, MASVINGO
ZIM. TEL: 0 -2561 5051

Position	Name	Signature	Date
	R. MUTUSWA		15/10/22

D. Witnessed by Rural District Council Representative

Position	Name	Signature	Date
EO Agric/Envt	Sirenu Kudzai-U		14/10/22

MWENEZI RURAL DISTRICT COUNCIL
CHIEF EXECUTIVE OFFICER
AGRIC & ENVIRONMENT DEPT.
14 OCT 2022
P.O. BOX 46 NESHURO, MASVINGO
PHONE

ANNEX 1. LAND OWNERS...CHIZUMBA-.....IRRIGATION SCHEME

S/N	LAND OWNER'S NAME	SIZE OF LAND(HA.)	SIGNATURE/ THUMPRINT	DATE	
1	FAINOSI SHENGILWE 22-159808 X SG	0,5	R Ngilazi		0779415984
2	VIGINEA SHENGILWE	0,5	R Ngilazi		
3	ELENI SHUMBA	0,5	TFutani		0774473575
4	ZONDANI FUTANI	0,5	TFutani		
5	LOVEMORE ZONDI SG-101493 R SG	0,5	Saraffina		0791468788
6	SARAFINA CHIHISANI 10-006493 X 10	0,5	Sarafina		
7	LAZAWE CHIHISANI SG-053562T SG	0,5	LChihisani		0786050266
8	Knowledge CHIHISANI	0,5	KChihisani		
9	SIBUSISIWE MASHAUELE SG-01889 R SG	0,5	SiBusisiwe		0713811496
10	SIMON SHENGILWA	0,5	SiBusisiwe		
11	NLAMBANI CHIHISANI SG-041903 P SG	0,5	Sositina		0788246050
12	TSATSAWANI MUTETWA 46-042122 H 13	0,5	Tm		0789092284
13	TAWANDA MASHAUELE 46-106211 U SG	0,5	Thal		0780082694
14	HENRI MASHAUELE	0,5	Thal		
15	TAKAWADA CHIHISANI	0,5	TChihiSani		0716767335
16	SARAFINA CHIHISANI SG-002536 H SG	0,5	S Chihisani		-
17	CLEVER CHIHISANI December 1984	0,5	C Chihisani		
18	WILLSON SHENGILWA SG-077606 G SG	0,5	R Ngilazi		0786643088
19	BRIGHT SHENGILWA	0,5	R. Ngilazi		
20	MUFARO MAPFUMO SG-057575 H SG	0,5	M mapfumo		0771867771
21	PRINCE MAPFUMO SG-151827 F SG	0,5	P mapfumo		
22	SOLOMON ZONDI SG-098824 B SG	0,5	S Zondi		0777024662

S/N	LAND OWNER'S NAME	SIZE OF LAND(HA.)	SIGNATURE/ THUMPRINT	DATE	
23	TSATSAWANI CHIHISANI 01-01-1980	0,5	T Chihisani		
24	SIMBARASHE CHIHISANI	0,5	S Chihisani		
25	ISAAC CHIHISANI SK-035024 W SK	0,5	I Chihisani		0788254988
26	LINA MACHAUKE SK-024616 H SK	0,5	L. Machauke		0775610832
27	BRIGHTON SHENGUWA 22-150964 J SK	0,5			0788809640
28	BRINE SHENGUWA	0,5			
29	PHILIP MAHLELA 185	0,5	Pagwirei		0778823082
30	KALINA NDLOVU	0,5	Pagwirei		
31	SUNUNGURAI SHENGUWA	0,5	Sibusisiwe		
32	BEST SHENGUWA	0,5	Sibusisiwe		
33	HLAISI CHITORO SK-123080 F SK	0,5	H. Chitoro		-
34	MATHALINA MUGUWA HLUPI SK-044120 S SK	0,5	Matalina		
35	TAUZIVEI MASUNGWI-NI SK-076019 F SK	0,5	T M		
36	ABIGIRI MAPFUMO SK-111207 D SK	0,5	Amapfumo		0782968982
37	AMON NDLOVU 22-223363 W SK	0,5	Andlovu		0776314974
38	SITENCIA NGWARU SK-088115 D SK	0,5	S. Ngwaru		
39	NESTAI ZONDI SK-085036 G SK	0,5	NZondi		0777211991
40	ALECK SHUNGUWA SK-100946 J SK	0,5	A shenguwa		-
41	SIKULISIWE SHOKO SK-057937 B SK	0,5	Shoko		0766755993
42	RODA BHANDA SK-001236 M SK	0,5	R Banda		
43	KELVION MURABA-RARI SK-063085 X SK	0,5			0779102999

ANNEX 1. LAND OWNERS..... ZVINYANINGWE .....IRRIGATION SCHEME

S/N	LAND OWNER'S NAME	SIZE OF LAND(HA.)	SIGNATURE/ THUMPRINT	DATE
44	RABSON MUGOMBA 22-215182 L22	0.5		
45	AGRITEX DEMO PLOT	0.5		
46	MUZITWI PRI. SCHOOL DEMO PLOT	0.5		
47	VENGAI MUKONDO 77-076971 Q22	0.5		

Appendix 4: Grievance log sheet at PMU

PROJECT TITLE: GCF BUILDING CLIMATE RESILIENCE		GRIEVANCE LOG SHEET - PMU											
S/N	NAME OF COMPLAINANT	CONTACT DETAILS	DESCRIPTION OF COMPLAINT	DATE RECEIVED	CHANNEL GRIEVANCE RECEIVED (Suggestion Box; Toll-free Line, email, letter etc.)	UNIT/ CONTRACTOR COMPLAINED OF	RISK PRIORITY INDEX	LOCATION DISTRICT, PROVINCE)	GENDER	ACTION TAKEN/AGREED RESOLUTION	FEEDBACK GIVEN Y/N?	OUTCOME	DATE GRIEVANCE CLOSED
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													