MINISTRY OF WATER,

WAMI/RUVU BASIN WATER BOARD

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ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED CONSTRUCTION OF CATTLE TROUGH AND DRILLING OF BOREHOLE, BONYE VILLAGE, BWAKILA CHINI WARD, MOROGORO DISTRICT IN MOROGORO REGION

DETAILED PROJECT BRIEF

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ABBREVIATIONS

AIDS	Acquired Immune Deficiency Syndrome
CCS&PT	Cervical Cancer Screening, Prevention and Treatment
CPAC	Comprehensive Post Abortion Care
CRB	Contractor Registration Board
CSO	Civil Society Organization
EA	Environmental Audit
EHS	Environmental, Health and Safety
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EMA	Environmental Management Act
EMO	Environmental Management Officers
ESMaP	Environmental and Social Management Plan
ESMoP	Environmental and social Monitoring Plan
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
FP	Family Planning
GAC	Global Affairs Canada
GPS	Global Positioning System
LGAs	Local Government Authorities
MKUWASSA	Makambako Urban Water Supply and Sanitation Authority
MST	Marie Stopes Tanzania
MTC	Makambako Town Council
NBS	National Bureau of Statistics
NCC	National Construction Council
NEMC	National Environment Management Council
NGOs	Non-Governmental Organizations
OSHA	Occupational Safety and Health Authority
PEA	Preliminary Environmental Assessment
SRH	Sexual Reproductive Health
STDs	Sexually Transmitted Diseases
TANESCO	Tanzania Electric Supply Company
TANROAD	Tanzania National Roads Agency
TBS	Tanzania Bureau of Standards
TD	Town Director
ToR	Terms of Reference
TTCL	Tanzania Telecommunication Company Limited
URT	United Republic of Tanzania
UTM	Universal Transverse Mercator

CHAPTER ONE

1. GENERAL BACKROUND TO THE STUDY

1.1. INTRODUCTION

The Wami/Ruvu Basin Water Board (WRBWB) is implementing a project named "Water Sector Support Project Phase II" with a support from International Development Agency (IDA) of the World Bank Group from 2017-2022. The IDA support of WSSP has the objective of improving Integrated Water Resources Management (IWRM) in the country and increasing access to Water Supply and Sanitation services in Dar es Salaam. The project has four components including:

1. Integrated Water Resources Management (IWRM);
2. Dar es Salaam Water Supply Improvement;
3. Dar es Salaam Sanitation Improvement; and
4. Project Management and Implementation Support.

Integrated water resource management has three major sub components including:

- **Sub-component 1** – Institutional Strengthening: This subcomponent entails the capacity development and strengthening of the water resources management institutions (NWB, BWBs, CWCs/SCWCs and WUAs) for sustainable WRM.
- **Sub-component 2** – Hydromet Systems Strengthening: designed to strengthen the hydromet system by construction and rehabilitation of water resources monitoring stations, mapping groundwater aquifers, assessment of the water quality, modernizing the hydromet and raw data portal and development of an Operational Decision Support System (ODSS) with Flood Early Warning System (FEWS) as a major component, among other requirements.
- **Sub-component 3** - Water Security and Conservation: This sub-component focuses on Wami/Ruvu Basin, which provides water for Dar es Salaam City, where investments aimed at improving water security and conserving the water environment will be put on the ground. Investments will be made on the community conservation works, earth dams, groundwater exploration and development, livelihood support, small scale infrastructure development and procurement of community works (equipment and seedlings). Support will also be provided on the construction, supervision of community-initiated works and studies on future interventions to ensure water availability.

Proposed construction of cattle trough project with boreholes as water source falls under sub-component 1.3 of the IWRM component of the WSSP II with the overall objective of ensuring that water resources are sustainably managed utilized and conserved for socio-economic development.

The EIA registration documents were prepared and submitted to the National Environment Management Council (NEMC) for registration and screening decision. The developer (WRBWB) was directed (screening decision letter ref. No: CB.145/208/348/05 dated 4/9/2020 – see Appendix 1) to carry out a full EIA for the proposed project in accordance with the EIA and Audit regulations of 2005 and its amendment of 2018. This EIA study was conducted between May and November 2020.

This report presents the Detailed Project Brief for the proposed project on construction of cattle trough and drilling of a borehole at Bonye village in Morogoro district. The report has been submitted to NEMC for review and EIA certification processes.

1.2 OBJECTIVES OF THE EIA STUDY

The overall objective of carrying out this EIA is to identify, predict and assess both positive and negative environmental and social impacts associated with the proposed project and propose mitigation measures to minimize the negative impacts and enhance the positive ones. The assessment made use of data and information on the physical, biological, and socio-economic environment to attain its intended objective, as well as enabling the development of management and monitoring plans for dealing with the observed impacts. Part IV of the EIA and Audit Regulations G.N. No. 349 of 2005and its amendment of 2018 provides the general objectives for carrying EIA study, which are:

- To ensure that environmental and social, considerations are explicitly addressed and incorporated into the project decision making process;
- To anticipate and avoid, minimize or offset the adverse significant biophysical, social and relevant effects of developmental proposal;
- To protect the productivity and capacity of natural systems and ecological processes which maintain their functions;
- To promote development that is sustainable and optimizes resources use and management opportunities;
- To establish and assess impacts that are likely to affect the environment before a decision is made to authorize the project;
- Propose mitigation and socio-management procedures aimed at managing the proposed mitigation of the identified potential impacts and that will form an all important part of the overall project execution; and
- To enable information exchange, notification and consultations between stakeholders.

The EIA Consultant team carried out this EIA study in line with the above-mentioned objectives.

1.3 METHODOLOGY AND APPROACH OF THE STUDY

Preparation of this Detailed Project Brief has followed procedures stipulated in the Environmental Management (Environmental Impact Assessment and Audit) (Amendment) Regulations, 2018, section 4A (6) (1) which requires explanation on how the Application for EIA Certificate for Type B2 Project should be conducted. The study has been undertaken based on checklists complimented by expert judgment of Consultant and through consultation with Proponent (MoW, Wami/Ruvu basin water board), local government officials in the vicinity of the project site. Preparation of this report involved a combination of consultation meetings, desktop study, and field investigations. It further involved review of literature/documents and field studies at the project site to gather information and data on various aspects of the project. Detailed description of methodology and approach used are provided in subsequent subsections:

1.3.1 Baseline Data and Information

(a) Project Description

This involved review of available information on the project to gain a basic understanding of the project components and its operation philosophy. This was accomplished through:

- Review of project documents including the EIA Registration Form submitted to NEMC (October 2018); and the project proposal document for the proposed project;
- Interview of the technical staff based at MoW, Wami/Ruvu Basin Water Board;
- Site visits and physical observations at the proposed project area and its surrounding environment;
- Assessment of potential locations and sources for support facilities and services (access road, water supply, waste disposal, sources of construction materials, power supply etc.);
- Review of projects of similar nature undertaken elsewhere in and outside Tanzania; and
- Literature review for identification of alternative technologies, materials and practices.

(b) Biophysical and Socio-economic Conditions

This involved collection of the baseline data and information at project core area, immediate vicinity and area of influence mainly from secondary sources and primary sources through site visits and physical observations at the project site. Specifically:

- Visit to the study area to make spot verification of the status of environmental and socio-economic conditions;
- Primary data were collected based on review of reports, interviews and discussions with key informants notably Wami/Ruvu Basin Water Board, Morogoro District, Ward and Mtaa leaders, and selected local community members in the locality. Specific checklists and interview guides were used; and
- Secondary data obtained from various reports such as the Morogoro socio-economic profile, web search, etc.

1.3.2 Impact Assessment

Impact assessments were determined by superimposing project facilities onto the existing bio-physical environment of the project site. This involved analysis of data for identification, prediction and evaluation of foreseeable impacts, both beneficial and adverse, of the proposed project using checklists, simple matrices and expert judgment; and reference to standards and guidelines. The impact assessment includes three principal components or steps; the identification of impacts, the evaluation of significance, and suggestion of mitigation measures with preparation of Environmental Management and Monitoring Plans and consolidation of the findings in this report.

1.3.3 Impact Identification and Evaluation

The methodology used considered all the potential impacts using a standard matrix approach, which takes into account impacts on the physical environment (e.g. air quality, noise level), impacts on the ecology (e.g. flora and fauna) and impacts on human socio-economic setting. Detailed description of methodology used to identify, evaluate and signify the impacts is provided in Chapter 4 of this Detailed Project Brief.

1.3.4 Mitigation Measures and Management Controls

Identifying and proposing mitigation measures that aim at eliminating or minimizing the potential negative impacts and promote positive ones using expert judgment best practices.

- Preparing the Environmental and Social Management and Monitoring Plan and Programme for ease of reference and follow-ups during project implementation; and
- Preparation of the Detailed Project Brief.

1.4 REPORT STRUCTURE

The report is presented in accordance with the format prescribed in section 4A (6) – (1) for Type B2 Project of the Environmental Management (EIA and Audit) (Amendment) Regulations, as follows:

i) Executive Summary
ii) Table of Contents
iii) Acknowledgement
iv) List of Acronyms and Abbreviations

1. Introduction
2. Project Background and Description
3. Environmental and Socio-economic Baseline Conditions
4. Assessment of Impacts and Identification of Alternatives
5. Environmental Mitigation Measures
6. Environmental and Social Management Plan
7. Environmental and Social Monitoring Plan
8. Summary and Conclusions
9. References
10. Appendices

1.5 TEAM OF EXPERTS FOR THE EIA STUDY

It is mandatory that the EIA team should consist of experts from multidisciplinary expertise. The consultant formulated the EIA team of multidisciplinary expertise and experience on related assignments and who built a strong foundation for the assignment success. The Study team composed of the following expertise: Environmental and Social Impact Assessment Expert; Civil Engineer; and Waste Management Expert. The Consultant team for this EIA study is provided in Table 1 below:

Table 1: Expert who carried out the EIA Study

SN	Name	Area of Expertise	EIA Registration Status	Signature
1	Eng. Hamza Rajabu	*Environmental Engineering and ESIA Expert*	Registered EIA Expert	
2	Nuhu Moto	*Civil and Municipal Services Engineering*	Not Registered	
3	Evody Ndumiwe	*Socio-Economic and Environmental Management*	Not Registered	
4	Miriam M. Esanju	*Water Resources Management*	Not Registered	

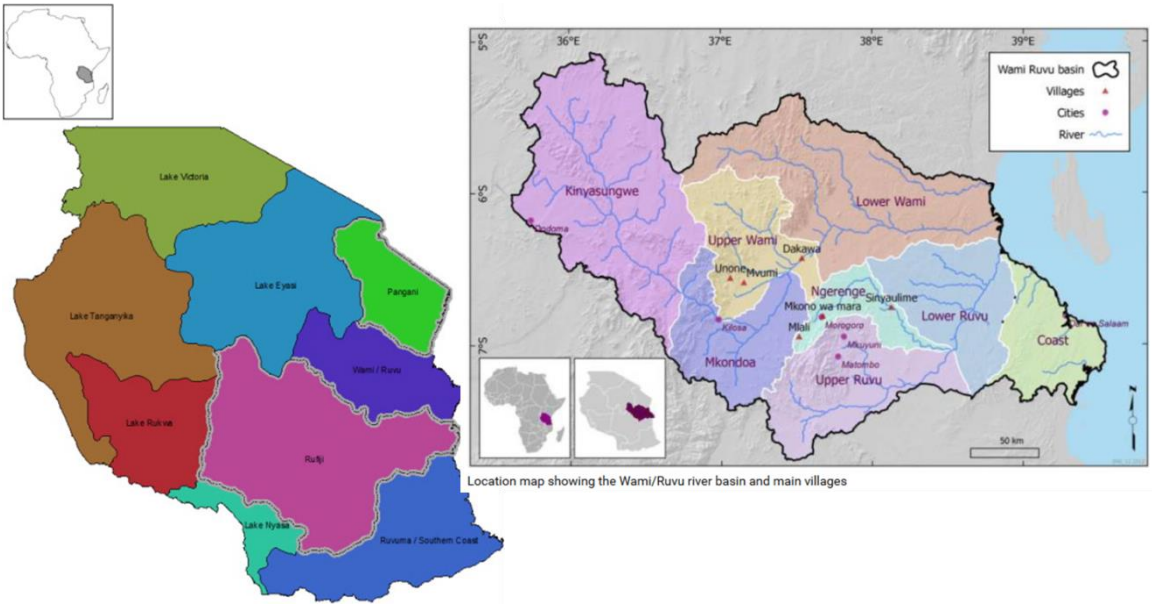
CHAPTER TWO

2. PROJECT BACKGROUND AND DESCRIPTION

2.1 THE PROJECT PROPONENT HISTORY AND RATIONALE

2.1.1 Project Proponent

The proponent for this proposed project is the Wami/Ruvu Basin Water Board (WRBWB). The Basin board was established in July 2002 under Water Act No. 42 of 1974 of Water Utilization (Control and Regulations) with its amendments No. 10 of 1981. But the former Act has been repealed with recently Water Resources Management Act No. 11 of 2009. Wami/Ruvu Basin is one of the nine River and Lake Basins of Tanzania established with the aim of ensuring the sustainable water resources management for sustainable utilization of available water resources for social economic development. The Wami/Ruvu Basin is located in the eastern part of Tanzania and has a catchment area of 66,294 km^2. The basin has two major rivers of Wami and Ruvu forming Ruvu and Wami Sub-basins with an approximate area of 43,742 km^2 and 17,789 km^2 respectively and it has coastal rivers located to the Eastern part of the Basin flowing into Indian Ocean, most of which are located in Dar es Salaam region. (Figure No 1)



Location map showing the Wami/Ruvu river basin and main villages

Figure 1: Wami/Ruvu basin Boundaries

The source of Wami River is Chandama highland (EL+1,511m) in the northern Tanzania and the catchment has an area of 43,742 km^2 and 637 km long. The Wami River runs through Dodoma, Bahi, Chamwino, Mpwapwa, Kilosa, Mvomero and Bagamoyo districts and drains into the Indian Ocean.

On the other hand Ruvu River is originating from Mt. Uluguru with a catchment area of 11,789 km^2 and 316 km long, It runs through Morogoro, Kibaha and Bagamoyo districts and drains out to the Indian Ocean. Apart from the main Ruvu river system , other small rivers draining the basin into the Indian Ocean includes Mkusa, Mpiji, Msimbazi on the southern part of the Ruvu River and Msimbazi, Kizinga, Mzinga, Mbezi and Luhute in the extreme south of the basin.

In charge of the basin operations is the **Water Officer** who is also the secretary of the Basin Water Board. The Head office of the WRBWB is located in Morogoro municipality with other sub-offices in Dar es Salaam and Dodoma. The vision of the Wami/Ruvu Basin Water Board (WRBWB) is to ensure basin water resources are sustainably managed for the socio-economic and environmental needs, interests and priorities of the basin population. The mission of the WRBWB includes facilitation of IWRM efficiently

and effectively in order to address the resource needs, interests, and priorities of the Basin population while protecting and conserving the water resources (WRBWB 2008).The population of both the Wami and Ruvu basins combined is approximately 7 million. This includes Dar es Salaam (5 million) and the smaller cities of Morogoro, Kibaha and Dodoma. About 80% of the basin population lives in urban areas and 20% in rural areas, thus the population is very urbanized compared to the rest of the country which is 20% urban and 80% rural. Outside of major urban areas, approximately 75% of total household income in the basin is earned from agriculture.

2.1.2 Project History and Rationale

Quality and quantity of surface water instreams and rivers in the basin have been deteriorating with time. This is due to increase of population and agricultural activities including animal keeping at the river sources. The movement of big number of livestock at the wetland and riverbanks lead to river banks erosion and increase of sediment load in the riverbed that reduces river carrying capacity Plate 1. Alternative water source had to be established to prevent the movement of livestock at riverbanks and bed in search of water and pasture thus construction of cattle trough at Bonye Village.

Plate 1: Sections of Livestock at the river banks at Bwakilachini Morogoro District (Source: MoW, 2019)

Proposed construction of cattle trough project with boreholes as water source falls under sub-component 1.3 of the IWRM component of the WSSP II with the overall objective of ensuring that water resources are sustainably managed utilized and conserved for socio-economic development. Cattle trough construction for Bonye Village aims at providing source of water for livestock in order to alleviate livestock intrusion within the water sources. The project aims at providing water for both livestock and community. Borehole will be drilled to provide water for livestock at the cattle trough and at domestic point (DP) that will be used by the community within the locality. From the borehole water will be pumped to 3m raised tank then distributed to the domestic point and cattle trough. The main project components will include borehole drilling (geological survey, drilling and pump test); construction of cattle trough and 3 tank raiser and water supply (main and distribution pipeline lying) plate 2.Generally, the project will involve vegetation clearing, earth works, concrete works, masonry works and plumbing.

2.2 PROJECT LOCATION AND ACCESSIBILITY

2.2.1 Location

The proposed project site for construction of the two cattle trough is located at Bonye village in Bwakila Chini ward in Morogoro rural district.

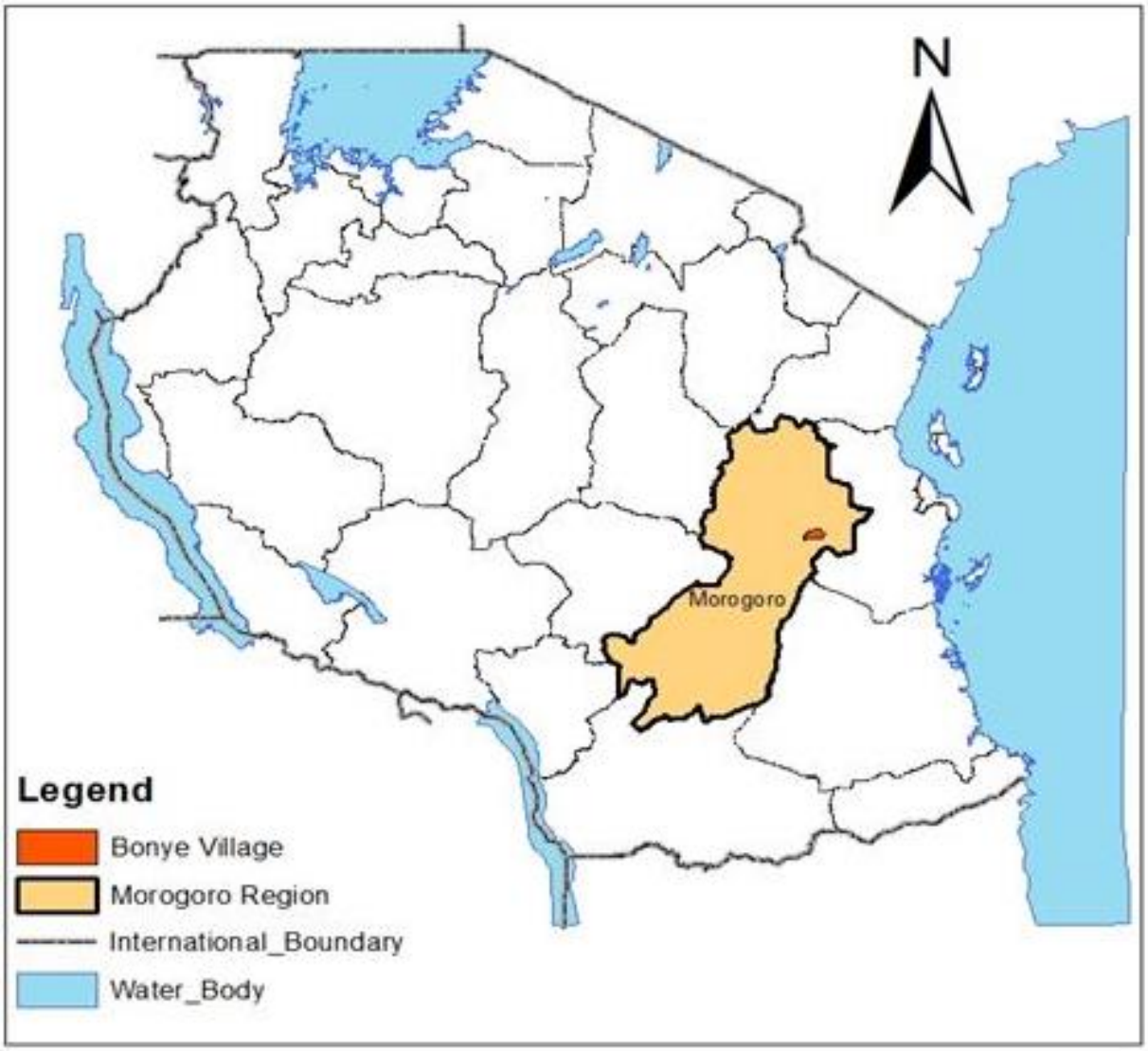


Figure 2: Location of the project area in Bonye village, Bwakila Chini ward in Morogoro rural District (NBS 2002)

Total area of the proposed construction site of cattle trough at UTM 36500.21Eand UTM 9182447.08S is approximately 4500 square meters.

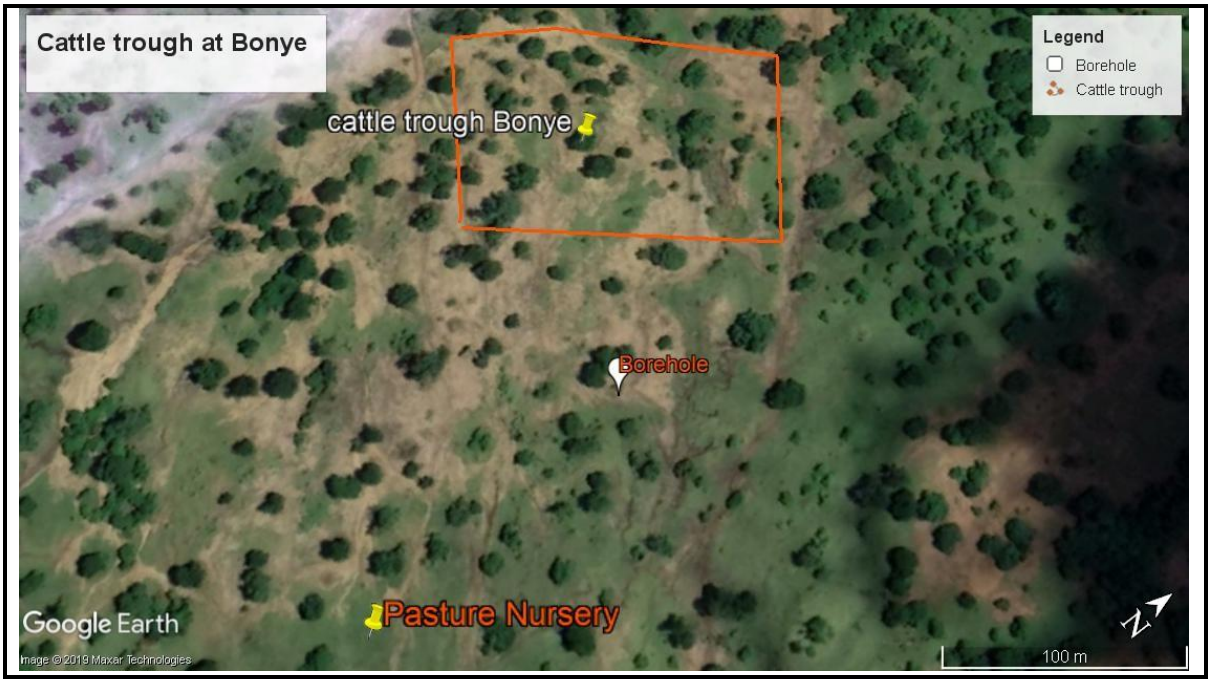


Plate 2: Sections of Project Location in Bonye Village, Bwakila Chini ward, Morogoro District (Source: MoW, 2019)

The proposed site for the construction of the two cattle trough and drilling of borehole as source of water for the cattle trough and community supply(domestic point at 200m from the borehole) is within the livestock keeper area/location as per Bonye village land use plan of 2010-2019. The project site is located along Kisaki Road approximately 5 km from Bwakila Chini Center.

2.2.2 Accessibility

The project site is easily accessible through Kisaki Road approximately 10 km from Bwakila Chini Center. The area is within livestock keepers grazing area as per village land use plan that designated area for crop cultivation activities (farmers) and livestock keeping.

2.3 OWNERSHIP OF THE PROJECT LAND

Formal the proposed land for construction of cattle troughs at Bonye belonged to Bonye Village council specifically within the area designated for Livestock keeping. The land was then legally transferred to Morogoro District council trough signed voluntary land donation agreement (appendix 2). The area that was given out for construction activities of cattle trough and its components is approximately 9800sqm.

2.4 PROJECT COMPONENTS

The proposed project is about construction of two cattle troughs and drilling of borehole as a water source for the cattle trough and the community around in Bonye Village, Bwakila Chini Ward, Morogoro District. From the borehole water will be pumped with a solar pump to a 3m raiser tanks. Solar pump was opted to reduce the operation cost enhancing the sustainability of the project. To reduce the risks caused by the interaction of animal and human at the water source, the livestock keepers community will be supplied with water for domestic use from constructed domestic point that will be located about 200m from the cattle troughs. Basically, the proposed construction works will involve small to medium scale civil works, plumbing and solar works. Therefore the main project components as will include the following:

- Civil works for major construction of two cattle troughs, tank raiser and domestic point ;
- Drilling works of the borehole and installation of the pump
- Electric works for installation of the solar pump
- Operation of the cattle trough and domestic point.

2.4.1 Civil works for major construction works

The design for the proposed construction of cattle trough and its components has been prepared. The proposed major construction and installation works for cattle trough and its associated facilities will include but not limited to the following civil works:

- Site clearance;
- Excavation for Construction of cattle troughs , Tank Riser and Domestic point
- Foundation laying
- Brick works
- Finishing

2.4.2 Pipe lying and Plumbing Works

Water supply systems for both raising main (from the borehole to the tank) and distribution main (from the tank to DP and cattle troughs) have been prepared. The proposed major pipe works and its associated facilities will include but not limited to the following civil works:

- Site clearance;
- Trench excavation
- Bed preparation
- Pipe Lying and Backfilling
- Construction of inspection chambers

2.4.3 Borehole works and Installation of the Solar pump

During survey of the underground water, the area for drilling of the borehole was identified at approximately 90 meter. The area proposed for drilling of the borehole is within livestock keepers designated area as per Bonye Village land use Plan. The land has been legally transferred to Morogoro District council (regulator/supervisor of the cattle troughs) trough signing of voluntary land donation agreement. Water from the borehole will be pumped by a pump driven with solar power to the tank raised 3m. Borehole works and installation of the solar panel and its associated facilities will include but not limited to the following civil works:

- Site clearance;
- Borehole drilling and casing installation
- Flushing
- Pumping test
- Water pump Installation
- Solar panel installation

2.4.4 Operation of constructed cattle trough and borehole

Cattle troughs and its components (borehole and domestic point) will be operated through established livestock keeping association. The association comprises of all the livestock keepers in Bonye village and it is guided with their constitution that explains in detail the operation procedures of the cattle trough including the fees that a member has to pay per livestock and mode of fee collection. The operation of constructed cattle trough and borehole will involve the following components of activities;

- Provision of water to the cattle and community
- Proper management of water and its facilities such as the water pump, solar and pipe fittings
- Maintenance of the cattle trough, pump, solar panel and its associated structures

2.5 PROJECT ACTIVITIES

Implementation of the proposed project will follow a conventional project cycle of scheduling, procedures and practices. It will involve five main phases; Planning and Design; Mobilization; Construction; Operation and Decommissioning Phases. Each phase is characterized by its activities as briefly described in the sections herein under:

2.5.1: Planning and Design Phase

The Planning and designing phase for the proposed project has been started. Among of the activities completed include detailed engineering design and bill of quantities (BOQ) for the construction and installation works. The ongoing activity for this phase is carrying out environmental and social impact (EIA) of the proposed project. The proposed layout and engineering drawings for the proposed construction works are provided on Appendices.

2.5.2: Mobilization Phase

The mobilization phase entails the preparatory activities necessary for proposed major construction works. This will include the following:

- Preparation of tender and contracts documents
- Procurement of contractors; and
- Mobilization of working tools, equipment, machinery and materials, etc.

2.5.3: Construction Phase

The construction phase will involve carrying out development activities that will facilitate proposed construction and installation works of cattle trough and its associated facilities. It will involve the following works but not limited to:

- Site Preparation
- Earth works;
- Civil works;
- Electrical and plumbing installation works;
- Supervision of construction works.

Site preparation activities and Earth works

Site preparation activities will include general clearance of the site. Other activities will be excavation works of the trenches and foundation for tank riser. All wastes as a result of site preparation will be safely disposed-off. Hands tools will be used for site clearance and preparation.

Materials inputs

The project will require various standard construction materials including cement, aggregates, sand, steel rods, timbers, pipes, electric cables, pumps, solar and water for the construction and installation works. Some materials will be obtained locally within Morogoro District, and others will be purchased from licensed local suppliers in Tanzania. Detailed list and quantity of construction materials required for construction and installation works is provided on Appendices (extract of BOQ).

Human Resources during Mobilization and Construction Works

Construction works will require a number of people skilled and unskilled. Construction of proposed project will require a total of about 20 people being skilled, semi-skilled and unskilled personnel at peak construction time. This period will last for about 6 months. Construction activities will be done by a qualified Contractor (registered by the Contractors Registration Board – CRB of Tanzania).

Transportation

Transportation of construction materials to the site will be done by trucks, using existing road networks in Morogoro region and Morogoro district in particular. It is anticipated that most of the construction equipment will be the property of Contractor.

Storage

Materials that are sensitive to weather such as cement will be stored in an on-site store. Other materials such as aggregates, gravel will be stockpiled at the site. Construction equipment will also be stored within

the site when not in use. Maintenance and repair of vehicles/trucks will be done in the existing garages in Morogoro. Filling of fuel for construction equipment will be done on site whereas for vehicles and trucks will be done outside the project area in existing fuel filing stations in Morogoro district.

Equipment and Machinery Requirements

The project will employ various types of construction equipment and machinery. Table2 below provides a list of machinery, equipment and vehicles that will be used during construction phase.

Table 2: Equipment requirement for mobilization and construction works

S/N	Quantity	Type	Activity
Borehole Drilling			
1	1	Rig	For drilling and Flushing
2	1	Compressor	For drilling and Flushing
3	1	Generator	For power supply during drilling
3	1	Pumping Test unit	For pumping test
Construction Machines			
1	1	Stationery concrete mixer	For preparation of concrete - concrete mixing
2	1	Concrete vibrator and poker	For vibrating concrete
3	1	Plate Compactor	For general compaction
4	1	Welding machine	For welding steel members etc.
Transport Facilities			
1	1	Dump/tipper trucks	For transport of construction materials such as gravel, sand, aggregates etc. and disposal of excavated materials
2	2	Light duty vehicles	For transport of light construction materials, stationery machines and staff
3	1	Supervision vehicles	For transport of staff for construction supervision purposes

Local supplies and services

Food supplies and medical facilities will be from the local suppliers and service providers in Bonye Village. However the contractor will provide room for local food vendors and ensure availability of First Aid medical services at the work place.

Construction supervision

Construction supervision of civil works shall be done by Engineers registered by Engineers Registration Board (ERB) of Tanzania. The supervision will be done in collaboration with the technical staff based at Wami/Ruvu Basin Water board in Morogoro. This will ensure smooth running of the scheme and adhere to the environmental standards.

2.5.4: Operation Phase

Operational phase will commence after construction works have been completed and proposed cattle trough and all of its associated structures are in place. It is projected that an average of 1500Cattles will be serviced per day and a total number of households that will be served in a community domestic point is 20. The following activities will be carried out:

- Provision of water to the cattle and community
- Proper management of water and its facilities such as the water pump, solar and pipe fittings
- Maintenance of the cattle trough, pump, solar panel and its associated structures

During the operation phase, the average capacity of the cattle trough at maximum estimation is expected to be able to serve 3000cattle per day. The significant quantity of utilities particularly water will be required for proper operation of the cattle trough.

2.5.5: Decommissioning Phase

The decommissioning phase will commence when operation of the health facility ceases due to various reasons. The main objectives of the commissioning phase are to ensure public health and safety are adhered, and to rehabilitate the project area to a state which will be favorable to other development activities. It will involve the following activities:

- ☞ Mobilization of the workforce;
- ☞ Dismantling of structures used during project implementation;
- ☞ Rehabilitation of the project site.

2.6: WASTE GENERATION AND MANAGEMENT

2.6.1: Waste Generation

Construction activities for the proposed project are expected to generate significant quantities of wastes. The major wastes expected from the project can be categorized into four waste streams; solid, liquid, hazardous and emission wastes. Table 3 below provides description of types of waste to be generated.

Table 3: Description of waste to be generated

Type of waste	Source and Characteristics
Overburden materials	Overburden materials shall emanate from earth/excavation works for establishment of foundations, and trenches. They will be generated during construction phase. It is estimated that about $10m^3$ of overburden materials will be generated.
Municipal solid waste	These will include garbage and rubbish (which includes papers, cardboards, woods, bottles, metals, plastic materials, containers and packaging materials They will be generated during construction and operation phases. It is estimated that about $15m^3$ will be generated during construction phase and about $1m^3$ per week during operation phase.
Liquid waste	This will include wastewater to be generated from sanitation facilities to be used by construction workers as well washing of equipment's/machineries. It is estimated that about 30 litres of wastewater will be generated per day.
Hazardous wastes	This includes chemical additives from construction activities such as paints, as well as leaking fuels and lubricants from poorly maintained trucks, vehicles and equipment. It is estimated that about 40 litres of this waste will be generated during construction phase.
Construction wastes	These are wastes generated as a result of construction works. It comprises surplus construction materials, waste from site clearance. It is estimated that about $8m^3$ of this waste will be generated during construction phase.
Emissions	These will include emissions from combustion of fossil fuels from construction vehicles and machinery.

2.6.2: Waste Management

Management measures which will be taken into account for management of waste to be generated due to construction activities and operation of cattle trough and borehole are summarized in Table 4 below.

Table 4: Waste management measures

Type of waste	Management Measure
Overburden materials	☞ Avoid unnecessary excavation of land thereby confining earth works to effective areas i.e. pipe laying and foundation works ☞ Stockpile and store most of overburden produced for backfilling and site rehabilitation ☞ Use the rest of overburden materials (if any) for land reclamation in the locality
Municipal solid waste	☞ Develop and implement a site specific solid waste management plan to prevent, minimize and control the disposal;
Liquid waste	☞ Develop and implement a site-specific liquid waste management plan to prevent, minimize and control the discharges; ☞ Construct onsite sanitation facilities i.e pitlatrine/ flush toilets ☞
Construction wastes	☞ Site construction waste management will be prepared and implemented. Some of waste will be used for land rehabilitation and backfilling of the trenches
Emissions	☞ Train drivers and operator to minimize emissions (e.g. shut off engines when vehicles not in use, etc.). Make use of efficient and well serviced vehicles and equipment's to minimize emissions

2.7: PROJECT AND EIA BOUNDARIES

2.7.1: Core Area of Project

The core project area constitutes the primary impact areas of the proposed project where the proposed cattle trough and borehole are located at Bonye Village, in Bwakila Chini ward in Morogoro District, Morogoro region.

2.7.2: Area of Influence of Project

This includes all areas extending beyond the immediate boundary of the project site and the wider area of project impacts. The size of the area of influence includes the entire Bwakilachini ward in Morogoro District, Morogoro region.

2.8: COST STRUCTURE OF THE PROJECT

The project investment costs comprises of all resources required to implement the proposed project on construction of Bonye cattle trough are estimated to be **220,000,000 TZS** (Two hundred twenty million Tanzanian Shillings. The project will be fully financed by IDA.

CHAPTER THREE

3. POLICY ADMINISTRATIVE AND LEGAL FRAMEWORK

3.1 INTRODUCTION

The environmental and social management in the United Republic of Tanzania are governed by the Environmental Management Act, (2004). Ministries and Local Government Authorities are responsible for environmental monitoring of projects under their jurisdiction. However, the Vice President's Office (VPO) has overall responsibility for environmental policy formulation, including coordination for and monitoring of the National Environmental Management Council (NEMC).

Since the proposed project on construction of cattle trough and drilling of borehole will be implemented in Tanzania, it has to comply with the Tanzanian's environmental and other related policies and legislations. The legislation applicable to this project addresses important aspects of environmental quality and proper management of natural resources. A policy framework is required to provide broad guidelines on areas of focus in undertaking environmental management activities in the particular sector. A legal and regulatory framework is essential for providing mandate, allocating specific responsibility and accountability to key actors and stakeholders, and also prescribes and enforces specific operating environmental procedures and standards. Finally an institutional framework is required to develop policies, guidelines and plans; to ensure compliance with laws and regulations; and to monitor, review and adapt policies, plans and regulations in the light of experience.

It is anticipated that the proposed project will result into a number of environmental and socio-economic impacts that must be addressed during the project cycle. The actions associated with mobilization, construction, operation and decommissioning phases of the project, have various positive and negative impacts. While the resulting negative impacts must be addressed so as to maintain the integrity of the environment, the project Proprietor must also ensure compliance to various policies and/or legal regimes that govern environmental management and other socio-economic issues. Since the execution of proposed project touches on various sectors, one has to comply with a number of policies and legislations relevant to the proposed project. This chapter addresses policy, legal and administrative framework which governs the environmental and social issues pertaining to the planning and implementation of this proposed project.

3.2 POLICIES

There are a number of sectorial policies that consider EIA as one of the planning tools for facilitating and promoting sustainable development. These policies envisage that by integrating environmental considerations in the decision making process is possible to avoid and minimize impacts associated with project implementation and that may have negative effects to the environment. The policies presented in the subsequent sub sections are some of the relevant sectoral and cross-sectoral policies that require undertaking of an EIA study prior to commencement of project implementation. In addition, these policies provide directives on the management of the project in order to ensure minimum impacts on the concerned natural resources and sensitive ecosystems.

3.1.1 The National Environmental Policy (1997)

The National Environment Policy (NEP, 1997) is the main policy document governing environmental management in the country. The policy addresses environmental issues as both natural and social concerns, and adopts the key principle of sustainable development. In terms of environmental management and protection, the policy identifies the following problems that are relevant in construction sector development:

- Land degradation;
- Lack of access to good quality water;
- Environmental pollution;
- Loss of wildlife habitat and biodiversity;

- Deforestation;
- Deterioration of air quality.

The policy requires EIA to be mandatory for all development projects likely to have significant environmental impacts. The intention is to ensure that the development projects are implemented in an economically sustainable manner while safeguarding environmental and social issues for the benefit of the present and future generations.

In undertaking this EIA study, Wami/Ruvu Basin Water board has observed one of the requirements of the NEP (1997) and will continue to observe other requirements of this policy during the whole life cycle of the project. The policy proposes the following measures as means for minimization of pollution likely to emanate project operations:

- Overall project cycle of the proposed project shall be adequately managed to minimize adverse environmental impacts;
- Waste discharge to surrounding environment shall be properly controlled;
- Preventive and clean up measures for accidents shall be formulated and implemented;
- Air pollution and noise level shall be controlled;
- Regular and periodic environmental audits shall be maintained to ensure the adoption of environmentally sound practices in project operations.

3.1.2 National Land Policy of 1995 (Revised in 1997)

The National Land Policy recognizes the need for protecting environmentally sensitive areas. The policy emphasizes on the protection of environment and natural ecosystems from pollution, degradation, and physical destruction. In addition, the policy recognizes the importance of social services such as water, roads, energy, and solid waste management for environmental protection. Thus, MoW, Wami/Ruvu basin water board shall observe the provisions of this Policy thereby conserving prehistoric sites and buildings, protecting environment and natural ecosystems from pollution, degradation, and physical destruction throughout project cycle.

3.1.3 National Water Policy (NAWAPO), (2002)

The National Water Policy (NAWAPO) recognizes freshwater as a basic natural resource, which sustains life and provides for various social and economic needs. In its natural state, water is an integral part of the environment whose quantity and quality determine how it can be used. Safe drinking water and good sanitation practices are basic considerations for human health. Also, the policy recognizes that access to adequate and safe water is a basic need and right for all human beings in order to improve health and alleviate poverty. The use of contaminated sources poses health risks to the population as evidenced by the incidences of water borne diseases such as diarrhea and cholera. Thus efficient management and equitable use of water should be promoted.

The main objective of NAWAPO is to develop a comprehensive framework for sustainable development and management of the Nation's water resources, in which an effective legal and institutional framework for its implementation is put in place. The policy aims at ensuring that beneficiaries participate fully in planning, construction, operation, maintenance and management of water supply and sanitation facilities for their sustainability. Furthermore NAWAPO encourage health safeguarding through safe disposal of excreta and solid waste. This shall be achieved by integrating water, sanitation and hygiene education programs. Also it insist that the provision of water supply and sanitation services water required to meet basic human needs shall enjoy priority number one of use by right. It is imperative that MoW and its Basin water boards are aware of NAWAPO.

3.1.4 National Policy on HIV/AIDS (2001)

HIV/AIDS is still a national, indeed a global disaster that calls for initiatives at National and global levels to contain it. It's a serious threat to the survival and development of the nation. National AIDS policy of 2001 explains about stigma and HIV/AIDS as one of the key challenges in the prevention and control of epidemic. In Tanzania like in other countries in South of the Sahara, stigma against HIV/AIDS remain very strong and play a major role in fuelling HIV infection. Fighting for this epidemic involves health workers, political leaders NGO's, PLHAS, community leaders and families. In order to guide the National policy on HIV/AIDS, the following are main relevant principals;

- All members of the community have individual and collective responsibility to actively participate in the prevention and control of HIV/AIDS epidemic;
- Strong political and government commitment and leadership at all levels in necessary for sustain and effective intervention against HIV/AIDS epidemic;
- Individuals are responsible for protecting themselves and others contracting infection through unprotected sexual intercourse and unsterilized piercing objects;
- Community have the right information on how to protect its member from further transmission and spread of HIV/AIDS;
- Pre- and post- counselling of HIV testing shall observe professional ethics with the emphasis on confidentiality and informed consent;
- Given the vicious circle between the HIV/AIDS and poverty, interventions for the control of epidemic should be simultaneously related by poverty alleviation initiatives.

Wami/Ruvu basin water board shall work in line with the contractor on provisions of this Policy during all phases of this proposed project.

3.1.5 The Gender Policy (1999)

The key objectives of the policy are to provide guidelines that will ensure that gender sensitive plans and strategies in all sectors and institutions are developed. While the Policy aims at establishing strategies to eradicate poverty, it puts emphasis on the gender quality and equal opportunity of both men and women to participate in development undertakings and to value the role played by each member of the society. Wami/Ruvu basin water board shall ensure that women are engaged in the project throughout the project cycle.

3.1.6 Construction Industry Policy, 2003

The objective of the Policy is to develop competitive construction industry with consideration of environmental responsibility in the implementation of construction projects. The aim is to promote the application of sustainable construction practices that are environmentally friendly. This includes application of technologies, products and practices which are not harmful to the environment, human health and safety; promoting education and training; and undertaking Environmental Impact Assessment (EIA) of projects. Wami/Ruvu basin water board office is in line with this policy objective through conducting EIA study for the proposed project.

3.1.7 National Employment Policy, 2008

Employment creation is a multidimensional issue involving all Tanzanians, Government Ministries, Departments and Agencies, Regional and Local Authorities, The Private Sector, Employers and Workers organizations, the Development Partners and a wide range of various NGOs and Civil Society organizations. The aim of National Employment Policy is to stimulate an adequate employment growth in our economy, in order to reduce unemployment and underemployment rates and eventually attain full, productive, and decent employment for all Tanzanians. The overall vision of this National employment Policy is to have society engaged in decent gainful employment capable of generating adequate income to sustain it, and reduce poverty as envisaged by the Tanzania Development Vision 2025, the National

Strategy for Growth and the Reduction of Poverty (MKUKUTA), as well as facing the challenges of labour Market gaps in the globalized economy.

The specific objectives of the National Employment Policy include the following:

- Enhance skills and competencies for those in the formal and informal sector especially rural areas;
- Promote the goal of decent and productive employment as a national priority and enable all participants in the labour force to gain productive and full employment;
- Promote equal access to employment opportunities and resources endowments for; marginalized and vulnerable groups, including women, youth and people with disabilities;
- Put in place conducive and enabling environment to promote growth of the private sector and transformation of the informal sector into formal;
- Ensure income security and social inclusion;
- Safeguard the basic rights and interests of workers in accordance with International Labour Standards.

The proposed project is expected to generate employment opportunities in all phases of its implementation. Therefore Wami/Ruvu basin water office is in line with the aim and vision of this policy.

3.3 THE LEGAL FRAMEWORK

In addition to the above policies, there are a number of legal and regulatory frameworks that power production projects must comply with, and which this EIA study has taken into consideration. In addition to the National Environmental Legislation, the Sectoral Legislations also must be observed by the project. Some of the relevant legislation and regulations that are relevant to the proposed project include the following:

- Environmental Management Act (2004);
- Environmental Impact Assessment and Audit Regulations (2005);
- Land Act, (No.4), 1999;
- The Water Resources Management Act (WRMA), 2009.
- Water Supply and Sanitation Act, 2019
- National Land Use Planning Commissions Act (No. 3), 1984;
- Occupational Health and Safety Act, (No. 5), 2003;
- Environmental Management (Solid Waste Management) Regulations (2009);
- Environmental Management (Water Quality Standards) Regulations (2007);
- Environmental Management (Hazardous Waste Management) Regulations (2007);
- Environmental Management (Air Quality Standards) Regulations (2007);
- Environmental Management (Soil Quality Standards) Regulations (2007);
- Employment and Labour Relation Act, ;
- HIV/AIDS Act, 2001;
- The Prevention and Control of HIV/AIDS Act, 2008;

3.3.1 The Environmental Management Act, (No. 20), 2004

The Environmental Management Act (EMA) Cap 191, 2004 provides the legal and institutional framework for sustainable management of the environment in implementation of the National Environment Policy. The Act outlines principles for environmental management such as precautionary principle; polluter pays principle; and the principle of public participation in development policies, plans and processes for the management of the environment. EMA lists all major development project including urban projects (multi-storey building, motor terminals, markets etc.) requiring undertaking an EIA. The EMA and the Environmental Impact Assessment and Audit and Regulations (2005) and its amendment of 2018 provide for the preparation of EIA and specify the procedures for undertaking the study and the details of the Environmental Impact Statement that must be submitted for approval. Further, the EMA (2004) and its

regulations set out the requirements for environmental audit, monitoring and reporting and ensuring adherence to commitments made under the approved Environmental Management Plan (EMP).
In line with this Act, the project proponent of the current project, referred to as "The proposed construction cattle troughs at Bonye and drilling of borehole Wami/Ruvu Basin Water Board (WRBWB) shall continually observe and abide by the provisions of this Act. The WRBWB is also aware of the general penalty provided for commitment of an offence against any provision of this Act for which no other penalty is specifically provided.

3.3.2 The Environmental Impact Assessment and Audit Regulations, G.N. No. 348 of 2005

The Environmental Impact Assessment and Audit Regulations No. 349 of 2005 were made pursuant to the Environmental Management Act No. 20 of 2004. The regulations provide the basis for undertaking Environmental Impact Assessments and Environmental Audits for various types of development projects with significant environmental impacts. Regulation 46(1) classifies projects into two types:

- Type A – projects requiring a mandatory Environmental Impact Assessment; and
- Type B – projects requiring an Environmental Audit (EA)

According to this regulation, the developer first registers the project, by submitting project brief, and Form EIA 1 to NEMC, with outline details of the project and its likely impacts. The regulations advocate for periodic and independent re-assessment and that the outcome of such assessment will serve to provide instructive feedback into the environmental management process. By carrying out this EIA study, WRBWB and its partners has complied with the requirements of this regulation.

3.3.3 The Land Act (No. 474), 1999 and its Amendment of 2004

The major function of this land act is to promote the fundamentals of the "National Land Policy" through giving clear classification and tenure of land, land administration procedures, rights and incidents of land occupation, granted rights of occupancy, conversion of interests in land, dispositions affecting land, land leases, mortgaging of land, easements and analogous rights, co-occupation and partitioning and, settlement of land disputes. One of the pertinent issues when dealing with land is the right of occupancy. The project will be implemented in the land which is legally owned by Morogoro District Council. In ensuring harmony with other land users in the area, Morogoro District council shall continue to observe the provisions of the Act and its regulations.

3.3.4 The Water Resources Management Act (WRMA), 2009.

The Water Resources Management Act (No.11), 2009 provides the objectives and principles of water resources management, water management plans, water use permits, discharge permits and ground water permit. The Act outlines principles for water resources management such as precautionary principle; polluter pays principle; the principle of eco-system integrity, the principle of international cooperation in management of the environmental resources shared by two or more states and the principle of public participation in development policies, plans and processes for the management of the environment. The Water Resource Management Act is the major legislation governing the management of water in Tanzania. The objectives of Water Resources Management Act is to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in a ways that take in to account all fundamental principles (in section 4.-(1)a-j.
WRBWB strives at protecting the water sources to comply with the provisions of the Water Resource Management Act, 2009 for betterment of water sources.

3.3.5 The Environmental Management (Solid Waste Management) Regulations, 2009

According to Regulation 7, every person living in Tanzania have a stake and a duty to safeguard the environment from the adverse effects of solid wastes and to inform the relevant authority on any activity and phenomenon resulting from solid waste that is likely to adversely affect the public and environment. For the purposes of ensuring minimization of the solid waste in their respective areas of jurisdiction, local

government authorities shall ensure compliance and enforcement of these regulations in their respective jurisdictions (Regulation 7).
Also, according to Regulation 13, Local government authorities shall ensure that every occupier of premises, business, industry or any activity generating solid waste minimizes the waste at its source by ensuring that; different types or kinds of solid waste are separated at the Source; different types or kinds of solid waste are collected into waste storage receptacles of specified standards, types, sizes, shapes, colours, easy to carry or move of waste containers, comply with and other specifications as the case may be.

The proposed project is expected to generate solid wastes during all phases of its implementation. WRBWB shall comply with all relevant waste management provisions during implementation of the proposed project.

3.3.6 Environmental Management (Water Quality Standards) Regulations (2007)

Section 6(1) of these Regulations describes about the prohibition to discharge hazardous substances, chemicals and materials or oil etc. No person shall discharge any hazardous substance, chemical, oil or mixture containing oil in any waters except in accordance with what is prescribed under these Regulations or any other written law. Furthermore section 6(1) state that a person who discharges any hazardous substance, chemical, oil or mixture containing oil in any waters or any other segment of the environment commits an offence. The proposed project will generated hazardous waste particularly medical waste during operation phase. Thus WRBWB shall ensure that this project complies with the provisions of this Act.

3.3.7: The Environmental Management (Hazardous Waste Control and Management) Regulations, 2009

The Regulation aims to control all categories of hazardous waste and to the generation, storage, transportation, treatment and disposal and their movement. Every person living in Tanzania has a duty to safeguard the environment from adverse effects of hazardous waste and inform a relevant authority on any activity and phenomenon resulting from hazardous wastes that is likely to adversely affect the environment and human health (Regulation.6). Any person generating handling or transporting hazardous waste or exercising jurisdiction under the regulation should be guided by principles of environmental and sustainable development; the precautionary principle; polluter pays principle and the producer extended responsibility (Regulation.4). The proposed project will generated hazardous waste particularly medical waste during operation phase. WRBWB shall observe the provisions of this Regulation during project implementation.

3.3.8 Environmental management (Quality Standards for Control of Noise and Vibration Pollution) Regulation, 2011

Part III section 6(1) of the regulation prohibit any person to make or cause any loud, unreasonable, unnecessary or unusual noise that annoys, disturbs, injures or endangers the comfort, repose, health or safety of other and of the environment. Part IV section 7(4) of the regulation express that the maximum noise level from a construction site as described in column 1 shall not exceed the level specified in Column 2. For the purposes of enforcing environmental noise and vibration standards and criteria Section 26(1), the council or an environmental inspector may order or carry out investigations of actual or suspected noise or excessive vibrations including the collection of samples, records and data. Construction phase of the proposed project is expected to generate significant levels of noise and vibration from use of construction equipment and machines. WRBWB and Contractor to be engaged for construction works shall comply with the requirements of this Regulation.

3.3.9: Occupational Health and Safety Act (No. 5), 2003

According to Occupation Health and Safety Act no 5, 2003, any person owning a factory or workplace is required, to register such factory or workplace under this act prior to its operation. A thorough pre-

placement and periodic occupational medical examination is mandatory under the Act. In addition, an exit medical examination carried out by a qualified occupational health physician is required for each employee leaving the factory. Other provisions for safety and health while attending to machinery and other works are provided. Main items of legislation pertaining to health and safety are found in the following regulations (1) The act deals with regulation of health, safety, and welfare of workers in factories and workplaces; (2) The Act sets standards for health, safety, and welfare.

The proposed project is expected to cause significant occupational health and safety hazards and risks during all phases of its implementation. WRBWB and Contractor to be engaged during construction phase shall strive to comply with all relevant requirements of this Act.

3.3.10: Employment and Labour Relation Act, 2004

The age classification of child labour and type of work to be employed without prejudice his/her social development is provided on Sections 5-(1), (2) and (3) of this Act. Also section 7 (1) provides details on condition of good and reliable employment environment. Furthermore, section 11(1) provides that provision of this Act on wage determination that stipulates a minimum term and condition of employment as shall be the employment standard. Section 11(2) and 14 (1) give the detail on employment contractual conditions. On other hand section19-(1), (2), (3) and (5) state the working duration and overtime conditions, moreover, section 31 provides details information on employment leave and section 32-(1),(2) and (3) provide the information on the sick and maternity employees on payment status, sick and maternity leave. The proposed project will generate employment opportunities during all phases of its implementation. WRBWB and Contractor to be involved in construction of the proposed project shall comply with all relevant stipulated conditions in Employment and Labour Relation Act, 2004.

3.3.11 Workers Compensation Act, 2008

The Act focuses mainly on:

- Provision for adequate and equitable compensation for employees who suffer occupational injuries or contact occupational diseases arising out of, and in the course of their employment, and in the case of death to their dependants;
- Provision for the rehabilitation of employee who have suffered occupational injuries or contacted occupational diseases in order to assist in restoring their health in dependence and participate in society;
- Provision for a frame work for the effective prompt and empathetic consideration, settlement and payment of compensation benefits to employee and their dependants;
- Provision for the establishment, control and administration of workers to compensation fund, and the legal framework for the contribution to and payment from the fund;
- Give effective to international obligations with respect to compensation and
- Promote prevention of accidents and occupational diseases.

This Act provides the right for compensation to workers for occupational injury in section 19 (1) - (5) or accident in section 20 and 21. Also in section 22 (1) - (5), employees have the right to compensation for occupational diseases. The proposed project will generate employment opportunities during all phases of its implementation. WRBWB and Contractor to be involved in construction of the proposed project shall abide by all relevant sections provided by this Act.

3.3.12: The HIV and AIDS (Prevention and Control) Act 2008

The Act focus basically on provision of the prevention, treat, care support and control of HIV and AIDS, for provision of the public health in relation to HIV and AIDS; to provide for appropriate treatment, care and support using available resources to people who are living with or at risk of HIV and AIDS and to provide for related matters under this Act, Section 4(1) gives details to promote public awareness on cause, mode of transmission, consequences, prevention and controls of HIV and AIDS. Further describe mode of reduction in spreading, prevalence on STI's in the population and adverse impacts resulting from HIV and

AIDS as well as protection right of orphans. The increase of care, support and access to person living with HIV and AIDS and HIV is also described in section 4(1) (f).
Further section 6(1) and (2) describe the necessity of private sectors in collaboration with Government in implementation Programs and Plans aim at or geared toward prevention, care of patients and control of HIV and AIDS in their respective area. Section 6(4) stipulates that TACAIDS as the main coordinator and advices of such matters. Further in section 8(1) describes the necessity of activities to be conscience on the public awareness of HIVS and AIDS, in addition, section 9 describes also, to coordinates and establish workplace Programs on HIV and AIDS for employees under his control and such Program involve provision of gender responsive HIV and AIDS education, distribution of condoms and support to people living with HIV and AIDS (awareness creation). In addition, section 19(2), describes the provisions of community based HIV and AIDS prevention, support and care services. WRBWB and Contractor to be involved in construction of the proposed project shall adhere to the provisions of this Act during all phases of the project implementation.

3.3.13: The Prevention and Control of HIV/AIDS Act, 2008

This Act in section 4-(1) provides relevant information consign person, institution and organization living or registered in Tanzania to promote public awareness and reduce the spread of HIV and AIDS and increase access to care and support to the person living with HIV and AIDS. Section 5 – safety and universal precautions shall be promoted by the Ministry concerning invasive medical and non-medical practices in order to reduce the risk of transmission of HIV and AIDS. Also, section 9 provides that every employer in consultation with the ministry shall establish HIV and AIDS program in working place. Another Relevant section of this Act is section 31 which restrict stigmatize in any manner to a person suspected of HIV and AIDS status. WRBWB and Contractor to be involved in construction of the proposed project shall abide by all relevant sections provided by this Act.

3.3.14 Contractors Registration (Amendment) Act No 15 of 2008

This Act provides some amendments to or repeals some articles of the Principal Act (No. 17 of 1997) and thus it does not repeal it. The Act establishes the Contractors Registration Board (CRB). The Board has a mandate to register contractors, regulate the conduct of the contractors and for related matters. Among other things CRB is required to take legal action against unregistered contractors who undertake construction; installation, erection or alteration works; ensure that all construction sites are hoarded; and labour laws, occupational health and safety regulations in the construction industry are adhered to. The proposed project will involve construction works during construction phase. WRBWB shall therefore engage registered contractor by CRB for construction works and make sure that the provisions of the Act are adhered to.

3.3.15 The Environmental Management Regulation, 2013 (Standards for the control of noise and vibration)

Part III section 9 (1) of the regulation provide general prohibitions of the noise level. It prohibit any person to make or cause any loud, unreasonable, unnecessary or unusual noise that annoys, disturbs, injures or endangers the comfort, repose, health or safety of other and of the environment. Section 10(4) of the regulation express the permissible noise levels in the construction site. It states that the maximum noise level from a construction site to which a person may be exposed, shall not exceed the level specified in Schedule 4 to these Regulations. Section 23 of this Regulation states that any person intending to carry out construction, demolition, mining or quarrying work shall, during the Environmental Impact Assessment studies: (a) identify natural resources, land uses or activities which may be affected by noise or excessive vibrations from the construction, demolition, mining or quarrying; (b) determine the measures which are needed in the plans and specifications to minimize or eliminate adverse construction, demolition, mining or quarrying noise or vibration impacts; and (c) incorporate the needed abatement measures in the plans and specifications.

Part IV section 24 provides measurement and control of noise. Section 24 (1) states that person shall not cause noise from any source which exceeds any sound level as set out in the applicable Schedule to these Regulations whereas section 24 (2) states that measurements shall be taken by the person causing the noise. Section 24(5) states that any person who makes noise in excess of the prescribed levels commits an offence. Section 25 ((1) states that person responsible for noise pollution or likely noise pollution shall undertake measurement of noise in accordance with these Regulations. Construction phase of the proposed project will use a number of equipment and machineries which might generate significant level of noise and vibration. WRBWB and Contractor to be engaged for construction works shall comply with the requirements of this Regulation.

3.4 DEVELOPMENT POLICIES AND STRATEGIES

3.4.1 The Tanzania Development Vision 2025

The Tanzania development vision 2025 is a re-assertion of a desirable future for Tanzanians by 2025. The Vision 2025 aims at achieving a high quality livelihood for its people. Attain good governance through the rule of law and develop a strong and competitive economy.

Tanzania's Development Vision 2025 aims at achieving an absence of abject poverty and attaining a high quality livelihood for all people that is socially desirable, economically viable and environmentally sustainable by 2025. Increased access to safe water and access to quality health services plays a key role in attainment of Tanzania's Development Vision. In the Vision 2025, "access to quality reproductive health services for all individuals and reduction in infant and maternal mortality'' are among the most important health service goals cited. Water supply, sanitation and water resource management also features prominently in the Development Vision.

The proposed project aim at improve the water quality and quantity through source protection. The project will also improve water supply and sanitation in the project area. Therefore the proposed project will be well aligned with the Tanzania Vision 2025 in contributing towards realization of the one of the principal goals of the vision which is attainment of a quality livelihood for all by 2025.

3.5 INTERNATIONAL AGREEMENTS AND TREATIES

3.5.1: ILO C138 Minimum Age Convention, 1973

The ILO Minimum Age Convention, 1973 (No.138) sets the age below which children should not be in work at 15 (or 14 if a country's economic status requires that in the short term). Two years before they reach this minimum legal age, children can do 'light work' - non-hazardous work for no more than 14 hours a week, and that does not interfere with schooling. Children under the minimum working age who are engaged in more than light work are in child labour. This Convention was ratified by the United Republic of Tanzania on the year 1998.

The project proponent (WRBWB) and Contractors to be engaged for construction works shall ensure no child is employed during all phases of project implementation in order to abide to the requirements of this Convention.

3.5.2: ILO C148 Working Environment (Air Pollution, Noise & Vibration) Convention, 1977

Working Environment (Air Pollution, Noise and Vibration) Convention, 1977 is an International Labour OrganizationConvention (No. 148) concerning the protection of workers against occupational hazards in the working environment due to air pollution, noise and vibration. Construction phase of the proposed project will use a number of equipment and machinery which might generate significant level of noise and

vibration. WRBWB and Contractor to be engaged for construction works shall strive to comply with the requirements of this Convention.

3.6 INSTITUTIONAL FRAMEWORK

This section provides description of national and local authorities and institutions involved in reviewing and approving projects as well as issuing permits and other management functions pertaining to the project. Authorities relevant to the proposed project on construction of Cattle trough and drilling of borehole at Bonye village, Bwakilachini Ward in Morogoro are presented herein under:

3.6.1: Environmental Management Authorities

The Tanzania Environmental Management Act, Cap 191 (2004) is the principal Act that establishes and sets out roles and responsibilities for institutions and bodies for management of environment issues of concern. EMA supersede other Acts in this regard with the exception of the National Constitution. EIA Regulation identifies different functions and assigns responsibilities to all parties involved in the EIA process of any proposed development undertaken for which EIA is obligatory.

(a) Minister Responsible for Environment

Established under EMA Cap.191 Section 13 to issue guidelines and designate duties to various entities. Under the EIA and Audit Regulations, 2005 the Minister is responsible for approval by issuing of decision letter / EIA Certificate for development projects. The Minister may delegate responsibility for EIA authorization to Director of Environment, LGAs and Sector Ministries.

(b) Director of Environment

Established under EMA, Cap. 191 Section 14 to coordinate, advice, assess, monitor and report environmental related aspects and activities. Division of Environment is responsible for policy and legal formulation and implementation; promoting the integration of environmental considerations into development policies, plans, programmes, strategies and projects; undertaking strategic environmental assessment. Under the EIA and Audit Regulations, 2005, it is the Director who provides advice to Minister for approval of Environmental Impact Statement report (EIS) of development projects.

(c) National Environment Management Council

Established under EMA, Cap. 191 Section 16; to undertake enforcement, compliance, review and monitoring of environmental impact assessment. Specifically section 18(2) (d) review and recommend for approval of Environment Impact Statement. The EIA and Audit Regulations, 2005, provide specific roles and responsibilities to NEMC in the undertaking EIA / PEA for new development projects (Part III – XI); Environmental Audit for existing development projects (Part X); and Environmental Monitoring and Reporting (Part XI).

(i) Environmental Impact Assessment EIA

- Registration/ application;
- Screening (assigning the appropriate level of environmental assessment to project);
- Facilitates public/stakeholders participation in environmental decision making;
- Review of Environmental Assessment reports: constitutes multidisciplinary, multi-sectoral committees to review the adequacy of EIS;
- Issuing of decision letters: screening results, approval of ToR and scoping report; and approval of EIA/PEA reports;
- Disclosure of EIS / EA report;
- Recommendations to the government for approval and clearance of EIA Certificates for projects.

(ii) Audit

- Undertaking Control Audits to check compliance or verify Self Audit reports (Regulation 49);
- Issuing Post Audit Orders: an improvement order for corrective measures for mitigating the environmental degradation revealed during audit study (Regulation 54).

(iii) Monitoring

- Monitoring environmental phenomena, operations of any industry, project or activity (Regulation 57(1)(a));
- Monitoring on-going projects on a continuous basis in consultation with Sector Ministry, Government Department, Agency or Institution.

Under the EMA, NEMC is empowered to establish specific offices or to appoint or designate officers to effectively perform its functions. Section 26: "NEMC may delegate to any sector Ministry, environmental body, employee or agent of the Council, the exercise of any of the powers or the performance of any of the functions or duties of the Council under the Act".

(iv) Registrar of EIA Expert /Firm of Experts /Environmental Auditor

Empowered under the Environmental (Registration of Environmental Experts) Regulations, 2005 to register and keep registry of qualified firms/individuals authorized to offer services in undertaking EIA, Initial and Control Environmental Audit Environmental Inspection, and other technical support.

(v) Environmental Inspector (Appointed or Designated)

Inspectors are empowered under the EIA and Audit Regulations, 2005 to enter on any land, premise or facility of the project for the purpose of inspection, to examine records and to make enquiries on the project (Regulation 55) or for the purpose of monitoring the effects of activity carried out on that land, premise or facility upon the environment (Regulation 58).

(vi) NEMC Zonal Offices

The zonal offices headed by Environmental Management Coordinators replicate all functions and departments of NEMC including overseeing Compliance and Enforcement; EIA; Research and Planning; and Environmental Information, Communication and Outreach. NEMC target 7 such offices namely: Lake Zone (Mwanza (centre), Geita, Kagera, Mara, Simiyu and Shinyanga); North Zone (Arusha (center), Tanga, Kilimanjaro, Manyara); Southern Zone (Mbeya (center), Iringa, Njombe, Rukwa, Ruvuma); South-Coast Zone (Mtwara, Lindi); Central Zone (Tabora, Kigoma, Dodoma, Singida); and Coast Zone (Dar es Salaam, Pwani, Morogoro). The proposed site is located in Morogoro Region falls under the jurisdiction of the Coast Zone.

(d) Sector (Ministries) Environmental Sections

Established under EMA, Cap. 191, Section 30, is responsible for all sector–specific environmental matters within the Ministry. The EIA and Audit Regulations, 2005 stipulates specific functions for relevant sector Ministries, Government Departments, Agency or Institutions including participation in Cross-Sectoral Advisory Committee for review of EIA Reports; review and verification of Environmental Audit Reports (Regulation: 53); monitoring on-going projects on a continuous basis (Regulation:58 (1); and to prepare and submit Monitoring reports to NEMC.

(e) Regional Secretariat

Established under the Regional Administration Act, 1997; Part II, Section 10 to assist the Regional Commissioner in the exercise of his functions in the region: EMA, Cap. 191 Section 34 confers additional roles to the Regional Secretariat to coordinate all environmental matters within respective region.

(f) Local Government Authorities

They are established under the Local Government Acts, 1982 to perform basic functions including promoting social and economic wellbeing and development of areas and people within jurisdictions. EMA, Cap. 191 direct that additional functions for the environment committees include any that are prescribed under EMA or assigned by Minister for Environment. Section 41 confer General Powers to the LGAs including to undertake inquiries and investigations, summon any person, resolve conflicts among various parties, inspect and examine any premise, order to remove substance or article harmful to the environment and prosecute or sue any violator.

- LGA Environment Management Officer (designated / appointed)

Established under EMA, Cap. 191 Municipalities, Districts to enforce, advice the Environment Management Committee, gather/ manage information, and report on state of local environment. Specifically section (36 (3) (f), EMO are tasked to monitor the preparation, review and approval of environmental impact assessment for local investments. Section 39 provides for Municipal Environmental Management Officer to coordinate all functions and activities for protection of environment within the municipality.

- LGA Standing Committee on Urban Planning and Environment

The Committee is established under Section 42 (1) of the Local Government (Urban Authorities) Act, 1982 as a standing committee responsible for urban planning. Functions of the standing committee are determined by respective urban LGAs for better performance of its functions and efficient management of its duties.

- Standing Committees of Economic Affairs, Works and Environment of a District or Township

Established under Section 96(1) of the Local Government (District Authorities) Act, 1982 to perform functions provided determined by the respective District or township authority. EMA, Cap. 191 Section 38 directs that additional functions for the environment committee include overseeing proper management of environment within District or Township.

(g) Registered EIA Expert /Firm of Experts /Environmental Auditor/Environmental Inspectors

Established under the Environmental (Registration of Environmental Experts) Regulations, 2005 these are qualified firms/individuals authorized to offer services in undertaking EIA, Initial and Control Environmental Audit, Environmental Inspection, EIA training and other technical support.

(h) Other Actors

The EIA and Audit Regulations, 2005 stipulate tasks to a number of other actors who performing under the auspices of NEMC in accordance with the regulations:

- **Investor/ Developer / Project Proponent**

This is the proponent of the project or undertaking subject of any environmental assessment requiring authorization. The Project Proponent is required to:

- Oversee and meet costs of Environmental assessment and implementation of Environmental Management Plan(EMP)/Environmental Monitoring Plan (EMoP) - (Regulations: 46 (3) and (4);
- Undertake Initial Environmental Audits and Environmental Control Audit, Self-auditing during implementation of EMP (Regulation: 50/57 (1) (c);
- Undertake Baseline survey before project implementation as basis for effective monitoring.

- **General Public**

The General public is empowered by EMA Cap. 191 and EIA and Audit Regulations, 2005 to participate in all environmental management matters concerning them and at all stages of the EIA process specifically to raise issues and concerns and to appeal when dissatisfied

3.6.2: Land Management Authorities

Minister Responsible for Lands / Land Use Planning is established under the Land Policy and the Land Act Cap 113 (Section 8) as the sole authority over all land matters. The Land Act poses to Minister the duty of policy formulation and implementation of Land Policy and Act. The Minister is directed to perform a number of functions (delegated to the Commissioner for Lands) including issuing permit for using land (other than village or reserved land).Under the Urban Planning Act (Section 5) the Minister ensure incorporation of principles of urban planning in planning processes and use and development of land. The Minister is empowered to designate any Body or Organ as a planning authority (Section 7 (4)) and to declare any area of land to be a planning area (Section 8(1)).

3.6.3: Physical Infrastructure Authorities

(a) The National Construction Council (NCC)

Established to advise the government on all matters relating to construction industry; to provide advisory services and technical assistance to construction industry stakeholders; implementation of standards, regulations and codes of practices on all related to the construction industry; to promote the use of innovative technologies and the application of best practices in the construction industry; and to promote environmentally sustainable construction practices including health and safety aspects.

(b) Engineers Registration Board (ERB)

The Board has the responsibility of monitoring and regulating engineering activities and the conduct of the engineers and engineering consulting firms in Tanzania. Under the law, it is illegal for an engineer or an engineering firm to practice the profession if not registered with the Board.

(c) Contractor Registration Board (CRB)

Established to register contractors and regulate the conduct of the contractors. CRB is required to take legal action against unregistered contractors who undertake construction, installation, erection or alteration works. CRB also ensure also all construction sites are hoarded and labour laws, occupational health and safety regulations in the construction industry are adhered to.

3.6.4: Public / Occupational Health, Security and Safety

(a) Occupational Health and Safety Authority (OSHA)

Established to oversee safety, health and welfare of persons at work, carries out all workplace inspections, including general inspections, plant and electrical inspections. It conducts industrial hygiene surveys and measurements, occupational health examinations of workers, offer advice on ergonomics and scrutinize workplace drawings.

(b) Ministry of Labour Occupational Health and Safety Inspectors

Established to keep record of publication on health and safety standards which are incorporated in the regulations, rules, or orders, to keep and maintain register of factories, to record amendments of substitution of any health and standards so published.

(c) Ministry of Home Affairs, Fire and Rescue Services Force

Established to Protection against fire hazards, to issue permit for use of fire-fighting equipment's, Inspection of fire equipment commissioning of fire protection and detection system installed, to perform research on fire hazards and fire incidences.

(d) Tanzania Commission for Aids - TACAIDS

The Commission is established for prevention and control spread of HIV/AIDS, to promote advocacy and education on HIV/AIDS; to protect human and communal rights of people infected with and affected by HIV/AIDS.

CHAPTER FOUR

4.0 ENVIRONMENTAL AND SOCIO-ECONOMIC BASELINE

4.1 INTRODUCTION

This chapter provides a description of relevant environmental, economic and social characteristics of the project core area, areas in the immediate vicinity (Bonye Village wherein the project area is located), as well as a broad description of the area of influence i.e. Bwakilachini ward and the Morogoro region at large. The level of detail in the various sections depends on the interactions between the project activities and the particular environmental or socio-economic aspects. Information provided in this chapter will be superimposed onto the project concept and components for impact identification, evaluation and development of mitigation measures.

4.2 SITE DESCRIPTION

The location earmarked for the proposed project is at Bonye village in Bwakilachini ward in Morogoro rural district. The area is within livestock keepers grazing area as per village land use plan that designated area for crop cultivation activities (farmers) and livestock keeping. The site contains a total approx. 4,500Sqm. (square meter) of land area which is also legally owned by Morogoro District council after being legally voluntarily donated by Bonye village council for construction of cattle trough and related activities/components. The cattle trough is located along Kisaki Road road approximately 5 km from Bwakilachini Center. The proposed project site is bare land. There is neither endangering flora nor fauna at the project site.

Plate 3: A section of proposed project site (Source: Wami/Ruvu Basin water office, 2019)

4.3 SITE CONDITIONS

4.3.1: Topography

The project site is within Morogoro rural district one of the six districts of the Morogoro Region. Morogoro Rural District covers an area of 19,056 square kilometers bordered by Pwani Region to the north and east,Kilombero District to the south, Kilosa Districtto the southwest, Mvomero District and the Morogoro Urban District to the west. The topographical variations in different parts of the Morogoro region explain the existing variations in the climatic conditions. The variation in rainfall is between 500 mm in low areas and 2,200 mm in the mountainous areas. Morogoro Region is characterized by mainly two natural features including mountainous and hilly areas (the Ukaguru Mountains, and the Uluguru and Nguru mountain ranges; Mahenge and Udzungwa mountains part of the "Eastern Arc Mountains") and the lowlands especially the Kilombero valley and the northern parts of the Region. The District covers 260 square kilometres bordered to the east and south by the Morogoro Rural District and to the north and west by Mvomero District. The core project site for the proposed project is a flat land.

4.3.2: Soil and Geology

The region is part of the Mozambique belt which is a poly-orogenic complex (Muhongo, 1994). The region's (Morogoro) constituting rocks are of Proterozoic, Archean and Early Palaeozoic ages that are divided into five sub-units (Sampson and Wright, 1964). Two dominant sub-units in Morogoro Municipality includes Hornblende-pyroxene granulites with some banded pyroxene granulites and Muscovite-biotite gneisses and migmatites (high metamorphic grade and are the dominant geological material in the Mindu, Lugala and Msembe hills and a bigger part of peneplain ridge crests northeast of Tungi and Kingolwira (Sampson and Wright, 1964)).

Morogoro municipality comprises of four major types of landforms including very steep mountains comprising of the Uluguru system with the average lowest altitude of 500 m to 2200 m as highest altitude; Piedmonts which are very steep with predominantly convex slopes foothills (600-1000 m asl), glacis (540-600 m asl) and alluvial fans (500-600 m asl); peneplains situated at an altitude range of 400-800 m consisting of ridge crests and ridge slopes and valleys, being flat to almost flat river terraces and flood plains at altitudes lower than 500 m, example the Ngerengere flood plain

4.3.3: Land Uses on the Project Site

Proposed site for construction of cattle troughs at Bonye village is within the livestock keeper designated area for livestock keeping as per Bonye Village Land Use plan. The adjacent land from the proposed site is used for animal keeping (pasturing).livestock keepers settlements are located approximately 500 meters from the proposed site.

4.4 HYDROLOGY CONDITIONS

4.4.1: Surface Water

The Morogoro Region's drainage is formed by many rivers that flow from highlands to lowlands in the valleys such as the main Mgeta, Mzinga and Mbakana in the Mgeta sub catchment on the south eastern side; Ulugurus, Mbezi, Mvuha, Mmanga and Mvizigo in the main Ruvu sub catchment and main Ngerengere in the Ngerengere sub catchment on the western side of the Uluguru flows to Main Ruvu River. Major rivers flowing include Kilombero, Ruaha, Wami , Luwegu , Ruvu , Ngerengere River, Mkata River, Mkondoa and Mkindo. Mbezi and Mvuha Rivers that flows through Bwakichini feeds Ruvu River that is the major source of water supply for a commercial/business city in Tanzania, (Dar es Salaam).

4.4.2: Groundwater

The aquifer lies in Neogene formation of Usagaran System whereby thick deposits of brownish and blackish clay soil exists. Alluvium deposits of sand clay soils and sand hill wash covers the large part of Mgeta Plain. Quartz was observed within the area of investigation. Main aquifers in the study area are highly weathered to fractured gneisses and granulities to the deep wells and medium to coarse sand with gravels are major aquifer in shallow to medium depth.

4.5 ATMOSPHERIC CONDITIONS

4.5.1: Climate

Morogoro Region has moderate temperature and rainfall. The warm season runs from July to September coinciding with the dry season. The average annual temperature is 18^0C in high lands and 30^0C low land. The average annual rainfall varies from year to year and between ecological zones. It's varies between 600mm and 1800mm experienced within two major rainfall seasons: with long rains between November and May. The mean monthly flow hydrograph for the Ruvu River and its tributaries indicates periods of high and low flows corresponding to the long and short rains The highest peak in Ruvu River and its tributaries is observed in April while the low flows in are experienced during the dry period of August-September.

4.5.2: Air Quality

The ambient air quality of the project area was assessed. Field observations entails that the project areas resemble to typical rural settings found in Tanzania. The potential point source emitters are mainly vehicles and motorcycles along Kisaki Road road approximately 10 km from Bwakila Chini Center. Thus, issues related to air quality are expected to be of a localized nature.

Gaseous emission in different locations within the proposed project area was measured. Table 5 provide information on the current air quality data on the proposed project area measured using an Outdoor Potable Air Monitor (Aeroqual Series 200). There were no vehicles but only few motorcycles movement at the time of measurement. The limit value of air emissions for Tanzanian standards (TZS) are provided for comparison. All pollutants measured were found to be below the recommended air quality standard (TZS 837:2005) set by TBS.

Table 5: Baseline air quality at the project site (Source: Consultant, 2019)

Date	**Maximum Reading**			**Minimum Reading**			**Average**			**Recommended Air Quality Standard**		
	LEL (%)	NO_2 (ppm)	CO (ppm)	LEL (%)	NO2 (ppm)	CO (ppm)	LEL (%)	NO2 (ppm)	CO (ppm)	LEL (%)	NO2 (ppm)	CO (ppm)
29th May 2020	0.0	9.7	18.5	0.0	5.9	6.9	0.0	7.8	12.7	0.25 at 20°C For methane	53 (EPA)	35 (EPA)

4.5.3: Noise Level

Field observations and measurements were made regarding existing noise levels at the proposed project site during this study.Instrumental noise measurements were made at a day time to establish baseline noise levels at the core project site. Noise level sat the project area are mainly contributed by anthropogenic activities including movements' of motor cycles along Kisaki Road. However, due to the existing social patterns of local residents, noise levels at night drop significantly in the project area. Noise levels were measured by Laser liner Model. The result of field noise measurement is provided in Table 6 below.

Table 6: Baseline noise level at the core project site (Source: Wami/Ruvu Basin water office, 2019)

Location	Average Noise Level (dBA)	
	Field measurement	TBS
Core project site at Dakawa Village	50	70

4.6 BIOLOGICAL CONDITIONS

4.6.1: Vegetation

The most common dominant vegetation cover types in Morogoro region are woodlands and forests. Apart from Brachystegia and Milicia species, some of the tree species are sub-montane rain forests due to prevalence of cool and humid environment on the highlands. Based on recent surveys there is no endangered plant species within the vicinity of the project location. Only when necessary land will be cleared and trees will be cut down. Revegetation will be done after the completion of the construction phase. The proposed project site is a built in land where there rest of land is bare land.

At the project site there is no any endangered species since the site is within the livestock keepers grazing area as per village land use plan designated by Morogoro District Council characterized by scattered short bushes and shrubs accompanied by long grasses in streams banks plate 4.

Plate 4: Vegetation observed at the proposed (Source: Wami/Ruvu Basin water office, 2019)

4.6.2: Animals

Considering location of the core project area which is Bonye situated in the rural environment, no fauna particularly birds, mammals, reptiles were observed to exist during EIA study. Domesticated animals were also not observed in the project core area.

4.7 EXISTING ENVIRONMENTAL THREATS AND CHALLENGES

There are neither environmental threats nor challenges in the proposed project area which were observed during EIA study.

4.8 : PLANNED FUTURE DEVELOPMENTS

During EIA study, no any development project was reported by authorities to be implemented in proposed project area or in conjunction with the proposed project.

4.9 SOCIO-ECONOMIC CONDITIONS

4.9.1: Local Administration and Governance

Local Administration

Administratively, the proposed project will be implemented at Bonye Village at Bwakila Chini ward, Morogoro District, Morogoro region, Tanzania.

4.9.2: Demographic Profile

Population

Like other councils in Morogoro Region, the population of Morogoro district has experienced a significant increase in growth. According to the 2012 Population Census the council population was 286,248 out of which, females accounted for 51 percent (145,424) of the population.

Like other wards in Morogoro district, Bwakila Chini has experienced a significant increase in population growth. According to the 2002 and 2012 Population and Housing Censuses the population of the township increased from 11,546 (estimated population) in 2002 before reaching 13,718 in 2012. This resulted in an increase of only 2,172 people from 2002 to 2012. According to the 2012 Population Census the ward's population was 13,718 out of which, females accounted for 51.3 percent (7,034) of the population.

Types and Pattern of Housing

The building structures in the project area have walls made of different materials ranging from muds, earth blocks (rammed earth), burnt and unburnt bricks, blocks and bricks made with cement, stones and cement – sand blocks. The types of mortar used for blocks and bricks are either mud or sand cement mortar depending on the types of wall construction materials. Typical roofing structures are made up of (1) grass thatch placed on timber / poles made into a grid/mesh to retain the grass (2) corrugated iron sheets placed on timber/ poles. It was observed that, the houses are scattered and far away to one another as part of the built-up environment. Most of the households are surrounded by simple kitchen and sanitary (toilets / latrines) infrastructures, traditional livestock sheds and some fenced. Most of the building structures in the immediate vicinity of the core project area are made up of muds, earth blocks. The roofing structures are made up of (1) grass thatch placed on timber / poles made into a grid/mesh to retain the grass (2) corrugated iron sheets placed on timber/ poles.

Ethnicity and Religion

The major languages spoken in Bwakila Chini ward are kiswahili, kipogoro, kiluguru and kindamba. With exception of Kiswahili, the other spoken languages are vernacular (specific to a particular tribe). However, the composition of the current population especially in Morogoro district is getting more cosmopolitan due to the influx of workers, businessmen and fortune seekers mainly from different regions of Tanzania.

4.9.3: Main Economic Activities

Like other urban places of Tanzania, major economic activities in Bwakila Chini ward are mainly livestock keeping and agriculture. Others are formal and informal employment, trading transportation and extraction of natural resources.

4.9.4: Economic Infrastructure

(a) Transportation Infrastructures

Road transportation:

Road transportation in Bonye Village is the major type of transportation for people and goods within and outside the township. It is one of the key sub-sectors that are responsible for sustainable development and poverty reduction initiatives in the village and at the ward level at large.

(b) Energy Infrastructure and Use

A number of sources of energy are being used in Bonye village for cooking, lighting and running various machines and industries and commercial activities. These include solar, thermal, biogas, fossil and firewood. SOLAR has continued to be the sole supplier of power for lightening in the village. The project area is mainly served by solar power and generator as far as electric energy is concerned. On the other hand, firewood is the dominant source of energy for domestic consumption. The main use of firewood has been cooking and this makes wood demand to be very high. Biogas has not yet been fully exploited in the township. Likewise, solar energy is not very common, but used as alternative source of energy in some of households and institutionsintownship. Fossil fuels are also being used in some households in the form of kerosene / paraffin mainly used for cooking and lighting.

(c) Communication network

The telephone service has the installed capacity of 4,010 service lines out of which 3,169 have been taken up. There are also 102 Fax lines, 35 Telex lines and 8 e-mail lines in operation. Telecommunication system in Bwakilachini ward is fairly adequate. Cellular phone networks have been introduced by Vodacom, Airtel, Halotel, Zantel and Tigo companies to serve in the area. Postal services, radio call, internet service cafes, telefax services, Radio and TV are also available in town centres. In Morogoro District, there are nine (9) Radio stations which receivable including Kiss FM, Radio Free Africa – RFA, TBC Taifa, Radio One, Radio Maria and Clouds FM. Television stations and most Radios can be received by using Satellite dishes. There is neither radio station nor television station that broadcasts from township.

4.9.5: Social Infrastructure and Services

(a) Education Facilities

Education in Bwakilachini Ward is provided both by the Public and Private sectors. The sector covers pre-primary, primary, secondary as well as educational colleges / vocational training. There is approximately 25 primary schools in the ward and gradual increase in primary schools in the district in recent years.

(b) Health Services and Facilities

The status of public health services in Morogoro District can be visualized among others, through the health infrastructures, availability and commitments of health practitioners, implementation of preventive and curative measures and availability of medical supplies. Distribution of health facilities by type indicates that there are 3 hospitals (1 public,2 private) , 6 health centres(5 public, 1 private) and 77 dispensaries (54 public, 23 private)and 85 public village health posts .Health facilities that are available at Bwakila ward where the project area is located include Bwakilajuu, Bwakilachini and Duthumi health centre.

(c) Water Supply

Water supply service in Morogoro District is generally not satisfactory. The main source of water in the district includes shallow wells, gravity water, rain water harvest and springs. It is estimated only 64% of the populations have access to safe and clean water.

(d) Waste Management and Sanitation

Sanitation facilities are essential for ensuring good health and favorable living environment in any society. Provision of solid waste management services in Bwakila Chini is satisfactory.it is indicated that total number of toilets needed in the District is approximately 3088 while existing number of toilets is 1139. Therefore District wise there is a shortage of 1949 toilets which is 79.01% of the District requirement. Bwakila Chini ward where the project area is located has a shortage of 64.76% of the required toilet which is approximately 630.

4.10 STAKEHOLDERS CONSULTATIONS AND PARTICIPATION

This section provides detailed description of stakeholder consultation and participation in the proposed project. It provides definition of stakeholder, stakeholders identification process, the initial list of stakeholders identified and consulted; the consultation methodology used; and identified stakeholders' issues and concerns regarding the propose project.

4.10.1 STAKEHOLDERS IDENTIFICATION AND PARTICIPATION

Stakeholders include individuals, groups or organizations that might be affected by or might affect in one way or the other (positively or negatively) the proposed project. They are found both at National, regional and local levels and range from government authorities, NGOs to local communities. The project proponent is required by the law to consult stakeholders on the preparation and results of their EIA and to disclose to the public the results of the EIA process. Continued consultation is also required during construction and operation phases of the project. The responsible decision making authority, as well as other relevant authorities with responsibilities, interests or special expertise relevant to the proposal have been directly contacted, in order to exchange and collect information and comments. This exercise enables to identify policies, legal or administrative constraints that may exist, as well as determining the major concerns of these various authorities whose interests may be affected by the proposal.

Stakeholder consultation exercise was conducted for selected potential stakeholders in Morogoro District where the proposed project will be implemented with the main goal of seeking views and concerns pertaining to this proposed project. Consultations carried out through interviews and meetings, physical visits and consultations. The EIA Consultant team considered all aspects of the project that can cause environmental or socio-economic changes at all stakeholders 'consultation meetings.

4.10.2 CONSULTED STAKEHOLDERS

The key stakeholders relevant to the proposed project have been identified and consulted. A list of potential stakeholders consulted is provided in Table and the signed sheets for the stakeholder consulted in attached in Appendix 3. Plate 05 below shows meeting with villagers at the Bonye village office,

Table 7: List of Stakeholders Consulted

SN	Stakeholders
1	The Council of Morogoro Environmental management Office
2	Morogoro District Construction/Works Office
3	Morogoro district Town Planning Office
4	Morogoro district Land, Survey and Map Office
5	Bwakilachini Ward Office
6	Bonye village Office

Plate 05: Stakeholders consultation with villagers

4.10.3 ACCEPTANCE OF PROPOSED PROJECT

The stakeholders met generally viewed the proposed project positively, hoping that it might stimulate the socio-economic status in their locality. A summary of the degree of acceptance by different stakeholders consulted above is presented in Table 8.

Table 8: Summary of project acceptance by different stakeholders

SN	Stakeholder	Acceptance Level		
		High	Medium	Low
1	The Council of Morogoro Environmental management Office	√		
2	Morogoro District Construction/Works Office	√		
3	Morogoro District Town Planning Office	√		
4	Morogoro District Land, Survey and Map Office	√		
5	Bwakilachini Ward Office	√		
6	Bonye village Office	√		

4.11 STAKEHOLDERS CONCERNS REGARDING PROPOSED PROJECT

4.11.1 Environmental Issues and Concerns

(a) Waste management

Proposed project is not expected to generate significant quantity of wastes during construction and operation phases. It was requested by stakeholders that appropriate measures should be put in place for the proper management of wastes to be generated.

(b) Noise, dust and air pollution

Stakeholders pointed out during construction phase, noise, dust and other emissions might be generated. They might cause environmental and health problems to both workers and the environment. Therefore appropriate measures should be put in place.

4.11.2 Socio-economic Issues

(a) Business opportunities

Construction phase of the proposed project will require significant quantities of construction materials and supplies. It was requested that local registered suppliers and contractors should be given first priority on such business opportunities.

(b) Employment opportunities

Local communities should be given priority on employment opportunities especially during construction phase of the proposed project in terms of unskilled and medium skilled labourers

4.11.3: Institution/ Policy Issues

(a) Full involvement of stakeholders

The WRBWB should fully involve Local Authorities e.g. Village and ward leaders in all steps of project implementation since they are closer to the people to be able to avoid vandalism, theft, and sabotage to the project.

(b) Complying to legal requirements

The WRBWB should comply with all relevant legal requirements. They should also acquire permits such as EIA certificate, building permit, road use permit for abnormal widths, etc.

CHAPTER FIVE

5.0 ASSESSMENT OF IMPACTS AND IDENTIFICATION OF ALTERNATIVES

Assessment of environmental and social impacts associated with implementation of the proposed project on construction of cattle trough isprovided in this Chapter five. The assessment will include the following key issues: details on impact zones; list of activities likely to cause impacts and risks; identification as well as classification and significance of impacts; and evaluation significance of impacts. Also, identification and analysis of alternatives will be included in this Chapter.

5.1: ACTIVITIES LIKELY TO CAUSE IMPACTS AND RISKS

Impacts identification has been based on cause-effect interactions between the projects' activities and the existing relevant baseline (valued) receptors - physical, chemical, biological, built or human. It extends through entire project cycle from planning and designing; mobilization, construction and demobilization; operation and maintenance; and decommissioning stages of the project. Construction activities and levels of civil works will differ with type of project component and are anticipated to affect all types of natural and settlements features and extend the impact area to include project related offsite locations. Summary of project activities likely to cause impacts are provide in Table 9 below.

Table 9: Summary of project activities likely to cause impacts

Activity	Source of Environmental and Social-economic Foot Prints
Mobilization and Construction Phase	
Extraction/procurement of construction materials, inputs and staff,	☞ Extraction /sourcing of construction materials ☞ Employment of skilled, semi-skilled staff & casual labourers ☞ Procurement of Contractors and Services Providers ☞ Procurement of domestic and industrial supplies and services
Transportation of input materials, machinery and equipment and crew;	☞ Transportation of construction and project equipment to the project site through main highway roads and on community earth roads
Demolition works, Site clearance and preliminary works	☞ Operation of machinery ☞ Disposal of demolition and cleared wastes
Earth works: excavation, filling, grading and compaction	☞ Soil movements: removal of top soils, excavation ☞ Compacting ☞ Piling of spoil materials ☞ Operation of fuel powered equipment and vehicles
Civil works for renovation of existing buildings	☞ Movements of construction materials ☞ Handling and mixing of materials ☞ Compacting ☞ Piling of excess materials ☞ Operation of fuel powered equipment and vehicles, ☞ Piling and disposal of construction wastes
Construction activities	**Working conditions (occupation health & safety risks)** ☞ Lack of /inadequacies in use of Personal Protective Equipment (PPE) ☞ Use of hazardous practices e.g. motored / sharp edged equipment, noise / emissions emitting ☞ Exposure to hazardous substances, chemicals (paints, adhesives, cement dust etc.), gases, dust, corrosive substances, disease agents, ☞ Practices exposing workers to extreme / risky working conditions: ☞ Exposure to disease agents / vectors ☞ Negligence at work i.e. understaffing and long working hours, employing wrong people on particular jobs, low morale, etc.
	Public Health and safety hazards ☞ Construction site hazards: falling in open pits, excavations accidents, ☞ Social interactions among newcomers and local communities ☞ Transport hazards: vehicles causing accidents, congested traffic, material spillage ☞ Creation of new water bodies (pits) as breeding habitats for agents/vectors of water-borne diseases (malaria, etc)
Demobilization	☞ Collection and disposal of demolition waste; ☞ Termination of employment
Decommissioning Phase	
Decommissioning of cattle trough	☞ Generation, collection and disposal of waste ☞ Dust emissions impairing air quality ☞ Termination or loss of employment ☞ Rehabilitation of the project sites

5.2: IDENTIFICATION OF IMPACTS

Environmental and social impacts are positive or negative change to the environment or social settings as results of human activities. In this EIA study, potential impacts were identified using a standard matrix approach which examines the effects of key project activities on the physical environment (e.g. air quality and land) and on the human socio-economic environment, of the core areas and areas of influence of the proposed project.

5.3: CLASSIFICATION AND SIGNIFICANCE OF IMPACTS

Potential environmental and social impacts have been classified in accordance with activities causing them. The identified impacts were considered to be significant if:

- Are extensive over time and space;
- Are intensive in consideration or proportion to assimilative capacity;
- Exceed environmental standards or thresholds;
- Do not comply with environmental policies, land use plans and sustainability strategy;
- Adversely and seriously affects ecological sensitive areas; and
- Adversely and seriously affect heritage resources, other land uses, communities or indigenous people's traditions and values.

The significance criteria therefore are based on the magnitude scale and duration of the impact; exposure and probability of the impact; consequence of the impacts according to score/scale and colour code implication. Detailed description of the significance criteria assigned for the various impacts of the project are provided in Table 10, Table 11 and table 12 below.

Table 10: Assessment of significance in terms of impact's magnitude, scale and duration

Criterion	Description	Possible Results		
		Term	**Description**	**Score**
Magnitude of the Impact	An indication of the severity of the impact, either positive or negative.	Very High	Extreme effect – where natural, cultural or social functions or processes permanently cease	5
		High	Severe effect – where natural, cultural or social functions are altered to the extent that they temporarily cease	4
		Moderate	Moderate effect – the affected environment is altered but natural, cultural or social functions continue, albeit in a modified way	3
		Low	Minimal effect – affects the environment in such way that natural, cultural or social functions and processes are not affected	2
		Very Low	Minimal or negligible effect	1
		Unknown	Magnitude of the impact unknown	5
Scale of the Impact	An indication of geographical extent of the Impact	National	Affects the resources of the country	5
		Regional	Affects the resources of the region	4
		District	Affects the resources of the district	3
		Local	Affects the project area and surrounding villages	2
		Site – specific	Localized, confined within the license area	1
		Unknown	Extent of the impact unknown	5
Duration of the Impact	An indication of duration or time over which the impact will be experienced.	Permanent	Will remain permanently	5
		Long term	Extends into the post-closure phase, but not Permanently	4
		Medium term	During the operational life of the project	3
		Short term	Shorter than the operational life of the project	2
		Transient	Very short duration	1
		Unknown	Duration of the impact is unknown	5

Table 11: Assessment of significance in terms of Exposure and Probability

Criterion	Description	Possible Results			
		Term	Description		Score
			Discrete Event	Prolonged Exposure	
Exposure to Impact	An indication of the frequency of the activity that may cause the impact, or the continuity of the exposure	Very High	Daily or continuous	Exposure in perpetuity	**5**
		High	Weekly	Continuous exposure into closure or post-closure phases	**4**
		Moderate	Monthly	Continuous exposure during construction and operations phases	**3**
		Low	Bi-annually	Continuous exposure throughout one phase	**2**
		Very low	Annually or less Frequently	Prolonged exposure yet finishes before end of a phase	**1**
		Unknown	Frequently of activity unknown	Continuity of exposure unknown	**5**
Probability of the occurrence	An assessment of the degree of certainty associated with a potential impact	Highly likely	Very likely or certain to occur		**5**
		Likely	Likely to occur		**4**
		Possible	May possibly occur		**3**
		Unlikely	Unlikely to occur		**2**
		Highly Unlikely	Very unlikely to occur, or almost impossible		**1**
		Unknown	Probability of the occurrence unknown		**5**

Table 7: Consequence assessment according to score/scale

Consequence	Magnitude + Scale + Duration	3-4	5-7	8-11	12-14	15
		Very Low	Low	Moderate	High	Very High
Likelihood	Exposure + Probability	2-3	4-5	6-7	8-9	10
		Very Low	Low	Moderate	High	Very High

The matrix of the scores of the "Consequence" and "Likelihood" (Figure 3) was used to determine the overall significance of the impacts**.** The colour codes are used to show the significance of the impact in the following manner:

- White colour for "Very Low Significance"
- Green colour for "Low Significance"
- Orange colour for "Moderate Significance"
- Red colour for "High Significance"
- Black colour for "Very High Significance".

The implications of these descriptions are provided in Table 13. Based on these implications, the mitigation measures and hence the ESMP were developed as presented in Chapters 7 and 8 respectively.

		Consequence of Impact (Aggregate: Magnitude + Duration + Scale)				
		Very Low	**Low**	**Moderate**	**High**	**Very High**
Livelihood of Impact (Compound: Exposure x Probability)	**Very Low**	**VL**	**VL**	**L**	**L**	**M**
	Low	**VL**	**L**	**L**	**M**	**H**
	Moderate	**L**	**L**	**M**	**H**	**H**
	High	**L**	**M**	**H**	**H**	**VH**
	Very High	**M**	**H**	**H**	**VH**	**VH**

Figure 3: Colour Codes for Impact Significance

Table 8: Colour Code Implications

Colour Code	Significance of the Residual Impact	Implications for Project	
		Positive Impacts	**Negative Impacts**
White	Very low significance	Negligible effects	Negligible effects
Green	Low significance	Some Benefits	Acceptable effect
Orange	Moderate Significance	Appreciable improvements to, or will sustain, existing resources	Effect is serious enough to cause concern. Changes to project design should be considered.
Red	High Significance	Very substantial improvement to existing resources	Unacceptable effect. The project should not proceed unless the design is changed so that the significance of this impact is reduced to acceptable levels
Black	Very high significance	Extremely beneficial and enduring effect	An automatic fatal flaw. The project should not proceed unless the design is changed so that this impact is eliminated or its significance is reduced to acceptable levels.

5.4: IMPACTS EVALUATION

Evaluation of impacts significance has been based on magnitude, extent and duration of the impact. The evaluation also assessed the likelihood of impacts happening, taking into account the avoidance and minimization strategies and best technologies and practices that Wami/Ruvu Basin water office will have to integrate in the designs of the project. Impacts associated with different phases i.e. planning, construction / installation, operation, etc. were analysed and presented separately. The impacts were dis-aggregated into environmental impacts and socioeconomic impacts for all phases of the proposed project.

5.5: EVALUATION OF ENVIRONMENTAL IMPACTS

5.5.1: Mobilization and Construction and Phases

Impact # 1: Depletion at points of source of construction materials

Construction minerals are readily available in Bonye Village and nearby places, obtainable from local suppliers extracted from sources most of which are authorized at local level. There are also a number of unregistered sources on peoples' properties. The sources are open to all contractors / users, not well-managed and associated with land degradation manifested by disorderly vegetation clearance and eroded soils. The proposed is expected to contribute to this awful situation leading to further cumulative effects of resources depletion and / or degradation at points of source. Most of construction materials (aggregate and sand) are expected to be obtained from existing official quarries located at Bonyevillage and Bwakila chini ward areas. Potential sources of water are borehole water drilled by Wami/Ruvu basin water office.

- *Impacts significance: negative, short-term and of low significance*

Impact # 2: Impairment of air quality & climate change due to exhaust emissions (dust, noxious gas)

Production of fumes as exhaust from fuel-powered transportation and vehicles engines will cause deterioration of ambient air quality. Dust emissions from various sources (i.e. dismantling of existing structures, collection of demolition wastes, progressive transportation of construction materials in uncovered trucks, stockpiling and off-loading materials at the site, and vehicles running on loose earth roads in the project area) will also degrade local air quality at the proposed project site. Odours from putrefaction of organic matter reduce air quality.

The main source of emission of atmospheric pollutants from construction activities emanate from the exhaust from engines (in construction equipment trucks/tipper, mixer etc.). Exhaust contain pollutants notably carbon dioxide (CO_2) plus small quantities of noxious gases such as nitrogen oxides (NO_x), sulphur dioxides (SO_x), hydrocarbons and particulate matters (PM). These Green House Gases (GHGs) are known to interfere with temperature regime and cause climate change effects. The extent of impairment of local air quality, will generally be low considering the quantities of pollutants that will be emitted, the duration of mobilization works and prevailing (likely turbulent) atmospheric conditions.

- *However, considering the scope and magnitude of the proposed project, the negative impact is anticipated to be of short-term and low significance*

Impact # 3: Soils damage/disturbance to surface and sub-surface organisms

Civil works for construction of cattle trough and associated support facilities will involves land excavation activities will result to the disturbance and direct loss of surface and sub-surface organisms and their habitats. More disturbances of organisms will be in the form of noise and vibrations produced due to increased traffic volume as well as movement of construction machineries and equipment across the project area.

- *Impacts significance: negative, short-term and of low significance*

Impact # 4: Disruption of onsite / offsite sensitive receptors

Causes of disturbances to fauna especially avifauna are noise and vibrations generated by transportation vehicles and trucks as well as working equipment and machinery. Operation of transportation tippers/dump trucks/Lorries/vans and vehicles will generate noise and vibrations causing disturbance to sensitive surface and subsurface organisms and consequently flight / immigration from the project area especially along materials transportation routes. Table 14provides a list of equipment and associated typical noise levels.

Table 9: Typical noise levels for selected materials transportation equipment

Equipment Description	Typical Noise Level (dBA) 50 ft from the Source
Compactor (ground)	80
Concrete Mixer	85
Dump Truck	84
Generator	82
Warning Horn	85

Cumulatively, the most likely sources of noise and vibrations associated with the project likely to affect nearby receptors (local fauna) are a variety of equipment used during resources mobilization including tippers/dump trucks/lorries/vans and vehicles. However, the noise levels are unlikely to significantly exceed the already existing noise levels from vehicular traffic in Morogoro District.

- *Impacts significance: negative, short-term and of low significance*

Impact # 5: Environment pollution from poor waste management

During construction phase, potential impacts on the environment may be associated with the handling, storage and disposal of construction materials containing pollutants as well as operation and maintenance of construction machineries and equipment. Environmental pollution may also results from domestic and

sanitary wastes from workers at construction site. In addition, leaking fuel, oil or other fluids from poorly maintained vehicles and equipment on the construction site are also potential source of environmental pollution.

- ☞ *Impacts significance: negative, short-term and of low significance*

5.5.2: Operation Phase

Impact # 6: Environmental pollution from poor waste management

Planned or accidental discharges will involve various types and quantities of waste materials during operation of the cattle trough. The waste materials shall include (i) domestic solid wastes including garbage as well as rubbish wastes which can include papers, cardboards, plastic materials including bottles and packaging materials). Materials and wastes may be discharged directly into environment.

Discharges of materials and wastes directly into surrounding environment will impair the physical, chemical and bacteriological qualities of receiving medium. Poor waste management can also pose nuisances and health risk to workers and the public at large. The tropical climate in Tanzania provides a favourable environment for rapid bacterial, viral and fungal development and other water-related infections. Diseases such as cholera and diarrhoea /dysentery are among the top ten diseases in most parts of the country.

- ☞ *Impacts significance: negative, long -term and of moderate significance*

5.5.3: Decommissioning Phase

Impact # 7: Impairment of air quality & climate change due to exhaust emissions (dust, noxious gases)

This impact will be similar to those under Impact # 2

Impact # 8: Environment pollution from poor waste management

During decommissioning phase of the proposed project significant quantity wastes particularly packaging waste is expected to be generated. Potential pollution on the environment especially soil may be associated with improper handling, storage and disposal of such waste during decommissioning phase of the renovated dispensary.

- ☞ *Impacts significance: negative, long-term and of medium significance*

The summary of significance of environmental impacts on valued environmental and social receptors per project activity is provided in Table 15:

Table 10: Summary of significance of environmental impacts

PROJECT ASPECTS		VALUED RECEPTORS					
Project Phase	**Impact**	**Physical**	**Chemical**	**Biological/ Ecological**	**Social**	**Economic**	**Cultural**
Mobilisation and Construction Phase	Impact # 1: Depletion at points of source of construction materials	L	IN	L	L	L	IN
	Impact # 2: Impairment of air quality & climate change due to exhaust emissions (dust, noxious gases)	L	L	L	L	L	IN
	Impact # 3: Soils damage/disturbance to surface and sub-surface organisms	L	IN	L	L	L	IN
	Impact # 4: Disruption of onsite / offsite sensitive receptors	L	IN	L	IN	IN	IN
	Impact # 5: Environment pollution from poor waste management	M	M	M	L	L	IN
Operation Phase	Impact # 6: Environment pollution from poor waste management	L	IN	L	M	IN	IN
Decommissioning Phase	Impact # 7: Impairment of air quality & climate change due to exhaust emissions (dust, noxious gases)	L	L	L	L	L	IN
	Impact # 8: Environment pollution from poor waste management	M	M	M	L	L	IN
Acronym	**Classification**						
IN	Insignificant						
VL	Very Low						
L	Low						
M	Moderate						
H	High						
VH	Very High						

5.6: EVALUATION OF SOCIAL IMPACTS

5.6.1: Mobilization and Construction Phase

Impact # 9: Increase income to local suppliers government revenue

The project is expected to use local resources as construction materials i.e. sand, gravels / aggregates and industrial supplies (i.e. cement, fuel, etc.). Most of construction materials will be procured at local level in Bonye Village and Bwakila chini ward in Morogoro District and surrounding areas and thus contribute to individual incomes as well as government revenue from suppliers. Construction crew will also require basic needs and refreshment such as food, drinks which will be available locally.

- ☞ *Impacts significance: positive, short-term and of moderate significance*

Impact # 10: Conflicts over use of local resources and social interactions

The project intends to form a construction crew (including engineers, semi-skilled and unskilled labourers) for execution of various construction activities. Based on experience from similar projects elsewhere, the social interactions between the construction crew and the existing local community might arise some social problems and conflicts as a result of use of local resources. Conflicts between the two groups of people may result due to sharing of social services, like water supply, electricity, economic infrastructures like roads, etc. Other potentials sources of social conflicts that might be linked to the project development are (1) conflicts related to blocked access to various social economic activities (2) conflicts related to vandalism of structures / equipment, theft of materials and other project portable items and (3) conflicts related to security issues.

- *Impacts significance: negative, short-term and of low significance*

Impact # 11: Nuisance and disturbances from noise and vibrations

The noise impacts are as presented under Impact # 4

Impact # 12: Creation of employment

Construction works of cattle trough will create direct (estimated at 20 people) and indirect employment opportunities to the people within the locality as well as well as from other places in Morogoro region. Direct employment will be in the form of unskilled (excavations, consignments, cleaning, etc), semi-skilled (driving, masonry works, equipment and machinery operations) and skilled (engineers, accountants, administrators, etc.) personnel. Indirect employment will include people who will be providing various services such as provision of food and fuel to the Contractor during construction phase. Creation of employment chances will bring both economic and social benefits. Socially the young and energetic otherwise poor people will be engaged in productive employment other than remaining idle as well as improving the relations between them and their dependants.

- *Impacts significance: Positive, short- long term and of moderate significance*

Impact # 13: Nuisance and loss of aesthetics due to improper waste management practises

Poor waste management may result in land-based and water sources contaminations and littering at points of generation and disposal sites. Wastes if not correctly handled, could cause noxious odours, attracts pests and scavengers and generate germs and could present an eyesore to the receiving environment and consequent loss of visual quality and/or aesthetic value.

Poor waste management may also be risks of infections and transmission of diseases which might include the potential exists for construction crews' exposure to water-borne, water based, water-related, vector-borne diseases and other communicable diseases that could result from both project activities and prevalent within project area of influence.

- *Impacts significance: negative, short-term and of low significance*

Impact # 14: Occupational health and safety hazards

Safe working environment is normally assured when code of practices in the working place are institutionalized. Failure during the planning to provide for and integrate health and safety (e.g. proper personal protective gear) and ensure that there is a distribution of responsibility and accountability for health and safety to all employees at all levels may lead to injuries to people, loss of lives and/or of property. All core activities pertaining to the project are associated with activities that may cause risk of serious injuries, fatalities to workers these include motored/sharp edged equipment, etc. Occupational health hazards may also be promoted by lack of procedures that mitigate negligence at work, fatigue due to

understaffing and long working hours, employing wrong people on particular jobs (e.g. employing unskilled persons), lack of protective gear, low morale, etc.

- *Impacts significance: negative, short-term and of moderate significance*

Impact # 15: Public health, safety and security hazards
Public health, safety and security refer to safety of all people working, living in, close or transient to project site. These include the public at Bonye village and entire Bwakila chini ward. Specific sources of public health, safety and security hazards related to the construction activities include:

- Site hazards: open pits and holes, excavations, confined spaces, falling objects, trips and slips;
- Noise from operating equipment (machines, trucks and vehicles);
- Air emissions, dust and odours;
- Social disruption resulting from newcomer and local community interactions;
- Transport hazards: vehicles causing accidents, congested traffic, material spillage;
- Creation of water bodies (pits) as breeding habitats for agents/vectors of water-borne diseases (malaria, etc.).

The consequences of exposure of public to hazards related to mobilization and construction activities may include but not limited to disturbances / nuisance and discomfort, injuries, fatalities, ill-health and complains from the public resulting at the extreme in delays of project activities.

The most common hazards to public are related to exposure to communicable diseases through workers interactions with locals. Disease transmission could be a result of interactions among the crew and locals caused by the potential for increased incidences in Sexually Transmitted Infections (STIs) and HIV/AIDS among locals. The presence of the crew and other project personnel with more income than locals could increase market for sex to the crew and consequent transmissions of STIs and HIV.

- *Impacts significance: negative, long-term and of moderate significance*

5.6.2: Operation Phase

Impact # 16: Increase access to water services
Operation of cattle trough will reduce the distance of travel to water source by the community through construction of the DP. Protection of the surface water bodies, the completion and operation of the new cattle trough will reduce tremendously the number of cattle from using the river water. Rivers that is likely to be affected with the construction of cattle trough in Bonye Village includes Bwakila Chini and Mgeta. During project implementation the river banks and bed will be impacted positive due to erosion rate reduction and regenerations of the river morphology.

- *Impacts significance: positive, long-term and of high significance*

Impact # 17*:* Creation of employment opportunities and income generation
Construction and Operation of cattle trough will create employment opportunities. It will also generate income to local suppliers of food and other services required for operation of cattle.

- *Impacts significance: positive, long-term and of medium significance*

Impact # 18: Nuisance and loss of aesthetics due to improper waste management practises
Various types and quantities of waste materials are expected to be generated during operation of the cattle trough. The waste materials shall include (i) domestic solid wastes including garbage (from food preparation and serving mainly to livestock keepers) as well as rubbish wastes which can include papers, cardboards, plastic materials including bottles and packaging materials);

Poor waste management may result in land-based and water sources contaminations and littering at points of generation and disposal sites. It can also pose nuisances and health risk to livestock especially the plastic wastes.

- ☞ *Impacts significance: negative, long-term and of medium significance*

Impact # 19: Occupational health and safety hazards
Safe working environment is normally assured when code of practices in the working place are institutionalized. Failure during the planning to provide for and integrate health and safety (e.g. proper personal protective gear) and ensure that there is a distribution of responsibility and accountability for health and safety to all employees at all levels may lead to injuries to people, loss of lives and/or of property. Construction activities of cattle trough may create occupational health and safety impact to workers if proper measures are not put in place.

- ☞ *Impacts significance: negative, long-term and of low significance*

5.6.3: Decommissioning Phase

Impact # 20: Loss of employment
People that will be employed and contracted as suppliers and service providers during operation phase of the proposed project will lose jobs (employment) and business opportunity immediate at the end of the project's life time. The loss of jobs and business opportunity will have far reaching impacts.

- ☞ *Impacts significance: negative, long-term and of medium significance*

Impact # 21: Nuisance and loss of aesthetics due to improper waste management practises
Poor waste management may result in land-based and water sources contaminations and littering at points of generation and disposal sites. Demolition wastes if not correctly handled, could cause noxious odours, attracts pests and scavengers and generate germs and could present an eyesore to the receiving environment and consequent loss of visual quality and/or aesthetic value.

- ☞ *Impacts significance: negative, short-term and of low significance*

Impact # 22: Occupational health and safety hazards
Safe working environment is normally assured when code of practices in the working place are institutionalized. Failure during the planning to provide for and integrate health and safety (e.g. proper personal protective gear) and ensure that there is a distribution of responsibility and accountability for health and safety to all employees at all levels may lead to injuries to people, loss of lives and/or of property. Decommissioning activities are likely to create occupational health and safety impact to workers and general public if proper measures are not put in place.

- ☞ *Impacts significance: negative, short-term and of low significance*

The summary of significance of social impacts on valued environmental and social receptors per project activity is provided in Table 16:

Table 11: Summary of significance of social impacts on valued environmental and social receptors

PROJECT ASPECTS		VALUED RECEPTORS					
Project Phase	**Impacts**	**Physical**	**Chemical**	**Biological/ Ecological**	**Social**	**Economic**	**Cultural**
Mobilization and Construction Phase	Impact # 10: Increase income to local suppliers government revenue	IN	IN	IN	M	M	IN
	Impact # 11: Conflicts over use of local resources and social interactions	IN	IN	IN	L	L	L
	Impact # 12: Nuisance and disturbances from noise and vibrations	IN	IN	IN	L	L	L
	Impact # 13: Creation of employment opportunities and income generation	IN	IN	IN	M	M	L
	Impact # 14: Nuisance and loss of aesthetics due to improper waste management practises	IN	IN	IN	L	L	IN
	Impact # 15: Occupation health and safety hazards	IN	IN	IN	M	M	L
	Impact # 16: Public health, safety and security hazards	IN	IN	IN	M	M	L
	Impact # 17: Creation of employment opportunities and income generation	IN	IN	IN	M	M	L
	Impact # 18: Nuisance and loss of aesthetics due to improper waste management practises	M	M	M	M	M	L
	Impact # 19: Occupational health and safety hazards	IN	IN	IN	L	L	L
Decommissioning Phase	Impact # 20: Loss of employment and business opportunity	IN	IN	IN	M	M	L
	Impact # 21: Nuisance and loss of aesthetics due to improper waste management practises	IN	IN	IN	L	L	L
	Impact # 22: Occupational health and safety hazards	IN	IN	IN	L	L	L
Acronym	**Classification**						
IN	Insignificant						
VL	Very Low						
L	Low						
M	Moderate						
H	High						
VH	Very High						

CHAPTER SIX

6.0 ENVIRONMENTAL AND SOCIAL IMPACTS MITIGATION MEASURES

This chapter provides a description of mitigation measures for the identified potential impacts with their significance. The purpose of mitigation measures is to minimize adverse (negative) impacts, avoid or compensate for those negative impacts that cannot be mitigated by the project. The positive impacts of the project will be enhanced. The mitigation measures have been defined based on stakeholder consultation, discussion with project team, expert analysis and opinion, experience with similar and or related projects and best engineering practices. The Proponent (Wami/Ruvu basin water office) is committed in implementing the mitigation measures proposed in this report.

6.1: MITIGATION MEASURES FOR THE ENVIRONMENTAL IMPACTS

6.1.1: Mobilisation and Construction Phase

Impact # 1: Depletion at points of source of construction materials

Wami/Ruvu basin water office will implement the following mitigation measures in order to mitigate this impact:

- Engage licensed firms to procure construction materials;
- Source construction materials (i.e. sand, gravel and natural stones) from authorized and/or registered burrow and quarry sites; and natural stones and quarry sites for gravel and aggregates at nearby official areas from project sites;
- Order only what will be required through accurate budgeting and estimation of actual construction requirements (i.e. according to Bill of Quantities);
- Ensure that wastage, damage or loss (through run-off and wind) of materials at the construction site is kept minimal by covering materials, provide appropriate storage and optimum use;
- Ensure that Contractor undertake restoration of disturbed sites to original state (where applicable);
- Make use of best practice management techniques during loading, transporting, unloading, stockpiling of raw materials as well as earth works.

Impact # 2: Impairment of air quality & climate change due to exhaust emissions (dust, noxious gases)

Wami/Ruvu basin water office will implement the following measures as a way of minimising this impact:

- Train driver to minimize emissions (e.g. shut off engines when vehicles not in use, etc.);
- Cover and damp excavated materials if the load is dry;
- Keep leak tight the dump trucks/haul vehicles that will be carrying input materials;
- Ensure that adequate freeboard is left when the haul vehicle is loaded;
- Ensure that placement of materials at the site is designed to allow loading on the leeward side as much as possible;
- Waters access roads used for construction to reduce dust during dry seasons;
- Make use of efficient and well serviced transportation facilities i.e. trucks and vehicles;
- Provide for regular servicing of engines of transportation facilities to improve efficiency;
- Monitor for dust emission in selected points in the project area.

Impact # 3: Soils damage/disturbance to surface and sub-surface organisms

The following mitigation measures will be implemented:

- Fence and limit clearance, trampling and digging activities within the areas needed for construction works

- ☞ Rehabilitate (backfill, compact with excavated materials and re-vegetate) all dug holes and pits to the original intact state soon after the construction activities
- ☞ Implement soil erosion control and land rehabilitation measures at all disturbed project sites;
- ☞ Whenever possible implement construction activities when the agents of erosion (i.e. rain and wind) are not active.

Impact # 4: Disruption of onsite / offsite sensitive receptors

Wami/Ruvu basin water office will implement the following mitigation measures in order to mitigate this impact:

- ☞ Whenever possible make use of quiet equipment and machinery;
- ☞ Make use of trucks, vehicles and equipment which are well serviced and have properly functioning mufflers;
- ☞ Optimize the mobilization activities by keeping trucks, vehicles and equipment movements to a minimum extent possible;
- ☞ Avoid the use of transportation routes that traverse near areas with sensitive receptors i.e. sensitive fauna and flora species as well as near water sources.

Impact # 5: Environment pollution from poor waste management

Wami/Ruvu basin water office will follow the normal and standard operational procedures to address the impacts of wastes. The measures to mitigate the impact of wastes will include the following:

- ☞ Ensure site housekeeping to minimize solid and liquid wastes generated from construction and other related activities such as food vending and petty businesses
- ☞ Carry out best practices in wastes management including wastes minimization, segregation, recycling and reuse of waste products where possible;
- ☞ Stockpile and store overburden materials for backfill and site rehabilitation after construction;
- ☞ Recyclable/usable materials (i.e. metal components, cut trees, etc.) will be provided for free to the local communities for use through their local governments;
- ☞ The solid wastes will be disposed at the designated solid waste disposal area;
- ☞ The construction crew shall use the existing on site sanitation facilities. When full sanitation facilities will be emptied and safely disposed at designated disposal area;
- ☞ Minimize excavations works during construction;
- ☞ Maximize the use of non-hazardous construction materials.

6.1.2: Operation Phase

Impact # 6: Environment pollution from poor waste management

Wami/Ruvu basin water office will implement the following mitigation measures in order to mitigate this impact:

- ☞ Provide periodical awareness, education and training to Wami/Ruvu basin water office staff, and livestock keepers on key aspects waste management
- ☞ Carry out best practices in wastes management including wastes minimization, segregation, recycling and reuse of waste products where possible;
- ☞ Provide appropriate onsite solid waste management facilities (i.e. collection points and bins, etc.)
- ☞ Construct and ensure proper use of the onsite sanitation facilities.

6.1.3: Decommissioning Phase

Impact # 7: Impairment of air quality & climate change due to exhaust emissions (dust, noxious gases)

Wami/Ruvu basin water office will implement the following measures to mitigate this impact:

- ☞ Train driver to minimize emissions (e.g. shut off engines when vehicles not in use, etc.);

- ☞ Cover and damp demolished materials if the load is dry;
- ☞ Keep leak tight the dump trucks/haul vehicles that will be carrying demolished materials;
- ☞ Ensure that adequate freeboard is left when the haul vehicle is loaded;
- ☞ Waters access roads used for construction to reduce dust during dry seasons;
- ☞ Make use of efficient and well serviced transportation facilities i.e. trucks and vehicles.

Impact # 8: Environment pollution from poor waste management

Wami/Ruvu basin water office will follow the normal and standard operational procedures to address the impacts of wastes as follows:

- ☞ Carry out best practices in wastes management including wastes minimization, segregation, recycling and reuse of demolition waste products where possible;
- ☞ Recyclable/usable materials (i.e. metal components, cut trees, etc.) will be provided for free to the local communities for use through their local governments;
- ☞ The demolished solid wastes will be disposed at the designated solid waste disposal area;
- ☞ Sanitation facilities will be emptied and safely disposed at designated disposal area;
- ☞ All hazardous materials and chemicals will be managed in accordance with Tanzania regulations.

6.2: MITIGATION MEASURES FOR THE SOCIAL IMPACTS

6.2.1: Mobilisation and Construction Phase

Impact # 9: Increase income to local suppliers government revenue

Wami/Ruvu basin water office and contractor to be engaged for construction works will to the following measures in order to enhance this impact:

- ☞ Maximize procurement of supplies from locals e.g. food, construction materials, etc.
- ☞ Maximize procurement of supplies from local licensed suppliers;
- ☞ Establish a system to manage local expectations.

Impact # 10: Conflicts over use of local resources and social interactions

In order to mitigate this impact Wami/Ruvu basin water office and contractor to be engaged will carry out the following mitigation measures:

- ☞ Furnish the construction site (for the construction crew) with all the necessary social services (i.e. water, electricity, etc.) to minimize interactions of the workers with the local people in the vicinity of the project area;
- ☞ Establish a process to detect and protect its infrastructures from security hazards;
- ☞ Employ security services from local providers to cater for 24 hours surveillance of the proposed projects' properties and infrastructures;
- ☞ Establish a system to manage local expectations.

Impact # 11: Nuisance and disturbances from noise and vibrations

Wami/Ruvu basin water office will implement the following mitigation measures in order to mitigate this impact:

- ☞ Whenever possible make use of quiet equipment and machinery;
- ☞ Make use of trucks, vehicles and equipment which are well serviced and have properly functioning mufflers;
- ☞ Optimize the mobilization activities by keeping trucks, vehicles and equipment movements to a minimum extent possible.

Impact # 12: Creation of employment opportunities

The following measures will be observed by Wami/Ruvu basin water office and Contractor to be engaged in order to enhance this impact:

- Publication of local employment opportunities;
- Optimize local employment by offering skills and trainings to locals particularly youth;
- Observe the national (Tanzania) and international labour standards;
- Allocate job fairly among local people (women and men) by working with local leaders;
- Give employment priority to the local communities with relevant skills based on gender;
- Provide awareness to locals on potential investment and employment opportunities.

Impact # 13: Nuisance and loss of aesthetics due to improper waste management

Wami/Ruvu basin water office will follow the normal and standard operational procedures to address the impacts of wastes. The measures to mitigate the impact of wastes will include the following:

- Ensure site housekeeping to minimize solid and liquid wastes generated from construction and other related activities;
- Carry out best practices in wastes management including wastes minimization, segregation, recycling and reuse of waste products where possible;
- Stockpile and store overburden materials for backfill and site rehabilitation after construction;
- Recyclable/usable materials (i.e. metal components, cut trees, etc.) will be provided for free to the local communities for use through their local governments;
- The solid wastes will be disposed at the designated solid waste disposal area;
- The construction crew shall use the existing on site sanitation facilities. When full sanitation facilities will be emptied and safely disposed at designated disposal area.

Impact # 16: Occupation health and safety hazards

Wami/Ruvu basin water office and Contractor to be engaged for construction works will put in place the following mitigation measures to manage this impact:

- Ensure availability of competent operators of machines and equipment and competent supervisors on site at all times during specific operations;
- Ensure provision and use of working machinery, equipment and tools;
- Ensure provision and use of proper personal protective equipment (PPEs), reasonable working hours, conditions and facilities;
- Post warning signs with appropriate text (local language) and graphics;
- Establish a code of practices at the work place include complying with relevant Tanzania (OSHA, 2003) Performance Standards on health and safety requirements;
- Observe for water and sanitation provisions;
- Establish fire-fighting equipments and procedures at the site;
- Establish a First Aid facility at the site.

Impact # 17: Public health, safety and security hazards

Wami/Ruvu basin water office and Contractor to be engaged for construction works will put in place the following mitigation measures to manage this impact:

- Ensure availability of competent operators of machines and equipment and competent supervisors on site at all times during specific operations;
- Provide warning signs with appropriate text (local language) and graphics;
- Establish a code of practices at the work place include complying with relevant Tanzania (OSHA, 2003) Performance Standards on health and safety requirements;

6.2.2: Operation Phase

Impact # 18: Increase access to water and protection of water sources

To ensure sustainable realization of this positive impact the following enhancement measures will be implemented by Wami/Ruvu basin water office:

- Develop and implement an environmental and social management and monitoring plan for the proper operation of cattle trough;
- Ensure availability of qualified staff and assistants;
- Ensure availability of sustainable financial resources for operation of cattle trough;
- Ensure proper management of cattle trough during operation phase;

Impact # 19: Creation of employment opportunities and income generation

The following measures will be observed by Wami/Ruvu basin water office in order to enhance this impact:

- Publication of local employment opportunities;
- Optimize local employment by offering skills and trainings to locals particularly youth;
- Observe the national (Tanzania) and international labour standards;
- Give employment priority to the local communities with relevant skills based on gender.

Impact # 21: Nuisance and loss of aesthetics due to improper waste management practises

Wami/Ruvu basin water office will implement the following mitigation measures in order to mitigate this impact:

- Provide periodical awareness, education and training to cattle trough operator staff on key aspects waste management
- Carry out best practices in wastes management including wastes minimization, segregation, recycling and reuse of waste products where possible;
- Provide appropriate onsite solid waste management facilities (i.e. collection points and bins, etc.)
- Construct and ensure proper use of the onsite sanitation facilities.

Impact # 22: Occupational health and safety hazards

Wami/Ruvu basin water office will put in place the following mitigation measures to manage this impact:

- Ensure provision and use of working equipment and tools;
- Ensure provision and use of proper personal protective equipment (PPEs), reasonable working hours, conditions and facilities;
- Establish a code of practices at the work place include complying with relevant Tanzania (OSHA, 2003) Performance Standards on health and safety requirements;
- Observe for water and sanitation provisions.

6.3: Decommissioning Phase

Impact # 23: Loss of employment

The Proponent shall implement the following measures to mitigate this impact:

- Provide on job training to employees that will help them undertake their jobs and may improve their employability once the project finishes;
- Provide the terminal benefits to all employees in compliance with employment laws.

Impact # 24: Nuisance and loss of aesthetics due to improper waste management practises

Wami/Ruvu basin water office will follow the normal and standard operational procedures to address the impacts of wastes. The measures to mitigate the impact of wastes will include the following:

- Ensure site housekeeping to minimize solid and liquid wastes generated from demolition activities;

- ☞ Carry out best practices in wastes management including wastes minimization, segregation, recycling and reuse of waste products where possible;
- ☞ Stockpile and demolition materials for backfill and site rehabilitation after construction;
- ☞ Recyclable/usable materials (i.e. metal components, cut trees, etc.) will be provided for free to the local communities for use through their local governments;
- ☞ The demolition solid wastes will be disposed at the designated solid waste disposal area.

Impact # 25: Occupational health and safety hazards

Wami/Ruvu basin water office and Contractor to be engaged for construction works will put in place the following mitigation measures to manage this impact:

- ☞ Ensure provision and use of working machinery, equipment and tools;
- ☞ Ensure provision and use of proper personal protective equipment (PPEs), reasonable working hours, conditions and facilities;
- ☞ Post warning signs with appropriate text (local language) and graphics;
- ☞ Establish a code of practices at the work place include complying with relevant Tanzania (OSHA, 2003) Performance Standards on health and safety requirements;
- ☞ Observe for water and sanitation provisions;
- ☞ Establish a First Aid facility at the site.

CHAPTER SEVEN

7.0 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

The Environmental and Social Management Plan (ESMaP) is developed for monitoring and managing the impacts during all phases of the project implementation. It sets the "environmental and social conditions" that will be abided by Proponent (Wami/Ruvu basin water office) in the course of implementing this proposed construction and implementation of cattle trough project. The ESMaP is a document which encompasses all major environmental and social impacts associated with the proposed project and its alternative mitigation and enhancement measures. The ESMaP addresses specific issues to be managed at the construction site and ensures that commitments made during the planning phase are incorporated into design, mobilization, construction and demobilization, operational and decommissioning phases of the project. The ESMaP also presents the implementation responsibilities during all phases. In its fully developed form, the ESMaP is also an emergency plan which describes actions foreseen in case of accidents or emergencies. The basic concepts for consideration are:

- Negative impacts on physical, biological and socio-economic setting are mitigated;
- Benefits that will arise from the development of the project are enhanced;
- Compliance with Tanzanian legislation and consistency with international guidelines and best practice is achieved;
- Development programs are identified and implemented with the active involvement of the community and sustainable outcomes are achieved;
- Good will and good relations with communities, civil society and governments at local and national levels are maintained;
- The project will endeavor to ensure that resources are available to implement the ESMP throughout all phases of project development and closure.

7.1 INSTITUTIONAL CAPACITY AND RESPONSIBILITIES

7.1.1: The Project Proponent and Financing Agency

Wami/Ruvu Basin Water Board (WRBWB)

WRBWB will be solely responsible for implementation of the ESMaP by Supervising and monitoring all components of the project. WRBWB shall also provide the necessary supervisory oversight to ensure the mitigation measures are implemented.

Wami/Ruvu basin water office will work closely with the Ministry water in all aspects of water provisions. It will also work in close collaboration with all Local Government Authorities in Bonye Village as part of the management and monitoring plans.

International Development Agency (IDA)

International Development Agency (IDA) of the World Bank will be responsible for provision of financial resources and ensuring financial control during implementation of this project. International Development Agency (IDA) will also provide general and high level guidance of the project execution including implementation of the Environmental and Social Management Plan.

7.1.2: Health Safety and Environment (HSE) Roles and Responsibilities for Key Personnel

The project's HSE will be developed to ensure that the environmental management requirements identified during project implementation are implemented on site through clear designation of roles and responsibilities.

The roles and responsibilities for managing environmental and social issues associated with the proposed project, rest principally the Project proponent, Wami/Ruvu basin water office. As per the EMA Cap 191 the local authorities and NEMC may play an oversight role. A summary of the HSE responsibilities for the key personnel within Wami/Ruvu basin water office are given:

Basin water officer

Basin water officer is overall responsible for Wami/Ruvu basin water office corporate management in Tanzania, including overall responsibility for EIA compliance, the basin water officer is the principal interface to the Tanzania Government for all Wami/Ruvu basin water office issues.

Wami/Ruvu basin water office Project Coordinator

The Wami/Ruvu basin water office's Project coordinator will be ultimately responsible for the safe and environmentally acceptable execution of the project in a manner consistent with the requirements of the ESMaP.

Environmental Control Officer (ECO)

Wami/Ruvu basin water board may designate an ECO who would be Responsible for oversight of environmental compliance. The ECO shall provide day-to-day supervisory role during the entire mobilization and operation period. The ECO shall be capacitated to coordinate the implementation of the various activities in the ESMaP and ensure all Wami/Ruvu basin water office's HSE management requirements are met by all aspects of the project. The ECO shall be the main contact person on all environmental and social matters related to the project (shall maintain contacts with officials in the various relevant Ministries, Departments and agencies both central and within Local Government Authorities and the Wami/Ruvu basin water office.

The above mentioned Wami/Ruvu basin water board personnel will form the Wami/Ruvu basin water office monitoring an Evaluation team to periodically review, update and set strategies for effective implementation of the ESMaP.

7.1.1 Stakeholders

A number of stakeholders will come into play during implementation of the ESMaP. It will be the responsibility of Wami/Ruvu basin water office ECO to coordinate the involvement of relevant government authorities and service providers particularly the LGAs in Morogoro district and meet related costs. Specific officers are DWE as well as environmental, public health and Sanitation officers, ward and mtaa officers. The roles stakeholders will be to participate in monitoring the implementation of the Environmental and Social Management Plan (ESMaP).

7.1.2 Permits and Notifications

Permits required before and during project implementation will be obtained by Wami/Ruvu basin water office from the appropriate regulatory authorities in Tanzania. They include environmental clearance certificate, building permits as well as the permits to dispose wastes as provided in table 17 below.

Table 12: Permitting requirement for the project

Type of Permit	Permitting Authority	Remarks / Status
Environmental Clearance Certificate	NEMC	This ESIA Report after review and approval by NEMC will facilitate the attainment of environmental clearance certificate
Building Permits	Morogoro District Council (MDC)	Application for building permit from the building department at MDC is in process. In addition, the project will engage licensed Consultant (registered by ERB) and Contractor(s) (registered by CRB).
Extraction of construction materials	Morogoro District Council (MDC)	Construction materials (i.e. aggregates, sand, etc.) will be sourced from licensed suppliers with required permits from MDC during mobilization and construction phases
Waste disposal	Morogoro District Council (MDC)	To be liaised with MDC during project construction operation phases

7.2 THE ESMaP FOR THE PROPOSED PROJECT

The ESMaP for this proposed project on construction of cattle trough in Morogoro District in Morogoro region, Tanzania is provided in Table 18 herein under. It highlights responsibilities for implementation of mitigation measures and cost estimates. Total cost for implementation of ESMaP for this proposed project is estimated to be TZS 9,000,000 during mobilization, construction and decommissioning phases and TZS 7,000,000 per year during operation phase. The EIA Consultant used informed judgment to come up with these indicative figures. Appropriate bills of quantities should clearly give the actual figures.

Table 13: Environmental and Social Management Plan for Construction of Cattle trough, Morogoro Region

PHASE	IMPACT	MITIGATION / ENHANCEMENT MEASURE	TARGET LEVEL/ STANDARD	RESPONSIBILITY	COST ESTIMATE IN TZS
		ENVIRONMENTAL IMPACTS			
Mobilisation and Construction Phase	Impact # 1: Depletion at points of source of construction materials	☞ Engage licensed firms to procure construction materials; ☞ Source construction materials (i.e. sand, gravel and natural stones) from authorized and/or registered burrow and quarry sites; and natural stones and quarry sites for gravel and aggregates at nearby official areas from project sites; ☞ Order only what will be required through accurate budgeting and estimation of actual construction requirements (i.e. according to Bill of Quantities); ☞ Ensure that wastage, damage or loss (through run-off and wind) of materials at the construction site is kept minimal by covering materials, provide appropriate storage and optimum use; ☞ Ensure that Contractor undertake restoration of disturbed sites to original state (where applicable); ☞ Make use of best practice management techniques during loading, transporting, unloading, stockpiling of raw materials as well as earth works.	GOT and Wami/Ruvu basin water office procurement guidelines	Wami/Ruvu basin water board Contractor(s)	Part of project contract sum to contractors
	Impact # 2: Impairment of air quality & climate change due to exhaust emissions	☞ Train driver to minimize emissions (e.g. shut off engines when vehicles not in use, etc.); ☞ Cover and damp excavated materials if the load is dry; ☞ Keep leak tight the dump trucks/haul vehicles that	Tanzania Environmental Management (Air Quality Standards) Regulations of 2007	Wami/Ruvu basin water board Contractor(s)	1,000,000 For awareness and education materials; and

PHASE	IMPACT	MITIGATION / ENHANCEMENT MEASURE	TARGET LEVEL/ STANDARD	RESPONSIBILITY	COST ESTIMATE IN TZS
	(dust, noxious gases)	will be carrying input materials; ☞ Waters access roads used for construction to reduce dust during dry seasons; ☞ Make use of efficient and well serviced transportation facilities i.e. trucks and vehicles; ☞ Provide for regular servicing of engines of transportation facilities to improve efficiency; ☞ Monitor for dust emission in selected points in the project area.			capacity building
	Impact # 3: Soils damage	☞ Fence and limit clearance, trampling and digging activities within the areas needed for construction works ☞ Rehabilitate (backfill, compact with excavated materials and re-vegetate) all dug holes and pits to the original intact state soon after the construction activities ☞ Implement soil erosion control and land rehabilitation measures at all disturbed project sites; ☞ Whenever possible implement construction activities when the agents of erosion (i.e. rain and wind) are not active.	No soil erosion tendencies; No pits or holes are left open; No loose soils.	Wami/Ruvu basin water board Contractor(s)	1,000,000 Management issues and others to be covered in BOQ
	Impact # 4: Disruption of onsite / offsite sensitive receptors	☞ Whenever possible make use of quiet equipment and machinery; ☞ Make use of trucks, vehicles and equipment which are well serviced and have properly functioning mufflers; ☞ Optimize the mobilization activities by keeping trucks, vehicles and equipment movements to a minimum extent possible;	Tanzania Environmental Management (Control of Noise and Vibration) Regulations of 2011	Wami/Ruvu basin water board Contractor(s)	Awareness materials covered above. Rest are BOQ issues and management measures

PHASE	IMPACT	MITIGATION / ENHANCEMENT MEASURE	TARGET LEVEL/ STANDARD	RESPONSIBILITY	COST ESTIMATE IN TZS
		☞ Avoid the use of transportation routes that traverse near areas with sensitive receptors i.e. sensitive fauna and flora species as well as near water sources.			
	Impact # 5: Environment pollution from poor waste management	☞ Ensure site housekeeping to minimize solid and liquid wastes generated from construction and other related activities such as food vending and petty businesses ☞ Carry out best practices in wastes management including wastes minimization, segregation, recycling and reuse of waste products where possible; ☞ Stockpile and store overburden materials for backfill and site rehabilitation after construction; ☞ Recyclable/usable materials (i.e. metal components, cut trees, etc.) will be provided for free to the local communities for use through their local governments; ☞ The solid wastes will be disposed at the designated solid waste disposal area; ☞ The construction crew shall use the existing on site sanitation facilities. When full sanitation facilities will be emptied and safely disposed at designated disposal area; ☞ All hazardous materials and chemicals will be managed in accordance with Tanzania regulations; ☞ Minimize excavations works during construction; ☞ Maximize the use of non-hazardous construction materials.	Tanzania Environmental Management ("Solid Waste Regulations of 2009", "Hazardous Waste Regulations of 2009" and "Water Quality Standards Regulations of 2007")	Wami/Ruvu basin water board Contractor(s)	2,000,000
Operation Phase	Impact # 6: Environment pollution from poor waste management	☞ Provide periodical awareness, education and training to Wami/Ruvu basin water office staff, patients and visitors on key aspects waste management ☞ Carry out best practices in wastes management	Tanzania Environmental Management (Water Quality Standards)	Wami/Ruvu basin water board MDC	2,000,000/= per year for provision waste containment

PHASE	IMPACT	MITIGATION / ENHANCEMENT MEASURE	TARGET LEVEL/ STANDARD	RESPONSIBILITY	COST ESTIMATE IN TZS
		including wastes minimization, segregation, recycling and reuse of waste products where possible; ☞ Provide appropriate onsite solid waste management facilities (i.e. collection points and bins, etc.)	Regulations of 2007 and Hazardous Waste Regulations of 2009		facilities and disposals
Decommissioning Phase	Impact # 7: Impairment of air quality & climate change due to exhaust emissions (dust, noxious gases)	☞ Train driver to minimize emissions (e.g. shut off engines when vehicles not in use, etc.); ☞ Cover and damp demolished materials if the load is dry; ☞ Keep leak tight the dump trucks/haul vehicles that will be carrying demolished materials; ☞ Ensure that adequate freeboard is left when the haul vehicle is loaded; ☞ Waters access roads used for construction to reduce dust during dry seasons; ☞ Make use of efficient and well serviced transportation facilities i.e. trucks and vehicles.	Tanzania Environmental Management (Air Quality Standards) Regulations of 2007	Wami/Ruvu basin water board Contractor(s)	2,000,000
	Impact # 8: Environment pollution from poor waste management	☞ Carry out best practices in wastes management including wastes minimization, segregation, recycling and reuse of demolition waste products where possible; ☞ Recyclable/usable materials (i.e. metal components, cut trees, etc.) will be provided for free to the local communities for use through their local governments; ☞ The demolished solid wastes will be disposed at the designated solid waste disposal area; ☞ Sanitation facilities will be emptied and safely disposed at designated disposal area; ☞ All hazardous materials and chemicals will be managed in accordance with Tanzania regulations.	Tanzania Environmental Management (Tanzania "Solid Waste Regulations of 2009", "Hazardous Waste Regulations of 2009" and "Water Quality Standards Regulations of 2007"	Wami/Ruvu basin water board Contractor(s)	1,000,000

PHASE	IMPACT	MITIGATION / ENHANCEMENT MEASURE	TARGET LEVEL/ STANDARD	RESPONSIBILITY	COST ESTIMATE IN TZS
		SOCIAL IMPACTS			
Mobilisation and Construction Phase	Impact # 9: Increase income to local suppliers government revenue	☞ Maximize procurement of supplies from locals e.g. food, construction materials, etc. ☞ Maximize procurement of supplies from local licensed suppliers; ☞ Establish a system to manage local expectations.	As maximum as possible	Wami/Ruvu basin water board Contractor(s)	Management measures
	Impact # 10: Conflicts over use of local resources and social interactions	☞ Furnish the construction site (for the construction crew) with all the necessary social services (i.e. water, electricity, etc.) to minimize interactions of the workers with the local people in the vicinity of the project area; ☞ Establish a process to detect and protect its infrastructures from security hazards; ☞ Employ security services from local providers to cater for 24 hours surveillance of the proposed projects' properties and infrastructures; ☞ Establish a system to manage local expectations.	Zero or as minimum as possible	Wami/Ruvu basin water board Contractor(s)	Some are management measures, others are part of the BOQ
	Impact # 11: Nuisance and disturbances from noise and vibrations	☞ Whenever possible make use of quiet equipment and machinery; ☞ Make use of trucks, vehicles and equipment which are well serviced and have properly functioning mufflers; ☞ Optimize the mobilization activities by keeping trucks, vehicles and equipment movements to a minimum extent possible.	Tanzania Environmental Management (Control of Noise and Vibration) Regulations of 2011	Wami/Ruvu basin water board MDC	Awareness and education materials; and capacity building covered above
	Impact # 12: Increase in traffic movements and possible road accidents	☞ Establish speed restraining humps, signs and symbols at all potential black spots on the access roads and within the health facilities; ☞ Provide awareness and education to project driver;	No or minimum interruption No or minimum traffic	Wami/Ruvu basin water board Contractor(s)	3,000,000/= for signs, symbols, temporary walk ways, fencing,

PHASE	IMPACT	MITIGATION / ENHANCEMENT MEASURE	TARGET LEVEL/ STANDARD	RESPONSIBILITY	COST ESTIMATE IN TZS
		staff, patients and visitors of the health facilities ☞ Establish appropriate and understandable signage; ☞ Erect and control safe points for pedestrian and vehicular crossing at designated points; ☞ Provide for orange safety fencing in order to indicate to pedestrians about the construction work area; ☞ Avoid interference of clearance and movements along roads.	accident		capacity building, etc.
	Impact # 13: Creation of employment opportunities	☞ Publication of local employment opportunities; ☞ Optimize local employment by offering skills and trainings to locals particularly youth; ☞ Observe the national (Tanzania) and international labour standards; ☞ Allocate job fairly among local people (women and men) by working with local leaders; ☞ Give employment priority to the local communities with relevant skills based on gender; ☞ Provide awareness to locals on potential investment and employment opportunities.	Tanzania labour Laws: Employment and Labour Relations Act, No. 6, (2004); Worker's Compensation Act, No 20, (2008)	Wami/Ruvu basin water board Contractor(s)	They are all management aspects
	Impact # 14: Nuisance and loss of aesthetics due to improper waste management	☞ Ensure site housekeeping to minimize solid and liquid wastes generated from construction and other related activities; ☞ Carry out best practices in wastes management including wastes minimization, segregation, recycling and reuse of waste products where possible; ☞ Stockpile and store overburden materials for backfill and site rehabilitation after construction; ☞ Recyclable/usable materials (i.e. metal components, cut trees, etc.) will be provided for free to the local	Tanzania "Solid Waste Regulations of 2009", "Hazardous Waste Regulations of 2009" and "Water Quality Standards Regulations of 2007"	Wami/Ruvu basin water board Contractor(s)	Covered above

PHASE	IMPACT	MITIGATION / ENHANCEMENT MEASURE	TARGET LEVEL/ STANDARD	RESPONSIBILITY	COST ESTIMATE IN TZS
		communities for use through their local governments; ☞ The solid wastes will be disposed at the designated solid waste disposal area; ☞ The construction crew shall use the existing on site sanitation facilities. When full sanitation facilities will be emptied and safely disposed at designated disposal area.			
	Impact # 15: Occupation health and safety hazards	☞ Ensure availability of competent operators of machines and equipment's and competent supervisors on site at all times during specific operations; ☞ Ensure provision and use of working machinery, equipment and tools; ☞ Ensure provision and use of proper PPEs, reasonable working hours, conditions and facilities; ☞ Post warning signs with appropriate text (local language) and graphics; ☞ Establish a code of practices at the work place include complying with relevant Tanzania (OSHA, 2003) Performance Standards on health and safety requirements; ☞ Observe for water and sanitation provisions; ☞ Establish fire-fighting equipment(s) and procedures at site; ☞ Establish a First Aid facility at the site.	Tanzania (OSHA, 2003) and HSE standards Tanzania labour Laws: Employment and Labour Relations Act, No. 6, (2004); Worker's Compensation Act, No 20, (2008)	Wami/Ruvu basin water board Contractor(s)	3,000,000/= for PPEs and capacity building programmes on occupational and public health, safety and security.
	Impact # 16: Public health, safety and security hazards	☞ Ensure availability of competent operators of machines and equipment's and competent supervisors on site at all times during specific operations; ☞ Provide warning signs with appropriate text (local language) and graphics;	Tanzania (OSHA, 2003) and HSE standards Tanzania labour Laws:	Wami/Ruvu basin water board Contractor(s)	Covered above

PHASE	IMPACT	MITIGATION / ENHANCEMENT MEASURE	TARGET LEVEL/ STANDARD	RESPONSIBILITY	COST ESTIMATE IN TZS
		☞ Establish a code of practices at the work place include complying with relevant Tanzania (OSHA, 2003) Performance Standards on health and safety requirements; ☞ Establish fire-fighting equipment's and procedures at the site.	Employment and Labour Relations Act, No. 6, (2004); Worker's Compensation Act, No 20, (2008)		
Operation Phase	Impact # 18: Increase access to water supply and protection of water resources	☞ Develop and implement an environmental and social management and monitoring plan for the proper operation of cattle trough and borehole; ☞ Ensure availability of qualified staff and assistants; ☞ Ensure availability of sustainable financial resources for operation of cattle trough; ☞ Ensure proper management of cattle trough during operation phase; ☞ Observe all Tanzanian guidelines by ministry of water.	National Water Policy (NAWAPO), (2002) The Water Resources Management Act (WRMA), 2009.	Wami/Ruvu basin water board	To be included in Wami/Ruvu basin water office annual operational costs
	Impact # 19: Creation of employment opportunities and income generation	☞ Publication of local employment opportunities; ☞ Optimize local employment by offering skills and trainings to locals particularly youth; ☞ Observe the national (Tanzania) and international labour standards; ☞ Give employment priority to the local communities with relevant skills based on gender.	Tanzania labour Laws: Employment and Labour Relations Act, No. 6, (2004); Worker's Compensation Act, No 20, (2008)	Wami/Ruvu basin water board	They are all management aspects

PHASE	IMPACT	MITIGATION / ENHANCEMENT MEASURE	TARGET LEVEL/ STANDARD	RESPONSIBILITY	COST ESTIMATE IN TZS
	Impact # 20: Nuisance and loss of aesthetics due to improper waste management practises	☞ Provide periodical awareness, education and training to Wami/Ruvu basin water office staff, patients and visitors on key aspects waste management; ☞ Carry out best practices in wastes management including wastes minimization, segregation, recycling and reuse of waste products where possible; ☞ Provide appropriate onsite solid waste management facilities (i.e. collection points and bins, etc.) ☞	Tanzania "Solid Waste Regulations of 2009", "Hazardous Waste Regulations of 2009" and "Water Quality Standards Regulations of 2007"	Wami/Ruvu basin water board	Covered above
	Impact # 21: Occupational health and safety hazards	☞ Ensure provision and use of working equipment and tools; ☞ Ensure provision and use of PPEs, reasonable working hours, conditions and facilities; ☞ Establish a code of practices at the work place include complying with relevant Tanzania (OSHA, 2003) Performance Standards on health and safety requirements; ☞ Observe for water and sanitation provisions.	Tanzania (OSHA, 2003) and HSE standards	Wami/Ruvu basin water board	2,000,000
Decommissioning Phase	Impact # 22: Loss of employment and business opportunity	☞ Provide on job training to employees that will help them undertake their jobs and may improve their employability once the project finishes; ☞ Provide the terminal benefits to all employees in compliance with employment laws.	Tanzania labour Laws: Employment and Labour Relations Act, No. 6, (2004); Worker's Compensation Act, No 20, (2008)	Wami/Ruvu basin water board	They are all management aspects

PHASE	IMPACT	MITIGATION / ENHANCEMENT MEASURE	TARGET LEVEL/ STANDARD	RESPONSIBILITY	COST ESTIMATE IN TZS
	Impact # 23: Nuisance and loss of aesthetics due to improper waste management practises	☞ Ensure site housekeeping to minimize solid and liquid wastes generated from demolition activities; ☞ Carry out best practices in wastes management including wastes minimization, segregation, recycling and reuse of waste products where possible; ☞ Stockpile and demolition materials for backfill and site rehabilitation after construction; ☞ Recyclable/usable materials (i.e. metal components, cut trees, etc.) will be provided for free to the local communities for use through their local governments; ☞ The demolition solid wastes will be disposed at the designated solid waste disposal area.	Tanzania "Solid Waste Regulations of 2009", "Hazardous Waste Regulations of 2009" and "Water Quality Standards Regulations of 2007"	Wami/Ruvu basin water board Contractor	1,000,000
	Impact # 24: Occupational health and safety hazards	☞ Ensure provision and use of working machinery, equipment and tools; ☞ Ensure provision and use of proper personal protective equipment (PPEs), reasonable working hours, conditions and facilities; ☞ Post warning signs with appropriate text (local language) and graphics; ☞ Establish a code of practices at the work place include complying with relevant Tanzania (OSHA, 2003) Performance Standards on health and safety requirements; ☞ Observe for water and sanitation provisions; ☞ Establish a First Aid facility at the site.	Tanzania (OSHA, 2003) and HSE standards Tanzania labour Laws: Employment and Labour Relations Act, No. 6, (2004); Worker's Compensation Act, No 20, (2008)	Wami/Ruvu basin water board Contractor(s)	1,000,000

CHAPTER EIGHT

8.0 ENVIRONMENTAL AND SOCIAL MONITORING PLAN

8.1: INTRODUCTION

The Environmental and Social Monitoring Plan (ESMoP) is an objective, periodical, reliable, and continuing process of observation and assessment of environmental changes. It is intended to ensure implementation of mitigation measures is done in accordance with regulations and standards. It is therefore based on monitoring indicators, which will have to be compared with targets to gauge the effectiveness of the mitigations plans. In addition, the baseline data will be compared with targets and post situation. The objectives of the Environmental Monitoring Program are:

- Ensure proper development and implementation of the environmental management plan and other mitigation measures;
- Asses the performance of environmental controls and mitigation measures;
- Ensure that the project proprietor, contractors and service providers corrects any mitigation measures that are not functioning acceptably.

8.2: MONITORING RESPONSIBILITY

Wami/Ruvu basin water office is committed to designing and implementing a comprehensive Environmental and Social Monitoring Programme (ESMoP) as an integral component of the proposed project on construction of cattle trough. Wami/Ruvu basin water office will implement the ESMoP, supervise and monitor all components of the plan during mobilization and operation phases, and maintain detailed records of monitoring outcomes. Wami/Ruvu basin water office has technical and human resource abilities to successfully conduct supervisory oversight of ESMoP implementation.

8.3: THE EMP FOR THE PROPOSED PROJECT

The ESMoP for the proposed project on construction of cattle trough is described on Table 19below. The total estimated cost for implementation of ESMoP is TZS 5,500,000 during mobilization and construction phases and TZS 2,500,000 per year during operation phase. The Wami/Ruvu basin water office used informed judgment to come up with these indicative figures.

Table 14: Environmental and Social Monitoring Plan for the proposed project on construction of Bonye Cattle trough

Impact	Monitoring Parameter	Monitoring Frequency	Monitoring Area	Measurement Unit	Standard / Norm/ Specifications	Responsibility	Cost Estimate (TZS)
A. Environmental Impacts							
Mobilization and Construction Phase							
Impact # 1: Depletion at points of source of construction materials	Source and quantity of materials	Monthly during mobilization and construction	Procurement records	None	Wami/Ruvu basin water office procurement guidelines	• Wami/Ruvu basin water office Consulting Engineer	Part of project running costs
Impact # 2: Impairment of air quality & climate change due to exhaust emissions (dust, noxious gases)	Particulate matter and Noxious gases such as CO, CO2, NOx, PM, SOx, VOC and Smoke	Twice during mobilization	Construction site in Bonye	Concentrations in ppm & Complaints from affected community groups	Tanzania "EMA (Air Quality Standards) Regulations of 2007" Smoke ≤0.15g/m	• Wami/Ruvu basin water office • MDC	1,000,000
Impact # 3: Soils damage/disturbance to surface and sub-surface organisms	Soil erosion tendencies	Monthly during mobilization and construction	Construction site in Bonye	Metre (m)	As minimum as possible	• Contractor (s) • Consulting Engineers • Wami/Ruvu basin water office	• Part of project running costs
Impact # 4: Disruption of onsite / offsite sensitive receptors	Noise levels	Continuous during mobilization	Construction site in Bonye	Complaints from affected community	Environmental Management (Control of Noise	• Wami/Ruvu basin water office	Part of operational costs

Impact	Monitoring Parameter	Monitoring Frequency	Monitoring Area	Measurement Unit	Standard / Norm/ Specifications	Responsibility	Cost Estimate (TZS)
		and construction		groups	and Vibration) Regulations of 2011	• MDC	
Impact # 5: Environment pollution from poor waste management	Number of construction crews trained, frequency of training, waste handling practices (collection, storage, transportation, treatment and disposal means)	Monthly	Construction site in Bonye	M^3 (Unit of Volume)	Tanzania "Solid Waste Regulations of 2009" and "Water Quality Standards Regulations of 2007"	• Contractor (s) • Consulting Engineers • Wami/Ruvu basin water office • LGA	500,000
Operation Phase							
Impact # 6: Environment pollution from poor waste management	Waste handling practices (collection, storage, transportation, treatment and disposal means)	Monthly	Construction site in Bonye	M^3 (Unit of Volume)	Tanzania "Solid Waste Regulations of 2009" and "Water Quality Standards Regulations of 2007"	• Wami/Ruvu basin water office • LGA	500,000
Decommissioning Phase							
Impact # 7: Impairment of air quality & climate change due to exhaust emissions (dust, noxious gases)	Particulate matter and Noxious gases such as CO, CO2, NOx, PM, SOx, VOC and Smoke	Twice during the phase	Demolition site in Bonye	Concentrations in ppm & Complaints from affected community	Tanzania "EMA (Air Quality Standards) Regulations of 2007" Smoke ≤0.15g/m	• Wami/Ruvu basin water office • MDC	500,000

Impact	Monitoring Parameter	Monitoring Frequency	Monitoring Area	Measurement Unit	Standard / Norm/ Specifications	Responsibility	Cost Estimate (TZS)
				groups			
Impact # 8: Environment pollution from poor waste management	Waste handling practices (collection, storage, transportation, treatment and disposal means)	Monthly	Demolition site in Bonye	None	Tanzania "Solid Waste Regulations of 2009" and "Water Quality Standards Regulations of 2007"	• Contractor (s) • Wami/Ruvu basin water office • MDC	500,000
B. Social Impacts							
Mobilization and Construction Phase							
Impact #9: Increase income to local suppliers government revenue	Type of supplies and expenses extracted / sourced locally	Monthly during mobilization	Procurement records	None	As maximum as possible	• Wami/Ruvu basin water office • LGAs	None
Impact # 10: Conflicts over use of local resources and social interactions	• Level of service provision to workers at the construction sites	Continuous during mobilization and construction	Complaints and contractors records	None	As minimum conflicts as possible	• Wami/Ruvu basin water office • MDC • Contractor • Consultant	• Part of institutional costs and service contracts
Impact # 11: Nuisance and disturbances from noise and vibrations	Noise levels	Twice per month	Construction site in Bonye	Complaints from affected community groups dB(A)	Environmental Management (Control of Noise and Vibration) Regulations of 2011	• Wami/Ruvu basin water office • NEMC • MDC	1,000,000

Impact	Monitoring Parameter	Monitoring Frequency	Monitoring Area	Measurement Unit	Standard / Norm/ Specifications	Responsibility	Cost Estimate (TZS)
					70dB during daytime; 60dB during night time		
Impact # 12: Increase in traffic movements and possible road accidents	Tendencies of injuries and accidents	Monthly	Construction site in Bonye	Records / Number / Complaints	No or minimum traffic accident	• Wami/Ruvu basin water office • MDC • Local leaders	None
Impact # 13: Creation of employment opportunities and income generation	Employees records and training programmes; reported incidences of unfairness	Monthly	Wami/Ruvu basin water office records	Number and composition	As maximum as possible	• Wami/Ruvu basin water office • Local leaders	None
Impact # 14: Nuisance and loss of aesthetics due to improper waste management practises	Number of construction crews trained, waste handling practices (collection, storage, transportation, treatment and disposal means)	Monthly	Construction site in Bonye	None	Tanzania "Solid Waste Regulations of 2009" and "Water Quality Standards Regulations of 2007"	• Contractor (s) • Consulting Engineers • Wami/Ruvu basin water office • MDC	1,000,000
Impact # 15: Occupation health and safety hazards Impact # 16: Public health, safety and security hazards	Number of construction crew trained, equipment maintenance reports; training reports to the construction crews, incidences of worker non-compliance with	Monthly	Construction site in Bonye	Medical and operational reports	Tanzania (OSHA, 2003) and HSE standards Tanzania labour Laws Tanzania labour Laws: Employment and	• Wami/Ruvu basin water office • OSHA	1,000,000

Impact	Monitoring Parameter	Monitoring Frequency	Monitoring Area	Measurement Unit	Standard / Norm/ Specifications	Responsibility	Cost Estimate (TZS)
	PPE; safety signage; drinking and sanitation facilities.				Labour Relations Act, No. 6, (2004); Worker's Compensation Act, No 20, (2008)		
Operation Phase							
Impact # 17: Creation of employment opportunities and income generation	Employees records and training programmes	Annually	Wami/Ruvu basin water office records	Number and composition	As maximum as possible	• Wami/Ruvu basin water office • MDC	None
Impact # 18: Nuisance and loss of aesthetics due to improper waste management practises	Number of Livestock keepers trained,	Quarterly	Project site in Bonye	None	Solid Waste Regulations of 2009; Water Quality Standards Regulations of 2007"	• Wami/Ruvu basin water office • MDC	Covered above
Impact # 19: Occupational Health and Safety Hazards	Equipment maintenance reports; incidences of worker non-compliance with PPE; safety signage; drinking and sanitation facilities.	Quarterly	Construction site of cattle trough	Medical and operational reports	Tanzania (OSHA, 2003) and HSE standards Tanzania labour Laws	• Wami/Ruvu basin water office • OSHA	1,000,000
Decommissioning Phase							
Impact # 20: Loss of employment and	Employees records and training	Monthly	Wami/Ruvu basin water	Number and composition	Tanzania labour Laws	• Wami/Ruvu basin water	None

Impact	Monitoring Parameter	Monitoring Frequency	Monitoring Area	Measurement Unit	Standard / Norm/ Specifications	Responsibility	Cost Estimate (TZS)
business opportunity	programmes		office records			office • MDC	
Impact # 21: Nuisance and loss of aesthetics due to improper waste management practises	Waste handling practices (collection, storage, transportation, treatment and disposal means)	Monthly	Demolition site in Bonye	None	Tanzania "Solid Waste Regulations of 2009" and "Water Quality Standards Regulations of 2007"	• Contractor (s) • Wami/Ruvu basin water office • MDC	Covered above
Impact # 22: Occupational health and safety hazards	Equipment maintenance reports; training reports to the construction crews, incidences of worker non-compliance with PPE; safety signage; drinking and sanitation facilities.	Monthly	Demolition site in Bonye	Medical and operational reports	Tanzania (OSHA, 2003) and HSE standards Tanzania labour Laws	• Wami/Ruvu basin water office • OSHA	1,000,000

CHAPTER NINE

9.0 PRELIMINARY DECOMMISIONING PLAN

9.1: INTRODUCTION

The proposed project on construction and operation of cattle trough in Bonye village in Morogoro Region is planned to have a minimum life span of 25 years. After that time the infrastructures will have to be closed and or reviewed. Nevertheless, the project may also be stopped if there will be changes on land use as per Tanzania government preferences. In those circumstances Wami/Ruvu Basin Water Board may decide to decommission the infrastructures. This chapter describes a preliminary decommissioning plan which provides important aspects to be considered in the detailed decommissioning plan to be developed by the operator towards closure of the infrastructures.

This plan establishes feasible decommissioning activities that can be accomplished without undue risk to the health and safety of the public and decommissioning personnel, without adverse effects on the environment, and within established guides and limits of the appropriate regulatory agencies. The generalized plan serves the purpose of ensuring that the decommissioning and ultimate disposition of the proposed facilities is considered during the initial design and construction. This preliminary plan is intended to remain a "living document," therefore; the revisions will be made throughout the operating life of the infrastructures. It must be reviewed periodically and revised to reflect any changes in the project development or operation that might affect decommissioning and post closure. The detailed plan therefore should cover all aspects of the closure and post closure components, their activities, targets, costs and timeframe.

Prior to the initiation of actual decommissioning activities for the project, a comprehensive final decommissioning and post closure plans shall be prepared with the aim of minimizing environmental and social impacts during and after closure of the proposed waste management infrastructures. The final plans should be prepared based on the known situation at the closure time, building on the preliminary plan and revisions, and will define specific work activities, including safety evaluations of planned decommissioning methods, costs, and the project status that will result from the decommissioning program. In addition, the decommissioning and site restoration activities shall comply with the local and international standards in effect at the time of decommissioning.

9.2: PURPOSE AND CONTENT

9.2.1:Plan Purpose

This preliminary plan serves to establish decommissioning as an important consideration from the inception of the project, during construction and throughout the operation of the proposed cattle trough infrastructures. The plan has the following purposes:

a) To ensure that project designers are cognizant of decommissioning, closure and post closure aspects during the initial design. Thus, where design choices that would enhance decommissioning are available for types of materials and system components, and location of components, these choices should be made;
b) To identity the ultimate decommissioning options and final project status. These options would be evaluated and narrowed to the method of choice as the end of the project life is approached;
c) To demonstrate to regulatory agencies that important aspects of decommissioning are considered as early as possible during the initial re-design of the Project. The plan serves as the starting point to demonstrate that areas such as decommissioning methods, costs, schedules, and operating impact on decommissioning will be reviewed and refined throughout the operating life of the project.

9.2.2:Plan Content

This preliminary plan provides a general description of decommissioning and closure methods considered feasible for the proposed facilities. The description should demonstrate that the methods considered are practical and that they protect the health and safety of the public and decommissioning / closure personnel.

Design personnel should study the proposed decommissioning and closure methods and take steps to ensure that the design incorporates features that will facilitate decommissioning and closure steps. Considerations include:

a) Provisions for adequate material-handling equipment.
b) An estimate of manpower, materials, and costs anticipated to support decommissioning.
c) A description of the anticipated final disposition and status of the facilities at the site
d) A discussion demonstrating that adequate financing will be programmed for decommissioning and closure activities
e) Identification of records that should be maintained during project development and operation which might facilitate decommissioning including a set of "as built" drawings.
f) A description of the anticipated post closure actions

9.2.3:Project Removal Methodology and Schedule

Project decommissioning has four phases: (1) pre-closure monitoring; (2) permitting; (3) interim protective measures; and (4) project closure and associated protective actions. The first three phases will occur prior to removal of the project (i.e. within the first six months). The fourth phase — project closure and associated protective actions — will take place within six months after closing the operations of the infrastructures.

The following description outlines the activities that will occur in each phase and provides references to detailed descriptions of each activity elsewhere in the plan:

(a) Pre-Closure Monitoring

Pre-closure monitoring includes environmental and socio-economic status of the project, and the surrounding. This monitoring is essential to identify if there are any environmental or social liabilities, which need to be settled before the permit for closure is given. This period will also be used to inventory all assets and facilities that need to be disposed of and to prepare a final decommissioning plan for approval by NEMC.

(b) Permitting

Wami/Ruvu basin water office shall obtain all permits required to undertake closure of the constructed cattle trough.

(c) Interim Protective Actions

This will take care of any interim protective measure that needs to be implemented to protect human health and the environment.

(d) Project Closure

As noted above, the removal of the project will be completed within six months. It will involve dismantling and recycling of the components parts. The project components will be dismantled and removed using minimal impact conventional construction equipment and recycled or disposed of safely. Effectively, the decommissioning of the proposed project will consider all project components described in Chapter 2.

9.3: PROCEDURE FOR DECOMMISSIONING AFTER CEASING THE OPERATION

The decommissioning will involve the following main activities:

9.3.1:Removal of Structures

When the Project reaches the end of its operational life, constructed cattle trough infrastructures will be dismantled unless the project proponent (Wami/Ruvu basin water office) requests that certain infrastructure be retained on land. The project components will be dismantled and removed using minimal impact conventional construction equipment and recycled or disposed of safely. The key components of the project that will be dismantled and decommissioned are summarized in Table 20. Decommissioning will be undertaken by licensed subcontractors using appropriate techniques and equipment's.

Table 20: Structures removal plan

Component	Decommissioning Measure
Civil structures	• they will be disassembled and removed from the site • The solid waste materials emanating from structures dismantling will be collected and safely dumped into existing approved dumpsites and be part of the decommissioning plan; • The foundation for structures will be removed to 1m down to the ground and covered with soil/fill in preparation for site rehabilitation.
Pipes and other electrical and electromechanical components (connection cabling, etc.)	• Disconnection of all wiring, cables and electrical interconnections • As far as possible, all materials and components (e.g. plastic, steel, electrical cables, etc.) will be reused, sold as scrap, recycled, or re-purposed to the maximum amount economically practical; • Any other components will be hauled to approve disposal facilities; • Any ground disturbed as a result of these activities will be rehabilitated.
Metallic components	• The metallic components will be disassembled, cleaned on site and transported and sold to authorize local scrap metal recycling vendors in Morogoro district or nearby areas.

9.3.2:Site Rehabilitation

Site rehabilitation refers to the rehabilitation of the overall property and not specifically to the cattle trough infrastructure areas. All those areas that have been disturbed as part of the project operations and that are no longer needed during the closure period will be rehabilitated. All manmade structures will be demolished, and the areas ripped and prepared for re-vegetation. Selected native species will be planted to initiate the re-growth of the native vegetation. The focus will be to revert back the land to its "protected" status. Prior to abandonment of the structures, a land survey will be conducted to ensure that conditions satisfy the decommissioning requirement.

9.4: DECOMMISSIONING RESOURCES REQUIREMENT

9.4.1: Materials Required

Decommissioning activities will require various resources including water, energy, as well as working tools and equipment to accomplish the closure and post closure tasks successful. Most of these resources will be obtained in Bonye. The preliminary list of resources and equipment that are expected to be used during project execution are listed in Table 21 and Table 22.

Table 21: Preliminary list of resources required during decommissioning

Materials required	Source
Water	Onsite sources at project area
Diesel powered generators	Registered and licensed suppliers in Morogoro Region
Lubricants (oil and grease)	
Fuel	

Table 15: Equipment requirement for decommissioning activities

S/N	Type	Quantity	Duration (Month)	Activity
Typical Construction Equipment				
1	Compactor	1	6	Soil compaction
Transport Facilities				
2	Trucks	1	6	Materials and crew transportation
3	Vehicles	1	6	Transportation of staff and crew to work locations across the project site

9.4.2:Closure Costs

Wami/Ruvu water basin office (WRWBO) will fund and implement all aspects of project closure (decommissioning), including but not limited to, all engineering, environmental monitoring, permitting, and mitigation activities associated with this plan.

9.5: DECOMMISSIONING PERMITS AND OTHER REQUIREMENTS

Wami/Ruvu water basin office shall ensure that all permits required for decommissioning process are sought. The permits may include permit to transfer equipment, disposal of hazardous materials (if any), etc. The standard procedures of demolishing techniques shall be used, and all identified hazardous materials will be collected and disposed of in accordance to the applicable laws, practice and regulations.

9.6: STAKEHOLDERS' ENGAGEMENT FORUM

When the time for decommissioning arrives, Wami/Ruvu basin water office shall form a team of experts (preferably engineering, water and environment) with a representative from NEMC which shall monitor the implementation of decommissioning plan and ensure that decommissioning is done according to the plan.

9.7: REPORTING

Decommissioning report shall be prepared and submitted to all relevant authorities including NEMC. The report shall provide the necessary details on the performance of the site during the closure period and would typically include a summary of the surface and underground monitoring results. Likewise, during post closure period, annual reports will be prepared and submitted to all relevant authorities including NEMC. The report will provide the necessary details on the performance of the site.

BIBLIOGRAPHY

IFC Environmental, Health and Safety (EHS) Guidelines;
ILO C138 Minimum Age Convention, 1973;
ILO C148 Working Environment (Air Pollution, Noise & Vibration) Convention, 1977;
ILO C182 Worst Forms of Child Labour Convention, 1999;
Morogoro District Council Socio-economic Profile;
URT, Employment and Labour Relations Act No 6 of 2004;
URT, Local Government Laws (Miscellaneous Amendments) Act, 2006;
URT, National Bureau of Statistics (NBS) (2013). 2012 Population and Housing Census: Population Distribution by Administrative Areas;
URT, National Strategy for Growth and Reduction of Poverty 2005;
URT, Tanzania Commission for AIDS, Act, 2001 of 2001;
URT, Tanzania Investment Act, Cap. 38;
URT, The Contractors Registration (Amendment) Act No 15 of 2008;
URT, The Environment Impact Assessment and Audit Regulations, 2005;
URT, The Environmental Management Act, Cap 191;
URT, The HIV and AIDS (Prevention and Control) Act no 28 of 2008;
URT, The HIV Policy (2001);
URT, The Land (Amendment) Act No 2 of 2004;
URT, TheLand Use Planning Act, 2007;
URT, The National Environmental Policy 1999;
URT, The National Investment Promotion Policy 1996;
URT, The National Land Policy 1996;
URT, The National Water Policy of 2002;
URT, The Occupational Health and Safety Act No 5 of 2003;
URT, The Public Health (Sewerage and Drainage) Act, Cap 336;
URT, The Public Health Act of 2009;
URT, The Registration of Environmental Experts Regulations, 2005;
URT, The Standards Act, 2009;
URT, The Tanzania Development Vision 2025;
URT, The Environmental Impact Assessment and Audit Regulations, 2005;
URT, The Water Resources Management Act No. 11of 2009;
URT,The Workers Compensation Act No 20 of 2008.

APPENDICES

Appendix 1: NEMC Screening Decision

NATIONAL ENVIRONMENT MANAGEMENT COUNCIL(NEMC)
BARAZA LA TAIFA LA HIFADHI NA USIMAMIZI WA MAZINGIRA

Telephone: +255 22 2774889,
Direct line: +255 22 2774852
Mobile: 0713 608930
Fax: +255 22 2774901
Email: dg@nemc.or.tz
Website: www.nemc.or.tz

35 Regent Street,
P. O. Box 63154,
11404 Dar es Salaam,
TANZANIA.

In reply please quote:
Ref: **CB.145/208/348/05** **04/09/2020**

Wami/Ruvu Basin Basin Board,
P. O. Box 826,
Morogoro.

RE: SCREENING DECISION FOR THE PROPOSED CONSTRUCTION OF CATTLE TROUGH AND DRILLING OF BOREHOLE, BONYE VILLAGE, BWAKILA CHINI WARD, MOROGORO DISTRICT IN MOROGORO REGION.

The above heading Refers,

We acknowledge receipt of your letter dated 24th July, 2020 submitting five (5) copies of Project Brief report for undertaking Environmental Impact Assessment (EIA) of the above-mentioned project. Please be informed that your project has been allotted with Application Reference Number (ARN) **13137.** Remember to quote this number in all of your future correspondences with the Council regarding this project.

The Council has reviewed the submitted documents and reached a decision that your project will end at a project brief stage. You are therefore required to submit five (5) copies of the detailed project brief report which will guide the Council in decision making. Kindly be reminded that the project brief should conform to the EIA and Audit (Amendment) Regulations, 2018 particularly Regulation 6(1) for the contents of the comprehensive project brief. In view of that the detailed project brief should compose the following:

i. The site location and accessibility of the proposed project and the physical area that may be affected by the project activities;
ii. The activities with explanations that shall be undertaken during proposed project mobilisation, construction, operation and decommissioning;

All correspondence should be addressed to the Director General

iii. Information on all types of waste that will be generated by the project in all project phases and its management;

iv. The proposed project components and designs;

v. The potential environmental, economic and socio-cultural impacts of the proposed project and the mitigation measures to be taken during and after implementation of the project;

vi. Detailed stakeholder consultations including but not limited to Morogoro District Council, Bwakila Chini Ward, Mtaa office, Land Office and project neighbours. Attach all letters that will be sent to the authorities for consultations, Pictures taken during consultation meetings, Names and original signatures (not scanned). Their views and concerns should be responded by the developer and included in the report.

vii. Detailed Environmental Management and Monitoring Plan for the proposed project;

viii. The report should have the following attachments:

a) Land ownership documents with appropriate land use;
b) Detailed engineering design and architectural drawings; and
c) Site layout plan of the project.

The budget for these review activities amounts to **Four millions shillings (Tshs. 4,000,000/=)** which excludes transport cost as elaborated on the attached NEMC proforma invoice **No. 05753** of **17/06/2020**. Note that, the amount can be paid through Government electronic Payment Gateway system (GePG) using a control number obtained at the council office through cell phone No. **0677069967**.

Please, do not hesitate to contact us in case you need additional information or clarifications on this process through Telephone No. +255 786453332.

We are looking forward to your cooperation concerning this project.

Yours Sincerely,

Arnold Mapinduzi
***For*: Director General**

Cc: Eng. Hamza Rajabu,
P.O. Box 72765,
Dar es Salaam.

All correspondence should be addressed to the Director General

Appendix 2: Proof of land ownership

MKATABA WA KURIDHIA KUTOA ARDHI KWA HIARI

MAKUBALIANO

KATI YA

HALMASHAURI YA KIJIJI CHA BONYE

NA

HALMASHAURI YA WILAYA

MOROGORO

KWA LENGO LA

KUTOA ARDHI KWA HIARI

OKTOBA/2019

MKATABA WA KURIDHIA KUTOA ARDHI KWA HIARI

MRADI WA KUENDELEZA SEKTA YA MAJI (WSSP II)

MKATABA HUU umesainiwa leo tarehe 17 ya mwezi 10 Mwaka 2019

BAINA YA

Halmashauri ya Kijiji cha BONYE wa Sanduku la Posta 1880 MOROGORO, Kijiji cha **BONYE**, Wilaya ya **Morogoro**, Mkoa wa **Morogoro** (ambaye atajulikana kama "***Mtoa Ardhi***" kwa upande mmoja);

NA

HALMASHAURI YA WILAYA MOROGORO wa Sanduku la Posta 1880 (atakaejulikana kwa jina "***Mpokeaji Ardhi***" kwa upande mwingine).

1

KWA KUWA MTOA ARDHI ni mmiliki halali wa eneo/ardhi/kiwanja/shamba lenye ukubwa wa mita za mraba 9800....., (upana wa mita .....70....., urefu wa mita .....140.....), lililopo katika Kijiji cha **BONYE**, Kata ya **Bwakila Chini**, Tarafa ya **Bwakila**, Wilaya ya **Morogoro**, Mkoa wa **Morogoro**. Kwa hiari yake mwenyewe bila kulazimishwa ameamua kutoa sehemu ya eneo tajwa katika Mkataba huu kwa **HALMASHAURI YA WILAYA YA MOROGORO** kwa ajili ya Mradi wa **Mabirika ya Kunyweshea Mifugo**.

KWAKUWA

Serikali kwa kushirikiana na Benki ya Dunia inatakeleza Mradi wa Kuendeleza Sekta ya Maji (WSSP II 2017-2022). Mradi huu unatoa kipaumbele katika kusimamia rasilimali za maji na kutoa huduma katika sekta ya maji na usafi wa mazingira. Mtekelezaji wa Mradi ni Serikali ya Jamhuri ya Muungano wa Tanzania ambayo imetoa jukumu hilo kwa Wizara ya Maji kupitia Bodi ya Maji Bonde la Wami/Ruvu.

KWAKUWA

Wananchi wa maeneo yote yatakayofaidika na Mradi, kwa pamoja na kwa hiari yao na kwa lengo la kuwezesha utekelezaji wa mradi huo kwa manufaa ya umma, wamekubali kutoa Ardhi zao kwa Halmashauri husika itakayotumika kwa ajili ya utekelezaji wa mradi.

HIVYO BASI pande zote mbili zinashuhudia na kukubaliana kama ifuatavyo:-

1. **KWAMBA** kwa kuthamini manufaa ya mradi kwa wananchi wa BONYE ,Mtoa Ardhi kwa hiari yake mwenyewe anaridhia kutoa eneo/shamba/kiwanja tajwa katika mkataba huu kwa ajili ya kuwezesha mradi wa **Mabirika ya Kunyweshea Mifugo.** Eneo hilo amelitoa bure na hatadai malipo yoyote katika wakati wowote.
2. Mkataba huu utaanza kutumika tarehe .....17/10/2019..... na hautakuwa na mwisho kwa sababu ardhi imetolewa moja kwa moja.
3. **KWAMBA** Mpokea Ardhi atatumia eneo analopewa kwa matumizi ya kuchimba kisima, kujenga mabirika ya kunyweshea mifugo na miundombinu yake na kwa matumizi mengine yanayoendana na mradi.
4. **KWAMBA** Mtoaji Ardhi hatoruhusiwa kufanya shughuli yoyote ya kibinadamu ambayo itahatarisha uwepo wa birika la kunyweshea mifugo na miundombinu yake kwa ujumla katika eneo lote litakalopitiwa na mradi kama vile kujenga Nyumba na kupanda miti mikubwa.
5. **KWAMBA** Mtoaji Ardhi anahakikisha kuwa ardhi aliyotoa kwa ajili ya mradi ni mali yake mwenyewe na hakuna mtu mwingine mwenye umiliki na eneo hilo na endapo atatokea mwingine kudai umiliki wa eneo hilo na ikathibitika kuwa ndiye mmiliki halali wa eneo hilo, basi mtoa ardhi atakuwa na jukumu la kulipa fidia kwa mtu huyo.
6. **KWAMBA** mkataba huu utasimamiwa na Sheria ya Mkataba ya Jamhuri ya Muungano wa Tanzania.
7. **KWAMBA** Mkataba huu ni wa kudumu na hautavunjwa kwa sababu yoyote ile.

KAMA USHUHUDA kuwa **MTOA ARDHI** na **MPOKEA ARDHI** wamekubaliana na masharti ya Mkataba huu kwa hiari yao wenyewe wamesaini mkataba huu Tarehe..17...Mwezi ...10.....
Mwaka.2019....kama inavyoonekana hapa chini:

KWA NIABA YA MTOA ARDHI:
JINA: YAHAYA S. KIDEO
SAHIHI: .....
CHEO: MWEKITI
TAREHE: 17/10/2019

MBELE YA:
JINA: NICKSON M. ALLY
SAHIHI: .....
CHEO: AFISA MAENDELEO YA JAMII
TAREHE: 17/10/2019

MBELE YA:
JINA: JOHN STEPHEN MSAMI
SAHIHI: .....
CHEO: VEO
TAREHE: 17/10/2019

FOR WATER OFFICER
WAMI/RUVU BASIN
WATER BOARD
P. O. BOX 826
MOROGORO

KWA NIABA YA HALMASHAURI YA WILAYA:
JINA: REHEMA S. BWASI
SAHIHI: .....
CHEO: DED
TAREHE: 24/10/19

MBELE YA:
JINA: IDDI A. NDABHONA
SAHIHI: .....
CHEO: MWANASHERIA
TAREHE: 24/10/2019

MBELE YA MWAKILISHI WA BODI YA MAJI BONDE LA WAMI/RUVU:
JINA: ROSEMARY MASIKINI
SAHIHI: .....
CHEO: KAIMU AFISA WA MAJI
TAREHE: 17/10/2019

Appendix 3: List of Stakeholder Consulted with their Signatures

ATTENDANCE REGISTER FORM, FOR WSSP11 PROGRESS IMPLEMENTATION MISSION

VILLAGE: BONYE; SERIKALI YA KIJIJI DATE: 03/012/2019

SN	NAME	ORGANISATION	DESIGNATION	PHONE	SIGNATURE
1.	SELEMANI NDULI	BONYE	MW/KIT	0773349759	[illegible]
2.	JOHN S MSAMI	KIJIJI BONYE	VEO	0787469221	[illegible]
3.	SHABANI KULANGA	BONYE	MW/KIJIJI		[illegible]
4.	SHABANI O. HUSSEIN	BONYE	AFISA MIFUGO KATA	0685555475	[illegible]
5.	HABIBU S. MHANGA	BONYE	MWENYEKITI KITONGOJI	0785119303	Habiba
6.	SHIDA R. NGUBI	BONYE	MW/KITONGOJI	0735368258	[illegible]
7	SIAMINI A BEIELO	BONYE	MW/KITONGOJI	0684168959	A.BEIELO
8	FUNDI H. BONYE	BONYE	MW/KITI KI	0782148857	[illegible]
9	RAPHAEL S KIDANDU	BONYE	MJUMBE	0692 64507	[illegible]
10	KUDURA SIAM	BONYE	MJUMBE	0786910900	KUDURA
11	ALLI DULI	BONYE	MJUMBE	-	ALLI
12	JACKSON NGOWI	BONYE	MJUMBE	0767108121	[illegible]

ATTENDANCE REGISTER FORM, FOR WSSP11 PROGRESS IMPLEMENTATION MISSION

VILLAGE: BONYE, JUMUIYA YA WAKIGAJI DATE: 03/12/2019

SN	NAME	ORGANISATION	DESIGNATION	PHONE	SIGNATURE
1	NSIYEYE JANHAN	BONYE	MJUMBE-B	0685121319	
	MARIA BURUSHI	"	MJUMBE-B	0782492260	
	ESTER MARUGANZA	"	MHAZINI M[illegible]-B	0688-421717	
	REHEMA BURUSHI	"	MJUMBE-B	0684-98[illegible]2965	
	MWASU NDIBESI	"	MJUMBE-B	0685047816	
	KONE TAREK	"	MKT - B		
	SAMWELI MIMBA	"	MJUMBE-A	0787993420	
	NYERERA LAIMBA	"	MJUMBE-A	0692919979	
	NGAYONGA MORINGE	"	MJUMBE-A		
	HADIJA NYERERA	"	MJUMBE - A	078[illegible]824581	
	BURUSHI LARUSAI	"	MKT - B	0787740831	
	NEEMA NDATOMIA	"	MJUMBE - A	0782 492264	
	SELEYANI KILAMBU	"	MJUMBE-A		
	NDANSI KAPARI	"	B	0689 129100	
	MASAUKE LEKUKO	"	MJUMBE - A	068388466	

Appendix 4: Engineering Drawing and Site Layout for the Proposed Project