THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF WATER

DODOMA URBAN WATER SUPPLY AND SANITATION AUTHORITY (DUWASA)

THE ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED CONSTRUCTION AND OPERATION OF EIGHT (8) STOREY OFFICE BUILDING FOR DODOMA URBAN WATER SUPPLY AND SANITATION AUTHORITY AT PLOT NO.1 BLOCK F, NCC-LINK TAMBUKARELI WARD, DODOMA CITY, DODOMA REGION

Submitted to:	**Prepared by:**
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AUGUST,2025

STUDY TEAM OF THE ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

This Environmental and Social Impact Assessment (ESIA) report was prepared by registered and certified Environmental Experts who are registered by the National Environment Management Council (NEMC). The study was conducted by a multidisciplinary team comprising a sociologist who was responsible for conducting socio-economic baseline survey and stakeholder consultations; Environmental Scientists who were responsible for the characterization of biophysical environment of the study area, identification and evaluation impacts and analysis of mitigation measures; and Civil Engineer and Architecture who were responsible for reviewing construction drawings, geotechnical investigation report and site characterization for the proposed project.

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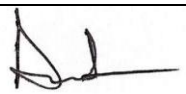
Deodatus Mushumbusi	Architecture	
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ACKNOWLEDGEMENT

Dodoma Urban Water Supply and Sanitation Authority (DUWASA), would like to acknowledge collective and individual contributions from a range of stakeholders such as Tanzania Building Agency (TBA), City Council of Dodoma (CCD), Fire and Rescue Force, OSHA, TANESCO, GST and community members from Tambukareli Ward and Salimini “Mtaa” during the preparation of this EIA report. The Proponent wishes also to acknowledgethe National Environment Management Council (NEMC) for reviewing the scoping report and approving Terms of Reference (TORs), which have guided this ESIA study. The report was prepared based on field work observations including stakeholders’ consultation, expert’s experience and secondary data from other various relevant reportsand documents which are cited in this report.

EXECUTIVE SUMMARY

Overview of the Project

Dodoma Urban Water Supply and Sanitation Authority (DUWASA) is an autonomous water utility legally charged with the delivery of water supply and sanitation services to urban residents of Dodoma City and the towns of Kibaigwa, Chamwino, Kongwa and Bahi. DUWASA decides to construct eight (8) storey office building to accommodate its staff due to the fact that the existing building is exhausted, lacks quality and modern office facilities and is not sufficient to accommodate all staff. The proposed project involves the construction of an 8-storey office building on a plot of a total area of approximately 13,670 square metres. The main goal of the project is to establish a modern, functional, and centralized office space that can effectively support DUWASA's operational needs and enhance service delivery to the community.

Objectives of the Project:

The building design aims to:

- Provide sufficient and modern spaces to accommodate all DUWASA staff.
- Support viable functional interactions to boost organizational effectiveness.
- Incorporate excellent and integrated security and safety features.
- Utilize cost-effective, high-quality building components, including passive construction materials and elegant finishes.

Project Components:

The building will feature;

i. Office rooms for various departments and stakeholders.
ii. Canteen, kitchen, gymnasium, and breastfeeding room.
iii. Conference rooms (including a 500-person main hall).
iv. Auditorium, archives, and record centers.
v. A roof garden and machine room.
vi. Toilets (disabled-friendly, male, female).
vii. Emergency assembly point, server room, and lounge for visitors.

viii. Generator shade, covered walkways, parking spaces, and landscaped gardens.
ix. The floor-by-floor layout includes;
x. Basement: Archives, record centers, strong rooms, pump room, sump area.
xi. Ground Floor: Customer service offices, infirmary, conference rooms, driver and security offices.
xii. Mezzanine: Canteen, gym, kitchen, breastfeeding room, and toilets.
xiii. 1st–7th Floors: Departmental offices, auditorium, and conference facilities.
xiv. 8th Floor (Roof): Stakeholders' offices, PIT room, roof garden, machine room, water tanks.

Main Activities:

The building will primarily serve as an administrative center for DUWASA. Activities will include;

i. Daily occupancy by DUWASA staff.
ii. Customer service operations.
iii. Temporary storage of materials for water supply network construction.

The project is intended to provide several employment and business opportunities and benefits during the implementation and operation phases. The new office building will ensure smooth and efficient execution of their daily tasks due to the improved and upgraded working environment.

It is clear that the construction and operation of the proposed Project will have both positive and negative environmental and social impacts. The proponent has commissioned experts on environment and social aspects to advise DUWASA on complying with AfDB Operational standards due to the fact that the process of construction, operation and eventual decommissioning of the proposed project might have the potential of causing impacts to the environment and community at large.

BRIEF DESCRIPTION OF PROJECT SITE AND THE MAJOR ENVIRONMENTAL AND SOCIAL STAKES/CHALLENGES

The proposed construction of the office building project area is located on Plot 1 Block F, NCC-Link “Salimini Avenue”, Tambukareli Ward, Dodoma City Council in Dodoma Region. The project site can be accessed through a tarmac road at about 5m to the road heading to UDOM at the junction close to the existing DUWASA head office building and opposite is bordered by Kambarage tower building. This road ensures site accessibility and smooth services provision. Basically, the site is well positioned in terms of accessibility. The Geographical location of the proposed project is at latitude 6.18646° S and longitude: 35.75268° E. Below is the existing project area condition for DUWASA office building.

Layout of the project area for the proposed 8 Storey DUWASA building

The proposed site is located within Dodoma City at a relatively flat plain; it is covered by insitu young superficial deposits mainly brown sandy soil mixed with some rock_fragments. The unit occurs as loose to semi -consolidated sediments which derive from weathering of basement rocks. The project area has a climatic condition typical of a semi-arid environment. Air quality and noise levels measured at the site were within acceptable limits set by the TBS and WHO. The

Socioeconomic data collected through field surveys and stakeholder consultations show that most residents use flash toilets, while DUWASA's sewer coverage serves only 20% of the City, though the project site is connected to the main sewer line. Solid waste is formally managed citywide and transported to Chidaya dump site. The existing office building on-site is outdated, overcrowded and lacks modern facilities including reliable water, sanitation, electricity, and waste systems contributing to poor functionality, low productivity, and health risks for employees.

INSTITUTIONAL AND LEGAL FRAMEWORK FOR IMPLEMENTATION OF THE PROJECT

Institutional Responsibilities

The implementation of the DUWASA office building project will be carried out under the coordination of multiple institutions, with the following defined roles;

Project Implementation Entity (PIE): DUWASA
Responsible for overall project coordination, execution, and compliance with national environmental regulations and AfDB's environmental and social safeguard requirements.

Oversees the implementation of the Environmental and Social Management Plan (ESMP).

National Environmental Management Council (NEMC)
Serves as the regulatory authority for environmental assessment in Tanzania.
Responsible for screening, reviewing, approving, and monitoring ESIA and associated plans.

Dodoma City Council and Local Authorities
Grant the building permit, ensure local compliance with urban planning regulations, and facilitate community-level engagement and grievance mechanisms.

AfDB (African Development Bank)
Provides project financing and requires compliance with its Integrated Safeguards System (ISS), particularly the Operational Safeguards standards (OSs);

Contractors and Subcontractors
Must implement environmental, health, safety, and social measures outlined in the ESMP and adhere to AfDB's safeguard policies, including gender and vulnerable group protections.

Other Supporting Institutions

- Ministry of Water – Technical oversight
- OSHA (Occupational Safety and Health Authority) – Monitors occupational

safety compliance
- Utility Agencies (e.g., TANESCO) – Coordinate utility connections and protection during construction.
- Tanzania Fire and Rescue Force-Ensure compliance with fire and safety regulations

Legislative and Regulatory Framework

The project shall comply with the following national laws and regulations:

- Environmental Management Act, 2004 and its amendments of 2024

This is the principal environmental legislation in Tanzania that requires environmental assessments for major infrastructure projects.

- **EIA and Audit Regulations, 2005 (GN No. 349) and its amendment of 2018 and 2024**

Specifies requirements and procedures for ESIA approval and monitoring.

- **Occupational Health and Safety Act, 2003**

Governs safety and health standards during construction and operation.

- **Urban Planning Act, 2007**

Regulates development planning and construction permitting.

- **Public Health Act, 2009**

Provides standards for ensuring community and worker health.

- **Workers Compensation Act, 2015**

Ensures financial protection for injured workers.

- **National Environmental Policy (NEP) of 2021**

The National Environmental Policy (NEP), 2021 emphasizes the need for environmental standards to ensure effective implementation. Chapter 4 highlights the formulation of specific criteria for conducting Environmental Impact Assessments (EIA) as part of the National Environmental Guidelines.

The NEP outlines key environmental objectives for the housing development sector, including:

i. Ensuring sustainability and equitable resource use for current and future generations without harming the environment or public health.
ii. Preventing and controlling land, water, vegetation, and air degradation.
iii. Conserving Tanzania's natural and man-made heritage and biodiversity.
iv. Improving conditions in degraded areas for healthier and more attractive living environments.
v. Raising public awareness about the link between environment and development, encouraging community participation.
vi. Promoting international cooperation and contributing to relevant global environmental efforts.

DUWASA is obligated to adhere to the provisions of this policy.

- **Construction Industry Policy (2003)**

Among the major objectives of the policy, which supports a sustainable building development sector, include the promotion and application of cost effective and innovative technologies and practices to support socio-economic development activities such as buildings, road-works, water supply, sanitation, shelter delivery and income generating activities and to ensure application of practices, technologies and products which are not harmful to either the environment or human health. This project is in-line with this policy as ultra-modern technology shall be used during construction and its operation.

- **National Land Policy (1995)**

The National Land Policy states that, "the overall aim of a National Land Policy is to promote and ensure a secure land tenure system, to encourage the optimal use of land resources, and to facilitate broad - based social and economic development without upsetting or endangering the ecological balance of the environment". This report partly responds to this requirement. DUWASA shall observe the provision of this policy.

- **National Human Settlements Development Policy (2000)**

Among the objectives of this policy that touch the investment sector are to improve thelevel of the provision of infrastructure and social services for the development of sustainable human settlements and to make serviced land available for shelter to all sections of the community. Such infrastructure and services constitute the backbone of urban/rural economic activities. The proposed building shall increase economic activities around Salmini 'Mtaa' in Dodoma city Council. DUWASA shall observe the provision of this policy.

- **National Gender Policy (2002)**

The key objective of this policy is to provide guidelines that will ensure that gender sensitive plans and strategies are developed in all sectors and institutions. While the policy aims at establishing strategies to eradicate poverty, it puts emphasis on 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 society. DUWASA shall adopt the policy through the provision of equal opportunities to both men and women during construction and related activities. DUWASA shall observe the provision of this policy.

- **National Employment Policy (1997)**

The major aim of this policy is to promote employment mainly of Tanzania Nationals. Relevant sections of this policy are (i) 10, which lays down strategies for promoting employment and section 10.1 is particularly focusing on industry and trade sectors (ii) 10.6 which deals with employment of special groups i.e. women, youth, persons with disabilities and (iii) 10.8 which deals with the tendencies of private sectors to employ expatriates even where there are equally competent

nationals. It is one of the objectives of DUWASA to have a notable trickle-down positive impact on the locals through various means one of which is direct employment in the area. The project will also provide direct employment to the locals in the area without specifying the number as it is not known how many technical workers will be available for the technical positions. Special attention will be to the marginalized groups to include disabled, women, and youth while strictly avoiding employing children as required by the law. Thus, the project shall be in line with the objectives of the policy.

African Development Bank's Environmental and Social Operational Safeguards requirement

The African Development Bank (AfDB) Operations Standards (OS) provide guidelines to ensure that development projects align with the highest standards for sustainability, environmental protection, social responsibility, and human rights. For this construction project of 8-storey DUWASA office building, there are relevant AfDB Operations Standards that are triggered and will be implemented in the following ways;

- **OS 1: Assessment and Management of Environmental and Social Risks and Impacts**

This requires a project developer to conduct a comprehensive Environmental and Social Impact Assessment (ESIA) to evaluate potential risks and impacts related to the construction process and the operation of the particular office building. This includes assessing ambient air quality, waste management and noise pollution. Also having a Risk Management Plan that address mitigation measures for identified risks, such as noise control, air quality monitoring, and waste disposal protocols. This has been assessed and outlined in the ESIA process; DUWASA will adhere and ensure is effectively implemented.

- **OS 2: Labour and Working Condition**

This Operation Standards emphasize on ensuring that all workers involved in the construction and subsequent operations of the office building are treated in line with the ILO (International Labour Organization) core conventions, including fair wages, working hours and health and safety. Further it insists on the provision of appropriate personal protective equipment (PPE) for all construction workers implement safety protocols, and ensure fair employment practices. DUWASA commit and ensure non-discriminatory practice and workers' rights are protected and prohibit child or forced labour in any stage of the project.

- **OS 3: Resource Efficiency and Pollution Prevention and Management**

This promotes the design to incorporate energy-efficient technologies in the building's design, such as LED lighting, energy-efficient HVAC systems, and

insulation to reduce operational energy consumption. The DUWASA building design already accommodated OS3: Also, the design includes systems that minimize water use and rainwater harvesting systems. Measures to reduce pollution during construction, such as dust control systems, waste management protocols, and proper disposal of construction waste was taken into consideration.

- **OS 4: Community Health, Safety, and Security**

This OS requires a developer to have a comprehensive health and safety plan for both construction workers and the surrounding community, ensuring safety during the construction phase. Establishing an emergency response plan to deal with potential incidents during construction (e.g., fires, accidents) and ensuring that workers are trained in emergency protocols. It further necessitates to engage the local community and inform them about construction impacts such as traffic disruptions, noise, and dust. DUWASA shall observe the provisions of this OS.

- **OS 5: Land Acquisition, Restrictions on Access to Land and Land Use, and Involuntary Resettlement**

This OS demand that land ownership and usage rights should be clear and that any acquisition or use of land complies with national laws and the AfDB's policies.
If land acquisition or resettlement is required, ensure that affected persons or communities are compensated fairly and are provided with adequate support in line with AfDB's Resettlement Policy Framework (RPF); Establish processes for affected people to provide feedback or raise concerns regarding land acquisition or use.

- **OS 6: Habitat and Biodiversity Conservation, and Sustainable Management of Living Natural Resources**

This emphasizes on biodiversity Impact Assessment hence conducting an assessment to identify potential impacts on local biodiversity and ecosystems and take appropriate measures to avoid or mitigate harm. Also incorporating landscaping that promotes local biodiversity and sustainability. DUWASA shall observe and adhere to this OS.

- **OS 7: Vulnerable Group**

This operational Standards insist to ensure that vulnerable groups (e.g., low-income populations, women, persons with disabilities) are considered in the design and construction of the building. This could include accessible entrances, ramps, and consideration of the socio-economic impacts on the surrounding community. DUWASA should comply to this OS.
Relevance. Care should be taken to ensure vulnerable groups (e.g., people with disabilities, women, youth) are not adversely affected and are considered in employment or consultation processes.

- **OS 8: Cultural Heritage**

Not relevant to this project. No known cultural heritage sites were identified

- **OS9: Financial Intermediary**

Not applicable. The project is directly implemented and not through a financial intermediary.

- **OS 10: Stakeholder Engagement and Information Disclosure**

This requires the developer to identify and engage all relevant stakeholders (e.g., government authorities, local communities, workers) and engage them early in the project through public consultations, surveys, and meetings. Regularly disclose project information to stakeholders, including environmental and social risks, benefits, and mitigation strategies, through public meeting. Establish a clear channel for stakeholders to voice concerns, ask questions, and provide feedback about the project. These mechanisms should be accessible and transparent, ensuring that grievances are addressed in a timely manner.

By integrating these AfDB Operations Standards into the planning and execution of the 8-storey DUWASA office building project, the project will not only comply with regulatory and institutional requirements but also ensure long-term sustainability, community welfare, and environmental stewardship.

- **Environmental Management Act No. 20 of (2004), Cap. 191 and (Amendment) Regulations, 2024**

The Environmental Management Act (EMA) is a piece of legislation that forms an umbrella law on environmental management in Tanzania. Its enactment repealed the National Environment Management Council Act. 19 of (1983) while providing for the continued existence of the National Environment Management Council (NEMC).

Among the major purposes of the EMA are to provide the legal and institutional framework for sustainable management of the environment in Tanzania; to outline principles for management, impact and risk assessment, the prevention and control of pollution, waste management, environmental quality standards, public participation, compliance and enforcement; to provide the basis for implementation of international instruments on the environment; to provide for implementation of the National Environmental Policy; to provide for establishment of the National Environmental Fundand to provide for other related matters.

Part III, Section 15(a) states that in matters pertaining to the environment, the Director of Environment shall coordinate various environment management activities being undertaken by other agencies to promote the integration of environment considerations into development policies, plans, programmes, strategies projects andundertake strategic environmental assessments with a view to ensuring the proper management and rational utilization of environmental resources on a sustainable basisfor the improvement of the quality of human life in Tanzania.

Part VI of the EMA deals with Environmental Impact Assessments (EIA) and other Assessments and directs that an EIA is mandatory for all development projects.

Section 81(2) states that “An Environmental Impact Assessment study shall be carried out prior to the commencement or financing of a project or undertaking”, while Section 81(3) states “a permit or license for the carrying out of any project or undertaking in accordance with any written law shall not entitle the proponent or proponent to undertake or to cause to be undertaken a project or activity without an Environmental Impact Assessment certificate issued under this Act”. ***Relevance:*** DUWASA has complied with relevant provisions of the Act by carrying out this EIA study.

- **The Water Supply and Sanitation Act No. 5 of 2019**

This is another legislation that provides for sustainable management and adequate operation and transparent regulation of water supply and sanitation services; provides for establishment of water supply and sanitation authorities as well as community owned water supply organizations; and provides for appointment for service providers. The main aim of this law is to ensure the right of every Tanzanian to have access to efficient, effective and sustainable water supply and sanitation services for all purposes by taking into account among others protection and conservation of water resources and development and promotion of public health and sanitation; and protection of the interest of customers. Under this law, the Minister responsible for water affairs shall establish water Authority and cluster water authorities in order to achieve commercial viabilities. DUWASA shall observe the provision of this act.

- **The Land Act No. 4 of 1999**

These laws declare all land in Tanzania to be “Public land” to be held by the state for public purposes. The Acts empower the President of the United Republic of Tanzania, to revoke the “Right of Occupancy” of any landholder for the “public/national interest” should the need arise. The laws also declare the value attached to land.

The law as amended in 2004 recognizes the role of land in economic and urban development. The law provides for technical procedures for preparing land use plans, detailed schemes and urban development conditions in conformity with land use plan and schemes. The LGA has the power to impose conditions on the development of any area according to the land-use planning approved by the Minister. This project conforms to this law because it has followed all development conditions provided. DUWASA shall observe the provision of this act.

- **The Urban Planning Act (2007)**

The law provides for the orderly and sustainable development of land in urban areas, to preserve and improve amenities; to provide for the grant of consent to develop land and powers of control over the use of land and to provide for other related matters. Under Section 3, among others the law seeks to improve level of the provision of infrastructure and social services for sustainable human settlement development. Therefore, the proposed building development is in line with the objectives of this law.

Section 58 of the Urban Planning Act provides for protection of buildings or group

of buildings of special architectural or historic interest. The law states “The planning authority may compile a list of areas, buildings or group of buildings of special architectural or historic interest and may amend any list so compiled, such areas may include; buildings, group of buildings, areas of unique biodiversity; and rare species of trees and special trees”. Section 59 gives powers to the planning authority to grant permission for demolition of such buildings or otherwise powers to restrain any proposed demolition. This project is in line with this law as DUWASA office building shall be constructed at the area where no relocation of people is needed. DUWASA shall observe the provision of this act.

- **Occupation Health Safety Act, (2003)**

The law requires employers to provide a good working environment to workers in order to safeguard their health. The employers need to perform medical examinations to determine fitness before engaging employees. Employers must also ensure that the equipment used by employees is safe and shall also provide proper working gear as appropriate. Workers and occupants’ safety will be given priority during both construction and operation phases of the project. It shall be the duty of the contractorin this case to ensure safety and health of workers during construction phase. All provisions of this Act relevant to the project activities shall be adhered.

- **Employment and Labour Relations Act No. 6 0f 2004**

The Act makes provisions for core labour rights; establishes basic employment standards, provides a framework for collective bargaining; and provides for the prevention and settlement of disputes. DUWASA will make sure that the Contractor adheres to employment standards as stated in the law and the contractor shall provide job opportunities to both skilled and no-skilled labours to the nearby communities. DUWASA shall observe the provision of this act.

- **Engineers Registration Act and its Amendments 1997 and 2007**

The Acts regulate the engineering practice in Tanzania by registering engineers and monitoring their conduct. It establishes the Engineering Registration Board (ERB). Laws require any foreigner engineer to register with ERB before practicing in the country. DUWASA and foreign engineers working with this project shall abide by the law requirement.

- **The Contractors Registration (Amendment) Act, 2008**

The Contractors Registration Act requires contractors to be registered by the Contractors Registration Board (CRB) before engaging in practice. It requires foreign contractors to be registered by the Board before gaining contracts in Tanzania. DUWASA has complied with the law requirement during the recruitment of contractor for project implementation.

- **The Architects and Quantity Surveyors Act (1997)**

Similarly require architects and quantity surveyors (QS) to be registered with the Board before practicing. Foreign architects and QS should abide by the law.

DUWASA has considered the requirements of this Act.

- **The HIV and AIDS (Prevention and Control) Act of 2008**

The law provides for public education and programmes on HIV and AIDS. Section 8(1) of the law states that "The Ministry (Health), health practitioners, workers in the public and private sectors and NGOs shall for the purpose of providing HIV and AIDS education to the public, disseminate information regarding HIV and AIDS to the public". Furthermore, Section 9 states that "Every employer in consultation with the Ministry (Health) shall establish and coordinate a workplace programme on HIV and AIDS for employees under his control and such programmes shall include provision of gender responsive HIV and AIDS education" This project shall abide by HIV/AIDS Act in the fight against the disease. DUWASA shall observe the provision of this act.

- **The Local Government Law (Miscellaneous Amendment) Act, 2006**

This act established the local governments and urban authorities with mandates to spearhead developments in Districts and urban centres (for Cities and Municipalities) respectively. By this law, the Authorities have mandates to formulate by laws to enhance environmental management within their district/urban authorities. DUWASA shall observe the provision of this act.]

- **Public Health Act, 2009**

An Act to provide for the promotion, preservation and maintenance of public health with the view to ensuring the provision of comprehensive, functional and sustainable public health services to the general public and to provide for other related matters. Section 66 of the Act states that: (1) A building or premises shall not be erected without first submitting the plans, sections and specifications of the building site for scrutiny on compliance with public health requirements and approval from the Authority. (2) A building, premises or its part or any structure shall not be occupied until a certificate of occupancy has been granted. (3) The provisions of subsections (1) and (2) shall not apply to the dwelling houses in the rural areas or houses erected in urban which have been recognized as such under the squatter upgrading programme. DUWASA shall observe the provision of this act.

- **Workers Compensation Act, No.5 of 2003**

Generally, the Act provides for the employment accident and occupational disease benefit. The employment injury schemes provide medical care and cash benefits to workers, who are injured on the job or develop occupational diseases. Eligibility is provided on a no-fault basis and may be coupled with restriction on workers legal right to sue for damages. In operating its activities, DUWASA shall observe the provisions of this Act.

- **The National Social Security Fund Act, (Cap.222. R.E.2002)**

The National Social Security Fund act sets guidance on protection of Tanzanian citizens against risks of loss of employment and income. ILO defines social

security as “the protection measures which society provides for its members, through a series of public measures against economic and social distress that would otherwise be caused by the stoppages or substantial reduction of earnings resulting from sickness, maternity, employment injury, unemployment, disability, old age, death, the provisionof medical care subsidies for families with children.”

Social Security Services are provided in three different schemes, namely, social assistance schemes; mandatory scheme and voluntary or supplementary schemes. DUWASA shall ensure that employees have social security coverage, which ismandatory for the case of employers.

This act defines roles of Employers, which includes registration of employees; timely and accurate remittance of contributions; awareness creation and sensitization; and Adherence to safety and occupational health rules. DUWASA will have to observe these guidelines and associated legal requirements

- **EIA and Audit Regulations, 2005 (GN No. 349) and its amendment of 2018 and 2024**

The regulations cemented the requirements of undertaking EIA study for new project and Audits for ongoing projects, likewise annual monitoring to ensure efficacy of the performance. Further it provides procedure to be followed while undertaking Environmental studies. Under Environmental Impact Assessment and Audit Regulations (Amendments), 2018 the first schedule lists typical examples of type A and B projects. The proposed project falls under the category of the project that requires mandatory Environmental Impact Assessment. This ESIA study has been conducted following the above stated Regulations.

- **Environmental Management (Air Quality Standards) Regulations, 2007**

The Regulations require for the contractor during construction stage of the project to ensure emissions of harmful gases is within allowable TBS standards. A personundertaking any activity shall be required to comply with the highest permissible emission limits from the atmosphere to a receptor and respective test methods forSulphur oxides, carbon monoxide, black smoke and suspended particulate matters, nitrogen dioxide, nitrogen dioxide, ozone as prescribed in the First Schedule to theseRegulations. DUWASA shall observe the provision of this regulation.

- **Environmental Management (Standards for the Control of Noise and Vibrations Pollution) Regulations, 2015,**

Regulation 7 (1) Except as otherwise provided in these Regulations, no person shall make or cause to be made any loud, unreasonable, unnecessary or unusual noise that annoys, disturbs, injures or endangers the comfort, repose, health or safety of others and that of the environment.

Regulation 8(1) except as otherwise provided in these Regulations, no person shall make or cause to be made excessive vibrations which annoy, disturb, injure or endanger the comfort, repose, health or safety of others and the

environment; or

Cause to be made excessive vibrations which exceed 0.5 centimeters per second beyond any source property boundary or 30 meters from any moving source.

This Act enforces the control of Noise and vibration level along the proposed projects and existing project. DUWASA shall observe the provision of this regulation.

- **Environmental Management (Water Quality Standard) Regulation, 2007**

The objectives of these Regulations is to-protect human health and conservation of the environment; enforce minimum water quality standards prescribed by the NationalEnvironmental Standards Committee; enable the National Environmental Standards Committee to determine water usages for purposes of establishing environmental quality standards and values for each usage; and ensure all discharges of pollutants take into account the ability of the receiving waters to accommodate contaminantswithout detriment to the uses specified for the waters concerned.

Relevance to the project: In part III sections (v) and (vi) emphasize; Protection of water sources and ground water prohibition to discharge hazardous substances, chemicals and materials or oil. The water sources for the project will be rain harvesting whereby treatment will be employed to ensure safe for human consumption. Also, in order to ensure the compliance with this regulation,office activities should be restricted on interferences with soils and vegetation that protects water sources.

- **Environmental Management (Soil Quality Standards) Regulations, 2007**

These regulations set limits for soil contaminants in agriculture and habitat, enforce minimum soil quality standards, prescribe measures designated to maintain, restoreand enhance the sustainable productivity of the soil and prescribe minimum soil quality standards for sustaining ecological integrity and productivity of the soil. According to the regulations, among others, the National Environmental Standards Committee has the powers to set pollutant limits and specify procedures for determination of the quality of soil for protection of the soil from degradation as a result of anthropogenic activities such as agricultural and mining activities and waste disposal. Owners and operators of a main polluting activity are required to voluntarily register with NEMC and obtain a soil pollutants discharge permit. Obligations of polluters are also given. According to the regulations, the NEMC plays a crucial role in soil quality compliance and enforcement.

Relevance to the Project: Activities of the office building shall be conducted in

such a manner that contamination of soil by waste disposal is minimized. Where necessary, these regulations will be used for ensuring that the ecological integrity of soil is protected at the project area.

- **The Environmental Management (Registration and Practice of Environmental Experts) Regulations, 2021**

This regulation requires the registration of environmental experts who are responsible for ensuring that construction projects comply with environmental standards. For an office building project, an environmental expert must be involved to conduct Environmental Impact Assessments (EIA), audits, and ensure that all environmental considerations are taken into account.
Compliance: DUWASA ensured that a registered environmental expert, certified by the National Environmental Management Council (NEMC), is involved in the project from the planning stage.

- **The Environmental Management (Hazardous Waste Control and Management) Regulations, 2021**

During the construction of an office building, there will be the generation of hazardous wastes such as paints, solvents, asbestos (if present), oils, and chemicals. This regulation sets out the procedure for handling, storing, and disposing of such waste to avoid environmental contamination.
Compliance: Hazardous waste generated during construction must be properly stored, segregated, labelled, and disposed of according to the guidelines provided in the regulation. DUWASA shall ensure that engage waste management companies licensed to handle hazardous waste and keep detailed records of waste management practices. DUWASA shall observe the provision of this regulation.

- **The Environmental Management (Control and Management of Electrical and Electronic Equipment Waste) Regulations, 2021**

As part of the office building construction, electrical equipment like air conditioning units, lighting, and other appliances may be installed. The disposal of old or obsolete electrical and electronic equipment should be done according to this regulation to prevent environmental harm due to improper disposal.
Compliance: Ensure that any electronic or electrical waste (e-waste) generated during the construction phase is properly collected, dismantled, and disposed of through a registered e-waste disposal service. Proper documentation should be kept to verify compliance with the regulations. DUWASA shall ensure compliance to this act.

- **The Environment Management (Prohibition of Plastic Carrier Bags) Regulations, 2019**

During the construction of an office building, plastic carrier bags may be used for packaging or transportation of materials. This regulation prohibits the use of plastic carrier bags and encourages the use of more environmentally friendly alternatives.
Compliance: DUWASA shall ensure that no plastic carrier bags are used during construction. DUWASA shall ensure that Contractors use biodegradable packaging or reusable containers for transporting materials. Workers should be educated on alternatives to plastic bags, and materials that arrive in plastic should

be removed and properly disposed of.

- **The Fire and Rescue Force (Fire Precautions in Buildings) Regulations, 2015**

These Regulations shall apply to all areas where the Act applies.
General provision on means of escape in the building have been provided in PART IIof Regulation 3. -(1) The provisions of this Part shall apply in determining the design, construction, protection, location, arrangement and maintenance of exit facilities to provide safe means of escape for occupants from all building's hereafter erected, altered or changed in occupancy. DUWASA shall comply with the provisions of this regulation.

- **Urban Space Standards Regulations, 2011**

Urban Planning and space Standards" include standards for residential areas, building lines and setbacks, plot coverage and plot ratio health and education facilities, golf courses, passive and active recreation, public facilities by planning levels, public facilities by population size, parking and agricultural show ground, standard for electrical supply and its way leave, way leave for water supply, road width, communication pylons, sewerage treatment plants, ponds**,** transportation terminals, stream/rivers valleys buffer zone, beaches and industrial plots and recommended colors for Land uses. Adequate and functional space shall be allocated in accordance with Urban Planning and Space standards prescribed in the schedule to these Regulations. ***Relevance to the Project:*** DUWASA has legally complied to this regulation by observing all space standards required for construction of high building.

Environmental Management (Solid Waste Management) Regulations, 2009
This regulation provides for principles for management and control of solid waste including administration and institutional arrangement, licenses and permits1. As provided, those for the purpose of ensuring minimizing of solid waste in their respect areas of the jurisdiction.
The 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: all kinds of solid waste are separated at the source. DUWASA shall observe the provision of this regulation.

Institutional Framework for the Management of Environment
Overall Management Responsibility
The institutional arrangement for environmental management in Tanzania is well speltout in the EMA (2004). There are seven (7) institutions mentioned by the Act, of which the Minister Responsible for the Environment is the overall in-charge for administration of all matters relating to the environment. Part III, Section 13(1) of EMA (2004) states that the Minister responsible for environment shall be in overall in-charge of all matters relating to the environment and shall in that respect be responsible for articulation of policy guidelines necessary for the promotion, protection and sustainable management of environment in Tanzania.
The legal institutions for environmental management in the country include;

- National Environmental Advisory Committee;
- Minister responsible for Environment;
- Director of Environment;

- National Environment Management Council (NEMC);
- Sector Ministries;
- Local Government Authorities (City, Municipal, District, Township, Ward, Village, sub-village “Mtaa and Kitongoji”)

National Environmental Advisory Committee

The National Advisory Environmental Committee is comprised of members with experience in various fields of environmental management in the public and private sector and in civil society. The committee advises the Minister on any matter related to environmental management. Other functions include:

- Examine any matter that may be referred to it by the Minister or any sector Ministry relating to the protection and management of the environment;
- Review and advise the Minister on any environmental plans, environmental impact assessment of major projects and activities for which an environmental impact review is necessary;
- Review the achievement by the NEMC of objectives, goals and targets set by the Council and advise the Minister accordingly;
- Review and advise the Minister on any environmental standards, guidelines and regulations;
- Receive and deliberate on the reports from Sector Ministries regarding the protection and management of the environment;
- Perform other environmental advisory services to the Minister as may be necessary.

The National Environmental Advisory Committee shall advice the minister pertaining to the issuance of the Environmental Certificate upon the review of this EIA for this project.

Minister Responsible for Environment

The Minister is responsible for matters relating to environment, including giving policy guidelines necessary for the promotion, protection and sustainable management of the environment in Tanzania. The Minister approves an EIA and may also delegate the power of approval for an EIA to the DoE, Local Government Authorities or Sector Ministries. The Minister also:

- Prescribes (in the regulations) the qualifications of persons who may conduct anEIA;
- Reviews NEMC reports on the approval of an EIA;
- Issues an EIA certificate for projects subject to an EIA;
- Suspends an EIA certificate in case of non-compliance.

Regarding this project the minister shall review NEMC reports on the approval of thisEIA before issuing the certificate.

Director of Environment

The Director of Environment heads the Office of the Director of Environment and is appointed by the President of the United Republic of Tanzania. The functions of the Director of Environment include:

- Coordination of various environmental management activities undertaken

by other agencies;

- Promotion of the integration of environmental considerations into developmentpolicies, plans, programmes, strategies, projects;
- Undertaking strategic environmental risk assessments with a view to ensuring the proper management and rational utilization of environmental resources on a sustainable basis for the improvement of quality of human life in Tanzania;
- Advise the Government on legislative and other measures for the management of the environment or the implementation of the relevant international environmental agreements in the field of environment;
- Monitoring and assessing activities undertaken by relevant Sector Ministries and agencies;
- Preparation and issuing of reports on the state of the environment in Tanzaniathrough relevant agencies;
- Coordination of issues relating to articulation and implementation of environmental management aspects of other sector policies and the National Environment Policy

National Environment Management Council (NEMC)

The NEMC's purpose and objective is to undertake enforcement, compliance, review and monitoring of EIA's and to facilitate public participation in environmental decision-making. According to the Environmental Management Act (2004) the NEMC has the following responsibility pertaining to EIA in Tanzania:

- Registers experts and firms authorized to conduct EIA;
- Registers projects subject to EIA;
- Determines the scope of the EIA;
- Set-ups cross-sectoral TAC to advise on EIA reviews;
- Requests additional information to complete the EIA review;
- Assesses and comments on EIA, in collaboration with other stakeholders,
- Convenes public hearings to obtain comments on the proposed project;
- Recommends to the Minister to approve, reject, or approve with conditions specific EIS;
- Monitors the effects of activities on the environment;
- Controls the implementation of the Environmental Management Plan (EMP);
- Makes recommendations on whether to revoke EIA Certificates in case of non-compliance;
- Promotes public environmental awareness;
- Conducts Environmental Audits

Concerning this project NEMC is responsible to register this EIA, determine the scope of the EIA to be conducted, Set-ups cross-sectoral TAC to advise on EIA reviews, recommends to the Minister to approve, reject, or approve with conditions specific EIS and Controls the implementation of the Environmental Management Plan (EMP) for this project.

Sector Ministries

The existing institutional and legal framework the Sector Ministries are required to establish Sector Environmental Sections headed by the Sector Environmental Coordinator.

The Sector Ministries' Environmental Sections;

- Ensure environmental compliance by the Sector Ministry;
- Ensure all environmental matters falling under the sector ministry are implemented and report of their implementation is submitted to the DoE;
- Liaise with the DoE and the NEMC on matters involving the environment and all matters with respect to which cooperation or shared responsibility is desirable or required;
- Ensure that environmental concerns are integrated into the ministry or departmental development planning and project implementation in a way whichprotects the environment;
- Evaluate existing and proposed policies and legislation and recommend measures to ensure that those policies and legislation take adequate account of effect on the environment;
- Prepare and coordinate the implementation of environmental action plans at national and local levels;
- Promote public awareness of environmental issues through educational programmes and dissemination of information;
- Refer to the NEMC any matter related to the environment;
- Undertake analysis of the environmental impact of sectoral legislation, regulation, policies, plans, strategies and programmes through Strategic Environmental Assessment (SEA);
- Ensure that sectoral standards are environmentally sound;
- Oversee the preparation of and implementation of all EIA's required for investments in the sector;
- Ensure compliance with the various regulations, guidelines and procedures issued by the Minister responsible for the environment and;
- Work closely with the ministry responsible for local government to provide environmental advice and technical support to district level staff working in thesector.

Local Government Authorities

Under the Local Government Act of 1982 (Urban and District Authorities), Local Government Authorities include the City Councils, Municipal Councils, District Councils, Town Councils, Township, Ward, Mtaa/ Village and Kitongoji.

The Environmental Management Committee of each jurisdiction:

Initiates inquiries and investigations regarding any allegation related to the environment and implementation of or violation of provisions of the Environmental Management Act;

- Requests any person to provide information or explanation about any matter related to the environment;
- Resolves conflicts among individual persons, companies, agencies non-governmental organizations, government departments or institutions about their respective functions, duties, mandates, obligations or activities;
- Inspects and examines any premises, street, vehicle, aircraft or any other place or article which it believes, or has reasonable cause to believe, that pollutant orother articles or substances believed to be pollutant are kept or transported;
- Requires any person to remove such pollutants at their own cost without causing harm to health and;

- Initiates proceedings of civil or criminal nature against any person, company, agency, department or institution that fails or refuses to comply with anydirective issued by any such Committee.
- Under the Environmental Management Act (2004), the City, Municipal, District and Town Councils are headed by Environmental Inspectors who are responsible for environmental matters. The functions of the inspectors are to:
- Ensure enforcement of the Environmental Management Act in their respectiveareas;
- Advice the Environmental Management Committee on all environmental matters;
- Promote awareness in their areas on the protection of the environment andconservation of natural resources;
- Collect and manage information on the environment and the utilization ofnatural resources;
- Prepare periodic reports on the state of the local environment;
- Monitor the preparation, review and approval of EIAs for local investors;
- Review by-laws on environmental management and on sector specific activitiesrelated to the environment;
- Report to the DoE and the Director General of the NEMC on the implementationof the Environmental Management Act and;
- Perform other functions as may be assigned by the local Government Authorityfrom time to time

MAJOR AND MODERATE ENVIRONMENTAL AND SOCIAL IMPACTS

The Environmental and Social Risks and Impact Assessment identified both positive and negative impacts associated with the proposed 8-storey DUWASA office building. Below is an enumeration of the major and moderate negative risks and impacts, structured for clarity and precision.

Pre -Construction phase impacts

- ✓ Displacement of the current office occupiers to the other building with limited space at DUWASA premises where there are no construction activities
- ✓ Generation of demolition wastes
- ✓ Hazardous and electronic wastes
- ✓ Dust
- ✓ Noise and vibration
- ✓ Traffic disruption
- ✓ Occupational health and safety (the demolition force)
- ✓ Pollution (waste disposal)
- ✓ Employment opportunities to local people for casual labours i.e. site clearance and demolition of the existing structures

Construction Phase Impacts

- ✓ **Employment opportunities:** The local people are likely to get casual labours i.e excavation and other works

- ✓ **Air pollution:** Temporary increase in dust and exhaust emissions from machinery; particulate matter levels may exceed recommended thresholds in the immediate vicinity of the construction site.
- ✓ **Noise pollution:** Elevated noise levels (exceeding 85 dB in peak hours) due to construction activities and equipment, with potential nuisance to nearby institutions and residences.
- ✓ **Occupational health and safety risks:** These includes;

  - **Working at Heights:** Falls from heights are a major concern in multi-story construction. This includes falls from scaffolding, ladders, edges of floors, and open shafts.
  - **Moving Objects:** Workers can be struck by falling or moving objects, including tools, materials, and equipment.
  - **Excavations and Trenches:** Deep excavations and trenches pose risks of collapse, potentially burying workers.
  - **Hazardous Materials:** Exposure to silica dust, welding fumes, and other hazardous materials can cause long-term health problems.
  - **Noise and Vibration:** Construction sites are often noisy, and workers can be exposed to harmful levels of noise and vibration from equipment.
  - **Electrical Hazards:** Contact with live wires, faulty equipment, or improper grounding can lead to electrical shock and burns.
  - **Heavy Machinery:** Operating heavy machinery like cranes, excavators, and forklifts involves risks of accidents, including overturning and being struck by the machinery.
  - **Manual Handling:** Repetitive lifting and awkward postures can lead to musculoskeletal injuries.
  - **Fire:** Fires can start due to various reasons on construction sites, posing risks to life and property.
  - **Environmental Factors:** Exposure to extreme temperatures (heat or cold), poor air quality, and hazardous weather conditions can affect workers' health.
  - **Poor Housekeeping:** Lack of proper housekeeping can lead to slips, trips, and falls.
  - **Equipment Failure:** Defective or poorly maintained equipment can malfunction and cause accidents.
  - Collapses: Structural collapses during construction can lead to severe injuries or fatalities.
- ✓ **Traffic disruption:** Temporary blockage or congestion on nearby access roads due to the transport of materials and machinery.
- ✓ **Solid waste generation:** Debris, scrap materials, and packaging waste

requiring proper disposal to prevent urban pollution.
Potential utility disruption: Accidental interference with underground electricity, water, or telecom lines during excavation.

- ✓ **Increased wastewater generation**
- ✓ **Visual Intrusion due to the structure to be built:** This will be managed by carefully building design and landscaping

Operation Phase Impacts

- ✓ **New Employment opportunities:** Such as office cleaners due to the new building which is larger compared to the existing ones
- ✓ **Increased solid waste generation:** Daily generation of office wastes, requiring an effective waste collection and disposal system.
- ✓ **Increased Water consumption and wastewater generation:** Demand for water supply and sanitation services increases, with potential overloading of existing public sewer systems.
- ✓ **Increased Energy use:** Significant power demand, including air conditioning and IT systems, contributes to indirect greenhouse gas emissions unless renewable energy options are adopted.
- ✓ **Health and safety risks:** Long-term risks to occupants and visitors without proper emergency and fire systems.

- ✓ **Increased surface runoff, due to increased pavement.**
- ✓ The increase number of occupants will increase traffic and parking space around the project area.

- **Cumulative Impacts**

Cumulative impacts are those that result from the incremental impact of the proposed development when added to other past, present, and reasonably foreseeable future actions in the area. Different activities in the project vicinity may collectively contribute to cumulative effects which are;

- Traffic congestion,
- Water services demand,
- Waste water disposal services,
- Air and noise pollution.
- Safety risks such as accidents and injuries to the occupiers especially in the absence of appropriate protective devices
- Rising property values and rents due to development.
- Disturbance to the current occupiers

STAKEHOLDERS CONSULTATION

Stakeholder consultations were conducted to ensure transparency, inclusivity, and alignment with the EIA and Audit regulation of Tanzania and the AfDB's Operational Safeguard 10, which requires meaningful engagement throughout the

project cycle. These consultations aimed to inform stakeholders about the proposed DUWASA office building project, identify potential environmental and social concerns, and gather recommendations for improved project outcomes.

Consultation Objectives:

- To inform key stakeholders and the public about the project and its likely impacts.
- To collect input on risks, opportunities, and expectations.
- To ensure community needs and expert guidance are reflected in project design and mitigation.

Key Stakeholder's Issues and Developer's Commitments:

S/N	Stakeholder Consulted	DATE	Issues and Concerns Raised	Incorporation into the Project
1	Dodoma City Council – Town Land Planner	30/10/2024	Requested compensation for affected properties	No properties will be affected; no compensation required
2	Dodoma City Council – Environmental Officer (EMO)	30/10/2024	Emphasized air pollution control and proper waste management	Air and waste management plans incorporated into ESMP
3	OSHA	23/10/2024	Compliance with Health and Safety requirements per OSHA Act No. 5 of 2003	Safety measures, PPE, emergency equipment, and trained safety officer to be included
4	TARURA	23/10/2024	No objection; advised consultation if access roads are upgraded	Access roads are adequate; coordination will occur if improvements are needed
5	TANESCO	30/10/2024	No objection; recommended use of a competent electrical contractor	Qualified electrical firm to be engaged
6	Fire Brigade	17/10/2024	Required inclusion of fire safety infrastructure	Firefighting equipment and emergency exits included in building design
7	Geological Survey of Tanzania (GST)	4/3/2025	Recommended Geotechnical Investigation	Geotechnical report is in appendix ix
8	Local Leaders (Tambukareli Ward Meetings)	28/01/2025	Requested employment opportunities for local laborers	Local labor to be prioritized during construction phase
9	National Construction Council (NCC)	07/03/2025	No objection; emphasized compliance with national construction regulations	Project will follow all legal and technical construction standards
10	Tanzania Meteorological Authority (TMA)	20/03/2025	Suggested use of climate data in project planning	Relevant meteorological data included in design (referenced in Chapter 4 of full ESIA report)

Stakeholder feedback was largely positive, with no objections to the project. All recommendations and concerns have been or will be incorporated into project planning, design, and the Environmental and Social Management Plan (ESMP).

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

The Environmental and Social Management Plan (ESMP) outlines the specific measures to mitigate and manage the potential environmental and social impacts identified during the assessment. The plan aligns with AfDB's Integrated Safeguards System, particularly Operational Safeguards 1,2,3,4,5,6, 7and 10, ensuring risks are addressed throughout the project lifecycle.

Environmental and Social Management Plan:

Phase	Impact	Mitigation Measures	Hierarchy Level	Responsible Institution	Time Frame	Target Standard	Annual Cost (TZS)
Pre-construction	Disturbance to the occupiers of the existing buildings	Move them to other office buildings where construction activities are not conducted	Minimization	DUWASA	Pre -construction phase	Minimal disturbance, Zero grievances	-
Pre-construction	Generation of demolition wastes	Proper waste management by collection of wastes to specific dump site	Avoidance	Contractor DUWASA	Pre -construction phase	Absence of demolition wastes to the project area	12,000,000
Pre-construction	Demolition Noise and	Fencing the	Avoidance	Contractor	Pre -construction	Noise level	12,000,000

Phase	Impact	Mitigation Measures	Hierarchy Level	Responsible Institution	Time Frame	Target Standard	Annual Cost (TZS)
	vibration	project area and use of sophisticated machines	Minimization		phase	not exceeding 85 dB and vibration level <10mm/s PPV	
	Demolition dust	Fencing and regular watering of the project area	Minimization	Contractor DUWASA	Pre -construction phase	Dust level to meet allowable standard i.e <200 µg/Nm³	10,000,000
Pre-construction	Influx of job seekers	Recruiting number of people required for the project	Avoidance Minimization	Contractor DUWASA	Pre-construction phase	Hiring required number of employees for the project	-
Pre-construction	Traffic disruption	Vehicles scheduling during hours with minimum traffic	Avoidance Minimization	Contractor	Construction phase	No traffic disruptions	-
Pre-construction	(Occupational health and safety risks) Exposure to	Awareness training on occupational	Avoidance Minimization	Contractor DUWASA	Pre-construction phase	Zero accidents and injuries	7,000,000

Phase	Impact	Mitigation Measures	Hierarchy Level	Responsible Institution	Time Frame	Target Standard	Annual Cost (TZS)
	Hazardous Substances such as dusts etc.	safety and health Use of PPE					
Construction	Soils and geological disturbance	Ensure safe excavation with shoring and slope banking	Minimization	DUWASA / Contractor	Construction Phase	No soil erosion and accidents at the area	3,000,000
Construction	Soils contamination	Use spill kits, shield waste areas, and prepare hazardous material control plans	Minimization	DUWASA / Contractor	Construction Phase	No oil spillage; Emergency response plan implemented	3,000,000
Construction	Air quality deterioration (dust due to earth movements)	Dust suppression, fencing site, health checks, and PPE provision	Minimization	DUWASA / Contractor	Construction Phase	Emission within allowable TBS standards	4,000,000
Construction	Air quality deterioration (due to equipment emissions)	Use of sophisticated machines	Avoidance Minimization	Contractor	Construction Phase	Emission within allowable TBS standards	10,000,000

Phase	Impact	Mitigation Measures	Hierarchy Level	Responsible Institution	Time Frame	Target Standard	Annual Cost (TZS)
Construction	Noise and excessive vibration	Maintain machinery, schedule works during day, provide PPE	Avoidance Minimization	DUWASA / Contractor	Construction Phase	Noise level within 70 dBA	4,000,000
Construction	Solid waste generation	Sort and collect waste to dump sites Re -use other wastes for backfilling e.g soil wastes from excavation works	Minimization	Contractor	Construction Phase	No hazard waste disposal	3,000,000
	liquid wastes generation	Connect to public sewer for waste water disposal Re-use for gardening	Minimization	DUWASA	Operation phase	No waste water pollution to project area	1,000,000
Construction	(Occupational health and safety risks) • Falls from Height	Hiring a safety personnel member for the project, Conduct Risk	Avoidance Minimization	Contractor	Construction Phase	No injuries, accidents and health impacts	5,000,000

Phase	Impact	Mitigation Measures	Hierarchy Level	Responsible Institution	Time Frame	Target Standard	Annual Cost (TZS)
	• Machinery-Related Accidents • Exposure to Hazardous Substances • Electrical Hazards • Fire and Explosion Hazards • Manual Handling and Ergonomic Risks • Noise and Vibration Exposure • Inadequate Welfare and Sanitation Facilities	assessment to identify risks, Raise the workers risks awareness, training on the use of PPE prepared and implement emergency plans, provide adequate and relevant PPEs, install warning signs, appoint assembly area, provide adequate and safe drinking water. Training on the use of equipment, machines and emergency procedures Proper					

Phase	Impact	Mitigation Measures	Hierarchy Level	Responsible Institution	Time Frame	Target Standard	Annual Cost (TZS)
		housekeeping and hazard identification and reporting, install temporary and permanent electrical systems to certified standards.					
Construction	Landscape and visual destruction	Install perimeter fence Proper landscaping	Avoidance Minimization	DUWASA / Contractor	Construction Phase	No access to the construction site	3,000,000
Construction	Traffic jam and accidents	Schedule deliveries at night, signage, traffic management plan	Minimization	DUWASA / Contractor	Construction Phase	No road accidents; Road accessibility	2,000,000
Construction	Transmission of HIV/AIDS	Provide HIV/AIDS awareness, Local labor recruitment,	Avoidance	DUWASA	Construction Phase	Minimal population influx; Zero HIV/AIDS transmission	1,000,000

Phase	Impact	Mitigation Measures	Hierarchy Level	Responsible Institution	Time Frame	Target Standard	Annual Cost (TZS)
		Provision of Condoms					
Operation	Solid waste generation	Sort, collect and transport wastes to dump sites	Minimization	DUWASA	Operation Phase	No haphazard waste disposal at project area	2,000,000
Operation	Liquid waste generation	Direct waste water to public sewerage system Re-use stormwater for gardening	Minimization	DUWASA	Operation Phase	No haphazard waste disposal	2,000,000
Operation	Increased energy consumption	Sensitize on efficient energy use, switch off lights, use energy saving lights	Minimization	DUWASA	Operation Phase	Efficient use of energy	7,000,000
Operation	(Occupational health and safety risks) Falls from Height, Electrical Hazards, Fire and Explosion	Implement OSHA guidelines, fire safety equipment,	Avoidance Minimization	DUWASA	Operation Phase	No injuries, accidents and health impacts	4,000,000

Phase	Impact	Mitigation Measures	Hierarchy Level	Responsible Institution	Time Frame	Target Standard	Annual Cost (TZS)
	Hazards, Ergonomic Risks, Inadequate Welfare and Sanitation Facilities	awareness to emergency plans and procedures to occupiers Safety awareness to occupiers, Appoint assembly point					
Operation	Risk of fire outbreak	Regular inspection to electrical wires and equipments , avoidflammable paints, install firefighting equipments Train the occupiers on firefighting procedures	Avoidance Minimization	DUWASA	Operation Phase	No fire outbreaks	5,000,000
Operation	Safety risks associated with earthquakes	Building has been designed to be seismic resilience as	Prevention and Minimization	DUWASA Contractor	Operation phase	No effects of earthquakes	10,000,000

Phase	Impact	Mitigation Measures	Hierarchy Level	Responsible Institution	Time Frame	Target Standard	Annual Cost (TZS)
		per geotechnical survey report for the project area conducted					
Operation	Increase demand of water supply	Install tanks, low-consumption fixtures, rainwater harvesting	Minimization	DUWASA	Operation Phase	Efficient use of water; Installation of water storage facilities	10,000,000
Operation	Air pollution (dust and odour)	proper waste disposal, clean areas regularly	Minimization	DUWASA	Construction and Operation Phase	Emission within standards; No odour	3,000,000
Decommissioning	Solid wastes (scraps and debris)	Segregate and recycle; adopt integrated waste management	Minimization	DUWASA Contractor	Decommissioning Phase	No haphazard waste disposal	5,000,000
Decommissioning	(Occupational health and safety risks) Machinery-Related accidents, Injuries from falling objects, Noise and Vibration	PPE provision, Safety awareness training,	Avoidance Minimization	DUWASA Contractor	Decommissioning Phase	No accidents injuries, and health impacts	5,000,000

Phase	Impact	Mitigation Measures	Hierarchy Level	Responsible Institution	Time Frame	Target Standard	Annual Cost (TZS)
	Exposure						
TOTAL							**76,000,000**

A. Key Environmental and Social Risk/Impact Management Measures:

Air and Noise Pollution Control
Regular watering of dusty surfaces, use of dust screens, and speed limits on-site.
Scheduling construction activities during daytime hours to reduce noise impact.

Waste Management
Segregation of construction waste and proper disposal via licensed waste handlers.
Provision of sanitation facilities at project site to prevent pollution.

Soil and Water Protection
Proper drainage systems, oil traps, and containment for hazardous materials.
Channeling surface run-off into stormwater or public drainage systems.

Environmental Health and Safety (EHS) Measures
Enforcement of PPE use, installation of site warning signs, and a trained safety officer on site.
Emergency response equipment (first aid, extinguishers, assembly points) installed on-site.

Gender and Community Interaction Risk Management
Mandatory Code of Conduct for all workers, GBV/SEA training, and zero-tolerance policy on misconduct.
Gender-sensitive grievance redress mechanism and community sensitization.

Employment and Local Inclusion
Prioritization of local labor recruitment for unskilled and semi-skilled jobs.
Promotion of fair wages, decent work conditions, and non-discrimination.

Climate Change Impacts Consideration
Integration of local climate data in structural design and energy efficiency planning.

Capacity Building
Regular environmental, health, and safety (EHS) training for site workers and supervisors.

Resettlement Action Plan (RAP)
No displacement or loss of land use was identified; therefore, no Resettlement Action Plan (RAP) is required

B. Specific Environmental, Occupational Health and Safety (EOHS) Clauses for Contractors
To ensure safe and responsible construction practices, the following EOHS clauses shall be included in all works contracts:

General Rules of Hygiene, Health, and Safety on Construction Sites
Contractors must provide Personal Protective Equipment (PPE) such as helmets, gloves, masks, and boots to all workers.
Site signage indicating hazards, speed limits, restricted zones, and safety reminders must be displayed clearly.
Designated safety officers must be present on site to monitor compliance with safety protocols.

STD and HIV/AIDS Awareness
Contractors shall implement an awareness program on sexually transmitted diseases (STDs), including HIV/AIDS. Educational materials and voluntary testing opportunities should be made available to workers.

Management of Worker–Community Relationships:
Workers must sign a Code of Conduct covering respectful behavior toward community members, especially minors and vulnerable groups.
Regular community engagement and sensitization sessions will be conducted to maintain good relations and avoid conflicts.

Gender Equity, GBV and SEA Prevention Measures:
Contractors must implement gender-sensitive hiring practices and ensure equal treatment of all workers.
Training sessions will be conducted on the prevention of gender-based violence (GBV), sexual exploitation and abuse (SEA).
A confidential grievance mechanism will be in place to report and address GBV/SEA-related incidents.
Zero-tolerance policies will be signed by all contractors, subcontractors, and worker.
A GRM will be established at the project level, accessible to workers and community members.
Contractors will also maintain a separate internal mechanism to address worker grievances promptly and transparently.

Emergency Preparedness:
All contractors must maintain an emergency response plan, including designated assembly areas, fire extinguishers and first aid kits.

Climate and Energy Efficiency Considerations:
Contractors shall implement energy-efficient construction practices, minimize waste, and consider green procurement where feasible.

ENVIRONMENTAL MONITORING MATRIX

The matrix below presents key parameters to be monitored throughout the construction and operation phases of DUWASA office building project. It ensures compliance with environmental and social requirements, as aligned with AfDB's safeguard policies and national standards.

S/N	Parameter to Monitor	Sampling Methods/Approach	Frequency	Cost Estimate (TZS)	Responsibility	Reporting
1.	Air Quality (Dust, PM_{10})	Visual inspection, portable air quality meters	Weekly (construction)	1,200,000	Contractor / Environmental Officer	Monthly Report
2.	Noise Levels	Handheld noise meters (dB) at boundaries	Weekly	800,000	Contractor / Environmental Officer	Monthly Report
3.	Waste Handling and Disposal	Site inspection; waste logs; manifests from licensed collectors	Once in two weeks	600,000	Site Supervisor / DUWASA	Monthly Report
4.	Occupational Health and Safety (OHS)	PPE checks, training attendance, incident logs	Monthly	1,000,000	OHS Officer / Contractor	OHS Monthly Compliance Report
5.	Water Usage and Drainage	Meter readings, inspections	Monthly	500,000	DUWASA Facilities Manager	Monthly Internal Facility Report
6.	Flora Protection (During landscaping)	Field inspection; photographic records	Monthly	300,000	Contractor / Environmental Consultant	Monthly Landscaping Report
7.	Fire Safety Equipment Availability	Fire drills, extinguisher checks, signage inspections	Monthly	400,000	Fire Safety Officer	Monthly Fire Safety Audit Report

The proposed construction of an 8-storey office building for DUWASA is both feasible and beneficial, with manageable environmental and social impacts. With a strong commitment to sustainability, the project has allocated **TSh 76,000,000** for the implementation of the Environmental and Social Management Plan (ESMP) and **TSh 31,000,000** for monitoring activities. These resources will ensure that potential impacts are effectively mitigated, compliance is maintained, and best practices are followed throughout the construction phase.

Recommendations:

- Ensure full and timely implementation of the ESMP.
- Conduct regular environmental and social monitoring to address any emerging issues.
- Provide training for staff and contractors on E&S compliance.

- Engage stakeholders consistently to maintain transparency and support.

With the allocated E&S budget and a proactive management approach, the project is well-positioned to proceed responsibly and contribute positively to DUWASA's institutional growth.

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ACRONYMS AND ABBREVIATIONS

CCD	City Council of Dodoma
DAS	District Administrative Secretary
DoE	Division of Environment
DUWASA	Dodoma Urban Water Supply and Sanitation Authority
EIA	Environmental Impact Assessment
EMA	Environmental Management Act
EMP	Environmental Management Plan
ESMP	Environmental and Social Management Plan
GST	Geological Survey of Tanzania
HIV/AIDS	Human immunodeficiency virus/ Acquired immunodeficiency syndrome
I & Aps	Interested and Affected Parties
NCC	National Construction Council
NEMC	National Environment Management Council
NEP	National Environmental Policy
NGOs	Non-Governmental Organizations
NOx	Nitrogen Oxides
OSHA	Occupational Safety and Health Authority
PPEs	Personal Protective Equipment's
QS	Quantity Surveyors
RAS	Regional Administrative Secretary
STDs	Sexual Transmitted Diseases
TAC	Technical Advisory Committee
TANESCO	Tanzania Electric Supply Company
TANROADS	Tanzania Roads Agency
URT	United Republic of Tanzania
WEO	Ward Executive Officer

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

Dodoma Urban Water Supply and Sanitation Authority (DUWASA) is an autonomous water utility legally charged with the delivery of water supply and sanitation services to urban residents of Dodoma City and the towns of Kibaigwa, Chamwino, Kongwa and Bahi. The Authority was established under section 3(i) of Cap. 272 of 1997 as repealed by Water supply and Sanitation Act No. 12 of 2009 and Act No. 5 of 2019. It was declared a fully autonomous entity by order of the Minister responsible for water sector on 13th February, 1998; and was officially inaugurated on 1st July, 1998.

DUWASA decides to construct eight (8) storey office building to accommodate its staff due to the fact that the existing building is exhausted, lack quality and modern office facilities and is not sufficient to accommodate all staff. The building is aimed to provide enough space to accommodate about 317 staff and space for essential activities in order to ensure smoothness of workers daily activities and good services provision. The proposed site for the project has a total area of approximately 13,670 square metres.

The building will consist of the facilities such as office rooms, canteen, kitchen, conference rooms, gymnasium, toilets for disabled, ladies and gents, breastfeeding room, auditorium, archives, record center and roof garden. The project will be funded by African Development Bank (AfdB). The project is intended to provide several employment and business opportunities and benefits during implementation and operation phases. The following groups are expected to benefit from the project;

a) **Local community**: construction activities will offer job opportunities for skilled and unskilled people and business opportunity to the nearby community at Dodoma City.

b) **DUWASA staffs**: The new office building will ensure smooth and efficient execution of their daily tasks due to the improved and upgraded working environment.

It is clear that the construction and operation of the proposed Project will have both positive and negative environmental and social impacts. In complying with the provisions of the Environment Impact Assessment and Audit Regulations, (GN) No. 349 of 2005, and its amendment of 2018, the proponent has commissioned experts on environment and social aspects to advise DUWASA on complying with the AfDB's Operational standards due to the fact that the process of construction, operation and eventual decommissioning of the proposed project might have potential of causing impacts to the environment and community at large. DUWASA has commissioned a consultant who will lead a team of registered ESIA expert to carry out the ESIA study for this project. Being aware of the

above, DUWASA has commissioned Mr. Majaha Malongo (Individual Registered EIA expert) to undertake Environmental and Social Impact Assessment of the proposed eight (8) storey office building on plot No.1 Block (F), NCC-Link area, Tambukareli ward in Dodoma City Council. The reconnaissance survey was conducted on October, 2024 and scoping report with Terms of References were submitted to the National Environment Management Council as per Regulation 10. - (1) Environmental Impact Assessment and Audit (Amendment) Regulations, 2018. The project was registered and TORs for undertaking the study were approved. The ESIA study was conducted in February, 2025.

1.2 Objectives of the Project

The main function of the proposed building will be for offices to be used by DUWASA staff and the building design objectives are to ensure fulfilling DUWASA preferences as;

i. Provide building spaces that are sufficient and has modern facilities to accommodate all staffs
ii. Viable functional interactions to enhance DUWASA effectiveness in providing services to the people.
iii. Excellent and inter-grated security and safety considerations
iv. Good quality but cost-effective building components, passive construction materials, elegant finishes and fittings.

1.3 Objectives of ESIA study

The overall objective of carrying out this ESIA was to identify, predict and assess both positive and negative environmental and social impacts associated with the proposed construction of the office building project and propose mitigation/enhancement 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 predict both negative and positive impacts of the project, to design mitigation measures of the adverse impacts, as well as to plan the monitoring of potential changes that may arise in the course of implementing the project. The specific objectives of ESIA will be as follows:-

i. To ensure that environmental considerations are explicitly addressed and incorporated into the development decision making process;
ii. To anticipate, avoid, minimize or offset the adverse significant biophysical, social and relevant effects of developmental proposal;
iii. To protect the productivity and capacity of natural systems and ecological processes which maintain their functions
iv. To promote development that is sustainable and optimises resources use and management opportunities;
v. To establish and assess impacts that are likely to affect the environment before a decision is made to authorise the project;
vi. Propose mitigation and socio-management procedures aimed at managing the

proposed mitigation of the identified potential impacts and that will form part of the overall EMP for the proposed project operations.

vii. To enable information exchange, notification and consultations between stakeholders;

1.4 Project Cost and Project Life Span

The cost for implementation of the proposed construction activities of the building is estimated to be 10 million USD covering the construction/installation materials, equipment and labour charges. The project will be funded by the African Development Bank. The lifespan of the project varies depending on the materials used for construction, renovation and maintenance schedule. Basing on experience the building can have a life span of at least about 50 years.

1.5 The Scoping Study

The scoping study is aimed at identifying the relevant key environmental and social economic issues before conducting the ESIA study so as to ensure all the important information are covered. The scoping report for the proposed project outlined various social and environmental concerns which were considered during preparation of this Environmental Impact Assessment report. As the product of the scoping report, ToRs were formulated to facilitate an efficient assessment process and assisted the teamof expert to focus on the environmental and social concerns that were identified and outlined in the scoping report.

Therefore, the specific objectives of scoping exercise were as follows: -

- To determine key environmental and social issues that are likely to be important during the ESIA study.
- To provide an opportunity for the Proponent, the relevant key stakeholders and affected parties within the project area by sharing information and express their views and concerns' regarding the project proposal which will enhance rational decision to the project.
- To focus the ESIA on reasonable alternatives and relevant issues to ensure that the resulting Impact Assessment is useful to the decision-maker and address the concerns of interested and affected parties.
- To facilitate an efficient assessment process that saves time and resources and reduces costly delays of the project but also to make re-design the project into socially accepted, economically viable and environmentally sound.

1.6 Methodology of the Study

The methodology used for data collection during scoping exercise and ESIA study is commensurate with the EMA Act, 2004 and Environmental Impact Assessment and Audit of 2005 and (Amendments) Regulations of 2018 it also follows African Development Bank

(AfDB) Operation Standards (OSs).

The methodology incorporated both quantitative and qualitative data collection techniques, integrating stakeholder engagement and baseline assessments to capture the full spectrum of potential impacts and risks at the project location.

1.6.1 Scoping

The scoping exercise was conducted between 15th February to 28th February 2025 to identify key environmental and social issues of concern and determine the scope of the ESIA. It was conducted mainly through consultation with key stakeholders, reviewing various reports, studies and literature related to the project and field observations at the project location.

1.6.2 Involvement of Stakeholders

The ESIA study team visited the proposed project area neighbouring community and relevant government institutions on February -March 2025. Stakeholders were selected based on their influence to the project implementation and follows AfDB OS10 to ensure Stakeholder's were appropriately engaged. interviews were conducted in order to inform the stakeholders about the proposed project and to collect baseline data and issues of concerns. The ESIA study applied different participatory methods to involve all relevant stakeholders; one to one interview with individual based upon a check list of general topics or questions and partly based on an open discussion were conducted. Focused group discussion (FGDs) was done to gather their perspectives on potential environmental and social risks of the project. This engagement includes local communities of Tambukareli Wards, National Construction Council, Geological Survey of Tanzania (GST), TANROADS, TARURA, City Council of Dodoma (CCD), OSHA, TANESCO and Fire Brigade. Details of stakeholders consulted date and locations are in Appendix II.

1.6.3 Physical Environment

Information on the climate, geology, topography and soils were obtained from secondary sources by compiling data from existing reports and source agencies. Maps were also examined to obtain some data such as topography of the general project area. Field work was carried out to augment and verify existing information relating to topography and soils and to obtain firsthand knowledge of the other physical aspects. Air Quality measurement was done to measure ambient air quality at and around the project site, focusing on key pollutants such as particulate matter (PM), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and carbon monoxide (CO); portable air quality monitors were used. Noise measurement was done to measure the existing noise levels at various points on the project location and nearby areas using sound level meters. Geotechnical investigation study was done as outlined in appendix ix.

1.6.4 Socio-economic Environment

Rapid field appraisal (RFA) techniques in conjunction with desk research were employed for investigations of the socio-economic considerations within the project area at Plot 1, Block F, NCC Link, Salmini Avenue, Tambukareli Ward in Dodoma City. Details about population and settlement characteristics, land uses and livelihood, infrastructures in place, water supply and other utilities, waste management practices and other social services were obtained.

1.6.5 Biological Environment

The information on the flora and fauna of the study area was gathered from existing literature on reported species as well as observations in the field. Ecological surveys was conducted to identify animals, vegetation and trees species in the project area at Plot 1, Block F, NCC Link, Salmini Avenue, Tambukareli Ward in Dodoma City.

1.6.6 Policy, Legal and Institutional Arrangements

Policy, legal and regulatory framework were compiled from review of documents; policies, legislation, guidelines and standards as well as African Development Bank safeguards policy (Oss) and guidelines.

1.6.7 Identification and Assessment of Risks and Impacts

Potential environmental, social, and economic risks and impacts associated with the construction and operation of the office building were identified and their significance assessed.

Data Collection Techniques: Impact and risks Identification was done by a team of ESIA experts involving environmental scientists, engineers, social scientists, Architecture and other relevant experts by brainstorming and identifying potential environmental and social impacts**.** Community Risk Perceptions was done by engaging local government leaders to discuss perceived risks and how the construction might affect their daily lives.

Scoping of Impacts: Matrix Method was developed to categorize and assess the significance of potential impacts based on criteria such as severity, extent, and likelihood. The matrix evaluated both negative and positive impacts.

The consultant, used the below general criteria to evaluate significance of the identified impacts. Criteria for significance include but not limited to the following;

i. Magnitude and likelihood of impact;
ii. Spatial and temporal extent;
iii. Potential to implement mitigation measures and controls;
iv. Likelihood and degree/timescale of environmental recovery;
v. Value of the affected environment/social component;

vi. Level of public concerns; and
vii. Political repercussions of the project.

The scales of those negative and positive impacts that are likely to occur were determined using a range of low, medium and high scale such as:

i. Low positive
ii. Medium/moderate positive
iii. High positive
iv. Low negative
v. Medium/moderate negative
vi. High negative
vii. No apparent impact

As the proposed activities will be within the current DUWASA Plot, cumulative effects are likely to occur and have been given consideration in the impact assessment as well as residual impacts that cannot be mitigated. The assessment considers contribution to local and national environmental and socio-economic issues.

1.7 Environmental Sampling Methodology

To accurately characterize baseline environmental conditions at the project site, a structured sampling approach was undertaken. The methodology ensured the collection of reliable, site-specific data that supports the assessment of potential environmental impacts from the proposed DUWASA 8-storey building project.

1.7.1. Sampling Design

A purposive sampling strategy was applied, targeting specific locations that are most likely to be affected by construction and operational activities. These locations included:

i. The core construction site
ii. Residential areas adjacent to the site
iii. Roadsides and pedestrian pathways
iv. Low-lying areas potentially affected by runoff

The selection of these sites was informed by site reconnaissance, stakeholder inputs, and the project's environmental risk profile.

1.7.2 Sampling Techniques

a) Water Quality Sampling

- Grab sampling method was used to collect water samples from nearby sources (e.g., stormwater drains or public taps if applicable).
- Samples were collected in clean, sterilized containers and analyzed for parameters including: pH, turbidity, BOD, COD, nitrates, and coliform bacteria.

b) Soil Sampling

- Composite soil samples were taken using augers at depths of 0–30 cm from undisturbed areas within and around the site.
- Parameters analyzed included pH, organic content, and potential contaminants (e.g., heavy metals, if suspected).

c) Air Quality Monitoring
- Air pollutants such as $PM_{2.5}$, PM_{10}, SO_2, and NO_2 were measured using portable digital air monitors.
- Measurements were taken during peak daytime hours at multiple points, including windward and downwind locations.

d) Noise Monitoring
- Noise levels were measured using calibrated sound level meters at 1.5 m above ground level.
- Readings were taken at different times of day to capture variations due to traffic and other human activities

1.7.3 Quality Assurance Measures

All equipments were calibrated before use.

1.8 Report Structure

This report is organized in twelve chapters. Chapter 1 gives a general background to the study; Chapter 2 deals with the project background and description; Chapter 3 gives a description of policy, administrative and legal framework which are relevant to the project; and Chapter 4 presents the baseline or existing conditions of the project site. Chapter 5 presents the findings of the stakeholders' consultation and public participation.

Chapter 6 presents the assessment of impacts and identification of alternatives for theproject and project operations. The chapter presents an assessment of aspects of the project that can cause environmental and socio-economic impacts. The chapter also determines the scale of the impacts and evaluate the significance of each in terms of defined criteria. Sources of both negative and positive impacts are presented. This is followed by impact quantification. Mitigation measures are provided for impacts considered significant. Chapter 7 gives details of mitigation measures that are summarized in Chapter 8 as Environment and Social Management Plan (ESMP). Chapter 9 presents the Environment and Social Monitoring Plan (EMP). Chapter 10 discusses cost benefit analysis while Chapter 11 presents an initial decommissioning plan. Chapter 12 provides Summary and Conclusions of the project.

CHAPTER TWO

2.0 PROJECT DESCRIPTION

2.1 General Project Description

The proposed construction of office building project area is located on Plot 1 Block F, NCC-Link “Salimini Mtaa”, Tambukareli Ward, Dodoma City Council in Dodoma Region. The project site can be accessed through a tarmac road at about 5m to the road heading to UDOM at the junction close to the existing DUWASA head office building and opposite is bordered by Kambarage tower building. This road ensures site accessibility and smooth services provision. Basically, the site is well positioned in terms of accessibility. The Geographical location of the proposed project is at latitude 6.18646° S and longitude: 35.75268° E as shown on Figure 1.

The proposed building design has considered green sustainability as follows;

i. Environment and sustainability consciousness (noise control, natural lighting, natural ventilation, energy conservation etc).
ii. Environmental protection; provision of greenery and environment management practice.
iii. Indoor environmental quality; thermal comfort, environmentally friendly finishingmaterials and comfortable spatial organization.
iv. Water efficiency: water efficiency fittings.
v. Energy efficiency: Energy efficient lighting accessories + monitors, natural lighting and ventilation, lobbies, street lights etc.

The proposed office building will comprise of the following facilities; office rooms, canteen, kitchen, conference rooms, gymnasium, toilets for disabled, ladies and gents, breastfeeding room, auditorium, archives, record center and roof garden, waiting area, emergency assembly point, server room, customers/visitors lounge, generator shade and covered walk ways. The proposed project has considered provisions for parking areas and garden areas. A summary of all building facilities are shown in Table 2.1.

Table 2.1: The components of the proposed building

S/N	ITEM	OFFICE	RECOMMENDED
1.	8TH FLOOR	Stakeholders Offices	Roof garden, Water laboratory, machine room, water tank, solar panel roof and reserve osmosis
2.	7 THFLOOR	MD	04 stakeholder's offices, PIT office, 02 TUGHE offices,1saccos office, conference room (50people) and 02 Personal Secretary's offices.
3.	6TH FLOOR	DAHRM	MD's office with toilets (inclusive of gym)
4.	5TH FLOOR	DWSS	DAHRM
5.	4TH FLOOR	DCS	DPMU and DWSS
6.	3 RDFLOOR	DPMU &DFA	CIA and team, HLS and team, HICT and team, HPME and team, HCPR and team
7.	2 NDFLOOR	CIA, HLS, HICT, HPME, HCPR	1STAuditorium and conference room
8.	1ST FLOOR	Various Offices	Auditorium upper level and Conference room
9.	MEZANINE		Canteen, Breastfeeding, Gym, Kitchen and toilets
10.	GROUND FLOOR	Customers Service Office, E- Transaction Office, 02 Drivers Office, Conference Room (500 People)	Service window for customer service, pool office, 01incharge office, conference room for 100people, e-transaction office,1TO'soffice, Drivers pool office, Infimary, 02 security guards offices including toilets and changing room
11.	BASEMENT	Various Offices	02 Archives, 02 Records center, 02 customer records, 03 strongroom, store, water tank, pump room and sump area.

Source: Architectural drawings, 2024

2.1.1 Location and accessibility of the project site

The proposed construction of the office building project area is located on Plot 1 Block F, NCC-Link "Salimini Avenue", Tambukareli Ward at Dodoma City Council. The project site can be accessed through a tarmac road at about 5m to the Kikuyu Avenue Road heading to UDOM at the left junction where the existing DUWASA head office building is located. The presence of roads ensures site accessibility and smooth service provision. Basically, the site is well positioned in terms of accessibility. The Geographical location of the proposed project is at latitude 6.18646° S and longitude: 35.75268° E as shown on figures

1 and 2.

Figure 2.1: Access road to the proposed project site

Figure 2.2: Google map extract showing location and accessibility of the proposed site.

2.1.2 Marginal Zones

The proposed project site is bordered by tarmac roads, developed plots and Kambarage building. These roads have been cleared and levelled by Dodoma City Council to connect several plots to the main UDOM road.According to the City Council of Dodoma land use plan for the site neighborhood contains medium-rise buildings.

2.1.3 Existing Situation at the Project Site

The surface geology of the entire plot is characterized/covered by in-situ young superficial deposits mainly of brown sand soil (These sediments are composed of silt to sand-sized particles mixed partly with quartz and feldspar rubbles. It occurs as an in situ loose to semi-consolidated soil layer formed from weathering of basement rocks, mainly tonalites. Tonalite makes the competent basement rocks of the project area (Refer geotechnical report appendix IX).

The plot is located on moderately flat ground covered by topsoil deposits chiefly made up of clay minerals, silica sand and to a lesser extent oxides of iron on a tonalitic basement. There are no prominent fault/shear which can affect the anticipated construction project of structural buildings, also no serious geological threat, such as structures or any features encountered in the project area that can prohibit development activities. This implies that the building's settings would not require excessive levelling excavations and the area is therefore suitable for construction purposes, including buildings of any kind, as the area is underlined by competent tonalite basement rock ((Refer geotechnical report appendix IX).

The site for the proposed office building is currently occupied by buildings which will be demolished to have a clear and open space. The site is within DUWASA premises and is currently being used for offices, stores and open store (yard).

Figure 2.3: Existing Conditions of the Project Site (Store yard area).

2.2 Project Design Approach

The conceptual design approach was to address the potential development needs of DUWASA.

i. It optimizes the site economically and provides exclusive zoning of functions and circulation routes at site level and building level.
ii. It provides sufficient floor space to accommodate all functions and allows for flexibility in future use.
iii. It creates a viable functional interaction by coordinating the tasks, working spaces to enhance DUWASA's effectiveness and efficiency in undertaking and providing the required services.
iv. The buildings to be esteemed and to be of an attractive architectural form, appropriate scale, distinct contemporary style and primarily responsive to the environment.
v. It provides excellent and integrated security and safety considerations to protect the classified areas and facilities.
vi. Utilisation of good quality but cost-effective structural components, a high degree of passive construction materials, elegant finishes and fittings to ensure efficient building fabric and minimal requirements for maintenance.

- **Functional Performance and Adequacy**

Open plan accommodation has been provided in offices. This will enable flexibility of partitioning and recycling of space for different functions as the need arises. The services are positioned to ease the coordination of installations and usability. Safety and security in terms of escapes, controls and suppressions have been carefully considered and will be incorporated in the detailed design stage.

- **High Performance Materials**

Special attention has been made to the detailed finishes and cladding for reasons of durability, aesthetics and maintenance. It is intended that resilient materials suchas non-slip porcelain tiles, glass and aluminum will be used. The external finishes are partially painted on the rendered block walling and glazing to windows and limited curtain walls.

Other facilities include:

(i) Construction of waste management systems including solid waste receptacles (waste bins)
(ii) Provisions of service line to the facility such as electricity supply and standby generator, water supply system and security systems i.e., CCTV cameras.
(iii) Waste water collection, storage and conveyance system will be comprised of underground system (pipes and manholes chambers and discharge system), storm water drainage channels (closed and open).
(iv) Firefighting systems include pump room, sprinkler pumps, smoke detectors, fire extinguishers i.e., portable fire extinguishers (dry powder and CO_2) etc.

2.3 Land Ownership

The project site land area is owned by DUWASA with all legal documents (Refer Appendix V) for ownership title deeds with title No. 11 312 -DLR. All proposed buildings will be constructed within DUWASA premises. Thus, Resettlement Action Plan (RAP) will not be required.

2.4 Project Utilities

2.4.1 Water Supply

The proposed building will be a modern facility, designed to accommodate at least 300 staff members and 200 valued customers at the same time of which the total demand is estimated to be 35,000 litres per capital per day. The source of water anticipated for the proposed project will be supplied by the proponent Dodoma Urban Water Supply and Sanitation Authority (DUWASA). Since the water pipeline is nearby the project site from the proposed project site, it is anticipated that during construction and operations phase of the project water will be easily connected to the project. The water supply can be used to meet the water requirements for all facilities such as cleanliness, gardening, in the wash rooms for flushing, firefighting etc. Ground and overhead water storage tanks have been proposed. A water pump will be used to pump water into the overhead tank and a gravity fed system will be employed to distribute water to the required areas. Storm water from the building roofs will be collected by gutters and channeled to water tanks and later be re-used.

2.4.2 Power Supply

The source of power during construction is from TANESCO. The power is used for lighting and equipment used during construction.

During operation phase, it is expected that power supply source will be from Tanzania Electric Supply Company Limited (TANESCO). Nearby the project site there is existing low tension distribution lines to supply power at the area. The installation of a switch room with a meter board will be required for power distribution to the buildings. Power requirement will be calculated based on area and designated use. This will allow TANESCO to confirm whether the existing transformers/ distribution line will be sufficient to serve the proposed development. Power sockets/points will be installed in all facilities to enable people to connect their equipment and devices. Provisions for expansion will also be taken into consideration. Cabling to and from the switch room will be done by use of cable trays for efficient and neat cable management. Also, in case of power outage there will be standby generator as alternative source of power to the proposed building. The distribution boards, fire detections systems and all electrical facilities specifications areas.

2.4.3 Sanitary Facilities

Sanitary facilities during the construction phase will be the existing toilets found in the compound. The toilets will be for both genders.

Sanitary facilities during operation phase will be provided for both males and females. Each floor of the buildings has been provided with toilet for both sex. It is recommended to use Indian type toilets combined with a flush valve system in the washrooms since it is the best vandal proof and hygienic system for use, also European type of toilets will be installed. With a proper facilities maintenance system, the washrooms will serve the users efficiently. Use of push taps for the wash basins will be an efficient way for reducing water usage in the washrooms unlike the knob type where the taps can be left running for long periods of time. The use of a high-level cistern for the urinals with distributed flush mechanisms will suffice for cleaning them.

2.4.4 Sewerage Systems

The waste water will be from toilets (grey water) and cleanliness activities. The generated waste water will be managed offsite, that is waste water will be connected to public

sewerage system. Thus, all effluent from the project will be conveyed directly to the system and finally being transported to the treatment plant.

With reference to project specific geotechnical survey study, the design of project facilities for waste water management has considered the location of water table, thus less or no risk of ground water contamination.

2.4.5 Drainage Systems

An ideal site when considering drainage is one that is sloping gently away from the road because the site can be drained naturally. At the project site or nearby there is existing public storm water drainage system, hence the proposed project area has storm water drainage systems. Thus, the design of drainage system will be connected with the nearby public drainage system, this is only for surface run off, but water from the building will be harvested and stored in the designed underground water tank for alternative use such as gardening and cleaning.

2.4.6 Passive Ventilation

Natural ventilation in office has been emphasized by the overall orientation of the buildings in relation to the prevailing wind directions. This has been emphasized by strategically locating windows to allow cross ventilation when desired.

2.4.7 Security

CCTV cameras shall be located at strategic locations to help curb insecurity. With the inclusion of ICT infrastructure, the security system can be linked to an emergency backup service provider to ensure quick response. Also, security lamps shall be installed in all strategic areas.

2.5 Project Activities

The project activities for the proposed DUWASA office building will involve various phases from the planning all the way to the mobilization, construction, operation and decommissioning. Each specific phase has its own activities which are described in the following sections.

2.5.1 Pre-Construction Phase

This phase entails mobilization of labor force, equipment as well as acquisition of various permits as required by the law. All raw materials will be purchased or acquired from registered sources or certified dealers. Other activities during this phase includes;

i. Geotechnical investigations to analyze soil types within the proposed site, underground water availability/ water sources;

ii. Architectural, Engineering and Services Designs that involves the application of engineering principles and technology to building design and construction.

iii. Site clearance

- **Materials, Labor and Equipment**

The materials, labor requirements and equipment to be used during construction and mobilization of the project site is as shown in Table 2.2. and Table 2.3.

Table 2.2: Materials and equipment to be used.

SN	Equipment	Quantity	Capacity / Type
1	Excavator	2	20–30 tons
2	Backhoe Loader	1	Standard
3	Dump Truck	4–6	10–20 tons
4	Compactor / Roller	1	10–12 tons
5	Drilling Rig	1–2	As per pile spec
6	Tower Crane	1–2	8–12 ton capacity, 60m
7	Concrete Pump	2	Boom (42m) + Stationary
8	Concrete Mixer Truck	2–4	6–8 m^3
9	Mobile Crane	1	25–50 tons
10	Rebar Bending/Cutting M/C	2–3	Standard (up to 32mm bar)
11	Vibrators	4–6	40–60 mm needle
12	Hoist (Material + Passenger)	1–2	1–2 ton / 1.5 m/s
13	Boom Lift	1	15–20 m height reach
14	Scaffolding	Full site	As per perimeter + floors

Table 2.3 Labour requirement to be involved

Category	Type	Estimated No. of Workers	Remarks
Engineers	Skilled	8	Responsible for HVAC, piping, elevators, supervision of all the construction works
Masons	Skilled	20	Wall construction, plastering, tiling
Carpenters (Formwork)	Skilled	25	Shuttering for beams, columns, slabs
Steel Fixers	Skilled	20	Cutting and fixing of reinforcement bars
Electricians	Skilled	8	Wiring, fittings, panel

Category	Type	Estimated No. of Workers	Remarks
			boards
Plumbers	Skilled	8	Water supply, drainage, sanitary fixtures
Welders	Skilled	5	Welding of embedded steel, brackets
Crane/Hoist Operators	Skilled	3	Operate tower crane or hoist
Equipment Mechanics	Skilled	2	Maintain site machinery and tools
Surveyors/Leveling Staff	Skilled	3	Layout and leveling of works
Mason Helpers	Semi-Skilled	20	Assist masons in brick/block works
Carpenter Helpers	Semi-Skilled	20	Assist carpenters with formwork
Bar Bender Helpers	Semi-Skilled	15	Support steel fixers with rebar
Electrician Helpers	Semi-Skilled	6	Help with conduit and wiring
Plumber Helpers	Semi-Skilled	6	Assist in pipe handling and installation
General Laborers	Unskilled	40	Material handling, cleaning, misc. work
Concrete Pouring Crew	Unskilled	20	Support during concrete casting
Curing Crew	Unskilled	10	Water curing for concrete surfaces
Scaffolding Crew	Unskilled	12	Scaffold erection and dismantling
Site Cleaners	Unskilled	8	Site cleaning and waste management
Day Laborers (on peak days)	Casual	20	Temporary workers for peak demand
Landscaping Workers	Casual	6	Planting, paving, site beautification
Security Guards (2/shift)	Casual	6	Guard site across multiple shifts
Helpers for Finishes	Casual	10	Painting, flooring, glass fixing

-

- **Labour Management as per OS2 Requirements:**

Under OS2, the project Must Develop and Implement a Labour Management Plan (LMP**)** covering;

  - Recruitment and terms of employment

- Grievances mechanisms
- Worker rights and protection

- **Ensure Fair and Safe Working Conditions**
  - Provide written contracts in a language workers understand
  - Set reasonable working hours, wages, and overtime policies
  - Ensure non-discrimination, freedom of association, and collective bargaining.

- **Protect Vulnerable Groups**
  - Prohibit child labour and forced labour
  - Implement gender-sensitive practices (e.g.,maternity protection,anti-harassment policies).

- **Occupational Health and Safety (OHS)**
  - Conduct risk assessments
  - Provide Personal Protective Equipment (PPE)
  - Train workers on site safety and emergency response
  - Maintain an incident reporting system

- **Worker Accommodation Standards (if provided)**

Ensure decent living conditions as per OSHA,2003 and OS2 workers accommodation guidelines, including: clean water, sanitation, privacy, and medical access.

- **Transportation**

Materials (fine and coarse aggregates) from quarries will be transported by trucks to the construction site. Other materials like cement will be transported by lorries to the construction site.

- **Types, Amounts and Treatment/Disposal of Wastes**

Types, amounts and treatment/disposal of wastes during the pre-construction phase shall be done as shown in **Table 2. 4.**

Table 2.4: Types, amounts and treatment/disposal of wastes during the pre - pre-construction phase

Waste	Types	Amount	Treatment/Disposal
Solid Waste (Degradable)	Garbage: food remains paper, fruits	7.5kg/day (based on generation rate of 0.1kg/day/ person as per capital generation of Dodo ma City and 75 workers are expected to be onsite during mobilization phase)	All wastes shall be collected and disposed by contracted companies who provides services within the area

Waste	Types	Amount	Treatment/Disposal
Solid Waste (Non Degradable)	Scrap metals, Tins, glasses plastics, and packaging materials	-	Sold to recyclers or taken to Authorized dumping place by the Municipal Council.
Liquid waste	Sewage	2.4 m^3 assuming that about 43 people will be onsite, 40Ltrs/cap/day where by 80% of water becomes waste water. (Referring to Ministry of Water Design, Construction Supervision, Operation and Maintenance Manual)	Contractor will ensure availability of sanitation system to handle waste water generated at the construction site
	Oil and Greases	-	Car maintenance shall be done at garages away from the project site

2.5.2 Construction Phase

The following are the activities to be executed at the proposed project site during construction phase;

i. Excavation and foundation work
ii. Material handling and storage
iii. Masonry, concrete work and related activities
iv. Structural steel works
v. Roofing works
vi. Electrical works
vii. Tree planting
viii. Drainage works
ix. Time of construction works

Construction Materials

Building Material will be transported to the project site from their extraction, manufacture or storage site using transport trucks. The trucks for transportation should not exceed weight limit. The trucks will be new or well serviced to be environmentally friendly. The building

materials to be used during construction of the project will be sourced from local sources. Construction materials will be supplied by suppliers.

Excavation

The upper (5 meters) soils at the site have shown variable type of soils ranging from the dominant coarse clayey gravelly silty SAND (SM - SC), with relatively low potential to shrinkage. As result of dominant coarse-grained friction soils, it is possible that the soils may suffer from liquefaction potential can be mobilized by both high-water content and seismo-tectonic activity.

Choice of foundation

The selection of the foundation type to be adopted to accommodate various criteria in a design process which evolves. It is crucial to approach this process on a broad front taking into account of all the relevant information and balancing the factors which can vary as decisions are made. Foundation design, in this project, has been therefore optimally be carried out using a careful blend of geology, soil mechanics, ground water condition (Refer geotechnical survey report appendix ix) and topographical features, theory of structures, experience and logical engineering judgment.

Geohazard Consideration in Structural Design: Incidence of geohazards could reasonably be expected to occur in the area during a major earthquake on any of the active faults in the Region. In this regard, structural design of the foundation should take into consideration of the dynamic loads and possible liquefaction potential associated with seismic activities (Refer Geotechnical survey report appendix ix)

Materials handling and storage

Building materials such as cements, reinforcement steel, fine and coarse aggregates will be stored on site, but delivery of these materials to the site will only be done whenever needed for construction purposes.

Construction materials and equipment, if not handled with care, can be hazardous to the environment and cause injuries to workers. For a safe working environment during the construction phase, the following measures shall be put in place;

i. Deliveries should be planned to keep the number of materials on site to a

minimum, and any stockpiles must be stable and well secured to avoid collapse and possible injury to workers and visitors at the site.

ii. Construction workers are to take precautions by using protective gear during construction work.

iii. Potential water pollutants, for example chemicals solvents and paint should bestored with extra caution such that they do not cause runoff pollution.

Masonry, concrete work and related activities

The construction of the building walls, foundations, columns, floors, drainage systems, among other components of the project involves a lot of masonry work and related activities. General masonry and related activities include dressing, concrete mixing, plastering, concrete pouring for slab, columns, construction of foundations and erection of building walls, curing of fresh concrete surfaces and mixing ofconcrete and cement.

Structural steel works

The building will use reinforcement steel in elements such as columns, beams and slabs for stability. Steel works involve steel cutting, welding and erection. The workerscarrying out this activity shall be required to wear appropriate personal protective equipment, such as helmets, safety boots, googles and hand gloves.

Roofing works

Roof and terraces shall be flat roofed finished in APP waterproofing membrane on waterproofing screeds and covered with interlocking concrete tiles. Reinforced concrete slabs and steel structures are to be used as per the Engineers' detail with waterproofing to be laid to follow manufacturers' specification.

Electrical works

Electrical installations including electrical wiring and conduiting/trunking for lighting and power installations, light fittings, fire alarm system, security lighting, landscape/garden lighting, trunking/conduiting for telephone/and security installations, power distribution, switchgear and lighting protection etc. shall be undertaken by qualified and duly registered contractors as per the attached drawings.

Tree planting

To improve the aesthetic value or visual quality of the site once construction ceases, the proponent will carry out landscaping. This will include establishment of trees, flower gardens and grass lawns and will involve replenishment of the topsoil. It is noteworthy that the proponent will use plant species that are available locally preferably indigenous ones for landscaping.

Plumbing works

Installation of pipe-work for water supply and distribution will be carried out within the buildings and associated facilities. In addition, pipe-work will be done on the waste water management system from premises to sewer system and for drainage of storm water from the rooftop into natural drainage system. Plumbing activities will include metal and plastic cutting, the use of adhesives, metal grinding and wall drilling amongothers.

Types, amounts and sources of project requirements

The main construction materials for the proposed project are sand, gravel, hard stones (aggregates), gauge polythene sheet, imported excavated soil, gamalin 20EC solution, reinforcement iron bars, water and timber, iron sheets, ceramics, glasses. Most of the materials shall be obtained locally (within Tanzania). All materials shall be supplied by certified suppliers.

Cement

The Cement is easily available in different hardware store in the Dodoma and from nearby Regions such as Morogoro/ from industries like Twiga Cement, Camel Cement packed in 50kg bags.

Reinforcement Steel

Reinforcing steel for structural works is also available in various areas within Dodoma or other regions. There are industries which manufacture steel in Dar es Salaam that contractors can source directly from the industries.

Aggregates

The aggregates will be sourced from the nearest certified quarries within Dodoma Districts or as per contractor identification.

Sand for Concrete

Sand will be collected from the registered quarries within Dodoma Region

Table 2.5 The estimation of the quantity of materials to be used during construction.

Material	Estimated Quantity	Unit	Remarks	Common Source
Cement (50 kg bags)	120,000	bags	For concrete, plastering, masonry	Local cement manufacturers (e.g., Dangote, Twiga Cement)
Sand (cum)	6,500	cubic meters	For concrete and mortar	Local quarries or river beds (subject to regulation)
Coarse Aggregate (cum)	8,500	cubic meters	Used in concrete mix	Approved Crushing plants or quarries (e Chigongwe)
Steel Reinforcement (tons)	500	tons	Main reinforcement in concrete	Steel mills or rebar manufacturers
Bricks/Blocks (nos)	450,000	pieces	Used for walls and partitions	Approved Brick/block manufacturing plants or on-site casting
Ready-Mix Concrete (cum)	6,200	cubic meters	Structural concrete for all floors	Approved local batching plants
Water (liters)	15,500,000	liters	Used for curing and mixing	DUWASA
Structural Steel (tons)	90	tons	Used for supports, stairs, etc.	Steel fabricators or approved suppliers
Tiles (floor and wall) (m^2)	7,500	square meters	Flooring, wall cladding in wet areas	Tile suppliers
Paint (liters)	6,000	liters	For internal and external painting	Approved Paint companies (e.g. Mega Builders etc)
Doors (nos)	180	pieces	Main and internal doors	Woodwork/flush door manufacturers
Windows (nos)	220	pieces	Aluminum/glass windows	Aluminum/glass window fabricators
Glass (m^2)	1,500	square meters	Façade and partition glass	Approved Glass fabricators

Material	Estimated Quantity	Unit	Remarks	Common Source
PVC Pipes (m)	5,000	meters	Water supply and drainage systems	Approved Plumbing material suppliers
Electrical Conduits (m)	12,000	meters	Embedded in walls for wiring	Approved Electrical hardware stores
Wiring (m)	25,000	meters	For all electrical circuits	Approved Electrical wire manufacturers
Switches & Sockets (nos)	1,200	pieces	For power distribution	Approved Electrical accessory suppliers
Light Fixtures (nos)	800	pieces	LEDs, ceiling lights	Approved Lighting fixture suppliers
Sanitary Fixtures (nos)	180	pieces	Toilets, sinks, urinals etc.	Approved Sanitary ware brands
False Ceiling (m²)	4,000	square meters	Ceiling in the office and lobby areas	Approved Ceiling system suppliers (e.g., Gyproc, Armstrong)

2.5.3 Operation Phase

Occupancy

The entire building shall be office rooms for DUWASA

Cleaning

Cleaners who would be hired by DUWASA will be responsible for cleaning of the offices and other parts of the premises. Cleaning will involve the use of substantial amounts of water, disinfectants and detergents.

General repairs and maintenance

The buildings and associated facilities will be repaired and maintained regularly during the operational phase of the building. Such activities will include repair of the building walls and floors, repairs and maintenance of electrical gadgets and equipment, repair of leaking water pipes among others.

Solid Wastes Management

Solid waste will be generated during various project operations and therefore must be properly managed. Solid waste will be generated from many areas of the facility including; canteen, kitchen, offices, store and the external environment. The types of solid waste likely to be generated will comprised of; papers, kitchen and canteen waste (decomposable), electronic waste and plastic materials.

Solid waste containers will be placed in office rooms, kitchen, canteen, store and in the common area. Easy access from both kitchens will be provided so that everyday wastes could be placed in their right containers and collection point will be across from the gate making easy way to empty them when necessary. The collection point will be fenced to prevent animal's access, visual protection. The amount of solid waste to be generated per month is approximately to be 8.88Kg per month.

The collection point and bins will also require regular checks and maintenance of the disposal systems, including disinfection to be applied to the containers. The recommended disposal methods include such as; disposal to the landfill.

Wastewater Management

During the operation phase, wastewater will be generated mainly from washrooms. Each floor will be provided with toilets for both men, female and disabled. The sewage waste shall be managed by offsite sanitation system.

The proposed project will mainly generate grey and black water from sanitary facilities and kitchen sections. The amount of waste water to be generated is approximately to be 1.8 million Liters.

2.5.4 Decommissioning Phase

During decommissioning of the proposed project, in which case the development would have to be demolished and land put to alternative use, different measures will be taken into account. These includes;

- Decommissioning will produce a lot of solid waste, which will be reused for other construction works or, if not reusable, disposed of appropriately by a licensed waste disposal contractor.

- All equipment, including electrical installations, furniture, finishing fixtures, partitions, pipework and sinks (obtained from the existing facilities), among others, will be dismantled and removed from the site on decommissioning of the project. If the equipment is in good condition, priority will be given to its reuse in other projects.

Once all the waste resulting from the demolition and dismantling works is removed from the site, the site will be restored through replenishment of top soil and reinstatement of the site to its original state. It is recommended that a decommissioning plan be prepared if demolition will be required.

CHAPTER THREE

3.0 POLICY, ADMINISTRATIVE AND LEGAL FRAMEWORK

Environmental Management Regulations in Tanzania

A clean and safe environment is the constitutional right of every Tanzanian citizen. Regulation on environmental management in the country is mainly vested on two public institutions, the National Environment Management Council (NEMC) and the Division of Environment (DoE) in the office of the Vice President. The NEMC undertakes enforcement, compliance, and review of environmental impact statements whereas the DoE provides the policy formulations and technical back-up and executes the overall mandate for environmental management in the country. The EIA certificate is issued by the Minister responsible for environment. There are many policies and pieces of legislation on environmental management in Tanzania, the relevant ones to this project are briefly discussed below;

3.1 National Policies

Environmental awareness in the country has significantly increased in recent years. The Government has been developing and reviewing national policies to address environmental management in various sectors. Among others, the objective of these policies is to regulate the development undertaken within respective sectors so that they are not undertaken at the expense of the environment. The national policies that address environmental management as far as this project is concerned and which form the corner stone of the present study include the following:

3.1.1 National Environmental Policy (NEP) of 2021

Tanzania currently aims to achieve sustainable development through the rational and sustainable use of natural resources and to incorporate measures that safeguard the environment in any development activities. The environmental policy document seeks to provide the framework for making the fundamental changes that are needed to bring consideration of the environment into the mainstream of the decision-making processes in the country.

The National Environmental Policy, 2021 stresses that for a framework law to be effective, environmental standards and procedures have to be in place. For example, Chapter 4 of the policy (Instruments for Environmental; Policy), Section 61, states that "*As part* of *the (National Environmental Policy) strategy in the implementation of the National Environmental Guidelines, specific criteria for EIA conduct will be formulated".*

The National Environmental Policy as a national framework for environmental management emphasized that the housing development sector shall focus on the following environmental objectives:

- Ensuring sustainability, security and the equitable use of resources for meeting the basic needs of the present and future generations without degrading the environment or risking health or safety.

- To prevent and control degradation of land, water, vegetation and air which constitute our life support system.

- To conserve and enhance our natural and man-made heritage, including the biological diversity of the unique ecosystem of Tanzania.

- To improve the condition and productivity of degraded areas including rural andurban settlement in order that all Tanzanians may live in safe, healthful, productive and aesthetically pleasing surroundings.

- To raise public awareness and understanding of the essential linkages between environment and development and to promote individual and community participation in the environmental action.

- To promote international co-operation on the environment and expand our participation and contribution to relevant bilateral, sub-regional, regional, and global organizations and programs, including implementation of treaties.

The NEP advocates the adoption of Environmental Impact Assessment (EIA) as a tool for screening development projects which are likely to cause adverse environmental impacts. DUWASA shall observe the provision of this policy.

3.1.2 Construction Industry Policy (2003)

Among the major objectives of the policy, which supports a sustainable building development sector, include the promotion and application of cost effective and innovative technologies and practices to support socio-economic development activities such as buildings, road-works, water supply, sanitation, shelter delivery and income generating activities and to ensure application of practices, technologies and products which are not harmful to either the environment or human health. This project is in-line with this policy as ultra-modern technology shall be used during construction and its operation.

3.1.3 National Land Policy (1995)

The National Land Policy states that, “the overall aim of a National Land Policy is to promote and ensure a secure land tenure system, to encourage the optimal use of land resources, and to facilitate broad - based social and economic development without upsetting or endangering the ecological balance of the environment”. This report partly responds to this requirement. DUWASA shall observe the provision of this policy.

3.1.4 National Human Settlements Development Policy (2000)

Among the objectives of this policy that touch the investment sector are to improve thelevel of the provision of infrastructure and social services for the development of sustainable human settlements and to make serviced land available for shelter to all sections of the community. Such infrastructure and services constitute the

backbone of urban/rural economic activities. The proposed building shall increase economic activities around Salmini 'Mtaa' in Dodoma city Council. DUWASA shall observe the provision of this policy.

3.1.5 National Gender Policy (2002)

The key objective of this policy is to provide guidelines that will ensure that gender sensitive plans and strategies are developed in all sectors and institutions. While the policy aims at establishing strategies to eradicate poverty, it puts emphasis on 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 society. DUWASA shall adopt the policy through the provision of equal opportunities to both men and women during construction and related activities. DUWASA shall observe the provision of this policy.

3.1.6 National Employment Policy (1997)

The major aim of this policy is to promote employment mainly of Tanzania Nationals. Relevant sections of this policy are (i) 10, which lays down strategies for promoting employment and section 10.1 is particularly focusing on industry and trade sectors (ii) 10.6 which deals with employment of special groups i.e. women, youth, persons with disabilities and (iii) 10.8 which deals with the tendencies of private sectors to employ expatriates even where there are equally competent nationals. It is one of the objectives of DUWASA to have notable trickle-down positive impact to the locals through various means one of which is direct employment in the area. The project will also provide direct employment to the locals in the area without specifying the number as it is not known how many technical workers will be available for the technical positions. Special attention will be to the marginalized groups to include disabled, women, and youth while strictly avoiding employing children as required by the law. Thus, the project shall be in line with the objectives of the policy.

3.1.7 African Development Bank's Environmental and Social Operational Safeguards requirements

The African Development Bank (AfDB) Operations Standards (OS) provide guidelines to ensure that development projects align with the highest standards for sustainability, environmental protection, social responsibility, and human rights. For this construction project of 8-storey DUWASA office building, there are relevant AfDB Operations Standards that are triggered and will be implemented in the following ways;

OS 1: Assessment and Management of Environmental and Social Risks and Impacts

This requires a project developer to conduct a comprehensive Environmental and Social Impact Assessment (ESIA) to evaluate potential risks and impacts related to the construction process and the operation of the particular office building. This includes assessing ambient air quality, waste management and noise pollution. Also having a Risk Management Plan that address mitigation measures for identified risks, such as noise control, air quality monitoring, and waste disposal protocols. This has been assessed and outlined in the ESIA process; DUWASA

will adhere and ensure is effectively implemented.

OS 2: Labour and Working Condition

This Operation Standards emphasize on ensuring that all workers involved in the construction and subsequent operations of the office building are treated in line with the ILO (International Labour Organization) core conventions, including fair wages, working hours and health and safety. Further it insists on the provision of appropriate personal protective equipment (PPE) for all construction workers implement safety protocols, and ensure fair employment practices. DUWASA commit and ensure non-discriminatory practice and workers' rights are protected and prohibit child or forced labour in any stage of the project.

OS 3: Resource Efficiency and Pollution Prevention and Management

This promotes the design to allow and incorporate energy-efficient technologies in the building's design, such as LED lighting, energy-efficient HVAC systems, and insulation to reduce operational energy consumption. The DUWASA building design already accommodated OS3: Also, the design includes systems that minimize water use and rainwater harvesting systems. Measures to reduce pollution during construction, such as dust control systems, waste management protocols, and proper disposal of construction waste was taken into consideration.

OS 4: Community Health, Safety, and Security

This OS requires a developer to have a comprehensive health and safety plan for both construction workers and the surrounding community, ensuring safety during the construction phase. Establishing an emergency response plan to deal with potential incidents during construction (e.g., fires, accidents) and ensure that workers are trained in emergency protocols. It further necessitates to engage the local community and inform them about construction impacts such as traffic disruptions, noise, and dust. DUWASA shall observe the provision of this OS.

OS 5: Land Acquisition, Restrictions on Access to Land and Land Use, and Involuntary Resettlement

This OS demand that land ownership and usage rights should be clear and that any acquisition or use of land complies with national laws and the AfDB's policies.

If land acquisition or resettlement is required, ensure that affected persons or communities are compensated fairly and are provided with adequate support in line with AfDB's Resettlement Policy Framework (RPF); Establish processes for affected people to provide feedback or raise concerns regarding land acquisition or use.

OS 6: Habitat and Biodiversity Conservation, and Sustainable Management of Living Natural Resources

This emphasizes on biodiversity Impact Assessment hence conducting an assessment to identify potential impacts on local biodiversity and ecosystems and take appropriate measures to avoid or mitigate harm. Also incorporating landscaping that promotes local biodiversity and sustainability. DUWASA shall observe and adhere to this OS.

OS 7: Vulnerable Group

This operational Standards insist to ensure that vulnerable groups (e.g., low-income populations, women, persons with disabilities) are considered in the design and construction of the building. This could include accessible entrances, ramps, and consideration of the socio-economic impacts on the surrounding community. DUWASA should comply to this OS.

OS 10: Stakeholder Engagement and Information Disclosure

This requires the developer to identify and engage all relevant stakeholders (e.g., government authorities, local communities, workers) and engage them early in the project through public consultations, surveys, and meetings. Regularly disclose project information to stakeholders, including environmental and social risks, benefits, and mitigation strategies, through public meeting. Establish a clear channel for stakeholders to voice concerns, ask questions, and provide feedback about the project. These mechanisms should be accessible and transparent, ensuring that grievances are addressed in a timely manner.

By integrating these AfDB Operations Standards into the planning and execution of the 8-storey DUWASA office building project, the project will not only comply with regulatory and institutional requirements but also ensure long-term sustainability, community welfare, and environmental stewardship.

3.2 Legal Framework

3.2.1 Environmental Management Act No. 20 of (2004), Cap. 191 and (Amendment) Regulations, 2024,

The Environmental Management Act (EMA) is a piece of legislation that forms an umbrella law on environmental management in Tanzania. Its enactment repealed the National Environment Management Council Act. 19 of (1983) while providing for the continued existence of the National Environment Management Council (NEMC).

Among the major purposes of the EMA are to provide the legal and institutional framework for sustainable management of the environment in Tanzania; to outline principles for management, impact and risk assessment, the prevention and control of pollution, waste management, environmental quality standards, public participation, compliance and enforcement; to provide the basis for implementation of international instruments on the environment; to provide for implementation of the National Environmental Policy; to provide for establishment

of the National Environmental Fund and to provide for other related matters.

Part III, Section 15(a) states that in matters pertaining to the environment, the Director of Environment shall coordinate various environment management activities being undertaken by other agencies to promote the integration of environment considerations into development policies, plans, programmes, strategies projects and undertake strategic environmental assessments with a view to ensuring the proper management and rational utilization of environmental resources on a sustainable basis for the improvement of the quality of human life in Tanzania.

Part VI of the EMA deals with Environmental Impact Assessments (EIA) and other Assessments and directs that an EIA is mandatory for all development projects. Section 81(2) states that "An Environmental Impact Assessment study shall be carried out prior to the commencement or financing of a project or undertaking", while Section 81(3) states "a permit or license for the carrying out of any project or undertaking in accordance with any written law shall not entitle the proponent or proponent to undertake or to cause to be undertaken a project or activity without an Environmental Impact Assessment certificate issued under this Act". Relevance: DUWASA has complied with relevant provisions of the Act by carrying out this EIA study.

3.2.2 The Water Supply and Sanitation Act No. 5 of 2019

This is another legislation that provides for sustainable management and adequate operation and transparent regulation of water supply and sanitation services; provides for establishment of water supply and sanitation authorities as well as community owned water supply organizations; and provides for appointment for service providers. The main aim of this law is to ensure the right of every Tanzanian to have access to efficient, effective and sustainable water supply and sanitation services for all purposes by taking into account among others protection and conservation of water resources and development and promotion of public health and sanitation; and protection of the interest of customers. Under this law, the Minister responsible for water affairs shall establish water Authority and cluster water authorities in order to achieve commercial viabilities. DUWASA shall observe the provision of this act.

3.2.3 The Land Act No. 4 of 1999

These laws declare all land in Tanzania to be "Public land" to be held by the state for public purposes. The Acts empower the President of the United Republic of Tanzania, to revoke the "Right of Occupancy" of any landholder for the "public/national interest" should the need arise. The laws also declare the value attached to land.

The law as amended in 2004 recognizes the role of land in economic and urban development. The law provides for technical procedures for preparing land use plans, detailed schemes and urban development conditions in conformity with land use plan and schemes. The LGA has the power to impose conditions on the development of any area according to the land-use planning approved by the Minister. This project conforms to this law because it has followed all development conditions provided. DUWASA shall observe the provision of this act.

3.2.4 The Urban Planning Act (2007)

The law provides for the orderly and sustainable development of land in urban areas, to preserve and improve amenities; to provide for the grant of consent to develop land and powers of control over the use of land and to provide for other related matters. Under Section 3, among others the law seeks to improve level of the provision of infrastructure and social services for sustainable human settlement development. Therefore, the proposed building development is in line with the objectives of this law.

Section 58 of the Urban Planning Act provides for protection of buildings or group of buildings of special architectural or historic interest. The law states "The planning authority may compile a list of areas, buildings or group of buildings of special architectural or historic interest and may amend any list so compiled, such areas may include; buildings, group of buildings, areas of unique biodiversity; and rare species of trees and special trees". Section 59 gives powers to the planning authority to grant permission for demolition of such buildings or otherwise powers to restrain any proposed demolition. This project is in line with this law as DUWASA office building shall be constructed at the area where no relocation of people is needed. DUWASA shall observe the provision of this act.

3.2.5 Occupation Health and Safety Act, (2003)

The law requires employers to provide a good working environment to workers in order to safeguard their health. The employers need to perform medical examinations to determine fitness before engaging employees. Employers must also ensure that the equipment used by employees is safe and shall also provide proper working gear as appropriate. Workers and occupants' safety will be given priority during both construction and operation phases of the project. It shall be the duty of the contractorin this case to ensure safety and health of workers during construction phase. All provisions of this Act relevant to the project activities shall be adhered to.

3.2.6 Employment and Labour Relations Act No. 6 0f 2004

The Act makes provisions for core labour rights; establishes basic employment standards, provides a framework for collective bargaining; and provides for the prevention and settlement of disputes. DUWASA will make sure that the Contractor adheres to employment standards as stated in the law and the contractor shall provide job opportunities to both skilled and no-skilled labours to the nearby communities. DUWASA shall observe the provision of this act.

3.2.7 Engineers Registration Act and its Amendments 1997 and 2007

The Acts regulate the engineering practice in Tanzania by registering engineers and monitoring their conduct. It establishes the Engineering Registration Board (ERB). Laws require any foreigner engineer to register with ERB before practicing in the country. DUWASA and foreign engineers working with this project shall abide by the law requirement.

3.2.8 The Contractors Registration (Amendment) Act, 2008

The Contractors Registration Act requires contractors to be registered by the Contractors Registration Board (CRB) before engaging in practice. It requires foreign contractors to be registered by the Board before gaining contracts in Tanzania. DUWASA has complied with the law requirement during the recruitment of contractor for project implementation.

3.2.9 The Architects and Quantity Surveyors Act (1997)

Similarly require architects and quantity surveyors (QS) to be registered with the Board before practicing. Foreign architects and QS should abide by the law. DUWASA has considered the requirements of this Act.

3.2.10 The HIV and AIDS (Prevention and Control) Act of 2008

The law provides for public education and programmes on HIV and AIDS. Section 8(1) of the law states that "The Ministry (Health), health practitioners, workers in the public and private sectors and NGOs shall for the purpose of providing HIV and AIDS education to the public, disseminate information regarding HIV and AIDS to the public". Furthermore, Section 9 states that "Every employer in consultation with the Ministry (Health) shall establish and coordinate a workplace programme on HIV and AIDS for employees under his control and such programmes shall include provision of gender responsive HIV and AIDS education" This project shall abide by HIV/AIDS Act in the fight against the disease. DUWASA shall observe the provision of this act.

3.2.11 The Local Government Law (Miscellaneous Amendment) Act, 2006

This act established the local governments and urban authorities with mandates to spearhead developments in Districts and urban centres (for Cities and Municipalities) respectively. By this law, the Authorities have mandates to formulate by laws to enhance environmental management within their district/urban authorities. DUWASA shall observe the provision of this act.

3.2.12 Public Health Act, 2009

An Act provide for the promotion, preservation and maintenance of public health with the view to ensuring the provision of comprehensive, functional and sustainable public health services to the general public and to provide for other related matters. Section 66 of the Act state that: (1) A building or premises shall not be erected without first submitting the plans, sections and specifications of the building site for scrutiny on compliance with public health requirements and approval from the Authority. (2) A building or premises or its part or any structure shall not be occupied until a certificate of occupancy has been granted. (3) The provisions of subsections (1) and (2) shall not apply to the dwelling houses in the rural areas or houses erected in urban which have been recognized as such under the squatter upgrading programme. DUWASA shall observe the provision of this act.

3.2.14 Workers Compensation Act, No.5 of 2003

Generally, the Act provides for the employment accident and occupational disease benefit. The employment injury schemes provide medical care and cash benefits to workers, who are injured on the job or develop occupational diseases. Eligibility is provided on a no-fault basis and may be coupled with restriction on workers legal right to sue for damages. In operating its activities, DUWASA shall observe the provisions of this Act.

3.2.15 Employment and Labour Relations Act, No 6 of 2000

The Act makes provisions for core labor rights; establishes basic employment standards, provides a framework for collective bargaining; and provides for the prevention and settlement of disputes and provides. DUWASA shall see to it that the Contractor adheres to employment standards as provided for by the law.

3.2.16 The Water Supply and Sanitation Act, No.5 of 2019

This is also a new legislation that provides for sustainable management and adequate operation and transparent regulation of water supply and sanitation services; provides for establishment of water supply and sanitation authorities as well as community owned water supply organizations; and provides for appointment for service providers. The main aim of this law is to ensure the right of every Tanzanian to have access to efficient, effective and sustainable water supply and sanitation services for all purposes by taking into account among others protection and conservation of water resources and development and promotion of public health and sanitation; and protection of the interest of customers. DUWASA will observe the provision of this act.

3.2.17 The National Social Security Fund Act, (Cap.222. R.E.2002)

The National Social Security Fund act sets guidance on protection of Tanzanian citizens against risks of loss of employment and income. ILO defines social security as “the protection measures which society provides for its members, through a series of public measures against economic and social distress that would otherwise be caused by the stoppages or substantial reduction of earnings resulting from sickness, maternity, employment injury, unemployment, disability, old age, death, the provision of medical care subsidies for families with children.”

Social Security Services are provided in three different schemes, namely, social assistance schemes; mandatory scheme and voluntary or supplementary schemes. DUWASA will have to ensure that employees have social security coverage, which is mandatory for the case of employers.

This act defines roles of Employers, which includes registration of employees; timely and accurate remittance of contributions; awareness creation and

sensitization; and Adherence to safety and occupational health rules. DUWASA will have to observe these guidelines and associated legal requirements.

3.2.18 The Tanzania Investment Act, (Cap.38 R.E.2002)

The act provides for legal mandates of Tanzania Investment Centre, which shall assist all investors to obtain necessary permits, authorizations, approvals, registrations, consents, licenses and any other matter required by law for a person to set up and operate investment in Tanzania. DUWASA shall comply with the relevant provision of the act by applying for registration at TIC and acquire all necessary certificates.

3.2.19 Relevant Regulations and Guidelines

3.2.19.1 The Environmental Impact Assessment and Audit Regulations (Amendment), 2018) and Environmental Impact Assessment and Audit (Amendment) Regulations, 2024,

The regulations cemented the requirements of undertaking EIA study for new project and Audits for ongoing projects, likewise annual monitoring to ensure efficacy of the performance. Further it provides procedure to be followed while undertaking Environmental studies. Under Environmental Impact Assessment and Audit Regulations (Amendments), 2018 the first schedule lists typical examples of type A and B projects. The proposed project falls under the category of the project that requires mandatory Environmental Impact Assessment. This ESIA study has been conducted following the above stated Regulations.

3.2.19.2 Environmental Management (Air Quality Standards) Regulations, 2007

The Regulations require for the contractor during construction stage of the project to ensure emissions of harmful gases is within allowable TBS standards. A person undertaking any activity shall be required to comply with the highest permissible emission limits from the atmosphere to a receptor and respective test methods for Sulphur oxides, carbon monoxide, black smoke and suspended particulate matters, nitrogen dioxide, nitrogen dioxide, ozone as prescribed in the First Schedule to these Regulations. DUWASA shall observe the provision of this regulation.

3.2.19.3 Environmental Management (Noise and Vibration Control) Regulations, 2015

Regulation 7 (1) Except as otherwise provided in these Regulations, no person shall make or cause to be made any loud, unreasonable, unnecessary or unusual noise that annoys, disturbs, injures or endangers the comfort, repose, health or safety of others and that of the environment.

Regulation 8(1) except as otherwise provided in these Regulations, no person shall-

a) make or cause to be made excessive vibrations which annoy, disturb, injure or endanger the comfort, repose, health or safety of others

and the environment; or

b) Cause to be made excessive vibrations which exceed 0.5 centimeters per second beyond any source property boundary or 30 meters from any moving source.

This Act enforces the control of Noise and vibration level along the proposed projects and existing project. DUWASA shall observe the provision of this regulation.

3.2.19.4 Environmental Management (Water Quality Standard) Regulation, 2007

The objectives of these Regulations is to-protect human health and conservation of the environment; enforce minimum water quality standards prescribed by the NationalEnvironmental Standards Committee; enable the National Environmental Standards Committee to determine water usages for purposes of establishing environmental quality standards and values for each usage; and ensure all discharges of pollutants take into account the ability of the receiving waters to accommodate contaminants without detriment to the uses specified for the waters concerned.

Relevance to the project: In part III sections (v) and (vi) emphasize; Protection of water sources and ground water prohibition to discharge hazardous substances, chemicals and materials or oil. The water sources for the project will be rain harvesting whereby treatment will be employed to ensure safe for human consumption. Also, in order to ensure the compliance with this regulation office, activities should be restricted on interferences with soils and vegetation that protects water sources.

3.2.19.5 Environmental Management (Soil Quality Standards) Regulations, 2007

These regulations set limits for soil contaminants in agriculture and habitat, enforce minimum soil quality standards, prescribe measures designated to maintain, restore and enhance the sustainable productivity of the soil and prescribe minimum soil quality standards for sustaining ecological integrity and productivity of the soil. According to the regulations, among others, the National Environmental Standards Committee has the powers to set pollutant limits and specify procedures for determination of the quality of soil for protection of the soil from degradation as a result of anthropogenic activities such as agricultural and mining activities and waste disposal. Owners and operators of a main polluting activity are required to voluntarily register with NEMC and obtain a soil pollutants discharge permit. Obligations of polluters are also given. According to the regulations, the NEMC plays a crucial role in soil quality compliance and enforcement.

Relevance to the Project: Activities of the office building shall be conducted in such a manner that contamination of soil by waste disposal is minimized. Where necessary, these regulations will be used for ensuring that the ecological integrity of soil is protected at the project area.

3.2.19.6The Environmental Management (Registration and Practice of Environmental Experts) Regulations, 2021

This regulation requires the registration of environmental experts who are responsible for ensuring that construction projects comply with environmental standards. For an office building project, an environmental expert must be involved to conduct Environmental Impact Assessments (EIA), audits, and ensure that all environmental considerations are taken into account.

Compliance: Ensure that a registered environmental expert, certified by the National Environmental Management Council (NEMC), is involved in the project from the planning stage. The expert will be responsible for ensuring adherence to environmental standards and preparing the necessary reports for approval which was done by DUWASA.

3.2.19.7The Environmental Management (Hazardous Waste Control and Management) Regulations, 2021

During the construction of an office building, there will be the generation of hazardous wastes such as paints, solvents, asbestos (if present), oils, and chemicals. This regulation sets out the procedure for handling, storing, and disposing of such waste to avoid environmental contamination.

Compliance: Hazardous waste generated during construction must be properly stored, segregated, labeled, and disposed of according to the guidelines provided in the regulation. Contractors should engage waste management companies licensed to handle hazardous waste and keep detailed records of waste management practices. DUWASA shall observe the provision of this regulation.

3.2.19.8 The Environmental Management (Control and Management of Electrical and Electronic Equipment Waste) Regulations, 2021

As part of the office building construction, electrical equipment like air conditioning units, lighting, and other appliances may be installed. The disposal of old or obsolete electrical and electronic equipment should be done according to this regulation to prevent environmental harm due to improper disposal.

Compliance: Ensure that any electronic or electrical waste (e-waste) generated during the construction phase is properly collected, dismantled, and disposed of through a registered e-waste disposal service. Proper documentation should be kept to verify compliance with the regulations. DUWASA shall ensure compliance to this act.

3.2.19.9 The Environment Management (Prohibition of Plastic Carrier Bags) Regulations, 2019

During the construction of an office building, plastic carrier bags may be used for packaging or transportation of materials. This regulation prohibits the use of plastic carrier bags and encourages the use of more environmentally friendly alternatives.

Compliance: DUWASA should ensure that no plastic carrier bags are used during construction. Contractors should use biodegradable packaging or reusable containers for transporting materials. Workers should be educated on alternatives to plastic bags, and materials that arrive in plastic should be removed and properly disposed of.

3.2.19.10 Environmental Management (Quality Standards for Control of Noise and Vibration Pollution) Regulations (2011)

Construction activities often generate significant noise and vibrations from equipment, demolition, and machinery operations. This regulation aims to control noise and vibration levels to protect workers, nearby communities, and the environment.

Compliance: DUWASA and contractors must ensure that noise and vibration levels are kept within the limits established by the regulations. This can be achieved by using quieter machinery, setting time limits on construction work, especially in residential or noise-sensitive areas, and using noise barriers or silencers where necessary.

3.2.19.12 The Fire and Rescue Force (Fire Precautions in Buildings) Regulations, 2015

These Regulations shall apply to all areas where the Act applies.
General provision on means of escape in the building has been provided in PART II of this Regulations. Regulation 3.-(1) The provisions of this Part shall apply in determining the design, construction, protection, location, arrangement and maintenance of exit facilities to provide safe means of escape for occupants from all building's hereafter erected, altered or changed in occupancy. DUWASA shall observe theprovision of this regulation.

3.2.19.13 Urban Space Standards Regulations. 2011

Urban planning and space Standards" include standards for residential areas, building lines and setbacks, plot coverage and plot ratio health and education facilities, golf courses, passive and active recreation, public facilities by planning levels, public facilities by population size, parking and agricultural show ground, standard for electrical supply and its way leave, way leave for water supply, road width, communication pylons, sewerage treatment plants, ponds**,** transportation terminals, stream/rivers valleys buffer zone, beaches and industrial plots and recommended colors for Land uses. Adequate and functional space shall be allocated in accordance with Urban Planning and Space standards prescribed in the schedule to these Regulations. ***Relevance to the Project:*** DUWASA has legally complied to this regulation by observing all space standards required for construction of high building.

3.2.19.14 Liquid Waste Management Guidelines, 2013

The Constitution of the United Republic of Tanzania (1977) makes it mandatory to protect human health of each citizen in Tanzania. Article 14 states that "every person has the right to live and to the protection of his life by the society in

accordance with the law," which may be interpreted to mean that Tanzanians are entitled to a healthy environment. The Environmental Management Act No 20 of 2004 was enacted to ensure this important requirement of the Constitution is realized. It includes principles of public participation in the development of policies, plans and processes for the management of the environment, the principle of inter-generational and intra- generational equity, the polluter-pays principle and the precautionary principle. It is in this context that efficient and sustainable waste management systems are required asthe country develops into a newly industrialized state by 2025.This strategy is being developed in order to have fully functional and compliant waste management systems in our urban centres with a major goal of protecting human health through enhancing a clean and healthy environment for all. ***Relevance to the Project:*** DUWASA has legally complied to this regulation by placing adequate waste water management systems septic tank and soak away pit, similarly the project is will connect to public sewer line.

3.2.19.15Environmental Management (Solid Waste Management) Regulations, 2009

This regulation provides for principles for management and control of solid waste including administration and institutional arrangement, licenses and permits1. As provided, those for the purpose of ensuring minimizing of solid waste in their respect areas of the jurisdiction.

The 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: all kinds of solid waste are separated at the source. DUWASA shall observe the provision of this regulation.

3.3 Institutional Framework for the Management of Environment

3.3.1 Overall Management Responsibility

The institutional arrangement for environmental management in Tanzania is well speltout in the EMA (2004). There are seven (7) institutions mentioned by the Act, of which the Minister Responsible for the Environment is the overall in-charge for administration of all matters relating to the environment. Part III, Section 13(1) of EMA (2004) states that the Minister responsible for environment shall be in overall in-charge of all matters relating to the environment and shall in that respect be responsible for articulation of policy guidelines necessary for the promotion, protection and sustainable management of environment in Tanzania.

The legal institutions for environmental management in the country include;

i. National Environmental Advisory Committee;
ii. Minister responsible for Environment;
iii. Director of Environment;
iv. National Environment Management Council (NEMC);
v. Sector Ministries;
vi. Local Government Authorities (City, Municipal, District, Township, Ward,Village, sub-village "Mtaa and Kitongoji")

3.3.2 National Environmental Advisory Committee

The National Advisory Environmental Committee is comprised of members with experience in various fields of environmental management in the public and private sector and in civil society. The committee advises the Minister on any matter related to environmental management. Other functions include:

- Examine any matter that may be referred to it by the Minister or any sector Ministry relating to the protection and management of the environment;
- Review and advise the Minister on any environmental plans, environmental impact assessment of major projects and activities for which an environmentalimpact review is necessary;
- Review the achievement by the NEMC of objectives, goals and targets set by the Council and advise the Minister accordingly;
- Review and advise the Minister on any environmental standards, guidelines and regulations;
- Receive and deliberate on the reports from Sector Ministries regarding the protection and management of the environment;
- Perform other environmental advisory services to the Minister as may be necessary.
- The National Environmental Advisory Committee shall advice the minister pertaining to the issuance of the Environmental Certificate upon the review of this EIA for this project.

3.3.3. Minister Responsible for Environment

The Minister is responsible for matters relating to environment, including giving policy guidelines necessary for the promotion, protection and sustainable management of the environment in Tanzania. The Minister approves an EIA and may also delegate the power of approval for an EIA to the DoE, Local Government Authorities or Sector Ministries. The Minister also:

- Prescribes (in the regulations) the qualifications of persons who may conduct anEIA;
- Reviews NEMC reports on the approval of an EIA;
- Issues an EIA certificate for projects subject to an EIA;
- Suspends an EIA certificate in case of non-compliance.

Regarding this project the minister shall review NEMC reports on the approval of thisEIA before issuing the certificate.

3.3.4 Director of Environment

The Director of Environment heads the Office of the Director of Environment and is appointed by the President of the United Republic of Tanzania. The functions of

the Director of Environment include:

i. Coordination of various environmental management activities undertaken by other agencies;

ii. Promotion of the integration of environmental considerations into developmentpolicies, plans, programmes, strategies, projects;

iii. Undertaking strategic environmental risk assessments with a view to ensuring the proper management and rational utilization of environmental resources on a sustainable basis for the improvement of quality of human life in Tanzania;

iv. Advise the Government on legislative and other measures for the management of the environment or the implementation of the relevant international environmental agreements in the field of environment;

v. Monitoring and assessing activities undertaken by relevant Sector Ministries and agencies;

vi. Preparation and issuing of reports on the state of the environment in Tanzaniathrough relevant agencies;

vii. Coordination of issues relating to articulation and implementation of environmental management aspects of other sector policies and the National Environment Policy

3.3.5 National Environment Management Council (NEMC)

The NEMC's purpose and objective is to undertake enforcement, compliance, review and monitoring of EIA's and to facilitate public participation in environmental decision-making. According to the Environmental Management Act (2004) the NEMC has the following responsibility pertaining to EIA in Tanzania:

i. Registers experts and firms authorized to conduct EIA;
ii. Registers projects subject to EIA;
iii. Determines the scope of the EIA;
iv. Set-ups cross-sectoral TAC to advise on EIA reviews;
v. Requests additional information to complete the EIA review;
vi. Assesses and comments on EIA, in collaboration with other stakeholders,
vii. Convenes public hearings to obtain comments on the proposed project;
viii. Recommends to the Minister to approve, reject, or approve with conditions specific EIS;
ix. Monitors the effects of activities on the environment;
x. Controls the implementation of the Environmental Management Plan (EMP);
xi. Makes recommendations on whether to revoke EIA Certificates in case of non-compliance;

xii. Promotes public environmental awareness;
xiii. Conducts Environmental Audits

Concerning this project NEMC is responsible to register this EIA, determine the scope of the EIA to be conducted, Set-ups cross-sectoral TAC to advise on EIA reviews, recommends to the Minister to approve, reject, or approve with conditions specific EIS and Controls the implementation of the Environmental Management Plan (EMP) for this project

3.3.6 Sector Ministries

The existing institutional and legal framework the Sector Ministries are required to establish Sector Environmental Sections headed by the Sector Environmental Coordinator.

The Sector Ministries' Environmental Sections;

- Ensure environmental compliance by the Sector Ministry;
- Ensure all environmental matters falling under the sector ministry are implemented and report of their implementation is submitted to the DoE;
- Liaise with the DoE and the NEMC on matters involving the environment and all matters with respect to which cooperation or shared responsibility is desirable or required;
- Ensure that environmental concerns are integrated into the ministry or departmental development planning and project implementation in a way whichprotects the environment;
- Evaluate existing and proposed policies and legislation and recommend measures to ensure that those policies and legislation take adequate account of effect on the environment;
- Prepare and coordinate the implementation of environmental action plans at national and local levels;
- Promote public awareness of environmental issues through educational programmes and dissemination of information;
- Refer to the NEMC any matter related to the environment;
- Undertake analysis of the environmental impact of sectoral legislation, regulation, policies, plans, strategies and programmes through Strategic Environmental Assessment (SEA);
- Ensure that sectoral standards are environmentally sound;
- Oversee the preparation of and implementation of all EIA's required for investments in the sector;
- Ensure compliance with the various regulations, guidelines and procedures issued by the Minister responsible for the environment and;
- Work closely with the ministry responsible for local government to provide environmental advice and technical support to district level staff working in thesector.

3.3.7 Local Government Authorities

Under the Local Government Act of 1982 (Urban and District Authorities), Local Government Authorities include the City Councils, Municipal Councils, District Councils, Town Councils, Township, Ward, Mtaa/ Village and Kitongoji.

The Environmental Management Committee of each jurisdiction:

- Initiates inquiries and investigations regarding any allegation related to the environment and implementation of or violation of provisions of the Environmental Management Act;
- Requests any person to provide information or explanation about any matter related to the environment;
- Resolves conflicts among individual persons, companies, agencies non- governmental organizations, government departments or institutions about their respective functions, duties, mandates, obligations or activities;
- Inspects and examines any premises, street, vehicle, aircraft or any other placeor article which it believes, or has reasonable cause to believe, that pollutant orother articles or substances believed to be pollutant are kept or transported;
- Requires any person to remove such pollutants at their own cost without causing harm to health and;
- Initiates proceedings of civil or criminal nature against any person, company, agency, department or institution that fails or refuses to comply with anydirective issued by any such Committee.

Under the Environmental Management Act (2004), the City, Municipal, District and Town Councils are headed by Environmental Inspectors who are responsible for environmental matters. The functions of the inspectors are to;

Ensure enforcement of the Environmental Management Act in their respective areas;

- Advice the Environmental Management Committee on all environmentalmatters;
- Promote awareness in their areas on the protection of the environment andconservation of natural resources;
- Collect and manage information on the environment and the utilization ofnatural resources;
- Prepare periodic reports on the state of the local environment;
- Monitor the preparation, review and approval of EIA's for local investors;
- Review by-laws on environmental management and on sector specific activitiesrelated to the environment;
- Report to the DoE and the Director General of the NEMC on the implementationof the Environmental Management Act and;
- Perform other functions as may be assigned by the local Government Authorityfrom time to time.

CHAPTER FOUR

4.0 ENVIRONMENTAL AND SOCIAL BASELINE INFORMATION

This chapter describes existing baseline information of the project site. The baseline information were analyzed regarding the physical data, biological data and socio- economic information. The presented information is based on the literature review, site survey information collected from the primary sources including interview with key informants, meeting with Ward Development Committee and assessors' observations.

During the period of collecting data for socio-economic baseline environmental conditions, different methods were used including literature review of relevant documents related with the project.

Other methods included the field survey (visual, inspection and observations), baseline data measurement, expert opinion on key issues and consultations with selected stakeholders of the project.

4.1 Physical Environment

4.1.1 Location and land area

Dodoma City Council is located at the South Eastern end of the Tanzania Central Plateau at an elevation of 1,200 metres above sea level with coordinates 6°10′23″S 35°44′31″E. The City is located at the geographical centre of the country on the vital Central Railway line; and on major cross road of the National East West trunk road and the famous Great North Road (Cape Town to Cairo), which passes in Tanzania through Mbeya, Iringa, Dodoma, Babati and Arusha. It is 486 kilometres west of Dar es Salaam and 441 Kilometres South of Arusha. Dodoma City Council covers an area of about 276,910 hectares, (equivalent to 2,769 sq. km).

4.1.2 Topography and Climate

Climate and Temperature

Dodoma City is a semiarid area, characterized by a marked seasonal rainfall distribution with a long dry season starting from late April to late November and a short wet season starting late November to the end of April. Average rainfall ranges from 550mm to 600mm per annum, although there are extremes like 743.3 mm (2000) and 365.7 mm (2005). The average temperatures vary from 20^0C in July to - 30^0C in November. Generally, the Council experiences both high and low temperature. The highest temperature is 31^0C while the lowest temperature is 13^0C.

Topography

Dodoma City stands on abroad upland plateau with an altitude ranging from 1050

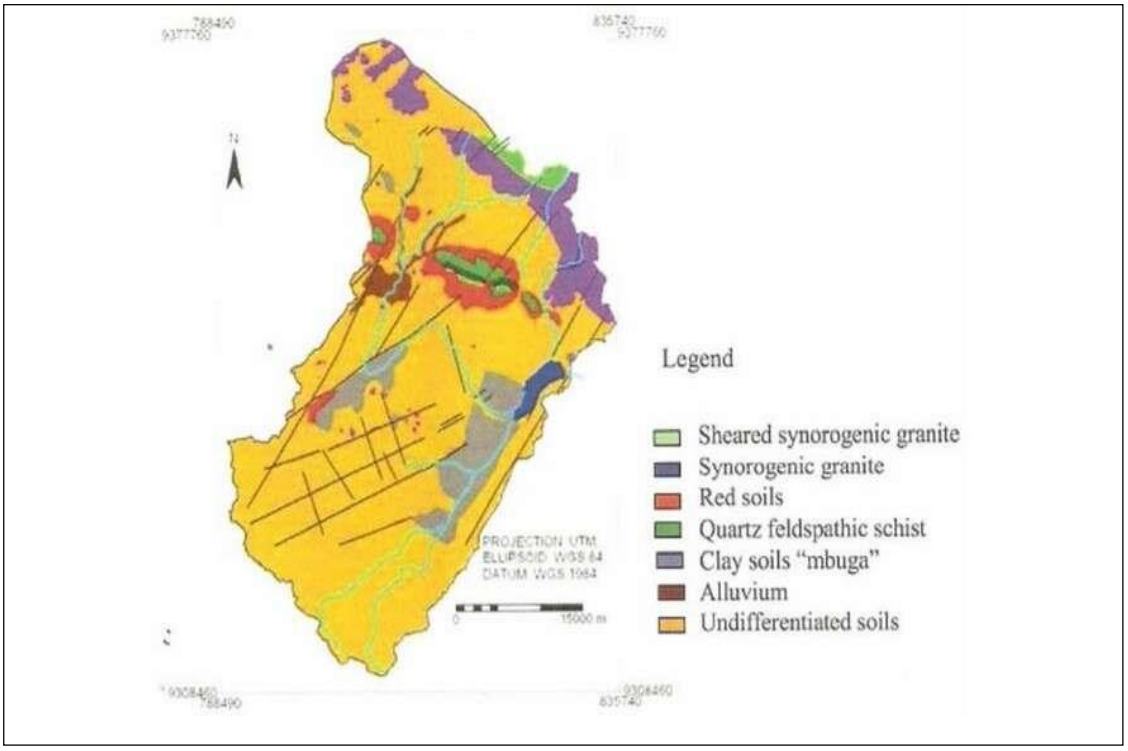
to 1468m above sea level. Topography of Dodoma City is generally flat or rolling terrain. At the city centre of Dodoma City, the elevation gradually incline from the south to thenorth. The general topography of the proposed project site is relatively flat with presence of trees.

4.1.3 Geology of the Project Area

The main geological features are the NW trending Chenene Mountains which exceeds about 2000 m in elevation and the gently rolling plains dotted with red soils (laterites), alluvium and “mbuga” clay soils in an elevation of about 1100 metres AMSL. The metasedimentary rocks are predominantly quartzite, ferriginous quartzites, ironstones, micaceous quartzites and quartzo-feldspathic schists. The Region is also characteristic of the different facies of granitic family of rocks. These granite rocks constitute type of rock found within this central part of Tanzania. The granitic rocks form several distinct hill masses. The hills occur in low, grass-covered and, in places,acacia wooded groups.

Granitic rocks found in the area can be subdivided into four petrotectonic groups namely: sheared synorogenic granite, synorogenic granodiorite and synorogenic granite.

The geomorphology of the Dodoma Region is principally a complex non homogeneous condition constituting land relief and soils. The mountainous areas are generally the northerly side where rainfall intensity is relatively higher than in the widespreadpediments (i.e. rock debris or pebbles extending outwards from the foot of slopes) or flatter locations. The reddish-brown soils are normally characteristic within the central part of the Region but are generally found in Dodoma City. Also, most of the rivers found in the Region are ephemeral and normally dries out during the hot spell. It is noteworthy that a relatively flatter Dodoma City is overlain by coarse textured sand or relatively low plastic clayey sand soils which overlie water bearing aquifers of largely fully weathered granodiorite rock. The granodiorite rock varies from highly fragmented to sound rock further beneath.



Source: Geotechnical Investigation Report

4.1.4 Onsite Environmental Baseline Conditions Measurement

4.1.4.1 Air quality

Meteorological conditions and air quality measurements (i.e. ambient particulate matter (PM2.5 and PM10) and ambient pollutant gases) were done at project area and nearby sensitive receptors around the site. Each parameter was measured at one-hour interval for three hours consecutively. Meteorological conditions during the measurement periods were favorable and were noted to be representative of typical conditions for the season. Similarly, all measured parameters representing air quality showed that their concentrations were within acceptable limits according to TBS/WHO. Both Meteorological conditions and Air quality at the project area were recorded by using Environmental Air Quality Tester Ecofive model ECO-12. During measurements, the device was placed at a breathing height of approximately 1.5 meters above the ground for a period of three hours consecutively. This position is assumed to be a relatively the breathing zone of the workers at their respective working stations. Three readings were recorded at each point and mean value used as a representative value of that particular point.

4.1.4.2 Noise levels

Noise is defined as unwanted sound and is considered as an occupational hazard. The high noise level intensity disturbs the ambient environmental quality and affects people at both work places and in residential areas. Noise monitoring was carried out at two locations to identify the impacts due to the existing sources on the surroundings and in the study area. In order to know the baseline noise levels measurements were done at project area and nearby sensitive receptors around the site.

Noise was recorded by measuring sound level using Digital Sound Level Meter model TA8152 that gave readings of instantaneous sound level and also maximum sound level. The device was held approximately 1.5m above the surface and at least 3m away from hard reflecting surfaces. A suitable windshield was used on the microphone for all measurements in order to minimize wind interference; Sampling was undertaken on 3 cycles per location, The Instrument was checked and calibrated prior to use. Each individual measurement was taken over a representative period of time to ensure that all possible variations in noise generation in the area. Care was taken to take enough measurements, over long enough periods and in normal working conditions to evaluate noise levels as near as possible to represent potential exposure levels.

Table 4.1: Results of Baseline Measurements at the project site.

S/N	Pollutant	Measured Value	Limit Level (TBS)
1	Sulphur oxides, SOx	0.01 mg/Nm^3 for 10 minutes	Daily average of hourly values shall not exceed 0.1 mg/kg or 0.5 mg/Nm^3 for 10 minutes
2	Carbon monoxide, CO	10mg/Nm^3 for periods of 15 minutes	1. A maximum permitted exposure of 100mg/Nm^3 for periods not exceeding 15 minutes. 2. Time-weighed exposures at the following levels: ▪ 100 mg/Nm^3 for 15 minutes ▪ 60 mg/Nm^3 for 30 minutes; ▪ 30 mg/Nm^3 for 60 minutes ▪ 10 mg/Nm^3 for 8 hours. or Daily average of hourly values shall not exceed 10mg/kg and average of hourly values in eight consecutive hours shall not exceed 20 mg/kg.
3	Nitrogen dioxide. NOx	30µg/Nm^3 for 8hours	150 µg/Nm^3 for 24-hours average value or 120µg/Nm^3 for 8 hours
4	PM10	18 - 29 µg/m^3	200 µg/m3
5	PM 2.5	16 - 23 µg/m^3	25 µg/m3
5	Noise level	40 -70 dB(A)	*Acceptable noise levels for industrial activities are 85 dB(A) and 65 dB(A) for residential areas*
6	Temperature	20ºC - 28 ºC	*The acceptable area of comfort for most types of works lies between 16°C to 24°C/61°F which is the WHO recommendation for the maximum temperature for working in comfort*
7	Humidity	40% - 70%	*The indoor relative humidity should not exceed the recommended limits between 30% and 60%.*
8	Wind	less than	
Note: Limit levels are as per TZS 845:2005 Air Quality – Specification standard and TZS932:2006 for Acceptable noise levels			

4.2 Agro Economic Zone

The Dodoma Region is characterized by broad upland plains which are part of East African ‘s Central Plateau. The Plains shelve gently down to mbuga swamps and separated by ranges of hills and punctuated by inselbergs, prominent, isolated rock outcrops. In their natural state, the plains are marked by open grassland with little or no tree or bush cover. Due to the erratic nature of the rains and strong radiant heat of the sun, much of the grass is sparse, except in the low-lying areas. Most common, however, are wooded grassland and bush land with thickets. These types of ground cover represent the majority in Dodoma area. In many areas they are typified by groups of enormous baobab trees. The bush tends to be leafless and drab in the dry season, but springs to luxuriant life during the rains when the whole countryside turns a brilliant green. Woodlands form the remainder of the area, with the heaviest concentrations on the hills of the Region.

The Dodoma hills rise about 400 metres above the general level of plains. They are of great charm, with gentle valleys dividing them, such as Ntyuka and Ruaha valleys. Bounding the northerly plain to the North east are the more mountainous Hombolo Hills, rising 900 meters above the plain. From the site of the capital these appear as a massive wall. This encompasses the plain, fascinating in their changing moods and colours.

4.3 Administration

Dodoma City Council is one of the seven Districts of the Dodoma Region of Tanzania. It is bordered to the west by Bahi District, and to the East by Chamwino District. Dodoma City Council is administratively divided into one parliamentary constituency, 4 divisions, 41 wards, 18 villages, 170 mitaa and 89 hamlets.

4.4 Geology and Soils

Generally, Soil in Dodoma City is considered to be of relatively low fertility, deficient in organic matter, moderate to poor permeability with shallow soil depth. The soils are sandy clay, sandy loam and clay which are reddish-brown or dark loam. The site is located on Clayey SAND and SANDSTONE ROCK layer.

4.5 Biological Environment

4.5.1Flora

There project location has few large trees dominated by *trichillia emetica* sp.famous as Mti Maji which means a water loving tree.

4.5.2 Fauna

The physical assessment made during field work noted that there is no wildlife animalsfound in the project location. The main fauna observed consist of reptiles such as lizards.

4.5.3 Rare, endangered and unique species of flora and fauna

There are neither rare nor endangered species identified at the proposed project area.

4.6 Socio-economic Environment

Generally, the City Council have most of the basic social services as described in the socio-economic profile and field visit conducted. The social services include; education, water, health, economic activities, communications and utilities such as energy, water supply and sanitation.

4.6.1 Economic Activities

4.6.1.1 Agriculture

Dodoma City Council depends on agriculture and livestock keeping for their livelihoodnot withstanding of the semi-arid condition of the area. The Dodoma City Council through its Agriculture department is keen in reducing vulnerability to climate change through following up of activities that are aimed at boosting agricultural production both at household and City level. Thus, the vision of the agriculture sector in Dodoma City Council is to have sustainable food security and increased agro-based incomes.

The mission is to promote and facilitate agricultural productivity and sustainable management and utilization of natural resources to ensure food security and increasedincomes at household level.

There are nine technical departments that are responsible for executing various activities aiming at achieving the vision for agriculture. These include:

- Agriculture, Irrigation and Cooperatives
- Livestock and Fisheries
- Water
- Sanitation and Environment
- Natural Resources and
- Community Development and Social Welfare.

Food crops grown in the City include; maize, sorghum, cassava and millet. With goodrains, the City Council produces surplus millet and sorghum which are sold to other regions. Principal cash crops grown in the City Council include: groundnuts, grapes, simsim, sunflower, tomatoes, water lemon and rosella.

4.6.1.2 Livestock keeping

Dodoma City Council through its department of Livestock and fisheries is embarking on various activities aiming at increasing the population of livestock and improving the quality of livestock products. These are done through: vaccination campaigns of different diseases, artificial insemination program, dipping services and empowering programs to stakeholders. By 2016/17 it was estimated that Tambukareli ward has 154 Cattle, 123 Goat, 209 Pigs, 444 Indigenous chicken and 2678 Chicken (Broilers). The community in the city has been able to earn income from this activity because they are selling the animals within the city and outside the city. (Source: Livestock Office, 2016/17).

4.6.1.3 Beekeeping

Dodoma City Council is having potential areas for keeping bees and these are found in deferent wards including Gawaye, Hombolo Makulu, Zuzu, Ng'ong'ona and Mkoyovillages. Currently estimate of beehives as of 2016/17 stands at 7,907 in the City which includes 2,931 modern bee hives and 4,976 are traditional ones. The beekeeping in Dodoma City Council is for self-employment. The products of the bee include wax andhoney and the community has been able to earn income from this.

During field visit and stakeholders' consultation meeting, Mtaa leaders informed the team that most common economic activities conducted in their areas are Civil servants and business such as retail shops, carpentry and food venders.

4.6.1.4 Land Uses

The land in the City is used for subsistence agriculture, grazing and forest reserve. The City has roads which are accessible in whole year round especially in urban. However, in some areas especially in rural accessibility is difficult during rainy season. About (85,945 Hectares) of the total area (2,769,000 hectares) is suitable for agriculture production. The rest of the land is subdivided in grazing land (65,337 hectares), forest reserves (26,731 hectares), and urban areas cover 1,522,950 hectares.

4.6.1.5 Population

According to the 2022 National Housing and Population Census, the population of Dodoma City Council was 765,000 consisting of 375,000(49%) males and 390,000(51%) and the average sex ratio of 96.5. Currently the population of Dodoma City is estimated to be 926,000. According to Sub-National Population Projection Based on 2022 Populationand Housing Census. Tambukareli ward has a population

According to the 2022 Population and Housing Census, Tambukareli Ward in Dodoma City had a population of 12,447 with sex distribution of 5,405 males and

5,351 females. The sex ratio, calculated as the number of males per 100 females, is approximately 101 with an average household size of 4.5. Total number of households is estimated to be 2,766.

4.6.1.6 Water Supply

Water supply for Dodoma City depends on ground water through drilling of boreholes. Dodoma urban areas are mostly served by ground water from Makutupora Basin at Mzakwe water source and other boreholes located at Nzuguni, Ihumwa, Nala, Iyumbu and Ntyuka, Mkonze and Michese. Currently water production is 88,744.65m ^{3} /day which is about 51% of the demand hence there is water ration in the City. DUWASA under the ministry of water is doing efforts to improve water availability situation by exploring other water sources; currently there are projects that are in the pipelines such as construction of Farkwa dam and Lake Victoria projects that aim to remove water availability in Dodoma Region.

4.6.1.7 Health Services

The health sector is made up of the people, institutions and resources, arranged together in accordance with established policies, whose primary purpose is to promote, restore and maintain health. In Dodoma City Council there are 101 health offering facilities, among which 81 are owned by government while the remaining 20 are owned by private entities including religious institutions and individual health specialists.

4.6.1.8 Transport

- **Road transport**

Dodoma region manages a vast road network exceeding 1,707 kilometers. The types of roads include Tarmac Roads which are the primary roads in Dodoma, including major highways and urban roads; Paved roads which includes roads that are surfaced with materials like asphalt or concrete. Unpaved Roads which are typically rural roads that are not surfaced with tarmac or concrete and Earth Roads which are basic roads made of compacted earth, often found in remote or less developed areas. The Dodoma City Outer Ring Road of 112km project is progressing well and is expected to significantly enhance the city's infrastructure.

- **Air transport**

Dodoma has one Airport and four Air Strips. The Airport is located in Dodoma City Council while Air Strips are located at Mpwapwa Town in Mpwawa District, Mvumi Village in Chamwino District, Kondoa Town in Kondoa District and Kongwa Village in Kongwa District. These Air Strips are used for emergency services such as floods and vermin attacking crops such as quelea quelea control. The Mvumi Mision airstrip is also used to serve Flying doctors serving Mvumi Mision District Designated Hospital.

The Government is in the process of constructing the second Airport in Dodoma at Msalato area.

- **Railway**

Dodoma City Council is well connected with most areas through the central line which is a major railway line in Tanzania. It runs west from Dar es Salaam to Mwanza and Kigoma. In the City, there are three railway stations at Zuzu, Kikombo and Dodoma town (Tambukareli). However, operationally services provided by the Railway Corporation have not been impressive due to number of factors including having old facilities and deteorating infrastructures. A new standard gauge railway has been built and is well operating from Dar es Salaam to Dodoma currently and will expand to Mwanza and Kigoma regions. Given the central location of Dodoma, the Standard Gauge Railway will be a major railway station, second to Dar es Salaam.

4.6.1.9 Energy

The energy sector in Dodoma City Council consists of electricity, firewood, charcoal, gas, petroleum products (kerosene, petrol, and diesel) cow dung, solar energy and biogas. By far, firewood is the main source of energy followed by charcoal for domestic use primarily for cooking and heating in the rural areas while electricity is mostly used for lighting and operating electricity appliances. The electricity infrastructure in Dodoma City Council is currently under the Tanzania Electric Supply Company Limited (TANESCO). TANESCO supplies the power through its national grid system.

4.6.1.10 Communication services

Communication services in the City have expanded from just the presence of postal office/agencies, radios, TVs to the provision of cellular, e-mail, facsimile and interment services. This has been a notable improvement in communication services which has accelerated the economic activities in the City.

4.6.1.11 Education

Dodoma is home to several universities, including the University of Dodoma (UDOM), St. John's University of Tanzania College of Business Education (CBE) and Institute of Rural Development Planning (IRDP). Dodoma has a total of 1,060 primary schools and a total of 222 secondary schools. The education system in Dodoma is well-established, with a public and private institutions providing quality education to students at all levels.

4.6.1.12 Sanitation

Most people surrounding project area use flash toilets as their main type of toilet facility. DUWASA as the Authority with the responsibility for sewerage collection and disposal services has a waste water treatment plant at Swaswa area that serve the whole Dodoma City; however, sewerage network coverage is only 20% therefore on-site sanitation is used for most areas in the City. Cesspit emptier trucks owned by DUWASA and other stakeholders are used for onsite sanitation services for areas with no sewerage network. For this project waste water will be drained to the main public sewer since at the project area there is existing sewerage network.

4.6.1.13 Solid Waste Management

There is a formal system for collecting or managing solid waste in Dodoma City; all solid wastes are collected from households to a special dump site at Chidaya area. Solid wastes are collected by special garbage trucks from households to Chidaya damp. At the project the wastes generated will be collected through dust bins and taken away by garbage trucks to dumping site.

4.7 Baseline Condition of the Site and Existing Buildings

The current site comprises an outdated office building that is no longer adequate for its intended purpose. Originally constructed several decades ago, the building has become increasingly insufficient to meet the demands of the growing workforce it serves. The existing office space is fragmented, with poorly designed layouts that do not support modern work practices or accommodate the evolving needs of the business. This results in reduced efficiency and functionality for its users. Currently there are two premises (administration and yard) that are both occupied by about 200 staff ; the one where construction will take place after being demolished is yard premises and has about 55 workers who will be moved to the administration premises during construction activities.

4.7.1 Functional Limitations of Existing Facilities

Office Space and Accommodation: The building struggles to accommodate the full number of workers, with overcrowding in certain areas. The current configuration of office spaces lacks flexibility, limiting the ability to reconfigure workstations as needed. Furthermore, some departments are operating from inadequate spaces, leading to discomfort and inefficiency.

Modern Facilities: The office building lacks essential modern facilities such as adequate air conditioning, advanced communication infrastructure, and ergonomic workspaces. The failure to modernize these features has caused a decline in worker productivity and employee satisfaction.

4.7.2 Infrastructure and Service Provisions

Water Supply: The building's water supply infrastructure is outdated, with frequent issues related to low water pressure, inconsistent supply, and occasional water contamination. This has resulted in raised health concerns among employees.

Sanitation: Sanitation facilities in the building are insufficient, with toilets often unable to handle the growing number of employees; there are only five (5) toilets for 347 employees of both gender with limited spaces. The plumbing system is prone to blockages and leaks, further contributing to the poor hygiene standards. Regular maintenance of these facilities is also increasingly costly and ineffective due to their deteriorating condition.

Electricity: The existing electrical system is underpowered and often experiences disruptions, particularly during peak hours. The wiring and power systems are outdated, presenting both safety concerns and operational challenges. These issues hinder the implementation of new technologies and pose potential risks to

employees and equipment.

Waste Management: The current waste management system is inadequate to handle the volume of waste generated by the building's occupants. The existing trash collection and disposal infrastructure is infrequent and inefficient, leading to unsightly conditions and potential health hazards. Additionally, there is no provision for recycling, which significantly limits the building's sustainability efforts.

4.7.3 Health and Safety Concerns

The existing office building poses several health and safety risks. These includes;

- Poor ventilation and air quality, which can lead to discomfort and long-term health problems for employees;
- Outdated fire safety systems that do not meet modern safety standards.
- Lack of proper emergency evacuation routes and signage.

These concerns not only affect the well-being of employees but also reduce the building's compliance with current health and safety regulations.

4.8 Justification for the Proposed Project

The current office building is no longer able to meet the needs of the growing workforce, and its facilities are outdated and inefficient. The building's inability to support modern office functions, combined with its deteriorating infrastructure, creates an urgent need for improvement. The proposed construction of a new office building will address these deficiencies by providing;

- **Adequate Office Space**: A larger, more flexible office layout to accommodate the growing number of employees and ensure a comfortable working environment.
- **Modern Facilities**: Advanced infrastructure including high-speed internet, air conditioning, ergonomic office furniture, and a flexible layout that fosters collaboration and productivity.
- **Upgraded Infrastructure**: Reliable, modern water supply, sanitation, and electrical systems that ensure uninterrupted services for employees and meet current standards.
- **Enhanced Sustainability**: A waste management system that includes provision for hazardous wastes recycling, and energy-efficient systems that reduce the building's environmental impact.

CHAPTER FIVE

5.0 STAKEHOLDERS CONSULTATION

5.1 Introduction

As per EIA and Audit regulations of 2005 and its amendment of 2018 the stakeholder's consultation is a very important component of the EIA processes. It is one of the key factors that enhance environmental governance. By definition stakeholders are individuals, groups of individual or institution that have interest in the project (World Bank, 2013). This includes those who are positively and negatively affected by the project. Stakeholders' participation involves processes whereby all those with an interest in the outcome of the project are actively participating in decisions on planning and implementation of the proposed development. The guideline on public participation further notes the following public participation process:

i. Provides an opportunity for Interested and Affected Parties (I & APs) to obtain clear, accurate and comprehensive information about the proposed activity, its alternatives or the decision and the environmental impacts thereof;
ii. Provides I & APs with an opportunity to indicate their viewpoints, issues and concerns regarding the activity, alternatives and /or the decision;
iii. Provides I & APs with the opportunity of suggesting ways of avoiding, reducing or mitigating negative impacts of an activity and for enhancing positive impacts;
iv. Enables the applicant to incorporate the needs, preferences and values of affected parties into the activity;
v. Provides opportunities to avoid and resolve disputes and reconcile conflicting interests; and
vi. Enhances transparency and accountability in decision making.

Inputs from public consultation provides the authorities, Interested and Affected Parties (I & APs) and proponent (DUWASA) an opportunity to ensure that decisions made in the course of the project give consideration to concerns and comments raised as part of the consultation. This set a ground for sustainable working relationship between proponent (DUWASA) and I & APs. It also provides an overview of the effectiveness and interagency cooperation that DUWASA can build upon or rely on for mitigation of project impacts.

This ESIA study involved a participatory approach. It entailed seeking information/experience from stakeholders such as City experts, Ward and Mtaa leaderships and Local representatives who have been involved or will be involved in one way or another in the implementation of the project.

5.2 Objectives

The objectives of stakeholder's consultation include the following:

i. Providing clear and accurate information about the project (e.g.

implementation schedule and expected impacts on the biophysical and socio-economic environments) to communities living in the project area, especially the project affected persons along the proposed site corridor in order to obtain feedback/valuable suggestions fiercely from impacted communities;

ii. Promoting understanding/awareness through the active engagement of individuals, groups, stakeholders, organizations who have a stake in the projectand its outcomes and

iii. Identification of local leaders whose further dialogue can be continued in the subsequent stages of project implementation.

5.3 Identification of Stakeholders

A stakeholder is any entity with a declared or conceivable interest or a stake in a policy concern. The range of stakeholders relevant to consider for analysis varies according to the complexity of the reform area targeted and the type of reform proposed and, where the stakeholders are not organized well. Stakeholder can be of any form, size and capacity. They can be individuals, organizations or unorganized groups.

The following stakeholders were identified during scoping study and their views are incorporated in the ESIA report

i. City Council of Dodoma Officials i.e. City Engineer, Environmental Officer, land surveyors, Town planner, Economist, Community Development officer etc.

i. Fire and Rescue Force office;
ii. Tambukareli Ward Office;
iii. Salimini Avenue office;
iv. Tanzania Building Agency;
v. GST Dodoma office;
vi. TMA -Dodoma office

5.4 Involvement of Stakeholders

Stakeholder's consultation exercise is meant to identify information that will be required for the baseline situation and for the environmental impact statement. Data/information gaps will be identified and strategies for collecting the information before or during the environmental impact assessment study will be in place.

The stakeholder's consultation processes applied different participatory methods in order to involve all stakeholders. One-to-one interviews with individual based upon a list of general topics or questions and partly based on an open discussion shall be done.

Consultation with Interested & Affected Parties (I & APs) have been conducted and will continue throughout the project phases to ensure regular communication

between the project proponent and I&APs. This will allow provision of updates, changes, alteration, and new concerns where necessary from both the project proponent and I & APs such that both parties have a common perception as to what the project entails.

5.5 Baseline Data and Information

Stakeholder's consultation exercise is meant to identify information that will be required for the baseline situation and for the environmental impact statement. Data/information gaps will be identified and strategies for collecting the information before or during the environmental impact assessment study will be in place.

5.6 Stakeholders' Views and Concerns

The stakeholders took interest on the consultation process keen to see that the project does not cause any irreversible adverse impact on the environment and that the Proponent must address all raised concerns on various components of the project. The role of the consultant is to moderate the meeting and assist the team in taking notes. The question-and-answer sessions will be used until all questions are exhausted and some form of consensus reached. The summary of the views from the consulted stakeholders is in Table 5.

5.6.1 Official Meeting with Local Leaders

The official meeting was held by 5 local leaders of Tambukareli Ward on 28th February, 2025 at Salmin Mtaa Office. The meeting was aimed to collect specific data across the site, identifying sensitive sites/areas such as cultural heritage that were across the site or its neighborhood (figure 2.1). This meeting also aimed at sensitising the Local leaders on how they can fully utilise the coming opportunities during the implementation of the project and cautioned them on the impacts that might occur during the project implementation.

Figure 5.1: Consultation Meeting with Local leaders at Salmini Mtaa at Tambukareli Ward

Source: Consultant Field work, February, 2025

5.6.2 Official Meeting with Dodoma City Council Experts

Meetings were held in respective City Council and the Region at large. The aim of the meeting was to discuss the project with the City Council Experts and to obtain relevant information from the respective City. Their main concern was on right information about the proposed site and Stakeholders involvement in all stages of the project

5.6.3 Consultation with other relevant stakeholders

The team conducted various stakeholder's consultations to different Government Agencies. These included, OSHA, TARURA, Fire and Rescue Force, City Council of Dodoma etc.

5.6.4 Summary of Identified Issues of Concern

Stakeholders consulted for this specific development project had various views and concerns. In brief most of the views gathered from the stakeholders are positive aboutthe proposed project and expected that the project will have positive impacts to the economy of the nation and shall improve livelihoods of local communities surrounding the project. Table 5.1 summarizes concerns and views of the consultedstakeholders.

Table 5.1: The summary of the views from consulted stakeholders

S/N	STAKEHOLDERS CONSULTED	ISSUES AND CONCERNS RAISED	INCORPORATED TO THE PROJECT
1.	Dodoma City Council Town Land Planner	• The area where people's property will be affected by the project compensation should be done before project commencement.	• The implementation of the project does not affect people's properties (no compensation required)
2.	Dodoma City Council Environmental Officer (EMO)	• There is no objection to the project. • Attention should be given to minimize air pollution that can affect nearby residents • Proper waste management and disposal should be taken into considerations.	• Proper management of wastes will be incorporated during construction and operation phase, this will minimize environmental pollution as the negative impact
3.	OSHA	• The construction site should adhere to health and safety rules and requirements as per OSHA, Act no.5 2003 by provision of safety gear to workers, placement of directives signs to the construction site and presence of emergence equipment and a safety officer to oversee safety issues.	• The comments will be incorporated during construction and operation phase, thus will helps to minimize negative impacts of health risks
4.	TARURA	• No objection to the project; in case of improving access roads TARURA experts should be consulted	• Access roads towards the project area are easily accessed
5.	TANESCO	• No objection to the project; for electrical installation a competent company should be hired	• The comment will be incorporated during construction phase thus, will minimize the impact of electricity shortage
6.	FIRE BRIGADE	• No objection to the project; the proponent should ensure presence of firefighting facilities	• Fire fighting facilities will be in place during the operation phase of the project, thus will help to mitigate negative impact of fire outbreak.

S/N	STAKEHOLDERS CONSULTED	ISSUES AND CONCERNS RAISED	INCORPORATED TO THE PROJECT
7.	Geological Survey of Tanzania (GST)	• A Geotechnical Investigation should be conducted to the project area to identify soil strength and characteristics	• The comment have been taken into consideration, as the Geotechnical Investigation is now conducted.
8.	Local leaders (Tambukareli Ward Meetings)	• The contractor should consider employing the local community as manual labors during construction phase.	• The comment will be incorporated during construction phase, thus will enhance the employment opportunity as the positive impact
9.	National Construction Council (NCC)	• No objection to the project, the construction activities should proceed as per Construction Legal requirements.	• The comment have been taken into consideration as the contractor will adhere to the legal construction requirement.

Table 5.2: Stakeholders' engagement method and alignment with OS10

Engagement Method	Description	Alignment with OS10 Requirements
Public Consultative Meetings	Conducted with community members, local leaders, and municipal authorities to gather input and address concerns about the project.	Fulfills OS10's requirement for early, inclusive, and meaningful consultation with affected people and other stakeholders.
Key Informant Interviews (KIIs)	Held with representatives from DUWASA, government agencies, and technical experts to obtain detailed feedback on project impacts.	Aligns with OS10's focus on engaging stakeholders with specialized knowledge and institutional roles in the project area.
Focus Group Discussions (FGDs)	Separate sessions with women, youth, and vulnerable groups to ensure their voices are heard and respected.	Supports OS10's mandate to ensure participation of vulnerable and marginalized groups, using culturally appropriate approaches.
Distribution of Project Briefs and Information Leaflets	Materials shared in Kiswahili and English to inform stakeholders about the project objectives, benefits, and potential impacts.	Meets OS10's requirement for accessible and understandable information disclosure, using appropriate languages and formats.
Use of Local Notice Boards and Radio Announcements	Used to disseminate meeting schedules and project updates to a wider audience.	Aligns with OS10's emphasis on broad outreach and the use of locally accessible communication channels.
Stakeholder Feedback Forms and Suggestion Boxes	Provided at local offices and meeting venues to collect anonymous comments and suggestions.	Supports OS10's standard of grievance management and continuous feedback, allowing all voices to be heard.
Establishment of a Stakeholder Engagement Plan (SEP)	A formal plan outlining who will be engaged, how often, and through what means.	Required under OS10 to promote structured and ongoing stakeholder engagement throughout the project cycle.

CHAPTER SIX

6.0 ASSESSMENT OF RISKS AND IMPACTS AND IDENTIFICATION OF ALTERNATIVES

6.1 Introduction

This chapter outlines the risks and potential negative and positive impacts that will be associated with the implementation of the project. The risks and impacts will be related to activities to be carried out during all phases that is mobilization, construction, operation and decommissioning stage of the project. The operational phase risks and impacts of the project will be associated with the activities carried out within the premise. In addition, decommissioning phase risks and impacts of the project are also highlighted. The risks and impacts of the project during each phase of the project can be categorized into: impacts on the biophysical environment; health and safety risks and socio-economic impacts.

During ESIA study, literature reviews of available information related to the site conditions and similar nature of the project was conducted. The team visited the project site for scoping exercise and EIA study. The study team site visit assisted in integration of ideas and findings which fostered the assessment and identification of the impacts associated with the project implementation. The EIA team undertook a social survey by conducting interviews with a broad spectrum of relevant stakeholders as identified in chapter 5. The role of each specialist was to collect sufficient data to assess the environmental impacts. In order to achieve this, the ESIAteam assessed the environment as it existed at the project area and secondary data from published and unpublished sources also through stakeholder's consultation meetings.

6.2 Environmental Risks Impact rating scale

To ensure a direct comparison between various ESIA studies, a standard assessment methodology was used to assess the significance (the importance of the impact in the overall context of the affected system) of the identified impacts. The criteria that were considered in the determination of the impact significance are:

Severity/Benefit: the importance of the impact from a purely technical perspective;

Spatial scale: extent or magnitude of the impact (the area that will be affected by the impact);

Temporal scale: how long the impact will be felt;
Degree of certainty: the degree of confidence in the prediction;
Likelihood: an indication of the risk or chance of an impact taking place;

To ensure integration of social and ecological risks and impacts, to facilitate specialist assessment of risks and impact significance, and to reduce reliance on value judgements, the severity of the risks or impact within the scientific field in which it takes place (e.g. vegetation, fauna) is assessed first. Thereafter, each risk and impact are assessed within the context of time and space, and the degree of certainty in the prediction is indicated.

The risks and impacts are then assessed in the context of the whole environment to establish the "significance" of the risks and impact. This assessment incorporates all social, cultural, historical, economic, political and ecological aspects of the risks and impact. Thus, the severity or benefit of risks and impacts within a specialist discipline is first assessed before the significance of the risks and impacts are evaluated in a broader context. Consequently, two rating scales are required, one to determine the severity or benefit, and one to determine environmental significance.

6.2.1 Severity / benefit

Severity is based on the professional judgement of the various specialists to evaluate the extent to which negative impacts would change current conditions, or how beneficial positive impacts would be on a particular affected system (for ecological impacts) or a particular affected party (for social impacts). The severity of impacts can be evaluated with and without mitigation order to demonstrate how serious the impact is when nothing is done about it. The word mitigation means not just "compensation", but also ideas of containment and remedy. For beneficial impacts, optimization means anything that can enhance the benefits. Mitigation or optimization must be practical, technically feasible and economically viable.

6.2.2 Spatial scale

The spatial scale defines the extent or area over which the risks and impacts will take place.

Table 6.1: Spatial scale

Individual	Individuals in the area could be affected
Household	Households in the area could be affected
Localised	The specific area to which this scale refers is defined for the impact to which it refers.
Study area	Includes the entire proposed project area
Ward	Includes the Tambukareli Ward and surrounding area
District	Includes area within the Dodoma City Council
Regional	The impacts will be of such a nature that it may affect the entire Dodoma Region
National	The impacts will be of such a nature that it may affect the entire Tanzania

6.2.3 Temporal scale

The temporal scale defines the times over which the risks and impacts would continue to occur.

Table 6.2: Temporal scale

Temporal scale	Explanation
Short term	Less than 3 years.
Medium term	Between 3 and 5 years
Long term	Between 5 and 20 years, and from a human perspective essentially permanent
Permanent	More than 20 years, and resulting in a permanent and lasting change

6.2.4 Identification of Risks and Impacts

Risks and Impact identification is a process designed to ensure that all potential significant risks and impacts are identified and taken into account in project design and implementation. A number of “tools” are available to assist in risks and impact identification. The simplest, and most frequently used, are checklists of impacts, although matrices, network diagrams and map overlays are also commonly used.

In this EIA study, a checklist and matrix methods were used. The checklists, which have been developed from previous experiences, provide lists of potential impacts associated with specific activities. They provide a quick method of identifying the impacts and as such help also practitioners to avoid overlooking some of the potential impacts, which are associated with a particular activity. The matrix provides a rather systematic way of evaluating the identified impacts. The identified positive and negative impacts and risks for the proposed project are summarized in Table 6.3 and 6.4.

6.3 The Project Activities which are Likely to generate Environmental and Social Impacts in all Project Phases

i. The project location will require site clearance specifically demolition of existing office buildings structures in the yard area of DUWASA current office and cutting of trees which will generate wastes that will need to be disposed of properly;

ii. Civil works will affect the communities both physically (air and water pollution, nuisance and contamination etc.); and socio-economically (land use, income generation, mobility and community association);

iii. Use of chemicals such as lubricants, oil and grease for vehicles and machinery (during construction and operation phase since DUWASA has a garage) may lead to land contaminations.

iv. Movement of vehicles and machineries may lead to nuisances, dust andvibrations;

v. The increase in interaction of different types of people will result in social and health risks caused by various diseases transmitted among these people and arising from high pressure on social and health services such as medical services; and

vi. The construction works will generate solid and liquid wastes

6.3.1 Demolition of Existing Building

The proposed site for the construction of the DUWASA 8-storey building currently hosts an existing structure that requires demolition prior to the commencement of construction activities. This demolition is necessary to clear and prepare the site for new development.

- **Potential Impacts**

The demolition process is expected to generate several environmental and social risks, including:

- Dust emissions, noise, and vibration
- Generation of solid waste and hazardous materials (e.g., asbestos, lead-based paint, etc.)
- Occupational health and safety risks for demolition workers
- Temporary disruption to nearby businesses, traffic, and pedestrians

- **Natural Risks**

Earthquakes risk due to Dodoma Region to be located in a rift valley area; there are observed small earthquakes occurring at Dodoma City with no significant impacts.

6.3.2 Mobilization phase activities

i. Site clearance and demolition of existing building structures
ii. Transportation and off-loading of construction materials
iii. Construction materials acquisition
iv. Construction of contractors' offices and supporting facilities

6.3.3 Construction phase activities

i. Excavation and foundation work
ii. Material handling and storage
iii. Masonry, concrete work and related activities
iv. Structural steel works
v. Roofing works
vi. Electrical works
vii. Tree planting
viii. Drainage works

6.3.4 Demobilization phase activities

i. Removal of all construction equipment
ii. Collect and dispose of all wastes generated during construction

6.3.5 Operation and maintenance phase activities

i. Testing and commissioning of the office building
ii. Testing firefighting and rescuing equipment
iii. Testing all the electric and electronic equipment
iv. Testing both clean and waste water systems
v. Infrastructure repair and maintenance

6.3.6 Decommissioning/Closure Phase

i. Disconnect the electrical and electronic equipment
ii. Demolish all structures
iii. Collect and dispose of all generated wastes both liquid and solid

Table 6.3: Identified positive impacts

A. Mobilization Phase	**B. Construction Phase**
Create job opportunities and support the existing local business	Creation of temporary employment. About 90 people have been hired during construction phase.
Source of Revenue to the Government	Skilled and unskilled employment opportunities for various constructions, administrative and other workers.
	Experience gained from the contractor (as a result of on-job training provided)
	The supply of various construction materials including pipes and fittings, cement, aggregates, and steel reinforcement
	Income generating opportunities for local business such as food and drinks supplied by vendors.
C. Operation Phase	**D. Decommissioning Phase**
Employment opportunities to people like security, cleanliness and food vendors.	Employment creation but is temporary to the locals
Increase Government Revenue through utilities bills such as electricity and water	
Increase of office space for the convenience and efficiency of daily DUWASA operations	

Table 6.4: Identified risks and negative impacts

A. Mobilization Phase	**B. Construction Phase**
• Cutting of trees in the project area • Demolition waste generation (solid and liquid waste) • Air quality deterioration (gaseous and dust emission) due to demolition of structures.	• Soils and geological disturbance • Soil contamination by oil and grease from vehicles and machines • Air quality deterioration by dusts and gaseous emission • Noise and excessive vibration generation • Land and soil pollution due to improper management of generated wastes • Occupational Health and safety risks

A. Mobilization Phase	B. Construction Phase
	• Landscape and visual destruction • Population influx that could results into transmission of HIV/AIDS
Operation Phase	**Decommissioning Phase**
• Solid and liquid waste generation • Increased energy consumption and demand • Occupational Health and Safety Risks • Fire outbreak risks • Increased demand for water supply • Air pollution (Dust; Source emissions; odour/foul smells from septic tanks when full) • Earthquakes risks	• Solid wastes (scraps and other debris onsite) • Air, water and soil pollution • Occupational health and safety risks • Engineering design should be earthquakes resilient

6.4 Risks and Impact Rating and Evaluation

The construction projects cause a wide range of environmental and social risks and impacts on a number of receptors. The EIA identify these risks and impacts for the purposes of mitigating the adverse ones or enhancing the benefits. Risks and Impact identification is a process designed to ensure that all potentially significant risks and impacts are identified and taken into account in the EIA process. A number of 'tools' are available to assist in impact identification. The simplest, and most frequently used, are checklists of risks and impacts, although matrices were also used. In this EIA study a simple matrix with the following ratings was used to determine significance of the identified impacts stated in section 6.3 & 6.4 above were used. The matrix consists of a horizontal list of development activities against a vertical list of environmental factors. Thus, it identifies risks and impacts by methodically checking each development activity against each environmental consideration to ascertain whether a risks or impact is likely to occur. Taking a step further, the ranking in all phase (mobilization, construction and demobilization / decommissioning) signified the magnitude of each and combined phases. As a result, the more the score illustrated the severity the risks or impact of the buildings project has. The following factors were used to ascertain the significance of the impacts;

General

- ✓ Magnitude and Extent
- ✓ Non-conformity with the environmental standards level of public concern

- ✓ Social impacts resulting from environmental change
- ✓ Scientific and professional evidence concerning:

- resource loss/ecological damage
- negative social impacts
- foreclosure of land
- resource use options and
- Environmental loss and deterioration

Ecological

- ✓ Habitat loss, degradation or fragmentation
- ✓ Impairment of ecological functions

Social

- ✓ Human health and safety
- ✓ Decline in important local resource Loss/gain of valued area
- ✓ Demands on services and infrastructure
- ✓ Political concern

The above factors were used to create six criteria which were used to determine thesignificance of the risks or impacts in the Matrix these includes;

Spatial Scale - The spatial dimension encompasses the geographical spread of the impacts regardless of whether they are short term or long term. Table 6.5 describes the ratings used in the simple matrix as far as spatial scale is concerned.

Table 6.5: Spatial Rating

International (I)	Trans Boundary
National (N)	Within Country
Regional (R)	Within Region
Local (L)	On and Adjacent to the Site

Temporal Scale - Temporal boundaries refer to the lifespan of impacts. Table 6.8 below describes the ratings used in the Simple Matrix.

Table 6.6: Temporal Rating

Short Term (ST)	During Construction
Medium Term (MT)	Life of a project
Long Term (LT)	Residual Impact Beyond Life of Project

Cumulative Impacts – These are Impacts that cause changes to the environment that are caused by an action in combination with other past, present and future humanactions.

Residual Impacts - These are long term impacts which go beyond the lifetime of the project. In other words, residual impacts refer to those environmental effects predicted to remain after the application of mitigation suggested by the EIA i.e. impacts with no mitigation measures.

Timing- During which phase of the construction is the impact likely to occur. The phases included Mobilization, Construction, Demobilization and Operation.

Keys:

+3	High positive impacts	+2	Medium positive impacts
+1	Low positive impact	-1	Low negative impact
-2	Medium negative impacts	-3	High negative impacts
0	No impacts		

Table 6.7: Environmental and Social Impacts Matrix for the proposed project

		IMPACT RATING CRITERIA					IMPACT SIGNIFICANCE RATING			
S/N	**Environmental parameters/Impacts**	**Spatial Scale**	**Temporal Scale**	**Reversibility**	**Cumulative Effects**	**Residual Impact**	**Mobilization Phase**	**Construction Phase**	**Demobilization Phase**	**Operation and Maintenance**
	Negative Impacts									
1.	Disturbance to the existing occupants/temporary relocation	L		IR				-1	-1	0
2.	Traffic disruption	L		R			-1	-1	0	-1
3.	Demolition wastes	L		IR			-2	-1	0	0
4.	Influx of job seekers	L		IR			+2	+2	0	+2
5.	Soils and geological disturbance	L	LT	IR			-3	-1	0	0
6.	Soils contamination	L	ST	R			-1	-1	-1	0
7.	Air quality deterioration	L	ST	R			-1	-3	0	-1
8.	Noise and excessive vibration generation	L	MT	R			-1	-3	-1	0
9.	Solid/liquid wastes generation	L	ST	R			-2	-3	-2	-2

S/N	Environmental parameters/Impacts	IMPACT RATING CRITERIA					IMPACT SIGNIFICANCE RATING			
		Spatial Scale	Temporal Scale	Reversibility	Cumulative Effects	Residual Impact	Mobilization Phase	Construction Phase	Demobilization Phase	Operation and Maintenance
10.	Occupational Health and safety risks	L	LT	R			-1	-3	-1	-1
11.	Transmission of HIV/AIDS	R	ST	IR			-1	-2	-1	-1
12.	Increased energy consumption and demand	R	LT	R			-1	-2	-1	-3
13.	Fire Outbreak risks	L	LT	IR			-1	-2	-1	-3
14.	Blockage of sewerage systems	L	ST	R			-1	-2	-1	-3
15.	Increased demand of water supply	L	LT	R			-1	-3	-1	-3
	Positive Impact									
16.	Availability of office space for DUWASA staff	R	LT	R						+3
17.	Create job opportunities and support the existing local business	R	MT				+2	+3	+1	+2
18.	Source of Revenue to the Government	R	ST				+2	+3	0	+3
							+2			

		IMPACT RATING CRITERIA					IMPACT SIGNIFICANCE RATING			
S/N	**Environmental parameters/Impacts**	**Spatial Scale**	**Temporal Scale**	**Reversibility**	**Cumulative Effects**	**Residual Impact**	**Mobilization Phase**	**Construction Phase**	**Demobilization Phase**	**Operation and Maintenance**
19.	Employment opportunities	R	ST					+3	0	+3
20.	Improved living standards	R	ST					+3	0	+3
21.	Earthquake	R		R			-1	-2	-1	-2

Key: Spatial Scale:

Local (L), Regional
(R), National (N): Temporal Scale: Short Term (ST), Medium Term (MT), Long Term (LT)Reversibility: Reversible(R), Irreversible (IR)

6.5 Impacts and Risks during mobilization and construction phase

6.5.1 Positive Impacts

- **Create job opportunities and support the existing local business**

This project is anticipated to create employment opportunities for people from different areas within and outside Dodoma City. Direct job creation will begin from the construction phase of the project whereby about 90 people have been employed to undertake both informal and formal jobs at the construction site. It is expected that the project development will attract different business activities at the site during this phase, such as food vendors, accommodation, real estate, and transportation improvement in the Region. This in turn will improve people's livelihoods. *This impact is considered positive, short- term and of moderate significance.*

- **Source of Revenue to the Government**

The government can source revenue from different suppliers through payment of different taxes and duties. This contribution will benefit other development activities of the region and country at large. *This impact is considered positive, long-term and of high significance.*

6.5.2 Negative Impacts during mobilization and construction

- **Waste generation and litters**

Site clearance activities will generate a lot of rubble and spoil the soils. The waste generated need adequate haulage facilities and at the right time. Also, domestic wastewater from onsite camps may be a problem if not handled properly. Inadequate management of the waste shall create unsightly condition on site. This impact is considered negative, short- term and of moderate significance.

- **Soils and geological disturbance**

The construction phase has involved use of heavy machinery and excavations, however there is no observed soil disturbance at the project site and nearby surroundings. The contractor had ensured all mitigation measures are in place to avoid soil disturbance and erosion. These measures will include clearing the project site of excavated materials or protect excavated sections from storm water, develop emergency measures and procedures for protection of soils. *This impact is considered negative, medium-term andof moderate significance.*

- **Soils and groundwater contamination**

Construction works involve the use of equipment including machinery and trucks which may accidentally cause oil spillage and contaminate soil and ground and surface water. Moreover, mishandling of generated waste during construction phase may also lead to soil and groundwater contamination as a result of leachate from the waste. *This impact is considered positive, negative-term and of high significance.*

- **Air quality deterioration**

Excavation works and movement of vehicles and mechanical construction equipment at the site might result into fugitive emissions of dust, smoke, exhaust particulates and exhaust gases. It is known that operation machines and trucks are prone to emission of gaseous emissions such as carbon dioxide and Nitrogen Oxides (NOx) which are harmful to the environment attributing to climate change and also affects people's health by causing respiratory diseases.

These emissions will be short term and will probably be significant only at the site and adjacent sites. It is expected that smoke and exhaust emissions will immediately be dispersed and diluted in the ambient air. *This impact is considered negative, cumulative, medium-term and of moderate significance.* It is considered as cumulative impact because the effect of pollution built up over time as multiple sources of pollution combine and interact.

- **Noise and excessive vibration generation**

Noise refers to harmful or annoying sound that can affect job performance, safety and health. Physical impacts may include; loss of hearing, pain, nausea and interference with communications when the exposure is severe. Psychological effects could be disruption of concentration and cause of annoyance. Construction activities tend to cause noise which affects the immediate environment and even disrupt other nearby operations. The noise may affect small animals and birds which are sensitive to noise. The effects of noise and vibration will be local (estimated to reach a perimeter of < 200m), short term and of low significance.

The Tanzanian Noise Level Standards requires noise should not exceed 60 dBA for day time and 50 dBA for night time for residential and industries small scale production and commerce. Workers who will be exposed to noise levels exceeding 90 dBA working hours should be restricted to 8 working hours. According to the recorded measurements for themachinery and equipment used at the project area noise levels were above Tanzania National Standards, therefore workers should wear PPEs and observe 8 working hours. *This impact is negative, short term and of medium significance.*

- **Construction solid/liquid wastes generation**

Construction works will generate solid wastes within the site including; rods of metal, pieces of iron sheets, broken glasses, pieces of wood, empty containers broken stones and garbage from workers. *This impact is considered negative, short-term and of high significance.*

- **Health and Safety Risks**

Construction activities such as excavation and concreting can pose occupational hazards and risks to construction workers and the general public living and working in the neighborhoods of the construction site. They can cause respiratory infections and injuries to limbs and body due to exposure to, dust and combustion gases, operation of equipment and handling of construction materials. Accidents may occur during construction as a result of workers being hit by falling construction materials or tools or falling down from higher levels. Dust and combustion gases can irritate the eyes and respiratory problems. While the operation of construction Equipment and handling of materials can result in injuries to the workers especially in the absence of appropriate protective devices. Specific impacts are a such as:

- **Working at Heights:** Falls from heights are a major concern in multi-story construction. This includes falls from scaffolding, ladders, edges of floors, and open shafts.
- **Moving Objects:** Workers can be struck by falling or moving objects, including tools, materials, and equipment.
- **Excavations and Trenches:** Deep excavations and trenches pose risks of collapse, potentially burying workers.
- **Hazardous Materials:** Exposure to silica dust, welding fumes, and other hazardous materials can cause long-term health problems.
- **Noise and Vibration:** Construction sites are often noisy, and workers can be exposed to harmful levels of noise and vibration from equipment.
- **Electrical Hazards:** Contact with live wires, faulty equipment, or improper grounding can lead to electrical shock and burns.
- **Heavy Machinery:** Operating heavy machinery like cranes, excavators, and forklifts involves risks of accidents, including overturning and being struck by the machinery.
- **Manual Handling:** Repetitive lifting and awkward postures can lead to musculoskeletal injuries.
- **Fire:** Fires can start due to various reasons on construction sites, posing risks to life and property.
- **Environmental Factors:** Exposure to extreme temperatures (heat or cold), poor air quality, and hazardous weather conditions can affect workers' health.
- **Poor Housekeeping:** Lack of proper housekeeping can lead to slips, trips, and falls.
- **Equipment Failure:** Defective or poorly maintained equipment can malfunction and cause accidents.

- **Collapses: Structural** collapses during construction can lead to severe injuries or fatalities.

This impact is considered negative, short-term and of high significance.

- **Landscape and visual destruction**

At the initial stages of construction, excavators and landscape distortion can be an eye sore to the passers-by. *This impact is considered negative, long-term and of high significance*

6.5.3 Socio Economic Impacts

- **Transmission of HIV/AIDS**

Construction works attracts influx of job-seekers and opportunistic businesses into any project site. Increased population (new job seekers) at the project area will increase chances of the local people to socialize with new comers, which may result into increased HIV-AIDS transmission rates. Another problem associated with population influx is the increased pressure and demand on available resources and social services. Effects of increased population will be short term. However, effects of HIV infections will be long term and high significance. *This impact is considered negative, long-term and of high significance.*

6.6 Impacts during the Operation Phase

6.6.1 Positive impacts

- **Employment opportunities**

This project is anticipated to provide employment opportunities for both skilled and unskilled workers within and outside the Dodoma Region. For instance, in the maintenance of the buildings different service providers will be needed such as plumbers, electricians and as well as cleanliness companies which recruit several individuals for thework. Also, since the building will have a canteen facility and it is expected that people will be contracted to operate it. *This impact is positive, long term and of high significance*

6.6.2 Negative impacts during operation phase

- **Earthquakes**

Earthquakes are likely to occur in the project area since Dodoma is located in a rift valley area.

- **Traffic congestion**

This is primarily due to the influx of employees, visitors, service vehicles, and deliveries, all of which significantly increase the volume of traffic in a neighborhood that may have previously had limited vehicle activity. This impact is negative, cumulative and of low significance.

- **Parking space**

Loading and unloading by suppliers and could block lanes or occupy limited parking areas if no designated bays are provided. This impact is negative, cumulative and of low significance.

- **Accidents**

The most likely cause for risks and hazards during operation is related, occupational accidents particularly to the office workers. Risks such as the possibility of disease transmission and wounding are possible. *This impact is considered negative, short-termand of high significance.*

- **Solid and liquid waste generation**

The facilities after completion and upon occupancy will generate solid of about 8.8kg per month and liquid wastes of about 1.2 million liters. The efficient management of the solid waste generated by the project during the operationphase rests on DUWASA though waste management systems adopted by Dodoma City Council. *This impact is considered negative, long-term and of high significance.*

- **Increased energy consumption and demand**

The building will be connected to the electric line which is already available in the area. However; increase in energy consumption will be experienced in the existing electric supply infrastructure. *This impact is considered negative, long-term and of moderate significance.*

- **Occupational Health and Safety Concern**

The developed area should be maintained at its optimum useful state and high standards of hygiene shall be maintained to avoid any disease outbreak. All electrical installations should be properly fixed and maintained to avoid any risk of fire outbreak. The facilities shall be provided with emergency exits, fire assembling point and First Aid Kit at all strategic areas. *This impact is considered negative, long-term and of high significance.*

- **Fire Outbreak**

Apart from office spaces provided there will also be kitchen and Canteen. Cooking will beby using LPG or charcoal. Use of LPG in cooking may lead to the risk of fire outbreak. *This impact is considered negative, short-term and of high significance.*

- **Blockage of sewerage systems**

The plumbing system and drainage might be blocked if the staff and other occupants do not exercise proper use and maintenance, this may lead to eruption of diseases due to exposed sewerage to the environment. *This impact is*

considered negative, long-termand of high significance.

- **Increased demand for water supply**

During the operation phase water demand will increase as water will be used for gardening, cleanliness, in the washrooms, kitchen etc. This demand may lead to the increase demand of the water from the water service provider and at times water rationingwill be required. About 62,040 litres of water will be consumed per day. Also water for fighting fire will be required and as per Fire and Rescue Force (Fire Precautions in Buildings) Regulations 2015 about 153,900 liters storage will be required which will at least sustain for 45 minutes in case of fire emergency. *This impact is considered negative,short-term and of high significance.*

- **Air pollution (Dust and foul smells)**

Air pollution may occur during operation activities. The source of pollution will mainly originate from piling of solid waste for a long time, rotting food stuffs especially vegetables and fruits (from canteen), and use of sanitary facilities without proper cleaning, burning waste on site, and source emissions from the generators as well as occurrence of uncovered manholes. *This impact is considered negative, long-term and of high significance*

6.7 Project impacts during the decommissioning phase

Solid wastes (scraps and other debris onsite)

Demolition works generates a lot of solid wastes. These wastes range from; wood, glass, tiles, waste metals and stones amongst others. *This impact is considered negative, short-term and of high* significance*.*

- **Occupational Health and Safety Concerns**

The decommissioning phase may cause accidents; inhalation of dust; generation of noise and occupational incidences like fall. *This impact is considered negative, long-term andof high* significance

6.8 Project Alternatives Analysis

Regulation 8(1) of the Environmental Management (Environmental Impact Assessment and Audit) (Amendment) Regulations, 2018, specifies the basic content of the scoping report for Type A projects subsequent to which, subsection (r) requires an analysis of alternatives. This section analyses the project alternatives in terms of site selection, waterand energy supply.

6.8.1 Relocation Option

Relocation option to a different site is not an option available for the project implementation because the Proponent have legally acquired the land at the designatedlocation and that the premises is easily accessible through tarmac road to UDOM and other internal roads and that relocation of the project will inquire either renting or purchasing another piece of land elsewhere which is not a very sought out option. Furthermore, the project location is appropriate for the

designated project which will fosterbeautification of Dodoma City.

6.8.2 Water supply option

The alternative water source was not seen feasible since water supplied by the proponent (DUWASA) is sufficient to cover all activities during construction and operation phase. Also, the infrastructures for water supply have been spotted close-by to the project area.

6.8.3 Alternative energy supply

The Proponent is highly dependent on the source of energy from TANESCO whose infrastructures have been observed to pass-by near the project site. However, the Proponent is anticipating to use other sources of energy to supplement electricity from TANESCO by installation a standby generator in case of power outage duringoperation of the building. The Proponent shall utilize all the two options to ensure constant supply of energy for smooth operations of the office building.

6.8.4 Zero or No Project Alternative

The No Project option in respect to the proposed project implies discontinuation of the project proposal hence the status quo is maintained. The site being retained in its existing form. This option is the most suitable alternative from an extreme environmental perspective as it ensures non-interference with the existing conditions. This option will however have the greatest implications on the socio-economic development and government operations. This suggests that the no project option is the least preferred option. From the analysis above, it becomes apparent that the No Project alternative is not attractive to DUWASA, the local people who are anticipating employment opportunities during construction phase, Dodoma City Council and whole Government at large will be denied.

CHAPTER SEVEN

7.0 RISKS AND IMPACT MITIGATION AND ENHANCEMENT MEASURES

7.1 Introduction

This chapter provides mitigation measures and compensatory actions and enhancement measures for the identified risks and impacts. Many of the potential risks and impacts identified in the preceding chapter can be avoided, minimized, rectified, reduced or compensated through the implementation of appropriate mitigation measures either at the planning stage or when applied to specific project and activities basing on implementation of the different phases.

7.2 Information and awareness rising

One of the important mitigation measures across the project is awareness. Workers or individuals can do something unaware that they are breaking the law or they are jeopardizing their life simply because they are not aware of the impact and problems predicted for the project and the consequences. Hence, information or room for consultation needs to be available at all times. In view of the above, many be solved sufficient or adequate information may be provided to workers, management and the community surrounding the project

Whilst provision of information for the project stakeholder's consultation has already commenced as a part of the EIS consultation process, it is important that this continues throughout the project from both the contractor and the proponent. The transparency and readily available information to the workers and local communities will be an important component in the successful implementation of the project.

7.3 Health and safety measures

As a basic minimum requirement, the contractor will be required to prepare a Health and Safety Plan and monitor its implementation. Health and Safety measures will be important not only for the construction workforce but also for the public**.** Key consideration for health and safety will include but not limited to;

i. Waste management plan to handle and dispose waste generated at upgrading siteworkshop and during operation of the project.
ii. Provision of personal protective equipment to be used onsite as appropriate
iii. Posting of appropriate warning and control signs of dangerous and restricted areas
iv. Fencing of the upgrading site to control the access to only authorized personnel
v. Availability of first Aid kits fully furnished and competent workforce on first aid
vi. Appointment of a health and safety supervisor or manager or any responsible person to ensure the implementation, monitoring and review of health and safety requirements.

7.4 Site Management

For the smooth management of site, there will be a site management plan to oversee issues of workforce, equipment, safety, environment, materials and other resources in consideration of safety, security, natural and human environment a site manager will be appointed and a site procedures handbook will be developed. This will include, but not limited to, the following topics.

- Working hours
- Planning and management of welfare facilities
- Management, collection and removal of wastes
- Management of waste materials
- Emergency procedures (such as spill response)
- Delineation and management of the working area
- Control site
- Control of re- fueling
- Control of noise and dust

7.5 Mitigation Measures

7.5.1 Mitigation Measures during Pre -construction phase

To manage these impacts, the following measures will be implemented;

- The building design must ensure proper reinforcement detailing in joints, use high-quality materials, avoid soft-story configurations, and include securely anchored non-structural elements.
- Foundations should be designed based on soil conditions, possibly using raft or pile systems. Compliance with Tanzania's building codes is essential, along with quality control, emergency planning, and professional oversight to ensure earthquake resilience.

- Pre-demolition assessment to identify and safely handle any hazardous materials in accordance with national laws and AfDB OS requirements
- Development of a Demolition Waste Management Plan (DWMP) to ensure proper segregation, reuse, recycling, or disposal of waste at licensed facilities
- Provision of PPE, safety training, and supervision for demolition crews in line with OS2 (Labour and OHS)
- Community notification and traffic management plans to ensure public safety and minimize inconvenience.

7.5.2 Mitigation Measures during Construction Phase

7.5.2.1 Soil and Geological Disturbance

The impact rating on soil and geological features on the project site is low, however the proponent through the contractor should ensure that excavations are undertaken safely in that shoring and good slope banking is put in place and by adhering to all safety measures.

7.5.2.2 Soil Contamination

The use of construction equipment including machinery and trucks may accidentally cause oil spillage and contaminate soil. Moreover, mishandling of generated waste during construction phase may also lead to soil contamination. The impact rating is high. The proponent and contractor will have to prepare a hazardous substance control system and emergency response plans that will include preparations for quick and safe clean-up of accidental spills. It will prescribe hazardous-materials handling procedures to reduce the potential for a spill during construction and will include an emergency response program to ensure quick andsafe clean-up of accidental spills.

Other mitigation measures to be undertaken include:

- Dispose offsite oily waste appropriately;
- Obtain spill kits for use in case of accidental spillages on site;
- Obtain portable secondary spill containments for use on site

7.5.2.3 Air Quality Deterioration

Dust, smoke, exhaust particulates and exhaust gases Excavation works and movement of vehicles and mechanical construction equipment at the site might result as part of air deterioration. It is known that operation machines and trucks are prone to emission of gaseous emissions such as carbon dioxide and Nitrogen Oxides (NOx) which are harmful to the environment attributing to climate change and also affects people's health by causing respiratory diseases. These emissions will be short term and will probably be significant only at the site and adjacent sites. It is expected that smoke and exhaust emissions will immediately be dispersed and diluted in the ambient air.

The following are the mitigation measures for the above impacts on air;

- Practice prevention measures such as dampening dust by use of water (sprinklingwater on surfaces that produce dust or covering them);
- Proper maintenance of equipment and keeping vehicle idling time to the veryminimum.
- Control over areas generating dust particles. Such areas should be regularly cleaned;
- Workers should be encouraged to go for regular health check-ups to ascertain theirhealth standards;
- Regular air quality tests to enhance air quality monitoring;
- Wet sweeping of the surfaces that produces a lot of dust particles; and
- Fencing the construction area to prevent the widespread of dust generated fromconstruction activities.
- Use of dust net to cover the building under construction
- Provide PPEs such as nose masks to the workers on the construction site;

7.5.2.4 Noise and excessive vibration generation

Noise that may be associated with construction and lead to the immediate environment and even disrupt other nearby operations. It may be mitigated by the following measures;

- Construction activities should be carried only during the day when most of the neighbors are active or are carrying on with their normal day chores. The appropriate time could be between 0800hrs to 1800hrs.
- Construction vehicle's drivers and machine operators should be sensitized to adopt a habit of switching off engines of their vehicles or machinery when they arenot in use.
- Regular maintenance of the construction machinery is highly encouraged toreduce the noise resulting from friction.
- The proponent should provide a well-marked billboard at the construction site gates. This is meant to notify the public of the construction activity and timings.
- Personal protective equipment and /materials such as earmuffs and earplugs should be provided to the workers when operating noisy machinery and in a noisy environment. This measure ensures physical barrier that reduces inner noise levels and guard against hearing loss.

7.5.2.5 Generation of Wastes

- **Solid wastes**

Wastes that are likely to be generated are rods of metal, pieces of iron sheets, broken glasses, pieces of wood, empty containers broken stones and garbage from workers during construction and will be mitigated as follows;

The wastes should be properly segregated and separated to facilitate recycling of some useful waste materials. For example; broken stones can be used for backfills. Integratedsolid waste management system may also be adopted through hierarchy of options like source reduction, recycling, composting and re-use. The proponent should ensure that measures are put in place to ensure that construction materials required for the project are carefully budgeted to ensure the amount of construction materials left are kept to theminimal level possible. All the solid wastes should be disposed of by the contractor to the sanitary landfill at Chidaya area which is located about 14km from Dodoma City Centre.

- Recyclable materials such as wooden plates for trench works, steel, scaffolding material, site holding, packaging material, etc. shall be collected and separated on-site from other waste sources for reuse, for use as fill, or for sale.
- Contractor shall develop and implement a Waste Management Procedure / Plan. The plan shall (i) identify what type of solid or liquid wastes and categories of wastes to be generated; (ii) identify ways to reduce the volume of waste by reusingor recycling initiatives; (iii) use best available mechanisms, practices and technologies for waste collection and transportation to solid waste disposal sites.
- Take all necessary measures to reduce the potential for litter and negligent behavior with regard to the disposal of refuse. At all places of work, the proponent shall provide litter bins, containers and refuse collection facilities.
- Solid waste may be temporarily stored on site in a designated area approved by the construction supervision consultant and relevant local authorities prior to collection and disposal through a licensed waste collector.

- Cover all waste storage containers, to be tipping-proof, weather proof and scavenger- proof.
- If not removed off site, solid waste or construction debris shall be disposed of only at sites identified and approved by the construction supervision consultant and included in the solid waste plan. Under no circumstances shall the proponent dispose of any waste materials in environmentally sensitive areas, such as in areas of natural habitat or in watercourses.
- Installation and proper operation of wastewater treatment system on site.

- **Liquid Wastes**

Liquid wastes that are likely to be generated during construction phase are waste water from construction activities such as concrete wash out, sanitary waste water and chemical and cleaning agents. The following mitigation measures should be put in place;

- Implement a wastewater management plan to collect, treat and dispose of wastewater generated during construction.
- Proper storage and handling by store chemicals, fuels and other liquids in designated areas with secondary containment to prevent spills and leaks.
- Provision of training and awareness to construction personnel on proper handling and disposal of liquids and chemicals

7.5.2.6 Impacts on Occupational Health and Safety

Depending on the occupational safety and health hazards encountered while performing assigned tasks, workers may require using properly fitting personal protective equipment (PPE) to avoid injuries and illness. They (workers) must be provided with full protective gear. These include working/safety boots, overalls, helmets, goggles, earmuffs, masks, gloves etc. Moreover, since this development involves the construction of a multi-storey building provision of scaffolding and hangers is essential for safeguarding the construction workers from falling down.

- Workers should always be sensitized on social issues such as drugs, alcohol,diseases etc.
- Local individuals preparing food for the workers at the site must be controlled to ensure that food is hygienically prepared. Allow only authorized food vendors to supply food for the workers at the site.
- Adapt effective emergency response plans. A good start of learning how to respond to an emergency is through First Aid. Regular drills and emergency situations shouldbe followed to impart the anticipated insight and awareness to the workers.
- Safety awareness may be gained through regular safety training or personal interestin safety and health.
- Provision of drinking water for the construction workers.
- A first Aid Kit should be provided within the site. This should be fully equipped alwaysand should be managed by qualified persons.

7.5.2.7 Transmission of HIV/AIDS

The increase in population (new job seekers) at the project area will increase chances ofthe local people to socialize with new comers, which may result into increased HIV-AIDStransmission rates. Therefore, the following measures have to be considered so as to avoid the challenge,

- The contractor shall deploy locally available labor to reduce socio intermingling between the local people and the new comers. Such intermingling has potential toincrease risk of spreading of communicable diseases (especially STD).
- A safety, health and environment induction course shall be conducted to all site workers, putting more emphasis on HIV/AIDS, which has become a national disaster.

7.6 Mitigation Measures During Operation Phase

7.6.1. Waste generation

- **Solid Waste**

After the completion and upon occupancy the generation of solid wastes is a routine thing. Therefore, there is a need of efficient management of the solid waste generated by the project during the operation phase rests and make the rest be done by Dodoma City Council. The following measures will be applied;

- The waste management plan for the existing facilities is well described in the ESMP of this report
- Wastes will be disposed of in a regular and an appropriate manner. Proper measures are in place to ensure that the wastes are disposed of efficiently throughreuse, recycling and proper disposal procedures.

- **Liquid Wastes**

Liquid wastes that are likely to be generated during operation phase are sanitary wastewater and chemical and cleaning agents. The following mitigation measures should be put in place;

- Implement a wastewater management plan to collect, treat and dispose of wastewater generated during operation.
- Provision of training and awareness to construction personnel on proper handling and disposal of liquids and chemicals
- All waste water will be directed to the septic tank for proper discharge of liquidwastes.

7.6.2 Increased energy consumption and demand

In solving the above impact DUWASA shall consider to install energy-efficient lights within the facilities for instance the use of energy saving bulbs. This will promote energy conservation during the operational phase of the project.

- Switching off security and internal lights during the day when natural lighting canbe used.

- Staff and other space occupants on energy efficient interventions.
- The occupants of the building will be sensitized to ensure energy efficiency in theirinterventions.

- Maintenance of regular checks of the electrical systems and appliances.

The above measures will be complemented by monitoring energy use during the operation of the facilities and set targets for efficient energy use.

7.6.3 Occupational Health and Safety Risks

- **Work-at-Height Hazards:**
  - **Falls from height**; this is one of the most critical risks during high-rise operation. Activities such as scaffolding, roofing, exterior painting, window installation, and structural framing at elevated levels increase the likelihood of falls also inadequate use or absence of fall protection systems (e.g., guardrails, safety nets, harnesses) further heightens the risk.
  - Falling objects (nails, hammers, pieces of metals etc.) from upper floors also pose a serious threat to workers at ground level and passersby.

- **Machinery-Related Accidents:**
- The use of heavy machinery such as tower cranes, hoists, concrete mixers, and earth-moving equipment presents risks including entanglement, crushing injuries, and struck-by incidents.
- Improper operation, lack of training, or maintenance failure can lead to catastrophic outcomes.

- **Exposure to Hazardous Materials:**
- Construction workers are likely to be exposed to cement dust, silica particles, paint fumes, solvents, and adhesives, which can cause respiratory issues, skin irritation, or long-term health complications such as silicosis or chemical sensitization.
- Poor ventilation in enclosed areas (e.g., basements or interior spaces) may increase the accumulation of toxic fumes.
- **Electrical Hazards:**
- Installation and handling of temporary and permanent electrical systems pose electrocution and fire risks.
- Accidental contact with live wires, faulty electrical tools, and wet working conditions can result in severe injury or death.
- **Structural Instability and Collapse:**
- During the construction phase, incomplete structures may be unstable, posing risks of partial collapse, particularly in adverse weather or due to engineering flaws.
- Improper formwork or shoring, especially during concrete curing, can also lead to accidents.
- **Fire and Explosion Risks:**
- Flammable materials (e.g., fuel, gas cylinders, paints) stored or used on-site pose fire risks, especially if not properly handled or stored.
- Welding, cutting, and grinding operations introduce ignition sources.
- **Manual Handling and Ergonomic Risks:**
- Workers are frequently engaged in lifting, carrying, and moving heavy loads, which can result in musculoskeletal injuries, back strains, or chronic

pain without proper technique or mechanical assistance.

- **Noise and Vibration Exposure:**

- Extended exposure to high noise levels from machinery and tools can cause hearing damage, stress, and reduced concentration, increasing the likelihood of accidents.

- **Inadequate Sanitation and Welfare Facilities:**

- Lack of clean drinking water, rest areas, and hygienic sanitation can affect workers' health and morale, increasing susceptibility to illness and accidents.

OCCUPATIONAL HEALTH AND SAFETY MEASURES

The project proponent will be supposed to do the following measures so as to avoid and minimize any risks;

i. The proponent shall follow the requirements of the Occupation Health and Safety Act, 2003.
ii. Provision of fire extinguishers, smoke detectors, fire escape doors and emergency assembly zones.
iii. Local individuals preparing food must be controlled to ensure that food is hygienically prepared and served.
iv. Adapt effective emergency response plans. A good start of learning how to respond to an emergency is through First Aid provision. Regular drills and emergency situations should follow to impart the anticipated insight and awarenessto the workers.
v. Provision of drinking water for staff.
vi. Comprehensive training and induction programs for all workers.
vii. Strict enforcement of the use of Personal Protective Equipment (PPE).
viii. Regular safety audits, inspections, and toolbox talks to workers
ix. Implementation of work-at-height protocols in line with OSHA regulations.
x. Adequate site supervision and safety signage. Proper storage and handling of hazardous substances as per MSDS guidelines.

Also, for specific risks the following outlined measures should be implemented;

Working at Heights (Falls from Heights)

- Use approved scaffolds, ladders and platforms.
- Install guardrails and toe boards on open edges.
- Wear fall protection gear (harness, lifeline and anchor).
- Inspect access equipment regularly.
- Train workers on safe height work practices.
- Cover and secure all floor and shaft openings.

Electrical Hazards

- Ensure systems are grounded and insulated.
- Use lockout/tagout during repairs.
- Keep electrical equipment dry.

- Inspect cords, plugs, and panels regularly.
- Train workers on electrical safety and response.

Poor Housekeeping

- Keep work areas and walkways clear.
- Store tools and materials properly.
- Remove waste regularly.

Collapses (Structural Failure)

- Use certified designs by qualified engineers.
- Install shoring and bracing during builds.
- Inspect structures before and after loading.
- Stop work if there are signs of instability.

Noise and Vibration

- Use quieter tools and keep equipment well-maintained.
- Rotate workers to reduce exposure.
- Provide hearing protection.
- Monitor noise levels to meet legal limits.

Hazardous Materials (Silica, Fumes, etc.)

- Use wet methods or dust control for silica.
- Ventilate work areas when welding or handling chemicals.
- Provide and enforce use of PPE (respirators, gloves, goggles).
- Store and label materials per safety data sheets (MSDS).
- Train staff on safe handling and communication.

Heavy Machinery

- Ensure only trained, certified operators may use machinery.
- Keep workers clear of operating machines.
- Use alarms, mirrors, and cameras on mobile equipment.
- Inspect and maintain machines routinely.

7.6.4 Increased demand of water supply

The foll owing mitigation measures will be taken in solving any related water problem during operation

i. The proponent should install water storage tanks and other water saving interventions at the site to save on water usage; like use of cistern tanks which uses small amount of water for flushing i.e. 5 litres cistern tank, use of taps with sensors/push button in male toilets install urinals with sensors/push button. The bathroom showers may be fixed withflow restrictors.
ii. Sensitize the occupants of the facilities on water saving techniques.

iii. Regular checks and maintenance of water pipes within the facilities to control leakages.
iv. Installation of alternative water supply source such as rainwater harvesting systemto cater for use at the toilets and gardens.

7.6.6.5Air pollution (Dust and foul smells)

Air pollution during operation activities can be mitigated by the following measures.

i. Unnecessary combustion of materials within the compound should be avoided;
ii. Clean and dust away all areas regularly;
iii. Solid waste should be regularly removed from the collection points;
iv. All rotting vegetables, fruits and food remains must be removed from the respectiveareas and disposed of appropriately.
v. Carry out proper maintenance of generators used on site;
vi. Manholes should be covered using airtight covers to reduce any odor and of foulsmell;
vii. Frequently (daily) clean the sanitary facilities by use of detergents;

7.6.6 Impacts associated with weather and climate changes

Climate change should be projected to increase the frequency and intensity of extreme weather events such as heat waves, droughts, and floods. These changes are likely to increase losses to property and crops, and cause costly disruptions to society.

Effort to reduce or prevent emission of greenhouse gases such using new technologies and renewable energies, making older equipment more energy efficient, or changing management practices or consumer behavior will be adopted.

Mitigation strategies include retrofitting project buildings to make them more energy efficient; adopting renewable energy sources like solar, wind and small hydro**.**

7.7 Project Impacts During Decommissioning Phase

7.7.1 Solid wastes (scraps and other debris onsite)

Due to different problems that may be associated with demolition works such as generation of a lot of solid wastes. These wastes range from; wood, glass, tiles, waste metals and stones amongst others and the problem can be mitigated

through thefollowing measures.

The wastes shall be properly segregated and separated to facilitate recycling of some useful waste materials. For example; broken stones can be used for backfills. Integrated solid waste management system may also be adopted through hierarchy of options like source reduction, recycling, composting and re-use.

All the solid wastes should be collected by the City Council as a responsible organ for waste collection and disposal.

7.7.2 Occupational Health and Safety Risks

Different incidents may likely to happen during decommissioning phase such as accidents; inhalation of dust; generation of noise can be mitigated by the following measures

Depending on the occupational safety and health hazards encountered while performing assigned tasks, workers will use properly fitting personal protective equipment (PPE) to avoid injuries and illness. Workers must be provided with full protective gear. These include working/safety boots, overalls, helmets, goggles, earmuffs, masks, gloves etc.

i. Workers will be sensitized on social issues such as drugs, alcohol, diseases etc.
ii. A first aid kit shall be provided within the site. This should be fully equipped at all times and shall be managed by a qualified person.

7.7.3 Residual Impacts

Are those impacts that remain after all feasible mitigation measures have been applied. To manage residual impacts, the project will implement targeted mitigation measures. Dust and noise will be controlled through water spraying, use of low-emission equipment, soundproofing, and scheduling of noisy activities during the day. A traffic management plan will address congestion, while water-efficient fixtures and rainwater harvesting will reduce demand on the city's supply. Wastewater will be safely connected to the main sewer with pre-treatment measures in place. Solid waste will be segregated and collected by licensed contractors. Energy efficiency will be achieved through LED lighting, natural

ventilation, and solar integration. The building design will minimize visual impact and include landscaping. Occupational health and safety will be ensured through training, PPE, and strict safety protocols.

7.7.4 Cumulative Impacts

Cumulative impacts are the combined effects of the proposed project with other existing or planned developments in the area over time.

To mitigate these, the project will coordinate with local authorities to align infrastructure planning, especially for water, wastewater, and traffic management. Sustainable building practices will be adopted, including energy-efficient systems, green landscaping, and proper waste segregation to reduce environmental load. Engagement with city planners will ensure integration into broader urban development strategies, helping to manage shared resources and minimize long-term environmental strain.

CHAPTER EIGHT

8.0 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

8.1 Introduction

The Environmental and Social Management Plan (ESMP) addresses the environmental impacts during preparation/mobilization, construction and operational phases of a project Table 8.1. Also, it considers decommissioning as an ultimate end of the project cycle. Due regard must be given to environmental protection during the entire project. In order to achieve this, a number of environmental specifications/recommendations are made. These are aimed at ensuring that the contractor maintains adequate control over the project in order to minimize the extent of impact during mobilization and construction, ensure appropriate restoration of areas affected by construction and prevent long term environmental degradation.

Based on the assessment undertaken a series of mitigation measures have been identified which aim to reduce and / or eliminate the predicted impacts of the project. It is important that these mitigation measures are appropriately applied to the project mobilization, construction and operation, and this management plan provides a strategic framework for their implementation.

The construction and operations of the project is anticipated to bring about both environmental and socio-economic impacts that need either mitigation or enhancement measures. Both the contractor and the Proponent are responsible for the implementation and compliance of the ESMP in accordance with the EIA and EA Regulations. The contractor is also required to prepare specific project guidelines which are Environmental and Social Management Plan (ESMP), Occupational Health and Safety Plan (OHS) and Grievance Redress Mechanism (GRM). To realize these goals, acceptability by a majority of the stakeholders and minimal effects to the physical environment will require to be ensured through participation in the project and continuous consultations, evaluations and review of the design aspects throughout project implementation cycles.

Among the factors that need to be considered in this particular project implementation will include,

(i) Enhancing integration of environmental, social and economic functions in the project implementation.
(ii) The contractors and other players in the project activities be prevailed upon to implement the ESMP through a sustained supervision and continuous consultation.

8.2 Significance of ESMP

The purpose of the Environmental/Social Management Plan is to provide a

summary of the mitigation measures identified to which stage (design, construction, operation) they are relevant, who is responsible for ensuring that the actions are taken, and what the broad costs associated with the delivery of the items is predicted to be.

The ESMP outlined below will address the identified potential negative impacts and mitigation measures on the following project stages:

(iii) Construction Phases
(iv) Operation Phase and
(v) Decommissioning Phase

8.3 Key Players in Implementing the ESMP

In order to ensure the sound development and effective implementation of the ESMP, it will be necessary to identify and define the responsibilities of the various key players that will be involved in the project. The following entities will be involved on the implementation of this ESMP:

- DUWASA;
- Consultants;
- Contractor;
- The Financial
- The National Environmental Management Council (NEMC).

- **DUWASA**

The responsibility for ensuring that mitigation measures specified in this ESMP and the contract documents are implemented will lie with DUWASA. The Environmental Management Officer from DUWASA and if necessary, representatives from NEMC will undertake monitoring during construction and operation phases of the project. Also, will be responsible to

- Monitor ESMP and EMP implementation and ensure adequate environmental and social mitigation measures are implemented based on requirement standards, including Contractors and sub- contractors
- Ensure adequate stakeholder engagement plan is being implemented throughout the project implementation and operations.
- Liaise with all key stakeholders at government and community level throughout the project

- **The Consultant**

The appointed Consultant will be required to oversee the construction programme and construction activities performed by the Contractor, in compliance with the present ESMP. It is recommended that prior to commencement of actual construction; the Consultant should submit a work site plan that complies with the national environmental guidelines and an updated ESMP for the different phases of the work. The environmental plan should specify in particular the location of sources of materials, disposal area of construction debris and arrangements for

traffic management. The plan should take into consideration the mitigation measures proposed in this ESIA Project Report. The consultant should also appoint an Environmental Field Officer (EFO) and a Health and Safety Officer (HSO) who will be responsible for the following tasks:

- Drafting environmental aspects during project implementation;
- Managing environmental and safety aspects at the work sites;
- S/He shall participate in the definition of the no working-areas;
- Recommending solutions for specific environmental problems;
- Controlling and supervising the implementation of the ESMP;
- Preparing environmental progress or "audits" reports on the status of implementation of measures and management of work sites.

- **The Contractor**

The project will be implemented by Contractor and will be responsible for constructing the project in accordance with the Technical Specifications required. The Contractors will implement the project fully in accordance with the ESIA Mitigation measures. The Contractor will nominate an Environmental Site Officer (ESO) who will be the Contractor's focal point for all environmental matters. The ESO will be routinely on-site for the duration of the construction works.

- **The Financial**

The Government of the United Republic of Tanzania through the Ministry of Water have been financed to implement the project. The MoW intends to apply a portion of the funds to finance construction of the proposed project. The funding organization (AfDB) will have overarching responsibility to ensure that the Project is carried out to the highest environmental standards strictly in accordance with the ESIA and the mitigation measures set out therein. Additionally, it is a requirement of the funding Institution that environmental and social impacts are managed in accordance with the AfDB Operational Guidelines.

- **The National Environment Management Council (NEMC)**

The National Environmental Management Council of Tanzania will play a key role in monitoring the project during the construction and operational phases to ensure that the mitigation measures set out in chapter 9 above are fully implemented.

Table 8.1: Environmental and Social Management Plan

Phase	Impact	Mitigation Measures	Hierarchy Level	Responsible Institution	Time Frame	Target Standard	Annual Cost (TZS)
Pre-construction	Disturbance to the occupiers of the existing buildings	Move them to other office buildings where construction activities are not conducted	Minimization	DUWASA	Pre -construction phase	Minimal disturbance, Zero grievances	-
Pre-construction	Generation of demolition wastes	Proper waste management by collection of wastes to specific dump site	Avoidance	Contractor DUWASA	Pre -construction phase	Absence of demolition wastes to the project area	12,000,000
Pre-construction	Demolition Noise and vibration	Fencing the project area and use of sophisticated machines	Avoidance Minimization	Contractor	Pre -construction phase	Noise level not exceeding 85 dB and vibration level <10mm/s PPV	12,000,000
	Demolition dust	Fencing and regular watering of the project area	Minimization	Contractor DUWASA	Pre -construction phase	Dust level to meet allowable standard i.e <200 µg/Nm³	10,000,000
Pre-construction	Influx of job seekers	Recruiting	Avoidance	Contractor	Pre-construction	Hiring	-

Phase	Impact	Mitigation Measures	Hierarchy Level	Responsible Institution	Time Frame	Target Standard	Annual Cost (TZS)
		number of people required for the project	Minimization	DUWASA	phase	required number of employees for the project	
Pre-construction	Traffic disruption	Vehicles scheduling during hours with minimum traffic	Avoidance Minimization	Contractor	Construction phase	No traffic disruptions	-
Pre-construction	(Occupational health and safety risks) Exposure to Hazardous Substances such as dusts etc.	Awareness training on occupational safety and health Use of PPE	Avoidance Minimization	Contractor DUWASA	Pre-construction phase	Zero accidents and injuries	7,000,000
Construction	Soils and geological disturbance	Ensure safe excavation with shoring and slope banking	Minimization	DUWASA / Contractor	Construction Phase	No soil erosion and accidents at the area	3,000,000
Construction	Soils contamination	Use spill kits, shield waste areas, and prepare hazardous material control plans	Minimization	DUWASA / Contractor	Construction Phase	No oil spillage; Emergency response plan implemented	3,000,000
Construction	Air quality	Dust	Minimization	DUWASA /	Construction	Emission	4,000,000

Phase	Impact	Mitigation Measures	Hierarchy Level	Responsible Institution	Time Frame	Target Standard	Annual Cost (TZS)
	deterioration (dust due to earth movements)	suppression, fencing site, health checks, and PPE provision		Contractor	Phase	within allowable TBS standards	
Construction	Air quality deterioration (due to equipment emissions)	Use of sophisticated machines	Avoidance Minimization	Contractor	Construction Phase	Emission within allowable TBS standards	10,000,000
Construction	Noise and excessive vibration	Maintain machinery, schedule works during day, provide PPE	Avoidance Minimization	DUWASA / Contractor	Construction Phase	Noise level within 70 dBA	4,000,000
Construction	Solid waste generation	Sort and collect waste to dump sites Re -use other wastes for backfilling e.g soil wastes from excavation works	Minimization	Contractor	Construction Phase	No hazard waste disposal	3,000,000
	liquid wastes generation	Connect to public sewer for waste water disposal	Minimization	DUWASA	Operation phase	No waste water pollution to project area	1,000,000

Phase	Impact	Mitigation Measures	Hierarchy Level	Responsible Institution	Time Frame	Target Standard	Annual Cost (TZS)
		Re-use for gardening					
Construction	Occupational Health and Safety Impacts (Occupational health and safety risks) • Falls from Height • Machinery-Related Accidents • Exposure to Hazardous Substances • Electrical Hazards • Fire and Explosion Hazards • Manual Handling and Ergonomic Risks • Noise and Vibration Exposure • Inadequate Welfare and	Hiring a safety personnel member for the project, Conduct Risk assessment to identify risks, Raise the workers risks awareness, training on the use of PPE prepared and implement emergency plans, provide adequate and relevant PPEs, install warning signs, appoint assembly area, provide adequate and safe drinking water. Training on the use of	Avoidance Minimization	Contractor	Construction Phase	No injuries, accidents and health impacts	5,000,000

Phase	Impact	Mitigation Measures	Hierarchy Level	Responsible Institution	Time Frame	Target Standard	Annual Cost (TZS)
	Sanitation Facilities	equipment, machines and emergency procedures Proper housekeeping and hazard identification and reporting, install temporary and permanent electrical systems to certified standards.					
Construction	Landscape and visual destruction	Install perimeter fence Proper landscaping	Avoidance Minimization	DUWASA / Contractor	Construction Phase	No access to the construction site	3,000,000
Construction	Traffic jam and accidents	Schedule deliveries at night, signage, traffic management plan	Minimization	DUWASA / Contractor	Construction Phase	No road accidents; Road accessibility	2,000,000
Construction	Transmission of	Provide	Avoidance	DUWASA	Construction	Minimal	1,000,000

Phase	Impact	Mitigation Measures	Hierarchy Level	Responsible Institution	Time Frame	Target Standard	Annual Cost (TZS)
	HIV/AIDS	HIV/AIDS awareness, Local labor recruitment, Provision of Condoms			Phase	population influx; Zero HIV/AIDS transmission	
Operation	Solid waste generation	Sort, collect and transport wastes to dump sites	Minimization	DUWASA	Operation Phase	No haphazard waste disposal at project area	2,000,000
Operation	Liquid waste generation	Direct waste water to public sewerage system Re-use stormwater for gardening	Minimization	DUWASA	Operation Phase	No haphazard waste disposal	2,000,000
Operation	Increased energy consumption	Sensitize on efficient energy use, switch off lights, use energy saving lights	Minimization	DUWASA	Operation Phase	Efficient use of energy	7,000,000
Operation	(Occupational health and safety risks) Falls from Height, Electrical Hazards,	Implement OSHA guidelines, fire safety	Avoidance Minimization	DUWASA	Operation Phase	No injuries, accidents and health impacts	4,000,000

Phase	Impact	Mitigation Measures	Hierarchy Level	Responsible Institution	Time Frame	Target Standard	Annual Cost (TZS)
	Fire and Explosion Hazards, Ergonomic Risks, Inadequate Welfare and Sanitation Facilities	equipment, awareness to emergency plans and procedures to occupiers Safety awareness to occupiers, Appoint assembly point					
Operation	Risk of fire outbreak	Regular inspection to electrical wires and equipments , avoid flammable paints, install firefighting equipments Train the occupiers on firefighting procedures	Avoidance Minimization	DUWASA	Operation Phase	No fire outbreaks	5,000,000
Operation	Safety risks associated with earthquakes	Building has been designed to be seismic resilience as per	Prevention and Minimization	DUWASA Contractor	Operation phase	No effects of earthquakes	10,000,000

Phase	Impact	Mitigation Measures	Hierarchy Level	Responsible Institution	Time Frame	Target Standard	Annual Cost (TZS)
		geotechnical survey report for the project area conducted					
Operation	Increase demand of water supply	Install tanks, low-consumption fixtures, rainwater harvesting	Minimization	DUWASA	Operation Phase	Efficient use of water; Installation of water storage facilities	10,000,000
Operation	Air pollution (dust and odour)	proper waste disposal, clean areas regularly	Minimization	DUWASA	Construction and Operation Phase	Emission within standards; No odour	3,000,000
Decommissioning	Solid wastes (scraps and debris)	Segregate and recycle; adopt integrated waste management	Minimization	DUWASA Contractor	Decommissioning Phase	No haphazard waste disposal	5,000,000
Decommissioning	(Occupational health and safety risks) Machinery-Related accidents, Injuries from falling objects, Noise and Vibration Exposure	PPE provision, Safety awareness training,	Avoidance Minimization	DUWASA Contractor	Decommissioning Phase	No accidents injuries, and health impacts	5,000,000
TOTAL							**76,000,000**

CHAPTER NINE

9.0 ENVIRONMENTAL AND SOCIAL MONITORING PLAN

9.1 Introduction

Monitoring refers to the systematic collection of data through a series of repetitive measurements over a long period of time to provide information on characteristics and functioning of environmental and social variables in specific areas over time. It ensures compliance with regulatory measures and understanding the degree of implementation of ESMP and its effectiveness. The monitoring results are also used extensively during the environmental auditing. The EIA and EA regulations requires the Proponent to prepare and undertake monitoring plan and regular auditing. Monitoring is needed to check if and to what extent the impacts are mitigated, benefits enhanced and new problems addressed.

Baseline monitoring — the measurement of environmental parameters during a pre- project period and operation period to determine the nature and ranges of natural variations and where possible establish the process of change.

Impact/effect monitoring: Involves the measurement of parameters (performance indicators) during establishment, operation and decommissioning phase in order to detect and quantify environmental and social change, which may have occurred as a result of the project. This monitoring provides experience for future projects and lessons that can be used to improve methods and techniques.

Compliance monitoring: takes the form of periodic sampling and continuous measurement of levels of compliance with standards and thresholds — e.g. for wastedischarge, air pollution.

Mitigation monitoring aims to determine the suitability and effectiveness of mitigation programs designed to diminish or compensate for adverse effects of the project. To guarantee that mitigation measures are properly done, monitoring is essential. Table 9.1 provides details of the attributes to be monitored, frequency, and institutional responsibility and estimated costs. These costs are only approximations and therefore indicative. Costs that are to be covered by the Proponent should be included in the project cost.

Table 9.1: Environmental and Social Monitoring Plan

Phase	Impact	Parameter to be monitored	Monitoring Frequency	Monitoring Area	Measurement Unit	Target Level/ Standard	Responsibility	Annual Costs [Tshs].
Mobilization and Construction Phase	Soils and geological disturbance	Impacted area	construction phase	Project area	m^2	No soil erosion and accidents at the area	DUWASA	1,000,000
	Depletion of WaterResources	Water storage facilities Efficient use of water Reduction in watercost	Once every month	Project area	m^3	Installation of water storage facilities Efficient use of water	DUWASA	1,000,000
	Soils and groundwater contamination	Heavy metals	Once before construction to establish baseline information	Construction site The nearest existing water source	CFU/100ml Mg/l NTU Mg/l	CFU = 0 BOD < 300 Nitrate < 30	DUWASA	2,000,000

Phase	Impact	Parameter to be monitored	Monitoring Frequency	Monitoring Area	Measurement Unit	Target Level/ Standard	Responsibility	Annual Costs [Tshs].
	Air quality deterioration	TSP and PM_{10} SO_2 NOx CO_2	Once before the construction starts and three times during construction	Project area and area adjacent to the project area	$\mu g/nm^3$ hourly mg/kg (hourly) $\mu g/nm^3$ (24 hrs) ppm (1hr)	0.20 0.1 150 35	DUWASA	1,500,000
	Noise and excessive vibration generation	Noise level	Once before construction	Project area	dBA	70dBA w.r.t TZS	DUWASA	1,000,000
	Solid/liquid wastes generation	Quantity of Solid and Liquid wastes generated	Once during construction	Project area	Kg/day m^3/day	NA Efficient solid and liquid waste management	DUWASA	500,000

Phase	Impact	Parameter to be monitored	Monitoring Frequency	Monitoring Area	Measurement Unit	Target Level/ Standard	Responsibility	Annual Costs [Tshs].
	Health and safety Impact	Accidents and Injuries	Once every month	Project area	-Number of safety measures provided -Incidents and accidents -Frequency of water sprinkling	Zero accidents and injuries	DUWASA	500,000
	Traffic snarl up andaccidents	Traffic jam Accidents	Daily	Project access roads	Traffic	-No trafficjam -No accidents	DUWASA	500,000
	Population Influx and Transition of HIV-AIDS	New infections	Before construction works	Workers at the construction site	NA	No new cases of infections	DUWASA	500,000
Operation phase	Solid and liquid wastegeneration	Solid waste and Liquid waste	Once every month	Project area	-Kg/day -m^3/day	NA Efficient solid and liquid waste management	DUWASA	1,000,000
	Increased energy consumption and demand	Energy consumption	Once every month	Project area	-Electricity units -Litres -Kg	Efficient use of energy	DUWASA	1,000,000

Phase	Impact	Parameter to be monitored	Monitoring Frequency	Monitoring Area	Measurement Unit	Target Level/ Standard	Responsibility	Annual Costs [Tshs].
	Occupational Health and Safety Concern	-Hygiene -Health of workers -Number of accidents and injuries -downtimes	Once every month	Project area	-Number of safety measures provided -Incident s and accidents	Zero health and safety hazards	DUWASA	1,000,000
	Fire Outbreak	Fire exposure	Once every month	Project area	NA	No fire outbreak	DUWASA	500,000
	Blockage of seweragesystems	Sewerage systems	Once every six months	Project area	NA	Zero blockage of sewerage systems	DUWASA	1,000,000
	Increase demand ofwater supply	Water consumption	Once per month	Project area	m^3/day	Efficient use of water	DUWASA	1,000,000
	Air pollution (Dust; Source emissions; odour/foul smells)	TSP and PM10 SO2 $N0_2$ Ox CO2 Smell	Once per after six month	Project area	µg/nm3 hourly mg/kg (hourly) µg/nm3 (24 hrs) ppm (1hr)	0.15 0.1 150 35	DUWASA	2,000,000
	Solid wastes (scraps and other debris onsite)	Solid waste	Three months after decommissioning	Project area	NA	-As original as possible	DUWASA	5,000,000

Phase	Impact	Parameter to be monitored	Monitoring Frequency	Monitoring Area	Measurement Unit	Target Level/ Standard	Responsibility	Annual Costs [Tshs].
	Air, Water and Soil Pollution	Receiving environment	Six months after decommissioning	Project site and nearby surroundings	NA	-As original as possible	DUWASA	3,000,000
	Occupational Health and Safety Concern	Health of workers Number of accidents and injuries	Once every month	Project area	-Number of safety measures provide d -Incidents and accidents	-No accidents, injuries	DUWASA	5,000,000
TOTAL AMOUNT								**31,000,000**

CHAPTER TEN

10.0 COST BENEFIT ANALYSIS

10.1 Financial Cost Benefit Analysis to the Project

Cost-benefit analysis is normally done in the framework of feasibility study of an activity. The aim of cost-benefit analysis is to inform the project proponent to make a decision on whether it makes economic sense to continue with the project; whether the chosen option is a cost-effective alternative; the costs of alternative ways of delivering a service and the estimate of the size of a project. The costs may include:

- capital expenditures;
- operating and maintenance costs;
- staff costs;
- materials;

Environmental health and other social costs.Benefits may include:

- better, more cost-effective service delivery;
- better, understanding of the target business;
- accurate targeting of the resource;
- the avoided costs-being the costs of the existing or conventional service delivery option;
- potential for additional revenues generated from new resources;
- productivity savings; and
- Protection of environment and health; and provision of other social benefits.

10.2 Quantifiable and Non-Quantifiable Benefits to Communities

The benefit to the communities may be looked into different perspectives. The successful construction of the building with a wide range of different usage will make money for local contractors and services provider who will be involved in the project

e.g. Contractors, Architectures, Geotechnical Investigation Experts and other Consultants who in turn will pay taxes which will be used by the Government to provide social services to the community. The project activities will also generate employment during construction and operation of the project. As indicated in chapter two (2) the activities that will be accommodated by the project will provide direct employment to Tanzanians from all businesses and services.

In addition to the DUWASA building operational expenditure on local goods and services including staff wages, food and beverages, concession fees, utilities and maintenance, the building project demonstrates the indirect contributions through building and induced spending by staff. It also suggests demonstration effects around training, standards, and stimulation of private sector development, and

recognizes the additional benefits generated during construction. Generally, since the project has a positive net present value it will contribute to Tanzania's economic growth and development.

10.3 Possible Costs to Government

As already mentioned, the Government will directly and indirectly benefit from taxi generated during construction of the building. Apart from tax generation, the investment will also enhance the economic growth and ancillary private sector development spurred by the operations and activities associated with the project. The image of thegovernment in investment sector will also be enhanced nationally and internationally that will increase attractions from other local and foreign investors and ensure continued market growth.

10.4 Environmental Cost Benefit Analysis

Environmental cost benefit analysis is assessed in terms of the negative versus positive analysis. Furthermore, the analysis is considering whether the impacts can be mitigated and the costs of mitigation of the impacts are reasonable. The benefits that will be obtained as the result of implementation of management and monitoring plan includes improved air quality, health conditions of workers and the surrounding environment. As it has been mentioned in Chapter 6 and 7, the benefits of the project, in terms of financial and social benefit are substantial, the environmental impacts can be mitigated and the financial resources needed to mitigate the impacts are relatively small compared with the actual capital investment. This project shall have a significant impact on the economy of Tanzania especially in the construction sector.

10.5 Social Economic Cost Benefit Analysis

The project will directly enhance investment in various business and services and will indirectly enhance the image of Tanzania as preferred investment destination. All these will enhance employment opportunities to the Tanzanians, contributing towards poverty eradication activities. Positive impacts arising from the project include: job creation; promotion of the business enterprises in the community; improvement of the people's social and economic wellbeing leading to better livelihoods; better planning and provision of infrastructural services; increase in the value of properties in the project vicinity; improvement and expansion of investment opportunities, optimum use of land, improved security, and improved health status of the community among others. As it can be seen in the impact analysis, there are no serious negative social economic impacts. It can therefore be deduced that the social benefit outweighs the social costs that are anticipated.

CHAPTER ELEVEN

11.0 DECOMMISSIONING PLAN

11.1 Introduction

The initial operation period for the project is estimated to be fifty (50) years, when most of the installed facilities and technology is expected to become obsolete. However, the exact life span of the project cannot be predicted due to other factors including growing demand of the critical infrastructure of the office buildings ready for DUWASA; possibilities decommissioning may be necessitated by several factors including change of policy, rehabilitation/renovations, modification and additional infrastructures. There are three scenarios that can happen in the future:

i. Major rehabilitation and/or upgrading which could involve dismantling and erection of new project facility and/or support facilities.
ii. Development of a completely new project facility at a new site.
iii. Total demolition and removal of the project facility structure

In case of demolition, its activities will involve the removal of infrastructures and facilitieswhich may be used to other similar project for continued use; fixtures and fittings like roofing, timber, windows, doors and furniture dismantled from the buildings and also sold; the buildings and associated foundations will be demolished and the demolition waste recycled as core in foundations or road fill as commonly practiced disposal method for demolition waste.

Equipment and machinery

There will be heavy equipment and machines mobilized for demolition of main project facilities and all other structures that include excavators and trucks to transport debris and other demolished materials from the site to the dump site.

A Fuel and chemicals

All lubricants and oils used on equipment and machines including trucks will be stored in a sealed container at the site. Then all used lubricants and oils will be removed from the site by a licensed used-oil collector.

Man power

More than 30 workers will be required for demolition activities during decommissioning that include both skilled and unskilled labors will be hired.

11.2 Decommissioning Plan

This is a preliminary decommissioning plan that establishes feasible decommissioning schemes that can be accomplished without undue risk to the health and safety of the public and decommissioning personnel, without adverse effects to the environment, and within established guidelines and limits of the appropriate regulatory agencies. While not a detailed document, this preliminary plan will ensure that the decommissioning and ultimate disposal of the project facilities is considered during the initial design and construction of the project. The preliminary plan will remain a "living document," and revisions will be made throughout the operating life of the project. It must be reviewed periodically and revised to reflect any changes in the project construction or operation that might affect decommissioning. Prior to the initiation of actual decommissioning activities for the project and its support facilities, a detailed final decommissioning plan will be prepared and approved.

The final plan will be based on the preliminary plan and revisions, and will define specific activities and include safety evaluations of planned decommissioning methods, new technology, and the project status that will result from the decommissioning program. In addition, this plan must contain sufficient information to obtain any approvals needed from the appropriate regulatory agencies to proceed with decommissioning activities.

11.3 Purpose and Content

11.3.1 Purpose

The preliminary plan serves to establish decommissioning as an important considerationfrom the inception of the project, during design and throughout the operation of the project. The plan has the following purposes;

a) To ensure that project designers are cognizant of decommissioning activities during the initial design of the project. 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 decommissioning method of choice as the end of project life approaches.

c) To demonstrate to regulatory agencies that important aspects of decommissioningare considered as early as possible during the initial 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.

11.3.2 Plan Content

This preliminary plan provides a general description of decommissioning methods considered feasible for the project. The description demonstrates that the methods considered are practical and that they protect the health and safety of the public and decommissioning personnel.

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

Considerations include:

i. Provisions for adequate material-handling equipment.
ii. An estimate of manpower, materials, and costs anticipated to support decommissioning.
iii. A description of the anticipated final disposition and status of the project and site.
iv. A discussion demonstrating that adequate financing will be programmed for decommissioning.
v. Identification of records that should be maintained during project construction and operation which might facilitate decommissioning, including a set of “as built” drawings.

11.4 Preliminary Plan

11.4.1 Project demolition methodology and schedule

DUWASA shall fund and implement all aspects of project decommissioning, including but notlimited to, all engineering, environmental assessment, permitting, construction, and mitigation activities associated with the demolition of the project, in accordance with this Plan. DUWASA shall monitor environmental impacts during and after project removal to respond to defined events during the monitoring phase.

DUWASA shall remove the project and supporting structures safely and in a manner that:

- Minimizes environmental impacts;
- Restores the site to a condition suitable for multiple use; and
- Pays all dues (workers, government, suppliers etc.).

Project removal will begin six months after closure and continue for six months. Within the six months from closure DUWASA will inventory all components that need to be removedand or disposed. This inventory will include building structures to be demolished and machinery to be disposed of. This information will assist in the preparation of the final decommissioning plan, for approval by NEMC.

After the approval of the decommissioning plan the metal parts will be removed first

within the first month (this is important to ensure that they are not vandalized). The second month of the decommissioning will be used to remove concrete structures. Debris will be used as road fills for rural roads.

All disturbed areas will be landscaped and re-vegetated using indigenous trees.

Project decommissioning has five phases: (1) pre-removal monitoring; (2) permitting; (3) interim protective measures; (4) project removal and associated protective actions; and (5) post-removal activities, including monitoring of environment and socio-economic activities.

The first three phases will occur prior to removal of the project (i.e. within the first six months). The fourth phase — project removal and associated protective actions — will take place six months after closure. The fifth phase will begin after total removal, and due to the nature of the project, should continue for at least one year.

The description that follows outlines the activities that will occur in each phase and provides reference to detailed descriptions of each activity elsewhere in this Plan.

(1)Pre-removal monitoring: Pre-removal monitoring includes environmental and socio economic status of the project, and the surroundings. This monitoring is essential to identify if there is any environmental or social liability that needs 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.

(2)Permitting: DUWASA shall obtain all permits required to undertake removal of the projectfacilities. This basically will include NEMC, Dodoma City Council and Local Government Authorities

(3)Interim Protective Actions: This will take care of any interim protective measures that need to be implemented to protect human health and environment.

(4) Project Removal: As noted above, the removal of the project will be completed withinsix months.

(5) Post-Removal Activities: Post-project removal monitoring will continue for one year.

CHAPTER TWELVE

12.0 SUMMARY AND CONCLUSION

The study revealed that the proposed construction and operation of DUWASA office building has both socio economic and environmental benefits. It emerged that the benefits exceed the costs. Also, all the identified environmental impacts can be mitigated to a level of minimum or no significance throughout the project cycle. Further, none of the potential impacts would result to permanent irreversible damage on the ecosystem components.

Environmental monitoring is essential to track and sustain the effectiveness of the mitigation measures proposed in this report. An environmental monitoring plan has been prepared. The focus areas of monitoring cover air, noise, solid waste, water and energy resources, occupational health and safety, as well as local employment and economic impact of the project during construction and operations. The burden of mitigation measures largely lies with the project contractor under supervision by the proponent. Key observations are that most adverse impacts are short-term and will disappear once civil works ends. The Contract for the proposed project should bear relevant clauses binding the contractor to institute environmental mitigation as recommended in this study.

The core monitoring strategy for this project will be through site meetings, in which case, it is recommended that the City Environmental Officers shall be invited to such meetings. Other stakeholders such as City engineers should also attend such meetings to ascertain that measures towards securing the health and safety of workers have been put in place. It is the duty of the proponent to carry out annual environmental audits once it has been commissioned. This will be in compliance with the Environmental Management Act, 2004 and Environmental Impact Assessment and Audit Regulations (Amendments), 2018. The tentative budget allocated to implementation of mitigation measures has been indicated in the Environmental management and monitoring plan proposed in the report. It is the responsibility of the project proponent to allocate this budget to facilitate diligent implementation of the mitigation measures and minimize potential negative impacts at construction and operational phases of the project.

REFERENCES

1. Environmental Management (Environmental Impact Assessment and Audit)(Amendments) Regulations, 2018
2. Geopave, 2020, Geotechnical Investigation for the proposed construction of OSHA office building on Plot no. 23 Block A – NCC – Dodoma City Council
3. Socio Economic Profile, Dodoma City Council
4. United Republic of Tanzania (URT) (2004), Environmental Management Act(EMA), Government Printers, Dar es Salaam.
5. United Republic of Tanzania (URT) (2005), Environmental Impact Assessment and Audit Regulations *G.N No 339,* Government Printers, Dar es Salaam.
6. United Republic of Tanzania, 1990: Health Policy
7. United Republic of Tanzania, 1990: Employment Policy
8. United Republic of Tanzania, 1995: National Land Policy
9. United Republic of Tanzania, 1997: Mining Policy
10. United Republic of Tanzania, 1997: National Environment Policy
11. United Republic of Tanzania, 1999: Gender Policy
12. United Republic of Tanzania, 1999: Land Act No. 4 and Village Land Act No. 5
13. United Republic of Tanzania, 2000: Human Settlement Development Policy
14. United Republic of Tanzania, 2001: National Policy on HIV/AIDS
15. United Republic of Tanzania, 2001: The Dar es Salaam Water and SewerageAuthority Act no.12
16. United Republic of Tanzania, 2002: National Water Policy
17. United Republic of Tanzania, 2003: Occupational Health and Safety Act No. 5
18. United Republic of Tanzania, 2004: Environmental Management Act (2004) – Cap191
19. United Republic of Tanzania, 2005: The Environmental Impact Assessment andAudit Regulations, Dar es Salaam
20. United Republic of Tanzania, 2007: The Urban Planning Act No. 8 of 2007
21. United Republic of Tanzania, 2008: The Public Health Act
22. United Republic of Tanzania, 2009: The Water Supply and Sanitation Act No. 12
23. United Republic of Tanzania, 2009: Water Resource Management Act, 2009
24. United Republic of Tanzania, 2025: The Tanzania Development Vision
25. United Republic of Tanzania, The workers Compensation act
26. United Republic of Tanzania. The National Strategy for Growth and Reduction ofPoverty NSGRP)

APPENDICES

Appendix I: Approved Terms of References

1.0 INTRODUCTION

The detailed scope of Terms of Reference (ToR) is intended to guide the Consultant to address relevant environmental and social issues during the assessment process. Among others, the ESIA shall be conducted in accordance with the requirements of the Environmental Management Act (2004). The Consultant shall do everything necessary to meet the objectives of the services and not less than the following task that should be undertaken during the Environmental and Social Impact Assessment.

2.0 OBJECTIVE OF UNDERTAKING THE STUDY

The proposed project is listed on EIA Mandatory list of projects as per EMA, 2004 and EIA and Audit Regulations of 2005 (amended, 2018). Part IV of EIA regulations G.N. 349 of 2005 provides the general objectives for carrying EIA, among others list comprise the following;

- To ensure that environmental considerations are explicitly addressed and incorporated into the development decision making process.
- To anticipate and avoid, minimize or offset the adverse significant biophysical, social and relevant effects of development proposal.
- To protect the productivity and capacity of natural ecosystems and ecological processes which maintain their functions.
- To promote development that is sustainable and optimizes resources use and management opportunities.

3.0 PROJECT DESCRIPTION

Dodoma Urban Water Supply and Sanitation Authority (DUWASA) is an autonomous water utility legally charged with the delivery of water supply and sanitation services to urban residents of Dodoma City and the towns of Kibaigwa, Chamwino, Kongwa and Bahi. The Authority was established under section 3(i) of Cap. 272 of 1997 as repealed by Water supply and Sanitation Act No. 12 of 2009 and Act No. 5 of 2019. It was declared a fully autonomous entity by order of the Minister responsible for water sector on 13th February, 1998; and was officially inaugurated on 1st July, 1998.

DUWASA decides to construct eight (8) storey office building to accommodate its staff due to the fact that the existing building is exhausted, lack quality and modern office facilities and is not sufficient to accommodate all staffs. The building is aimed to provide enough space to accommodate about 317 staff and space for essential activities in order to ensure smoothness of workers daily activities and good services provision. The proposed site for the project has a total area of approximately 13,670 square metres.

The building will consist of the facilities such as office rooms, canteen, kitchen, conference rooms, gymnasium, toilets for disabled, ladies and gents, breastfeeding room, auditorium, archieves, record center and roof garden. The project will be funded by African Development Bank (AfdB). The project is intended to provide several employment and business opportunities and benefits during implementation and operation phases. The following groups are expected to benefit from the project;

4.0 SCOPE OF WORK

The EIA shall be conducted in accordance to the guidelines laid down by the Environment Management Act (EMA, 2004). The main steps to be followed by the Consultant during the preparation of the Environmental Impact Assessment (EIA) will involve: Identifying, collecting and analyzing information which includes:

- Project characteristics and activities;
- Baseline data of the environmental and socio-economic setup;
- Predicting impacts;
- Evaluating impact significance:
- Identifying and proposing mitigation measures:
- Preparing the Management and Monitoring Plan and Follow up; and
- Presenting the information which involves writing an environmental Impact Assessment Statement (EIS)

The Consultant shall provide description of the relevant parts of the project using maps of appropriate scale where necessary and include the following information: -

- Project justification.
- Location.
- General layout, size, and capacity;
- Pre-construction activities
- Construction activities
- Schedule of project activities
- Staffing and support.
- Facilities and services
- Operation and maintenance activities
- Life span

The Consultant shall carryout the following tasks;

Task 1: Stakeholders Consultation

The Consultant shall undertake an open and transparent consultation process to ensure that the views of interested and affected parties are and approximately incorporated in the project design.

Opinions of the stakeholders involved should be recorded for submission as part of the report. Meeting with Ward and village Committee shall be held to obtain

their views on the project and its implication to the environment and social aspects. Consultations with stakeholders have been undertaken in this scoping stage of the EIA. Main stakeholders and their concerns are elaborated. The Consultants shall carry this further during the EIA study

Task 2: Baseline Data and Information

Description of the study area

In order to cover assessment of all key issues related to the project, the study area should be much wider than waste stabilization ponds project area where many of the project facilities and services will be located. This is because some of the impacts might have local, regional or national implication. The Consultant shall, further determine and set the project boundaries particularly spatial boundaries (i.e. impact area coverage and area of influence).

Description of the Proposed Project

The Consultant shall provide description of the relevant parts of the project include the following information

- Location of all project-related development and operation sites;
- General facilities, project size, capacity;
- Project activities (Mobilization, construction activities; operation and decommission activities)
- Project life span

(a) Physical environmental this shall cover; topography; soils; climate and meteorology; surface and groundwater hydrology, existing water pollution discharges, and receiving water quality.
(b) Biological environment: flora; fauna; rare or endangered species; ecologically important or sensitive habitats, including parks or reserves, significant natural sites; species or commercial

Task 3: Description of the Environment

Assemble, evaluate, and present baseline data on the relevant environmental characteristics of the study area include information on any changes anticipated before the project commencement. Modify the lists below to show the critical information for this project category or which is relevant to it. Environmental characteristics of the study area shall be presented on a map to facilitate the understanding of the study area

Physical environment
This shall cover geology; topography; soils; climate and meteorology; ambient air quality; surface and groundwater hydrology; existing sources of air emissions; existingwater pollution discharges; and receiving water quality.

Biological environment: flora; fauna; rare or endangered species; ecologically important or sensitive habitats, including parks or reserves, significant natural

sites; species or commercial importance; and species with potential to become nuisances, vectors, or dangerous (of project site and potential area of influence of the project).

Socio-cultural environment; population land use; planned development activities community structure; employment; distribution of income, goods and services; recreation; public health; Gender issues and HIV/AIDS, Cultural/ historic properties; tribal peoples and customs, aspirations, and attitudes to the project.

Task 4: Legislative, Policies, Administration Framework

Describe the pertinent regulations and standards governing environmental quality, health and safety, protection of sensitive areas, protections of endangered species, siting, and land use control at international, national regional and local levels, The Consultant shall undertake a review of policies, legislation and administrative framework within which the environmental management of the proposed construction of office buildingwill be carried out. The following and any other relevant legislation and policies shall be reviewed: -

a. National Environmental Policy (NEP) of 2021
b. National Transport Policy (2002) National Mineral Policy (1997)
c. Construction Industry Policy (2003)
d. National Land Policy (1995)
e. Energy Policy (2003)
f. National Human Settlements Development Policy (2000)
g. National Gender Policy (2002)
h. The National Water Policy (2002)
i. National Forestry Policy (1998)
j. National Policy on HIV/AIDS (2001)
k. Environmental Management Act No. 20 of (2004), Cap. 191
l. The Land Act No. 4 of 1999 and the Village Land Act No. 5 of (1999)
m. The Water Resources Management Act No. 11 of 2009
n. The Water Supply and Sanitation Act No. 12 of 2009
o. Energy and Water Utilities Regulatory Authority Act, 2001
p. The Railways Act, 2002
q. Protected Places and Areas Act (1969)
r. Antiquities Act of 1964 (as amended in 1979) and the Antiquities Rules of1991
s. The Urban Planning Act (2007)
t. Land Use Planning Act (2007)
u. Occupation Health Safety (2003)
v. Local Government Acts No.7 & 8 of 1982
w. National Land Use Planning Commission Act 3/84
x. Explosives Act, 56/63
y. Regional and District Act No 9, 1997
z. The Land Acquisition Act 1967
aa. Employment and Labour Relations Act No. 6 0f 2004

bb. Engineers Registration Act and its Amendments 1997 and 2007
cc. The Contractors Registration Act (1997)
dd. The HIV and AIDS (Prevention and Control) Act of 2008
ee. The Local Government Laws (Miscellaneous Amendments) Act (1999)

Task 5: Analysis of Alternatives to the Proposed Project
Describe alternatives that were examined in the course of developing the proposed project and identify other alternatives, which would achieve the same objectives. The concept of alternatives extends to siting, design, technology selection, construction techniques and phasing, and operating and maintenance procedures. Compare alternatives in terms of potential environmental and social impacts; capital and operating costs; suitability under local conditions; and institutional, training, and monitoring requirements. When describing the impacts, indicate which are irreversible or unavoidable and which can be mitigated. To the extent possible, qualifythe costs and benefits of each alternative, incorporating the estimated costs of any associated mitigating measures. Include the alternative of not constructing the project to demonstrate environmental and social conditions without the project. Various environmental and social criteria should be developed to select the best office building project alternatives.

Task 6: Identification, Analysis and Assessment of Potential Impacts
The Consultant shall identify, analyse and assess environmental and social impacts ofthe proposed railway works. The Consultant shall distinguish between positive and negative impacts, direct and indirect impacts, and immediate and long-term impacts. Identify impacts that are unavoidable or irreversible. Wherever possible, describe impacts quantitatively, in terms of environmental components affected (area, number), environmental and social costs and quality of available data, explaining significant information deficiencies and any uncertainties associated with the predicted impacts.

An overview shall be provided of different groups of people and their cultural, ethnicsand socio-economic characteristics, and how they are likely to benefit and / or be negatively affected by the project. Negative impacts may include but not be limited to physical relocation, loss of land or other physical assets, or loss of access to livelihood. The significance of impacts of the proposed railway works shall beassessed, and the basis of this assessment shall be specified.
The Consultant should take into consideration existing by-laws, national and international environmental standards, legislation, treaties, and conventions that mayaffect the significance of identified impacts. The Consultant shall use the most up todate data and methods of analyzing and assessing environmental and social impacts. Uncertainties concerning any impact shall be indicated. The Consultant shall conducta review of gender issues in the project study shall include the rail section influence to the lives of men, women, and children, the elderly and disabled so as to come up with a quantifiable analysis of the benefits which will accrue to them during and after water supply network extension and boreholes drilling.

Task 7: Mitigation Measure
The Consultant shall suggest cost-effective measures for minimizing or eliminating adverse impacts of the proposed extension of water supply network and drilling of

boreholes. Measures for enhancing beneficial impacts should also be recommended. The costs of implementing these measures shall wherever possible be estimated and presented. If compensation is recommended as one form of mitigation, the Consultant shall identify all the names and physical addresses of people to be compensated.

The Consultant shall review the ongoing measures on HIV/AIDS awareness creation within the project area and proposed for the mitigation measures. The proposed shall include a 26 plan of action, which will identify responsible key implementers, time frame and expected output. Proposed mitigation measures and cost estimates shall be grouped in a separate Bills of Quantities (BOQ) for the project and should also include cost of supervision for the implementation of mitigation measures.

Task 8: Environmental and Social Management Plan (EMP)
The Environmental Management Plan focuses on three genetic areas

a. Implementation of mitigation measures, institutional strengthening and training, and monitoring. The Consultant shall prepare an Environmental and social Management Plan, which will include proposed work programme, budget estimates, schedules, staffing and training requirements and other necessary support services to implement the mitigation measures. Institutionalarrangements required for implementing this management plan shall be indicated. The cost of implementing the monitoring and evaluation including staffing, training and institutional arrangements must be specified. Where monitoring and evaluation will require inter-agency collaboration this should be indicated.

b. Identify institutional needs to implement environmental assessment recommendations. Review the authority and capability of institutions at local,regional, and national levels and recommend how to strengthen the capacity to implement the environmental and social management and monitoring plans. The recommendations may cover such diverse topics as new laws and regulations, new agencies or agency functions, inter-sectoral arrangements, management procedures and training, staffing, operation and maintenance training, budgeting, and financial support.

c. Prepare detailed arrangements to monitor the implementations of mitigating measures and the impacts of the project during construction and operation. Include in the plan an estimate of capital and operating costs and a description of other required inputs.

d. In the case of land acquisition, a Resettlement Action Plan should be prepared and implemented in according to the National Land and Village Land Act 1999. All properties to be affected by the railway project should undergo valuation for compensation.

Task 9: Development of Environmental Monitoring Plan
In preparation of the Monitoring plan the consultant shall ensure that the plan

consist the following:

(i) phases of the project;
(ii) identified impacts;
(iii) mitigation measures; and
(iv) parameter to be monitored.
(v) sampling area/points
(vi) frequency of monitoring
(vii) Standard/target level
(viii) responsible institutions
(ix) budget estimates

The consultant shall also:

i) determine and assess methods to monitor impacts for predicting accuracy remedial measures for effectiveness
ii) describe follow up scheme and post project action plan
iii) assess the level of financial commitment by the proponent for management and monitoring plan and follow activities

The consultant shall be guided by the cost-effectiveness principles in proposing mitigation measures. Estimation of costs of those measures shall be made. The assessment will provide a detailed plan to monitor the implementation of the mitigation measures and impacts of the project during construction and operation.

Task 10: Environmental Impact Statement (EIS)
The EIS document shall be concise and in line with EIS format stipulated in the Environmental Impact Assessment and Audit Regulations (2005) G.N. No. 349 0f 2005. The contents and the structure of the main text (EIS) shall be presented according to Regulations 18(1) and (2) of the Environmental Impact Assessment and Audit Regulation, 2005.

The Executive summary shall not be in separate document rather, shall be part of the EIS. The *contents* and *structure* of the Executive Summary shall be as per *Regulation 18 (3).* There shall be a *standalone/separate document* of Non-Technical Executive Summary to be both in *Kiswahili* and *English* languages stating the *key findings*, *conclusions* and *recommendations* as per the requirement *of Regulation 19(2) of the EIA and Audit Regulations of 2005.*

Submission of the EIS, Non-Technical summary and prescribed fees shall observe the requirements of Regulations 19 to 21 of the *EIA and Audit Regulations of 2005 (amended, 2018).*

Task 11: Review
The review report from NEMC may require further input (data collection, consultation inputs etc.). The consultant shall undertake to provide extra information and inputs until the project review is satisfactorily concluded.

5.0 DURATION

The expected duration of the assignment is four (4) weeks.

6.0 REPORTING

The ESIA reports should be concise and limited to significant environmental Issues. The Main text should focus on findings, conclusions, and recommended actions supported by summaries of the data collected and citations for any references used in interpreting data. Detailed or un-interpreted data are not appropriate in the main text and should be presented in appendices or separate volume. Unpublished documents used in the ESIA may not be readily available and should also be assembled in appendices. Organized the ESIA may not be readily available and should also be assembled in appendices. Organized the ESIA reports according to the outline in the Environmental Impact Assessment and Audit Regulations (2005) and it amendments of 2018. The main report contains separate an Executive Summary both in English and Swahili.

7.0 RECORDS OF MEETINGS

The consultants shall provide record of the names of organizations, government and departments and individuals whose views will be obtained. The record will also provide description of views and information that will be obtained.

8. REFERENCES

The objective of this section is to identify and record the written materials used in the study. This is extremely important because some of the material used as back ground information may be in unpublished form, and yet it may be necessary that these are available.

9.0 STUDY TEAM

The Environmental Management Act (EMA) requires the ESIA assignment to be conducted by registered experts qualified by NEMC.

The consultants shall deploy consultants/experts with the demonstrable practical experience in conducing EIA studies, with specific experience in environmental engineering, environmental management, water resources and sociology.

PROPOSED TEAM OF EXPERT

Team Leader (Registered EIA Expert)

Mr . Majaha Malongo

Mr. Majaha Malongo is a registered environmental expert under National Environmental Management Council; he is holding a Master degree in Environmental Science and Management specialized in environmental management and risk assessment.

Other Supporting Experts

Maria Hollela

Ms. Maria Hollela is an environmental specialist, appointed environmental inspector and registered environmental expert; she is holding a Master degree in Environmental Sciences and Management, specialized in environmental management she is also an expert in occupational health and safety management.

Eng. Orest John

Orest John is a registered engineer under Engineers Registration Board (ERB). He is holding a bachelor of Science in Environmental Engineering; specialized in project implementation and management.

Deodatus Mushumbusi

Deodatus Mushumbusi is a registered Architecture; holding a bachelor degree in Architecture with experience in construction industry**.**

Veronica Kubena

Ms. Veronica Kubena is a sociologist, specialized in social activities; she is holding a bachelor degree in Sociology and Development.

Appendix II: Screening Letter

THE UNITED REPUBLIC OF TANZANIA
VICE PRESIDENT'S OFFICE
NATIONAL ENVIRONMENT MANAGEMENT COUNCIL (NEMC)

In reply please quote:
Ref: HD.88/145/236/02

28 February,2025

Managing Director,
Dodoma Urban Water Supply and Sanitation Authority (DUWASA)
P.O. Box 431,
DODOMA.

Dear Sir/ Madam,

Re: THE ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENTFOR THE PROPOSED CONSTRUCTION OF EIGHT (8) STOREY OFFICE BUILDING FOR DODOMA URBAN WATER SUPPLY AND SANITATION AUTHORITY AT PLOT NO.1, BLOCK F, NCC-LINK TAMBUKARELI STREET, KILIMANIWARD, DODOMA CITY, DODOMA REGION

Please, refer to the above-mentioned heading.

2. The National Environmental Management Council (NEMC) acknowledges receipt of your documents submitted on 28thFebruary,2024 allotted with the number EC/EIA/2024/9484.Having reviewed your Scoping Report, the Council decided that, theEnvironmental Impact Assessment (EIA) study is required. Also, the Council reviewed your ToR's and found that they are generally adequate to guide the EIA study. In this regard, you are required to prepare and submit six (6) hard copies and a soft copy of the Environmental Impact Statement (EIS) for review. Please, observe the following while preparing the EIS:

i) Detailed stakeholders consultation including but not limited to Occupational Health and Safety Authority, Fire and Rescue Force, Wami/Ruvu Basin Water Board, Dodoma City Council, Geological Survey of Tanzania (GST), National Construction Council (NCC), Relevant Ward/Mtaa office and neighbours;
ii) The contents and organization of the report should comply with the requirements of EIA and Audit Regulations, 2005 and its amendments of 2018, particularly Regulation 18(2)(a) i to xvi;
iii) The Environmental Impact Statement should have the following attachments;
    a) Detailed architectural drawings and site layout plan of the project (provided in A3 type);
    b) Land ownership certificate;
    c) Authentic geotechnical survey report;
    d) Other relevant licences and permits;

Central Zone Office, Kambarage Tower, 6th Floor, P.O. Box 2724, Dodoma. Phone: +255 262963859, +255 262963860, Email Address: nemcdodoma@nemc.or.tz Website: www.nemc.or.tz

3. The budget for review and approval activities amounts to TZS 5,000,000.00 as stipulated in the Environmental Management (Fees and Charges) Regulations, 2021 for type A projects. Take note that the mentioned amount excludes the transportation cost for the site verification team to visit the project site and return from the NEMC Central Zone Dodoma Office. Therefore, you will make arrangements for the site verification team to visit the project site.

4. In case you need further clarification on this process please contact us through Tel. No. 0622333533

5. Thank you for your continued cooperation.

Novatus F. Mushi
For: Director General

CC: MajahaMalongo
P.O. Box 138
Dodoma, Tanzania

Appendix III: Stakeholders Consulted For The Project

SIGNATURE OF CONSULTED STAKEHOLDERS

ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PROPOSED EIGHT (8) STOREY OFFICE BUILDING FOR DUWASA AT PLOT NO 1 BLOK F NCC -LINK TAMBUKARELI STREET, KILIMANI WARD, DODOMA CITY,DODOMA REGION.

PROPONENT: DODOMA URBAN WATER SUPPLY AND SANITATION AUTHORITY (DUWASA)

P.O.BOX 431 DODOMA TANZANIA

S/N	NAME	DATE	POSITION	INSTITUTION	PHONE	SIGNATURE
1	IMP HAMADI DADI	17.10.2024	FIRE MARSHAL	FIRE	0719872245	[signature]
2	ATATILE MWAMGALE	23.10.2024	HEALTH INSP	OSHA	0712799543	[signature]
3	JOHN MAHINA	23.10.2024	ENGINEER	TARURA	0755438888	[signature]
4	Dr Vandesty Hilly	30.10.2024	CNEC	Dodoma City	0782989707	[signature]
5	ANNA P NADE	30.10.2024	TPO	Dodoma City	0719731055	[signature]
6.	PAUL PASTORY Paul	30.10.2024	PHRO	TANESCO	0719232131	[signature]

SIGNATURE OF CONSULTED STAKEHOLDERS

ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PROPOSED EIGHT (8) STOREY OFFICE BUILDING FOR DUWASA AT PLOT NO 1 BLOK F NCC -LINK TAMBUKARELI STREET, KILIMANI WARD, DODOMA CITY,DODOMA REGION.

PROPONENT: DODOMA URBAN WATER SUPPLY AND SANITATION AUTHORITY (DUWASA)

P.O.BOX 431 DODOMA TANZANIA

S/N	NAME	DATE	POSITION	INSTITUTION	PHONE	SIGNATURE	COMMENTS/REMARKS
1	PRISCUS R. KAOPA	05/03/2025	Manager (ENG)	GEOLOGICAL SURVEY OF TANZANIA	0789054348	[signature]	I advice to conduct geotechnical survey on the site prior to construction.
2	HAPPINESS P. KORUGOBA	05/03/2025	EMO	CCD	0764041639	[signature]	See the attached consultation's form.
3	ATHANAS M. SUGWA	07/03/2025	SQS	NCC	0678633936	[signature]	Proceed as per Construction legal requirement.

MAHUDHURIO YA KIKAO CHA KAMATI YA MTAA WA SALMINI NA VIONGOZI WA DINI WA KUJIHOFANYIKA 28/02/2025

	JINA	CHEO	SAHIHI	NAMBA ZA SIMU
1	LISTER SIMON PETER	M/KITI		0717-790360
2.	MARIAM A. SONGORO	KNY-MEO		0755552704
3.	KASSIM MUHUJA	MSUMBE		0754752495
4	HAWA KIPUTIPUTI	—11—	Hputiputi	0745977170
5	FESTO MIKA	—11—	Mika	0756289941

OFISA MTENDAJI WA MTAA
MTAA WA SALMINI
KATA TAMBUKAREL

SIGNATURE OF CONSULTED STAKEHOLDERS

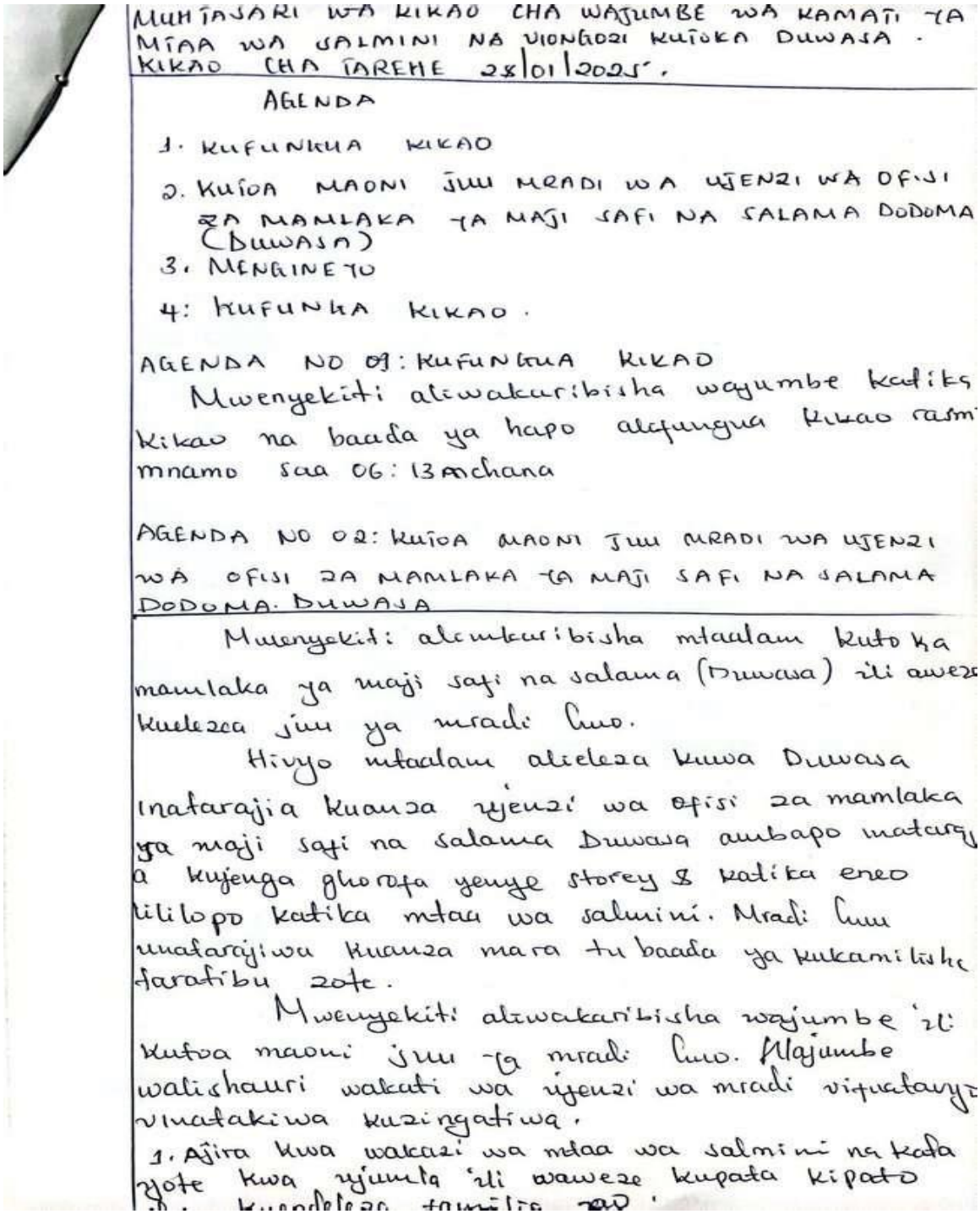
ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PROPOSED EIGHT (8) STOREY OFFICE BUILDING FOR DUWASA AT PLOT NO 1 BLOK F NCC -LINK TAMBUKARELI STREET, KILIMANI WARD, DODOMA CITY,DODOMA REGION.

PROPONENT: DODOMA URBAN WATER SUPPLY AND SANITATION AUTHORITY (DUWASA)

P.O.BOX 431 DODOMA TANZANIA

S/N	NAME	DATE	POSITION	INSTITUTION	PHONE	SIGNATURE
1	LISTER SIMON PETER	28/02/2025	M/KITI	SALMANI	0717-790360	
2	MARIAM A. SONDERO	28/02/2025	KNY-MED	SALMANI	0755552744	
3	KASSIM MUHIJA	28/02/2025	MJUMBE	SALMANI	0754752488	
4	HAWA KIPUNIPUTI	28/02/2025	—11—	SALMANI	0745977820	
5	FESTO MIKA	28/02/2025	—11—	SALMANI	0788259745	

Appendix IV: Minutes Of Meetings With Local Government And Community Meeting at Tambukareli Ward



MUHTASARI WA KIKAO CHA WAJUMBE WA KAMATI YA MTAA WA SALMINI NA VIONGOZI KUTOKA DUWASA. KIKAO CHA TAREHE 28/01/2025.

AGENDA

1. KUFUNGUA KIKAO
2. KUTOA MAONI JUU MRADI WA UJENZI WA OFISI ZA MAMLAKA YA MAJI SAFI NA SALAMA DODOMA (DUWASA)
3. MENGINEYO
4. KUFUNGA KIKAO.

AGENDA NO 01: KUFUNGUA KIKAO

Mwenyekiti alewakaribisha wajumbe katika kikao na baada ya hapo alifungua kikao rasmi mnamo saa 06:13 Archana

AGENDA NO 02: KUTOA MAONI JUU MRADI WA UJENZI WA OFISI ZA MAMLAKA YA MAJI SAFI NA SALAMA DODOMA. DUWASA

Mwenyekiti: alemkaribisha mtaalam kutoka mamlaka ya maji safi na salama (Duwasa) ili aweze kueleza juu ya mradi huo.

Hivyo mtaalam alieleza kuwa Duwasa inatarajia kuanza ujenzi wa ofisi za mamlaka ya maji safi na salama Duwasa ambapo watarajia kujenga ghorofa yenye storey 8 katika eneo lililopo katika mtaa wa salmini. Mradi huu unatarajiwa kuanza mara tu baada ya kukamilisha taratibu zote.

Mwenyekiti alewakaribisha wajumbe 'ili kutoa maoni juu ya mradi huo. Wajumbe walishauri wakati wa ujenzi wa mradi vifuatavyo vinatakiwa kuzingatiwa.

1. Ajira kwa wakazi wa mtaa wa salmini na kata yote kwa ujumla 'ili waweze kupata kipato

Appendix V: Right Of Occupancy

TITLE No. 11312 DLR
REGISTERED 11-10-2006
at 1:08 P.M.
Assistant Registrar of Titles

CDA/DED/TRU/PA: 8773
CDA/L.O. NO. 96253/5917

CAPITAL DEVELOPMENT AUTHORITY

GROUND LEASE NO. 5917

LEASE AGREEMENT

Made and entered into this 01st day of SEPTEMBER 20.05

BETWEEN

CAPITAL DEVELOPMENT AUTHORITY, a body corporate established under the Public Corporations Act, 1969 by the Capital Development Authority **(ESTABLISHMENT)** order Government Notice No. 230 of 1973, as amended by the Public Corporations Act No. 2 of 1992 of P. O. Box 913, Dodoma (hereinafter referred to as "the Lessor") of the one part,

AND

DODOMA URBAN WATER AND SEWERAGE AUTHORITY a body corporate established by Act of Parliament of P. O. Box 431 DODOMA (hereinafter referred to as "the Lessee") of the other part

THIS AGREEMENT WITNESSES as follows:
WHEREAS the Lessor has been endowed with Right of Occupancy registered in the Land Registry at Dodoma under **Title No. 4585 DLR** in respect of land within the Capital Development Area as described in the Dodoma National Capital Planning Order Government **Notice No. 63 of 1978**, except alienated lands and in the terms thereof is authorised to grant Leases; the Lessor hereby enters into a Lease Agreement (hereinafter referred to as "the Lease") whereby the Lessor demises and the Lessee takes a piece of land (hereinafter referred to as "the land") for a term of **thirty three years** commencing on **01st** day of **January 2005** and expiring on **31st** day of **December 2037** according to the true intent and meaning of the **Land Act, 1999** and subject to the provisions thereof and to any regulations made thereunder and to any enactment in substitution therefore or amendment thereof and to the following special conditions:

PART A: THE LESSEE SHALL

1. **PAY** in advance to the Lessor the following Ground Rent and/or other charges of shillings **three hundred forty one thousand eight hundred thirty (shs. 341,830/=)** on the first day of July in each year of the term without any deduction **PROVIDED** that the rent may be revised after every five years thereafter.

2. **ERECT** or cause to be erected on the land a building or buildings (hereinafter referred to as "the improvements") in such materials and in accordance with specifications as the Lessor may require, and to that end shall:

TANGANYIKA
STAMP DUTY PAID ON
ORIGINAL Sh. 2001=

Stamp Duty Shs. 2001= Paid
and Revenue Receipt No. 0212 2779

i. on or before the 30th day of **June 2005** submit for approval by the Lessor such plans, drawings, specifications and other information as may be required by the Lessor in respect of the improvements proposed to be erected;

ii. within **six** months from the date of notification by the Lessor of approval of the aforementioned development proposals, commence building on the land and the improvements in accordance with such plans and specifications;

iii. proceed continually from the commencement of building and complete the improvements in accordance with the plans and specifications so that they are capable of use and occupation on or before the 31st day of **December 2007.**

iv. throughout the remainder of the term hereby granted have and maintain the land and the improvement to the satisfaction of the Lessor;

v. comply with such other conditions relating to the improvements as may be contained in the annexture hereto, if any.

3. **NOT** erect or commence to erect on the land any building, buildings or other structures, except with the prior written consent of the Lessor.

4. **NOT** subdivide the land or assign sublet or otherwise dispose of or deal with whole or any part of the land or the improvements thereon without the prior written consent of the Lessor.

5. **MAINTAIN** and protect all beacons on the land and be responsible for the cost of replacing any such beacons that may be missing or destroyed.

6. **BE** liable to pay any and all costs arising herefrom and in particular:-
   i. any fees or stamp duties which may be discovered to be payable in connection with the Lease.

   ii. an amount or amounts leviable by the duly authorized institutions by way of rates or like local property taxes.

   iii. an amount or amounts equal to any rates or like levy paid by the Lessor in respect of the land or improvements thereon.

   iv. such sum as the Lessor shall assess as a proper share attributable to the land of the cost of making up the roads or improvements of the same upon which the land fronts, abuts or adjoins, whether demand for such sum is made during or after such making or improvement thereof. (This condition does not oblige the Lessor to make up or improve the roads).

7 **USE** the land solely for residential purposes use group 'I.' use class (a) as defined in the Town and Country Planning (Development and Zoning) (Capital Development Area) Regulations, 1979

8 **BE** responsible, where applicable:-

   i. for protecting and preserving throughout the term of the lease all the existing and future infrastructure facilities on the land. Any damage, destruction or loss caused thereto shall be made good at the Lessee's expense.

ii. for further protecting and conserving existing and future horticultural amenities such as trees, flower gardens etc provided within or immediately adjoining the land. Any damage, destruction or loss caused thereto shall be made good at any time at the lessee's expense.

9. **YIELD** up to the Lessor the land and improvements in good order and condition upon determination of the Lease by effluxion of time or otherwise.

PART B: THE LESSOR SHALL

1. **ENSURE** that the lessee paying ground rent and/or other charges hereby reserved in **PART "A"** Clause 1 hereof and complying with other terms and conditions hereinbefore contained shall peaceably and quietly hold and enjoy the land and improvements during the said term without interruption from the Lessor or any other person claiming under or in trust for the Lessor.

2. **NOTWITHSTANDING** the restrictions contained in **Part "A"** Clause 4 hereof permit the Lessee to grant a sublease or subleases in respect of the land and improvements for a term or terms not exceeding five years, provided the Lessee has complied with the development conditions set out in **Part "A"**, Clause 2 hereof.

3. **UPON** breach by the Lessee of any of the foregoing terms and conditions re-enter upon the land and improvements thereon and forfeit the Lease and immediately thereupon the said term shall absolutely determine and whenever this power of re-entry and forfeiture shall arise the Lessor shall serve upon the Lessee a written notice specifying the nature and extent of the breach and requiring the Lessee to remedy the breach within the time to be specified in the said notice and also the action to be taken by the Lessor if the breach is not remedied within the specified period.

4. **GRANT** to the Lessee at the lessee's option and on satisfactory performance of the obligations hereinbefore contained, an extension of the Lease on such terms and conditions as may be agreed by the parties provided that the Lessee serves upon the Lessor not more than six months notice in writing prior to the expiry of the Lease provided that such an extension will not be granted where the land is required by the Lessor for other development.

PART C: ARBITRATION

In the event of any dispute arising between the parties hereto in respect hereof either the Lessor or the Lessee may apply for arbitration to the Minister for the time being responsible for land matters and the Minister's decision shall be binding on both parties.

SCHEDULE

All that land known as Plot No. 1 Block 'F' NCC LINK (Mlimani) Dodoma Municipality being part of the land within the Capital Development Area registered under certificate of **TITLE NO. 4585-DLR** containing **thirteen thousand six hundred seventy (13670)** square metres, shown for identification only edged red on the plan attached to this Lease Agreement and defined on the registered Plan Numbered **46061** deposited at the office of the Director of Surveys and Mapping at Dar es salaam.

We the **LESSOR** and the **LESSEE(S)** hereby accept the terms and conditions contained in the foregoing Lease Agreement.

SEALED with the **COMMON SEAL** of the said **CAPITAL DEVELOPMENT AUTHORITY** and **DELIVERED** in the presence of us this 01st day of SEPTEMBER 20.05

Signature: .....
Name: **ABDARAHAMANI KIVATIRO OMARI MBWAMBO**
Postal Address: **P.O. BOX 913, DODOMA**
DODOMA.

Qualification: **AG. DIRECTOR GENERAL**

Signature: .....
Name: **AHMAD SALUM KILINGO**
Postal Address: **P.O. BOX 913**

DODOMA
Qualification: **CORPORATION SECRETARY**

Seal

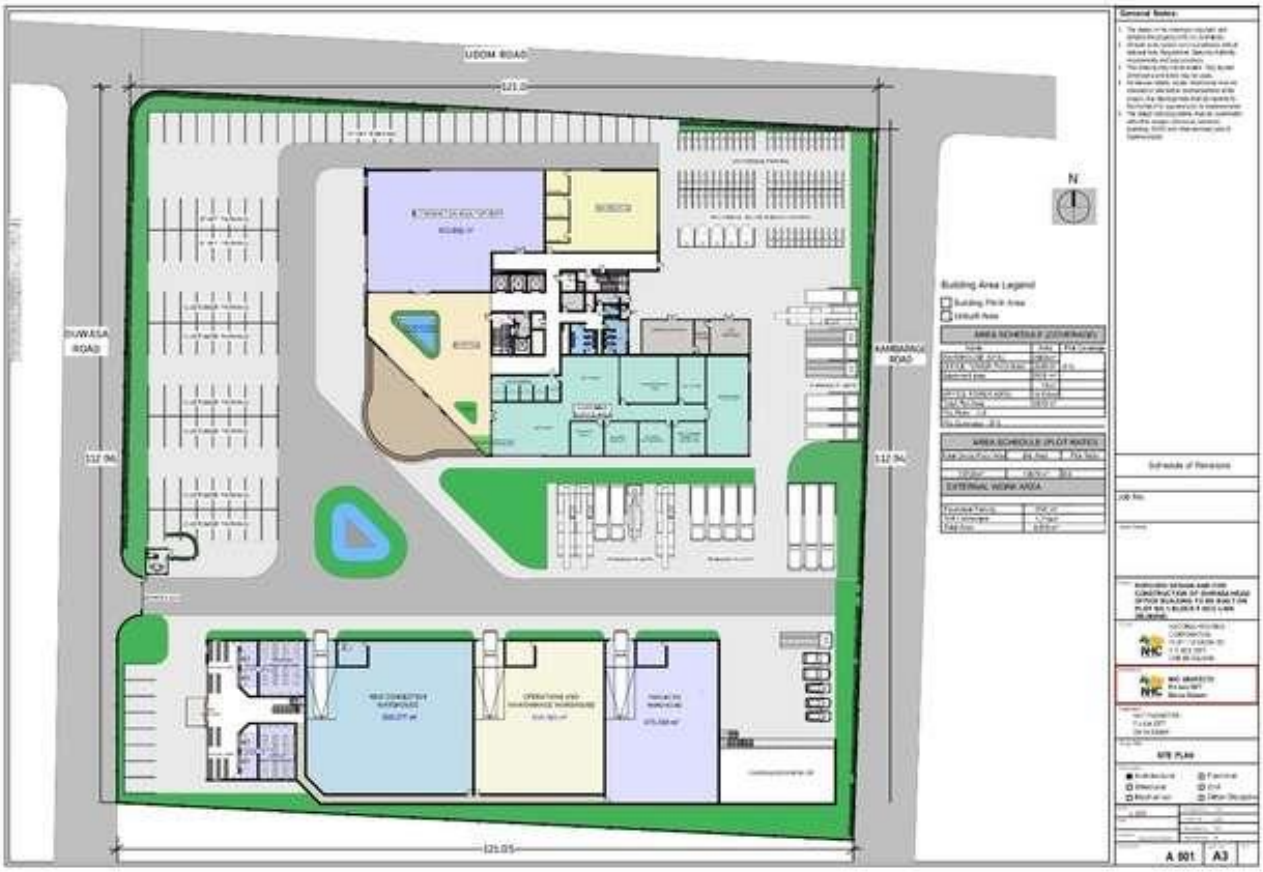
SEALED with **COMMON SEAL** of the said **DODOMA URBAN WATER AND SEWERAGE AUTHORITY** and **DELIVERED** in the presence of us this 01 day of SEPTEMBER 2004

Signature: .....
Name: PETER A. MDACHI
Postal Address: P.O.BOX 931
DODOMA
Qualification: Managing Director

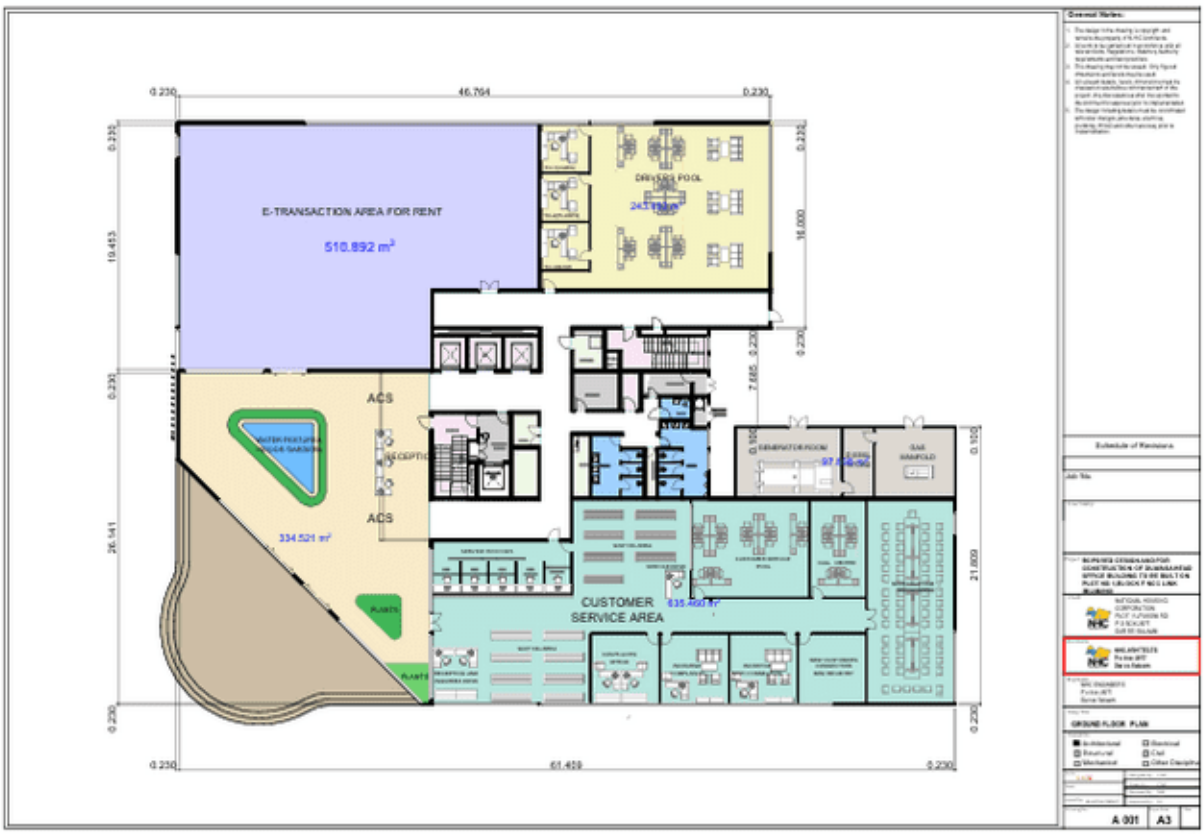
Signature: .....
Name: Mary J.E. MASSAM
Postal Address: P.O.BOX 2208
DODOMA
Qualification: ADVOCATE

Seal

Appendix VI: Site Plan



Appendix VII: Floor Plan



Appendix VIII: Emergency And Response Preparedness Plan

1.0 INTRODUCTION

The purpose of this Emergence Response Plan is to adequately save lives and avoid injuries, safeguard property and records and also establish procedures, responsibilities, resources and an organizational chain of response to emergency cases occurring within daily project operations andthe community leaving near by the project area.

This plan will be handling man-made or natural events including fire, hazardous material, , medical injuries, explosion, civil disturbances, earthquake, etc.

2.0 EMERGENCE RESPONSE PROCEDURES

Fire Emergences

All building occupants are requested to observe and discover evidences of fire including:

- Smoke
- Burning smell
- Abnormal heating of any material or machines

Fire response Plan (For Large Fires)

- Use emergency communication systems to notify Emergency coordinator / Supervisor (Mobile no: 0715783666 and 0768336699 of the location of the scene immediately.
- The Doors in the large building should be opening outwardly so as to easier outsidemovements of people from the building
- Activate nearest fire alarm.
- Alert people that there is a fire within the building.
- Rescue any person in immediate danger to safety as long as it is safe to do so.
- If clothing of person is on fire, cover the person with fire blankets or if it is not availableor use water if showers are available.
- Proceed to nearest exit and evacuate the building area using the nearest exist
- Close door behind you to contain any smoke and prevent fire from spreading (if fire hasoccurred in the building).
- Go to the emergency assembly area and do not re-enter the building until it is safe to doso.
- If you are unable to get out of the room, use what you have to prevent smoke from enteringthe room under doors etc.
- Try to draw attention to the area you are trapped in; phone, use window or call for help. (Most fires related deaths are from smoke inhalation).

For small fires:

- Only use a fire extinguisher if the fire is very small and you know how to do it safely

- Extinguish the fire without evacuation. Use properly the fire extinguisher located in your area however, personnel must be properly trained.
- If you have doubts of the proper operations of the extinguisher and or fire extinguishing is ineffective, evacuate immediately from the building.
- Call firefighting crew immediately for assistance

3.0 ACCIDENT / INCIDENT REPORTING OBLIGATION

- All incidents / accidents must be reported.
- Notify the Manager responsible, Safety Manager and Environmental personnel if the Accident/Incidents have led into Environmental impacts.
- Report all incidents and accidents using Incident/Accident form to ensure that corrective measures are in place to prevent re occurrence in future.
- The filled Incident and Accident form will be signed off when all corrective actions arealready done.

4.0RESPONSIBILITIES

Employees/ Occupants

- Occupants/Employees are responsible to ensure that all incidents or suspicious situations are reported immediately.
- When fire alarm signal has sounded or shout for fire, employees are required to Immediately evacuate the building and If possible, knocking on their neighbor's doors andwhile saying – EMERGENCE, GET OUT!
- Familiarize with the Emergence Response Plan.
- To use appropriate PPE as recommended by Safety personnel especially employees working with chemicals, noise and dust environment.
- To know where the assembly point is.

Office Supervisor/Emergence Coordinator

- Emergence Coordinator or Office Supervisor will be responsible to organise the rescue team (Fire crew, first aiders and emergency response team) during emergencies cases.
- To identify OHS training needs depending upon the existing requirements.

Emergence Respond Team

- To quickly respond and evacuate the facility within the designated timeframe and follow all other procedures as listed in the emergency
- plan.

- Know where emergency and first aid equipment are found in the

building (s) and how touse such equipment.

- Know the Emergency numbers and understand how the chain of command works.

5.0 TRAININGS PROGRAMS

- Safe working procedures and trainings in the safe handling of chemicals and hazardous substances, and also appropriate storage facilities and personal protective equipment, mustbe provided.
- Employees will be trained depending upon the Training needs of each section.
- Occupational Health, Safety and Environmental Meetings will be held in monthly basis to ensure that issues arise from each department are communicated and managed accordingly.
- Key personnel will be trained on evacuation procedures, use of fire equipments, first aidprocedure etc.
- Notices indicating contact details for first aiders or appointed persons, the emergency contact number, and where the first-aid box is, must be posted at the site.

6.0 PENALTIES

Any person who will not act positively to this plan will be taken to disciplinary committee

7.0 EMERGENCE CONTACT DETAILS

Table: List of Emergency Preparedness plan

S/N	NAME OF INSTITUTION	TITLE	CONTACT
1.	FIRE & RESCUE FORCE	Fire Inspector	0717158253
2.	DUWASA	Customer Services	+255 26 2324245

APPENDIX IX: Geotechnical Report

1. INTRODUCTION

Geoscientific investigation is an important aspect in infrastructure construction projects as it helps avoid geo-hazard prone areas and eventually minimize the impacts resulting from geo-tectonic activities. The best practice on global perspective is that man-made structures such as houses, dams, bridges and roads are designed from the collected data that intend to achieve optimal operations and safety to people and the environment. The information collected for the purpose of this work include: geophysical data (high-resolution airborne and detailed ground total magnetic intensity data), geological data (identification of lithological units, their distribution, and structures), and geochemical data (soil sampling and analysis).

The Dodoma Urban Water supply and Sanitation Authority (DUWASA), owner of the plot under consideration, assigned the Geological Survey of Tanzania (GST) to undertake a geoscientific investigation to assess the suitability of the plot for a construction project. This undertaking was based on the fact that the Government of Tanzania, through the Prime Minister's Office, has taken initiatives that require the assessment of sites on account of geological hazards to be conducted prior to the construction of any public building. Dodoma Region is located within the seismically active Eastern Branch of the East African Rift System (EARS). The Eastern Branch of the EARS runs through Mara, Arusha, Simiyu, Manyara, Singida, Dodoma and northern part of the Iringa Region. The region has experienced earthquakes to a magnitude of 5.5 in the Richter scale. Though there has been no potential damage caused by earthquakes in the region, it has been a necessary requirement to conduct assessment on geological condition.

GST has completed geoscientific investigation that took six (6) days, from 12th to 17thJune of 2025. The work entailed of physiographical survey, surface geological investigation, geochemical assessment and geophysical survey for subsurface geological structures.

1.1 Location and Accessibility

The plot is administratively located at Uzunguni Ward within Dodoma District in Dodoma Region. It is located on the south direction of Dodoma City, as illustrated in Figure 1 and detailed by coordinates in Table 1. Access to the plot is available via a tarmac road that leads to the University of Dodoma about 2 km from the city center.

Table 1: Coordinates of the project area (UTM Zone 36S Arc 1960).

Corner Point	UTM		Geographical coordinates	
	X (Easting)	Y (Northing)	Longitude	Latitude
A	804730	9315580	35.75336713	-6.185347003
B	804616	9315600	35.75233697	-6.185171608
C	804634	9315713	35.75249419	-6.184149633
D	804639	9315716	35.75253919	-6.18412229

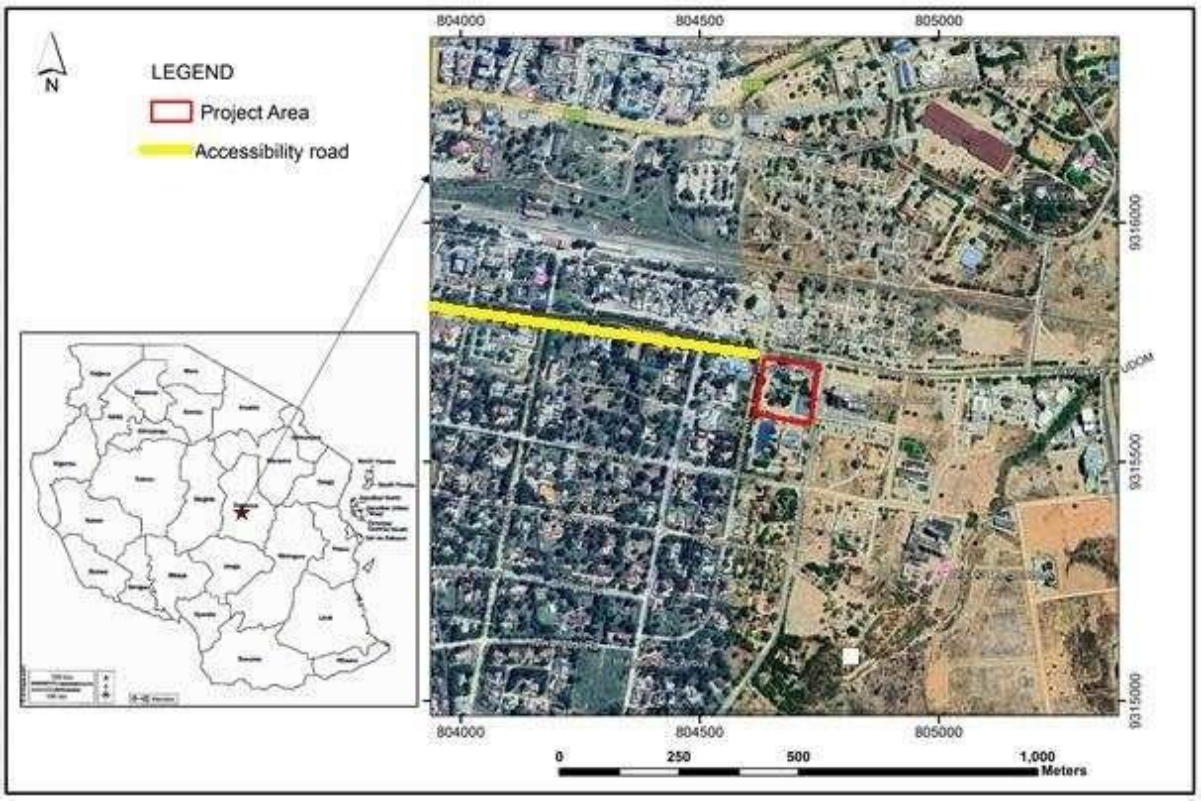


Figure 1: Location of the project area marked by red line polygon.

1.2 Physiography of the area

The project area is located in a relative flate plain. It is covered by insitu young superficial deposits mainly brown sandy soil mixed with some rock fragments. The unit occurs as loose to semi-consolidated sediments which derive from weathering of basement rocks. There are no exposed outcrops observed within the project area. The area is bordered by tarmac road heading to University of Dodoma and Kambarage Tower to east direction. The area is occupied by various premises of the existing office.

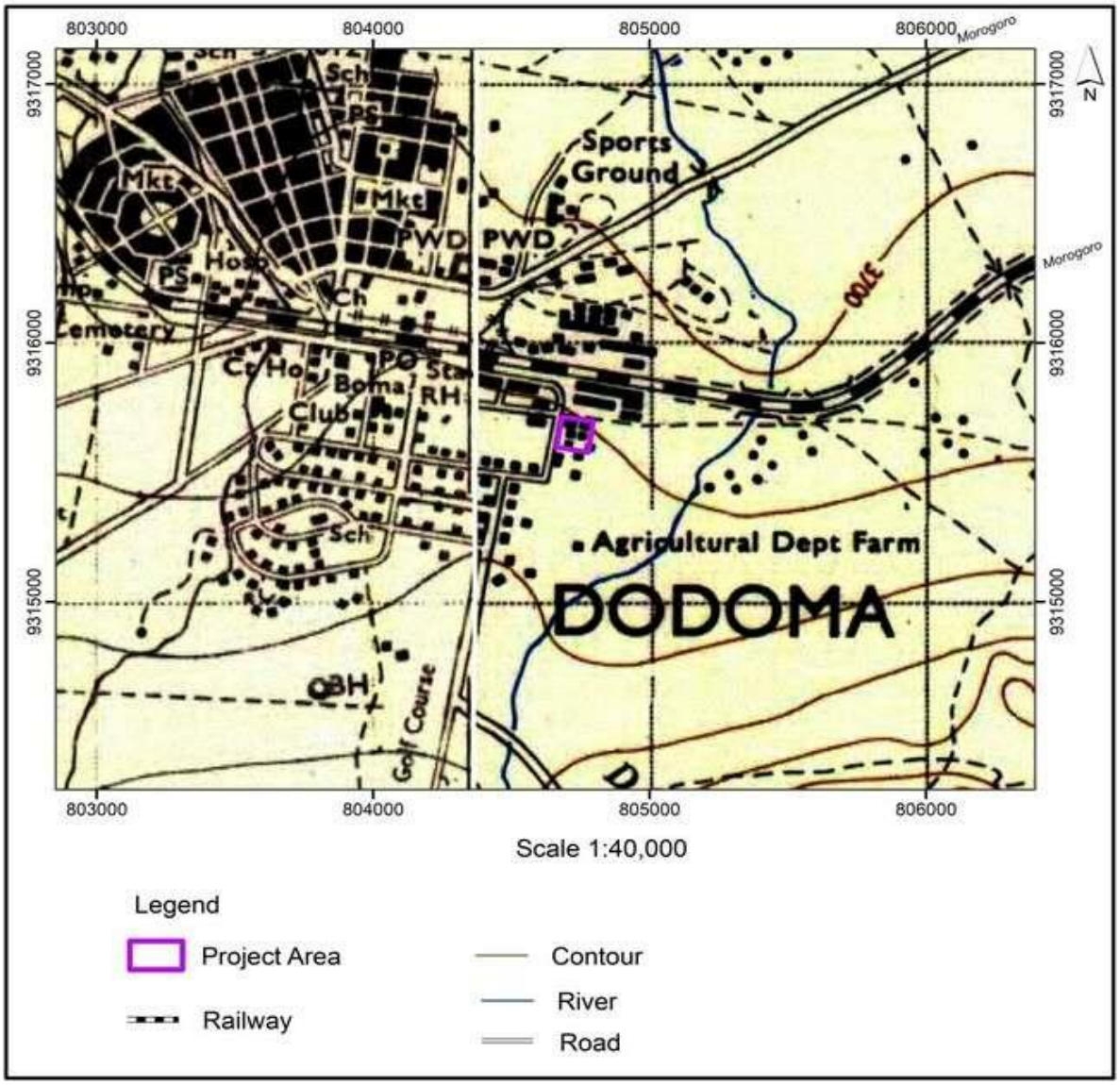


Figure 2: Topographical map of the project area

1.2 Objective

1.2.1 Main Objective

The main objective is to assess the surface and subsurface geological conditions of the area on account to geo-hazards mitigation, safety and healthy environment for the anticipated building construction project

1.2.2 Specific objectives

i) Pursue surface and subsurface investigation to demarcate lithological units.

ii) Characterization of surface and subsurface lithological units using geological mapping techniques.

iii) Delineation of subsurface structures.

1.3 Scope of work

The scope of work is limited within the block perimeter using geological, geochemical and geophysical techniques. However, the investigation will describe the physiography, rock, and soil distribution, identify toxic elements in soil and rocks; subsurface structures and depth of superficial soils.

2. BACK GROUND INFORMATION

2.1 Geological information

Geological information comprises regional geological setting and local geology. This information is important for better understanding of the project area in relation to lithological units and structures that may affect construction activities.

2.1.1 Regional Geological Setting

The project area lies within the Archean Tanzanian Craton, specifically Meso-Neoarchean Dodoma complex (Figure 3). The Tanzanian Craton comprises migmatitic gneisses predominantly of sedimentary origin and granitoids which are intercalated by narrow green schist to amphibolite facies (Kabete, et al., 2012). These rocks are considered as the oldest metasedimentary rocks (3.6 Ga) that were intruded by granitoids (2.8 to 2.6 Ga) which were later covered by volcanic rocks (Kabete et al., 2012; Leger et al., 2015). The Dodoma basement rocks comprise the Dodoma gneissic with tonalite-trondhjemite-granodiorite (TTG) orthogenesis and intermediate to felsic granitoids (Thomas et al., 2010). Several prominent geological structures are observed within the Dodoma complex region which includes NE-SW and NNW-SSE trending dyke swarms of Paleoproterozoic to Mesozoic age (Leger et al., 2015).

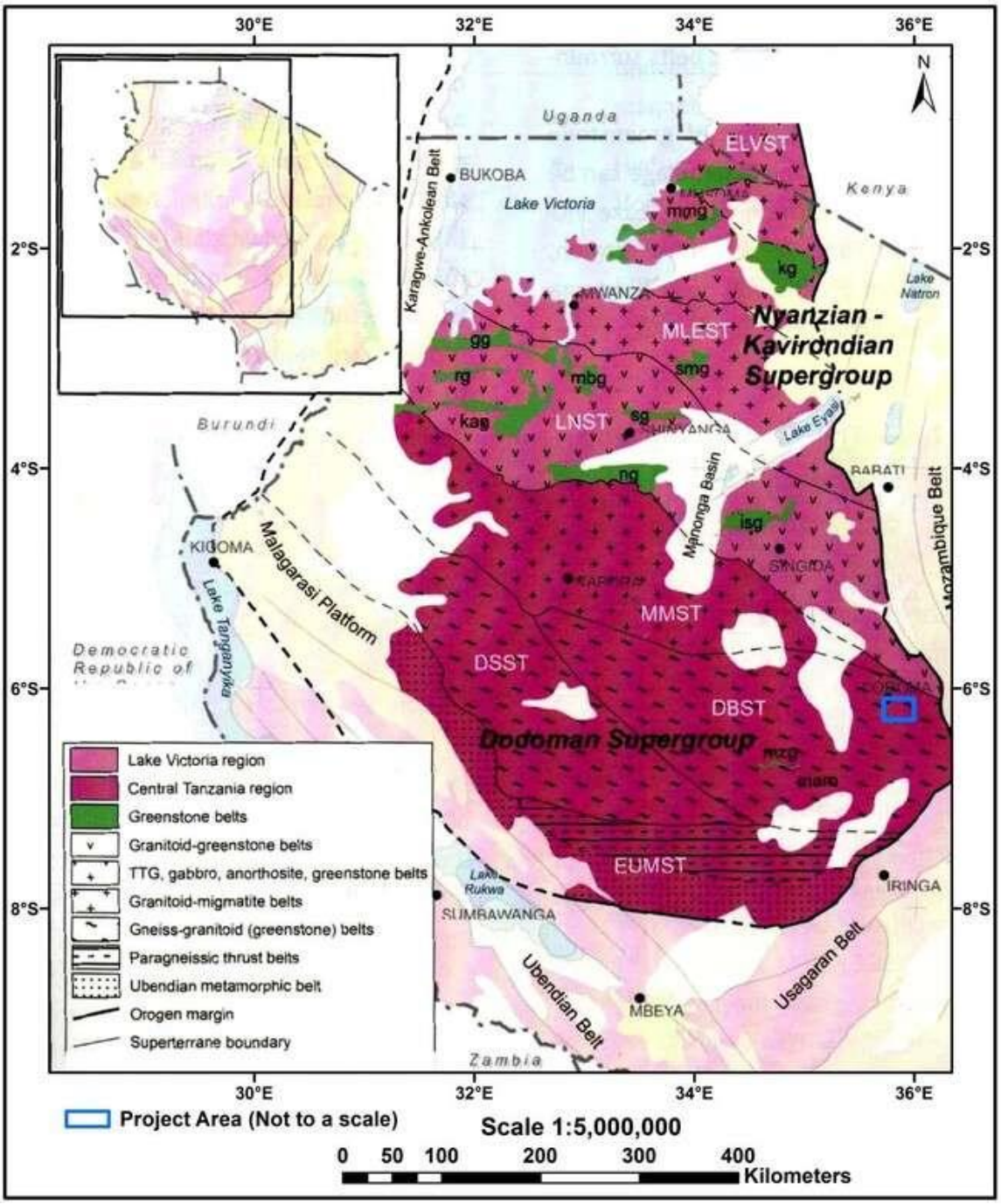


Figure 3: The regional geological map of Tanzania

2.1.2 Local geology

The area is covered by a young superficial loose to semi-consolidated brown sand soil. These sediments are medium to coarse grains consisting of quartz and feldspars deriving from underlying granitoids, specifically tonalite. It is an intrusive, sheared and jointed rock composed of medium to coarse grains of quartz and feldspars with epidote veinlets. This tonalitic rock form part of Dodoma basement that comprises of

tonalite-trondhjemite-granodiorite (TTG) orthogenesis and intermediate to felsic granitoids (Thomas et al., 2010).

2.2 Geochemical survey

The Geological Survey of Tanzania (GST) carried out a regional survey for stream sediment covering the whole QDS 162 (Dodoma) including the project area. The survey was conducted in order to identify gold anomalous areas and its associated elements such as Co, Mn, As, V, Ba, Sb, U, Ni, As, Cr, Fe, Ag, Pb, Zn, Cu, and Cd for further follow up program. The survey was done at a sampling density of one sample per 10 km^2 which is too spaced to be used for the project area. Consequently, soil sampling in the project area was designed at an interval of 50m from point to point and 100m line to line.

The survey data analysis shows no substantial economic concentration of metals nor an elevated level of toxic elements within the project area.

Table 2: The concentration levels for some metals from regional geochemical survey of QDS 162 (Dodoma).

S/N	Element	Minimum value (ppm)	Maximum value (ppm)
1	Cd	0	0.30
2	Pb	5.22	78.42
3	Zn	14	157
4	Cu	2.40	103
5	U	0.6	57.36
6	Ni	4.27	287.37
7	Cr	17.58	819.56
8	Fe	0.78	10.47
9	Mn	84	2314
10	As	0	57

11	V	7.77	399.87
12	Ba	182	1785
13	Sb	0	3.54
14	Ag	0	3.54
15	Co	0	50.33

2.3 Geophysical information

Available regional geophysical information includes high-resolution airborne magnetic data, gravity, and seismic data sets.

2.3.1 High Resolution Airborne Magnetic Data

High-resolution airborne magnetic data acquired in 2014 were processed and analyzed to understand general patterns of the total magnetic intensity map (TMI) of the region in relation to the project area (Figure 5). The regional high-resolution magnetic map indicates that the prominent structural features have a general regional trend of NE-SW while some structural features trend NW-SE. These structures might be faults, dykes, shears and/or lithological contacts. The TMI map also indicates that the project area is located within moderate to high magnetic anomalies (Figure 4, Figure 5).

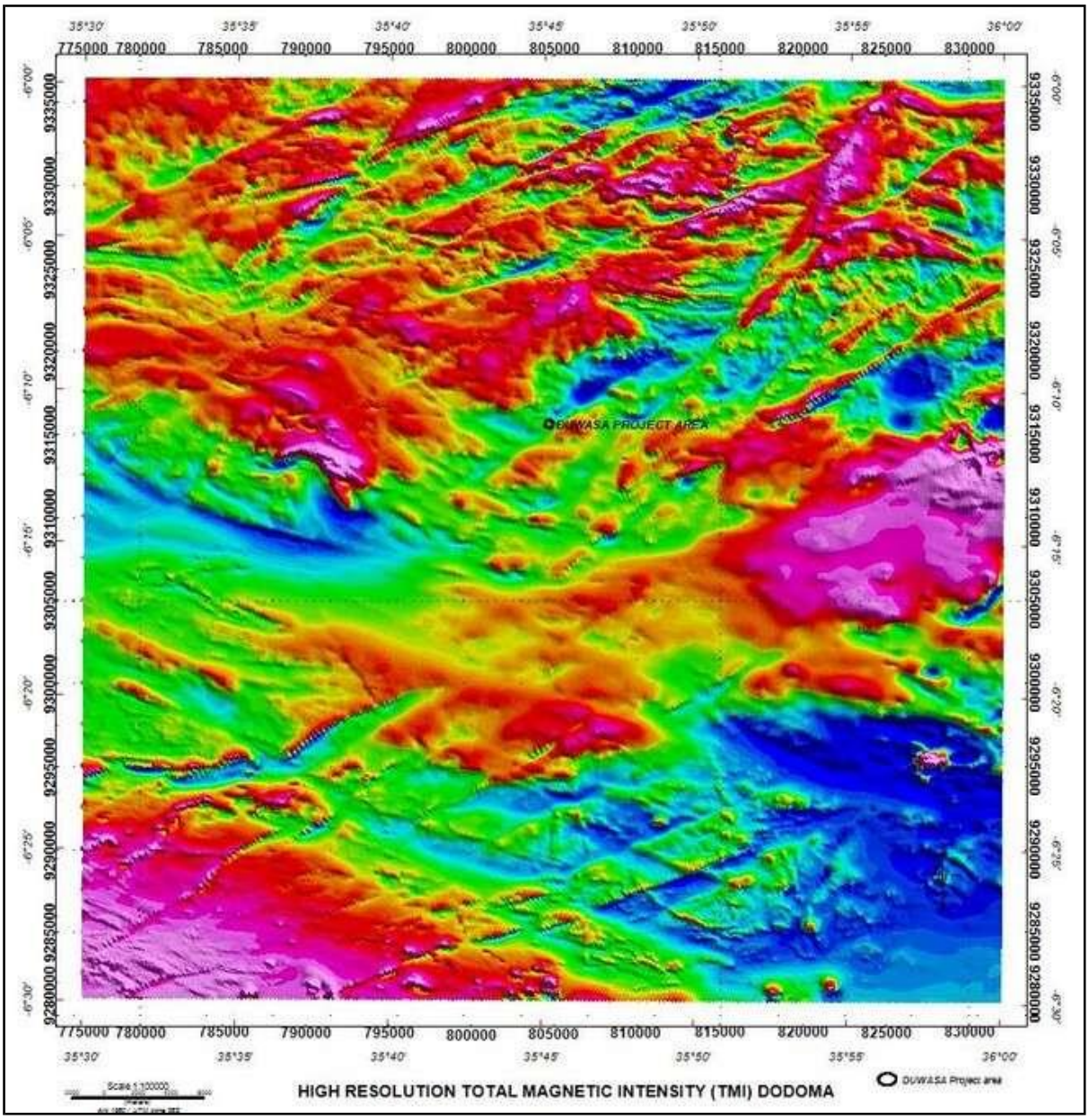


Figure 4 High-Resolution aeromagnetic map (TMI) QDS 162

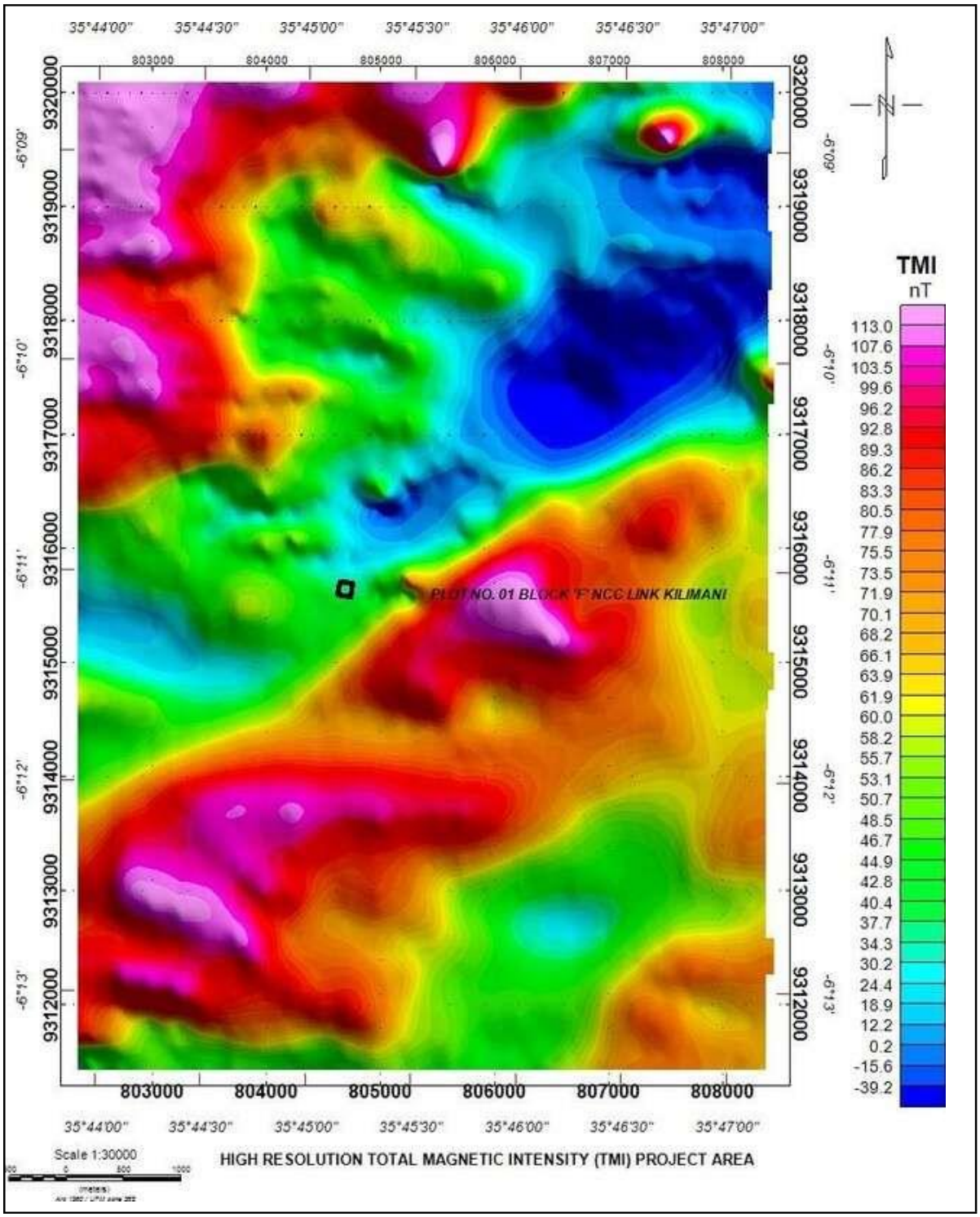


Figure 5: Shows the location of Plot on the high-resolution magnetic map.

2.3.2 Gravity data

The low-resolution airborne gravity dataset shows the distribution of rock densities within QDS 162 shown in Figure 6. The north eastern central part of the sheet where the project area is located, shows that, the subsurface materials (rocks) are characterized by moderate densities, whereas high density anomaly is observed in the south, southwest, central and southeast of the project area. Western side of the sheet indicates the presence of low density materials. It is worth to note that high density materials suggest high stability of rock materials suitable for erecting structures including buildings with minimal risks (less vulnarable) to seismic activities such earthquakes.

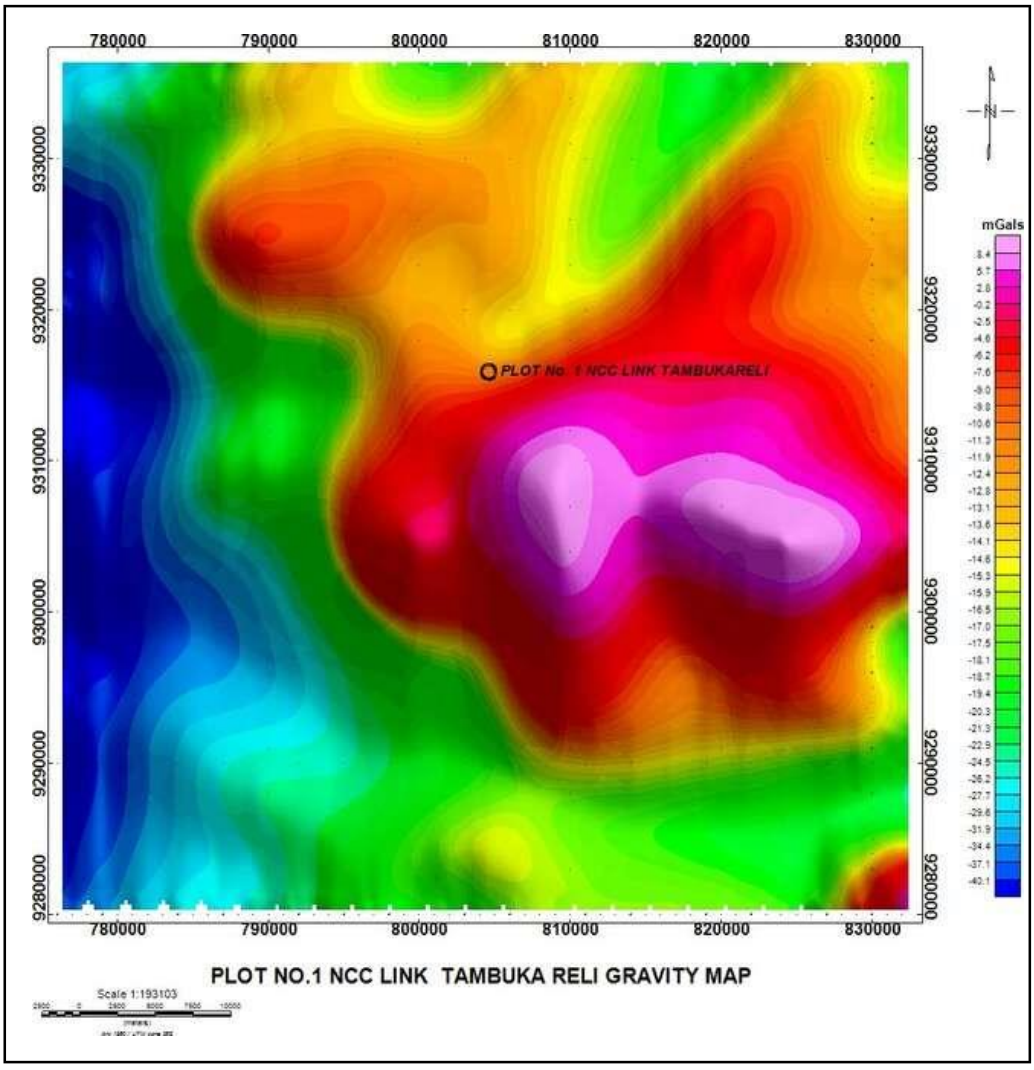


Figure 6: Shows the location of project area on QDS 162 Gravity map.

2.3.3 Seismic activity

The seismic activities in the region are attributed to the presence of the East African Rift System (EARS). The rift system extends from northern Somalia through Ethiopia, Kenya, and Tanzania to Mozambique. The EARS is an active tectonic phenomenon that forms two branches in Tanzania, namely Western and Eastern branches with the general trend of NW-SE and NE-SW, respectively that are prone to earthquake activities.

The western branch has recorded earthquake events to a magnitude of 7.4 which occurred in December 1910. On the other hand, the Dodoma Region, located within the eastern branch of the EARS has experienced earthquake events up to the magnitude of 5.5 on the Richter scale. Most of the earthquake events are associated with major earthquake epicentre clusters located in Haneti, Sanzawa, and Hombolo areas to the northern and northwest parts of the project area at a range of distance between 30 and 100 kilometers (Figure 7). However, the nearby seismic cluster is located at Nala area. There is no record of earthquake events within the project area, however, the closest epicenter is located about 10.00 km away from the project area with a magnitude of 4.51 on the Richter scale.

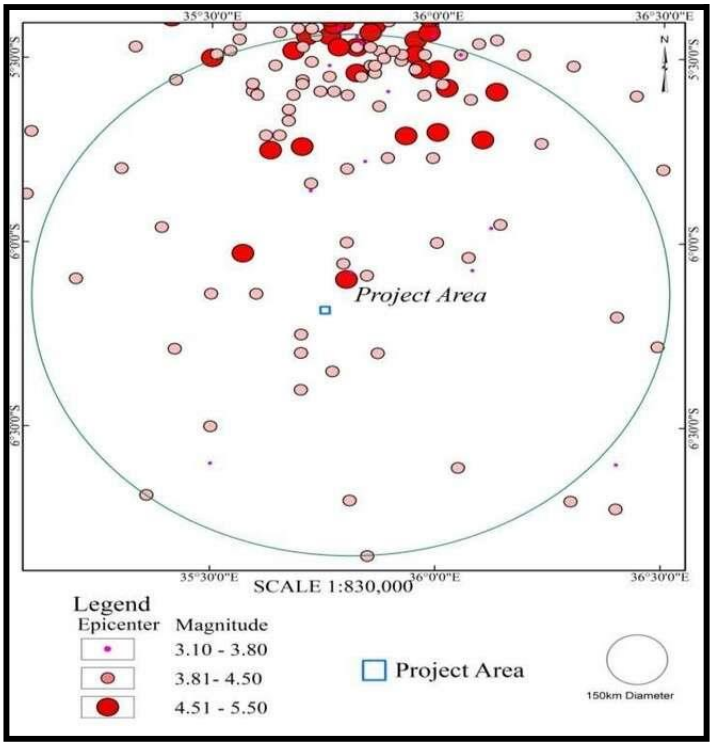


Figure 7: Seismic map showing seismic activity around the project area.

3. GEOSCIENTIFIC INVESTIGATION ON THE PROJECT AREA

Geoscientific investigation on the project area started with desk work that involved collecting archived data related to the work from the GST database. Data sets were analyzed and used to supplement data acquired during fieldwork. These data sets include a Topographical map of QDS 162, a Geological Map of QDS 162 (Dodoma), Geochemical data of QDS 162 (Dodoma), High-resolution airborne magnetic data of QDS 162, Airborne gravity data of QDS 162, Seismic data of Dodoma region and Google Satellite imagery.

Prior to the commencement of the fieldwork, site visit was carried out on the project area for the sake of work planning, demarcating the plot boundaries, assessing the nature of the terrain, and designing appropriate methodologies for the proposed work. This site visit was carried out in September 2024.

Geological data were obtained by conducting geological mapping within the project area. Lithological units and related geological features were recorded and used for geological map production. Geochemical analysis for hazardous elements were analysed on collected soil samples. Samples were prepared and analysed at GST Laboratory using XRF machine. Geophysical data were analyzed by using Geosoft Oasis Montaj software for griding XYZ airborne data sets. Ground magnetic data were processed using GemLink and Geosoft Oasis Montaj software. A generalized filter was used to enhance subsurface structures and geological bodies (Figure 17)

3.1 Fieldwork, data acquisition and analyses

This chapter describes survey procedures, materials and techniques used at the time of investigation. Some of the important techniques employed in order to accomplish the intended objective includes: site visit, literature review, surface geological mapping, geochemical sampling, geophysical investigations and laboratory analysis.

3.1.1 Surface geological investigation

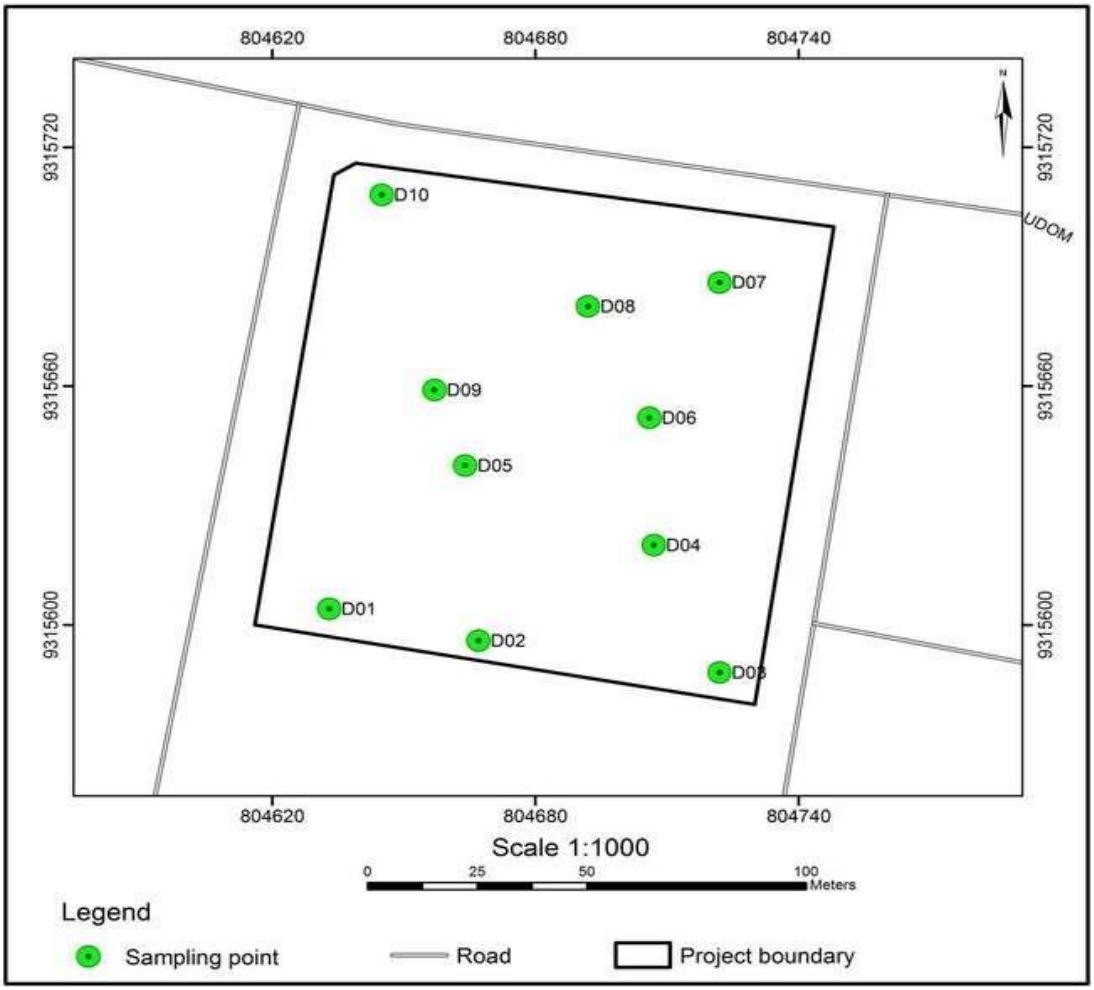
The fieldwork involved geological mapping of rocks for the identification of rock types and their distribution, asses the extent of weathering of rocks, mineralogical composition and existing structural features.

As part of the program, geological traverses were planned in such a way that it crosses most of the regional structures observed in the previous studies. During the survey, macro and micro structural measurements of linear structures was done by using Brunton compass in order to establish general orientation.

3.1.2 Geochemical investigation

Geochemical soil sampling was conducted by collecting representative samples for geochemical studies to determine the concentration of toxic elements such as U, Th, Cd, Pb, Zn, Cu, Ni, Cr, Fe, Mn, As, Ba, Sr and Ag in the soil. For this purpose, a total of twenty (20) soil samples were collected in a relatively regular pattern with optimum sample spacing of about 50m and line spacing of about 50m (Figure 8).

Figure 8: Soil sampled pattern map.



Soil samples were taken from B-horizon within a depth of 30 to 40 cm. These samples weighed between 1 and 2 kilograms, which were sieved to 2mm mesh and packed in well-labelled plastic bags, then packed into calico bags to avoid contamination (Figure 9). The reason for collecting soil samples from the B-horizon is that, unlike the A- horizon which mainly consists of organic matter, the B-horizon has a potential for mineral accumulation (Macheyeki et al., 2020).

Figure 9: (a) Digging sampling hole and (b) soil sampling and packing.

3.1.3 Geophysical investigation

Two geophysical methods were deployed for the investigation which involved a ground magnetic survey and Electrical Resistivity Tomography (ERT). According to Kearey et al. (2002), the two methods are highly used to map concealed lithologies and subsurface structures based on the response of various physical properties of rocks.

Ground magnetic survey is a passive method of measuring the total magnetic field intensity of the Earth's magnetic field at some points along the Earth's surface by using a magnetometer. The method is useful to delineate subsurface structures and their lateral extension which are susceptible to changes in magnetic susceptibility. In addition, magnetic anomalies can indicate the presence of subsurface zones with high

and low magnetic susceptibility hence, the method is very helpful in engineering studies for locating lithological contact and weak zones such as faults and dykes (Burger et al 1992, Telford et al 1990, McDowell et al., 2002),

Magnetic Data acquisition were done by two magnetometers, namely GEM GSM- 19T Proton Precession magnetometers with inbult integrated navigation system (GPS). One was set as a base station and the other one was used as a rover. The base station magnetometer was set at a selected location on the ground in an environment free from disturbances such as electric poles, houses, etc. The base station records magnetic field intensity aimed at detecting diurnal variations and the rover recorded total magnetic field intensity along the planned survey profile lines in the project area. Gem Link Software was used for downloading and pre-processing correction to reduce diurnal variations of ground magnetic data while Oasis Montaj was used for secondary data inspection, noise removal, and processing acquired data. Corrected and analyzed data were gridded, filtered, and enhanced by various filters to visualize concealed features. Finally, data were processed and interpreted using Oasis Montaj software.

The survey lines were planned in SW-NE direction with line spacing of 5 m (Figure 10) crosscutting the regional general structural trend (NW-SE) deduced from High Resolution airborne magnetic map QDS 162 (Figure 4 and Figure 5)

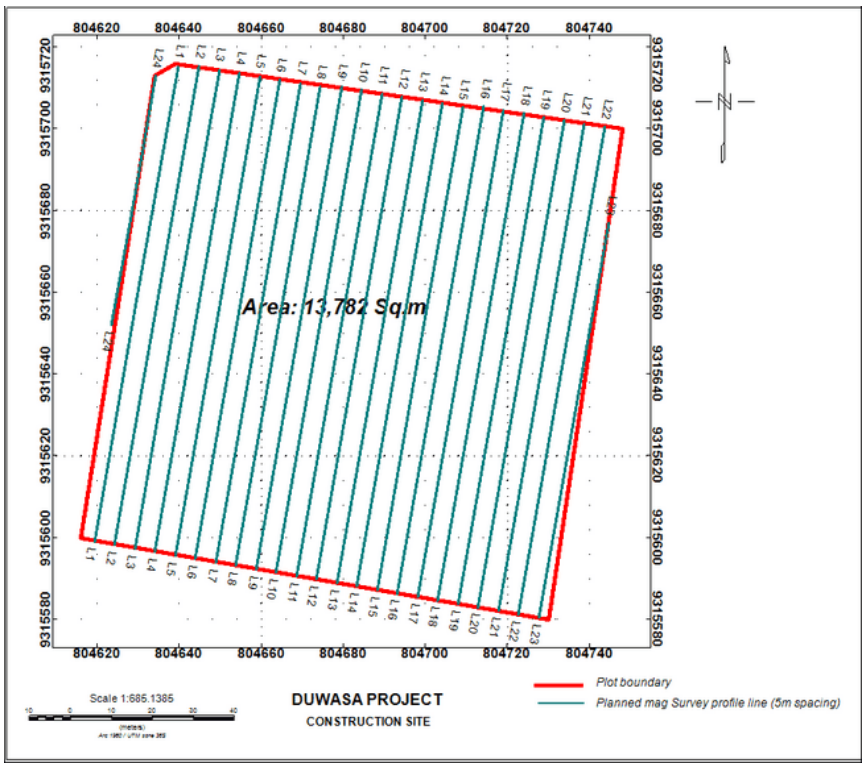


Figure 10: Ground magnetic survey profile lines layout

Electrical Resistivity Tomography (ERT) survey is a method for imaging subsurface geological structures from electrical resistivity measurements made by surface electrodes. This method provides sets of data that can give subsurface geological formation including competent rock, weak zone and thick sediment cover (Haile & Atsbaha, 2014).

The electrical resistivity tomography data acquisition was acquired using Pole - Dipole array configuration (Figure 11) whereby one electric current electrode was set at an infinity position perpendicular to the direction of a profile line while the second current electrode was aligned along with potential electrodes sharing the same sampling interval of 5m. Line spacing between profile lines was 10m, total of 16 dipoles were applied to investigate subsurface geological structures within the project area (Figure 12).

Six (4) ERT profile lines were aligned almost in E - W direction perpendicular to the general regional structural trend as interpreted in regional high resolution aeromagnetic map of QDS 162 (Figure 5) and the coordinate of the profile line are shown in Table 3.

The subsurface structures were determined by the variation of resistivity data. The subsurface structures were further modelled by using RES2DINV software to produce inverted ERT models and 2D Pseudo sections concerning horizontal and vertical variations. The vertical axis of the ERT model indicates the surface elevation and depth below the surface while the horizontal axis indicates the horizontal distance along the ground surface. The cross-section represents the vertical slice through the ground, beneath the line of electrodes. The top of the cross-section corresponds to the ground surface. The colours in the cross-section indicate the estimated electrical resistivity: the red and orange colours indicate high resistivity while the purple and blue colours indicate low resistivity.

The equipment used in the survey were GDD Transmitter (TX4, 5000W), GDD Receiver (GRx 8-32) with sixteen (16) channels, Allegro (A handheld PC) (Figure 13) including all ERT/IP accessories such as an Honda generator (6.5kVA) to power up the GDD Transmitter, two stainless steel polarized electrodes, sixteen

(16) non-polarized porous pots, copper sulphate solution, geophysical electric cables, water containers, hammers and GPS.

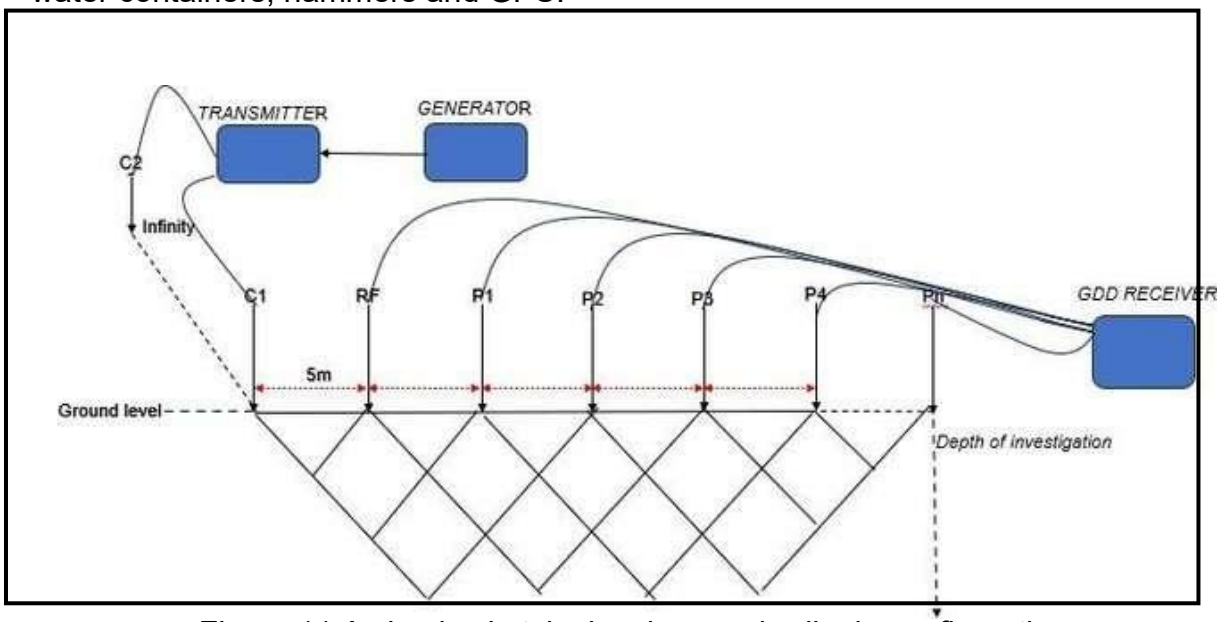


Figure 11:A simple sketch showing a pole-dipole configuration.

Table 3:Coordinates of IP and ERT profile lines (Datum: Arc1960, UTM Zone 36S)

Line	LAT	LONG	X	X1
L1	-6.184176462	35.7525485	804640	804640
L1	-6.184306861	35.75354232	804750	804750
L2	-6.184402377	35.75254967	804640	804640
L2	-6.184488061	35.75345297	804740	804740
L3	-6.185081055	35.75237261	804620	804620
L3	-6.185166037	35.75341134	804735	804735
L4	-6.184854673	35.75246173	804630	804630
L4	-6.184939889	35.75345531	804740	804740

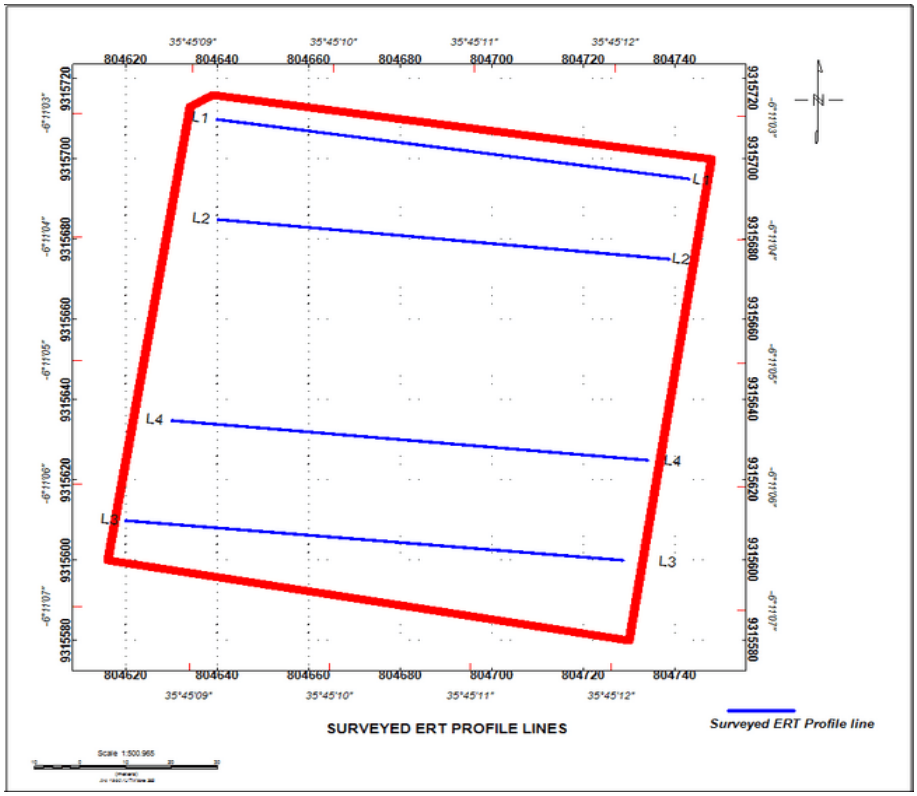


Figure 12:Planned IP and ERT profile lines

Figure 13: GDD IP Transmitter model TX4 and IP Receiver model GRx 8 –32

The survey technique entailed charging the ground for two (2) seconds with a current varying from 2400 mA to 4400 mA using two (2) stainless steel polarized electrodes and sixteen(16) non-polarized porous pots filled with copper sulphate solution were used to record the voltage drop when the electrical current supply was turned off. IP is created by injecting current into the Earth, "charging" specific mineral phases, much like a capacitor (Dahlin et al., 2002). After the flow of electric current stops, the polarisation measures the steady decrease of voltage from this stored charge.

3.2 Laboratory analysis

Soil samples collected from the project area were analyzed for toxic elements at GST Laboratory. Toxic elements including U, Th, Cd, Pb, Zn, Cu, Ni, Fe, Mn, As, Ba, Sr, Ag, and Cr were analysed using the X-ray fluorescence (XRF) method. A total of ten (10) soil samples were oven-dried at 105° C for one hour, followed by sieving using a 75- mesh size. Ten grams of each sieved soil sample were put in clean sample cups. Then, the cups containing samples were placed in the XRF machine for analysis.

4.0 FINDINGS AND DISCUSSION

4.1 Surface geological findings and discussion

The surface geology of the entire plot is characterised/covered by in-situ young superficial deposits mainly of brown sand soil (Figure 14). These sediments are composed of silt to sand-sized particles mixed partly with quartz and feldspar rubbles. It occurs as an in situ loose to semi-consolidated soil layer formed from weathering of basement rocks, mainly tonalites. Tonalite makes the competent basement rocks of this area.

Figure 14: General appearance of young superficial deposits in the plot area

Therefore, the interpretation from geological observations indicates that the area falls in the stable basement rock underneath (Figure 15).

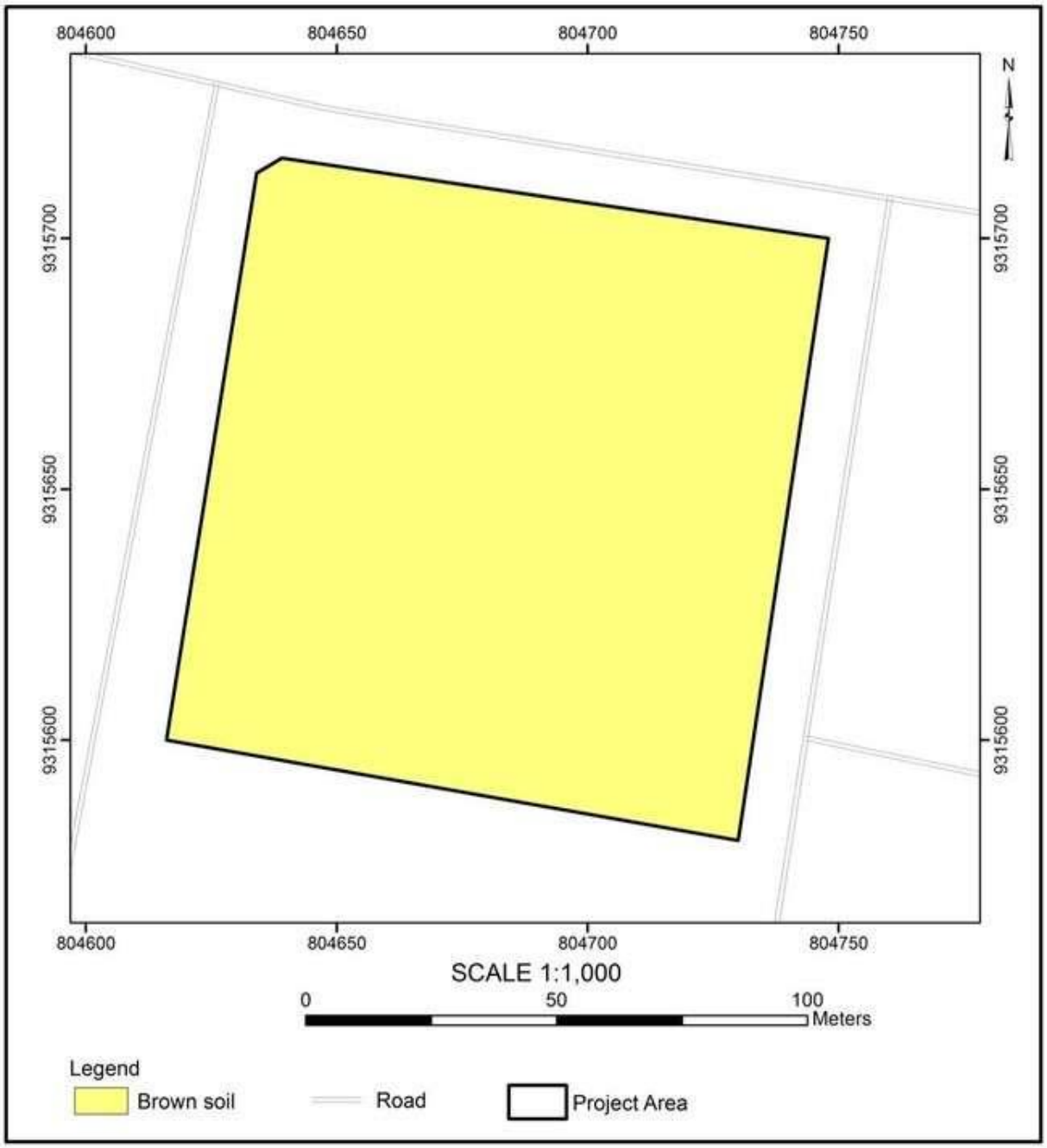


Figure 15: Geological map of the project area

4.2 Geochemical finding and discussion

Ten (10) soil samples were collected within the plot and analysed for toxic elements including U, Th, Cr, Cd, Mn, Sr, Cu, Ni, Bi, Zn, As, and Pb as shown in the appendix. The results obtained (Appendix 1) were then compared with the average concentration set by the World Health Organization (WHO) as summarized in Table 4.

Table 4: Measured Metals and trace elements as compared to concentrations set by WHO.

S/N	Metals	Ave. Analysed metal conc. (ppm) for 14 samples	Conc. (ppm) set by WHO (1996)
1	Arsenic (As)	4.86	5.486
2	Lead (Pb)	30	100
3	Chromium (Cr)	41	120.848
4	Zinc (Zn)	65	50
5	Copper (Cu)	108	36-103.35
6	Nickel (Ni)	66	466.256

Based on the results, the toxic elements that were analysed such as As, Cr, Zn, Cu and Ni returned values that are relatively low when compared to the concentration values set by WHO and others were within the tolerable ranges. The U and Th were generally not detected. In this regard, the metal concentration of the aforementioned elements has no potential elevated values of toxic elements that can be environmentally harmful to inhabitants.

Therefore, most of the soil samples analysed for toxic elements have environment-permissible limits when compared to the concentration set by WHO.

4.3 Geophysical findings and discussion

4.3.1 Ground magnetic survey

The magnetic signature indicates that the area is quite stable, without any prominent structures. High magnetic anomalies in the plot are caused by ferruginous superficial deposits and tonalitic basement rocks that mostly cover Dodoma City. Moderate

magnetic anomalies are observed to surround the high magnetic signatures, which signify the presence of intercalation of various superficial deposits. The amplitude of magnetic field intensity is low, especially on the northwestern and southeastern sides of the plot indicating the thick sedimentation (Figure 16). The moderate to high magnetic anomalies contrast with competent rocks, while low magnetic anomalies contrast with responses from high-degree weathering materials (Haile and Ayele, 2014). The site area which reveals moderate (greenish to yellowish colour) to high magnetic (reddish to pinkish colour) anomalies is safe for building while the areas showing low magnetic anomalies (blue colour) need special building design consideration at the site (Haile and Ayele, 2014).

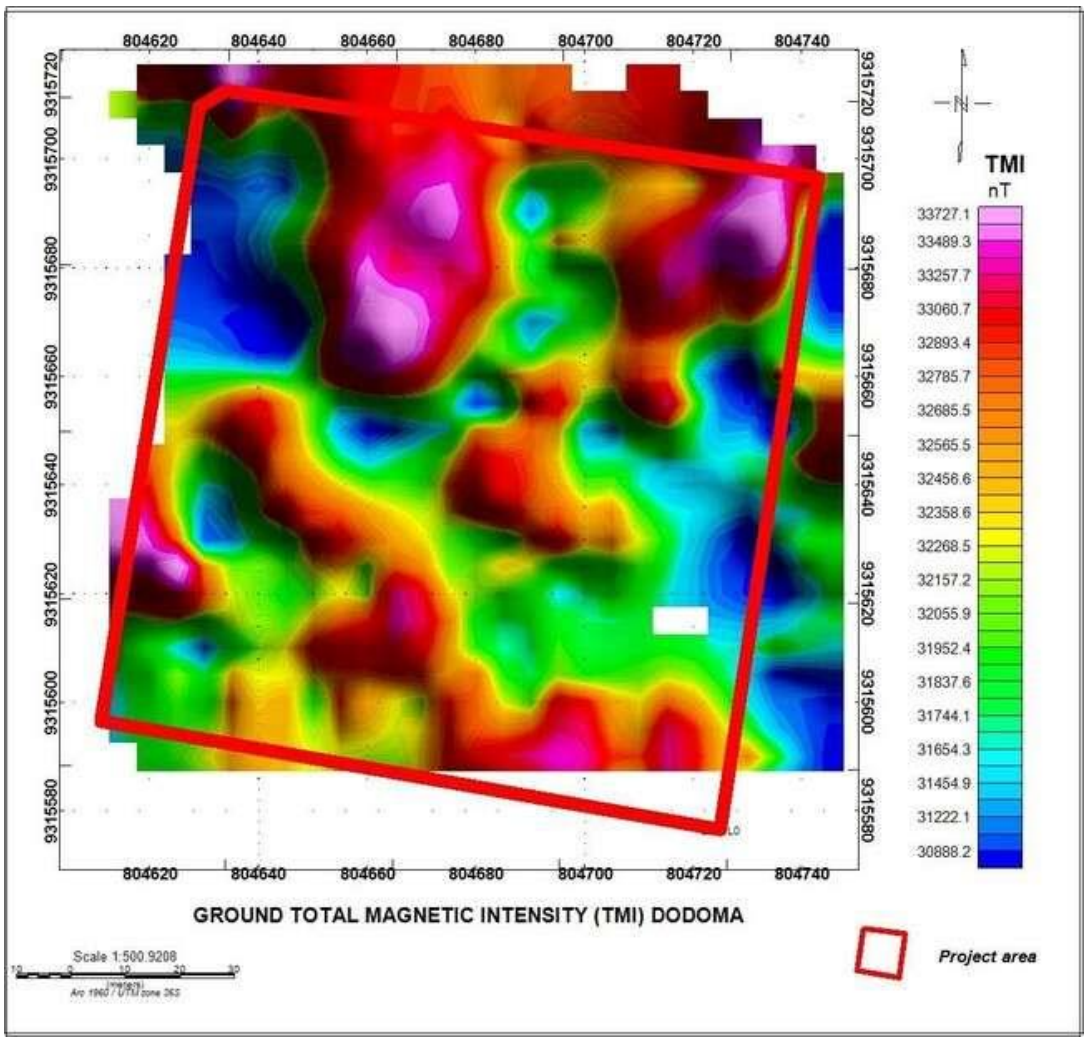


Figure 16: Total Magnetic Intensity (TMI) of the project area

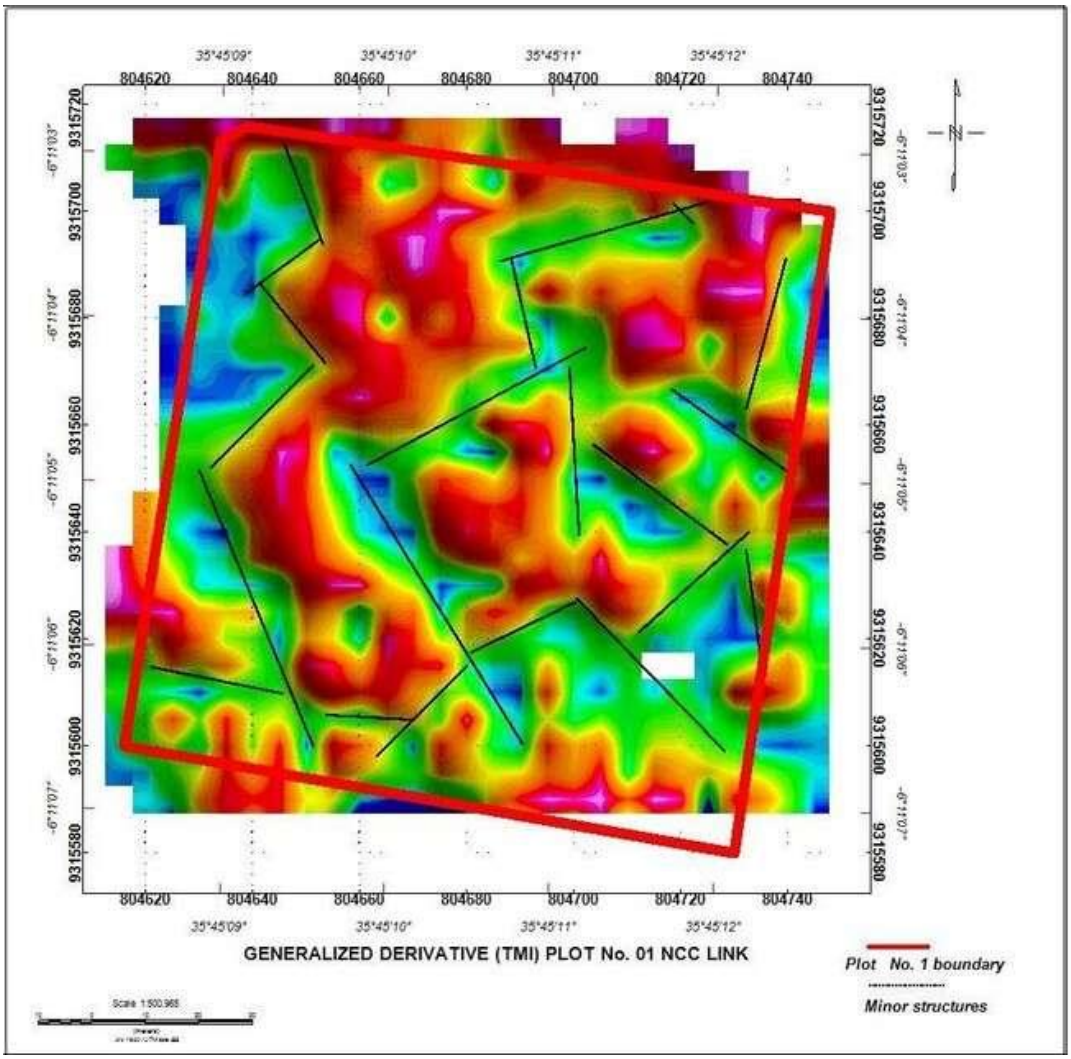


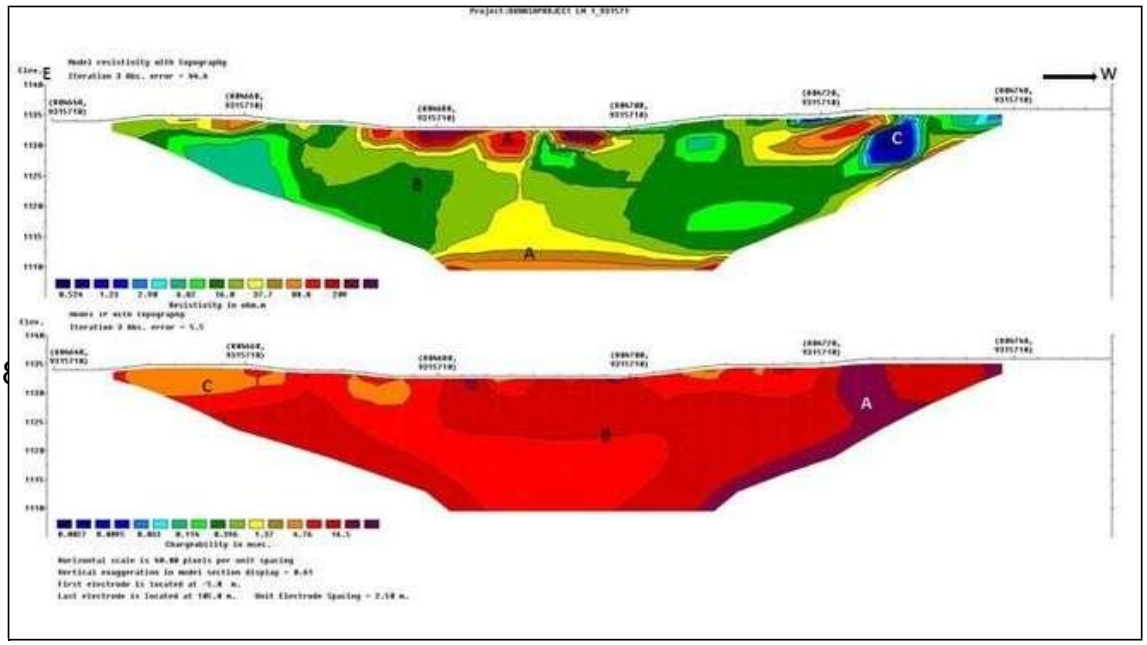
Figure 17: Enhanced magnetic anomalies using generalized derivative filter.

4.3.2 Electrical Resistivity Tomography

Horizontal and vertical variations of resistivity and chargeability for four (4) profile lines were surveyed and hence plotted in the form of inverse pseudo-section models (Figure 18 to Figure 25). The models of all profile lines show three geo-electric layers. All the models show a very low resistivity in the north-western part of the plot at a depth range of 1.5m – 38m. The moderate to high resistivity layers blanket the project area from east to the west. The thickness of the topmost layer ranges from near the surface on some of the models to 18 m, especially in the eastern and western part of the project area. The high resistivity values may be contributed to the presence of compacted sand soil within the area as evidenced during fieldwork.

However, low resistivity values can be attributed to any unconsolidated superficial deposits which may be saturated with groundwater. The thickness of sand soil within the area under investigation is estimated to be 4m – 6m, while that of weathered material (soil especially clay and saprolite) is approximately 18m. The highest resistivity values depict competent geological materials; very low resistivity values suggest weathered or unconsolidated geological materials, often less competent to support the erection of heavy engineering structures (Omowumi, 2014).

Figure 18



Inverted Electrical Resistivity Tomography (ERT) and Induced Polarisation (IP) Models Results.

Survey line 01:

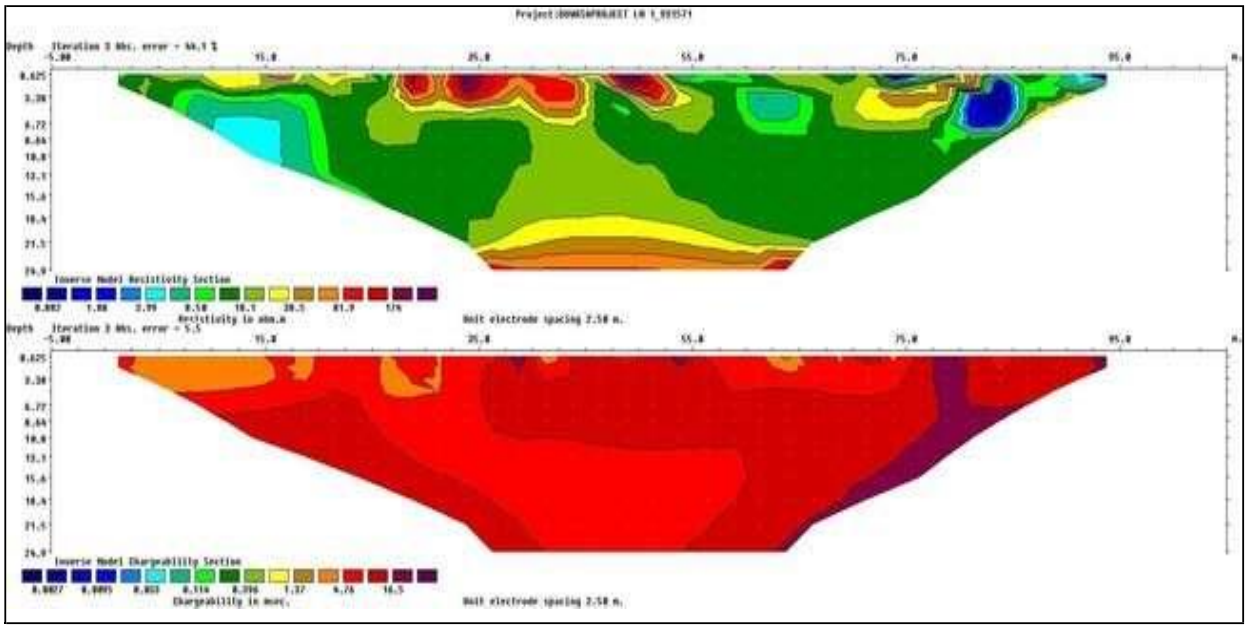


Figure 19: Inverted model ERT/ IP maps showing depth and local position Line 01.

Survey line 02:

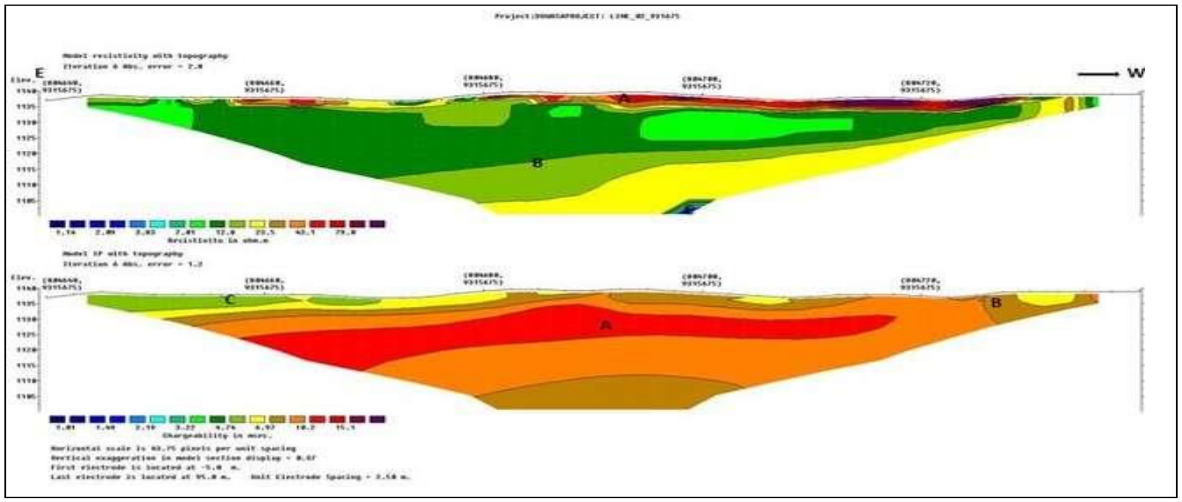


Figure 20: Inverted model ERT/IP maps with topography and *coordinate* Line 02

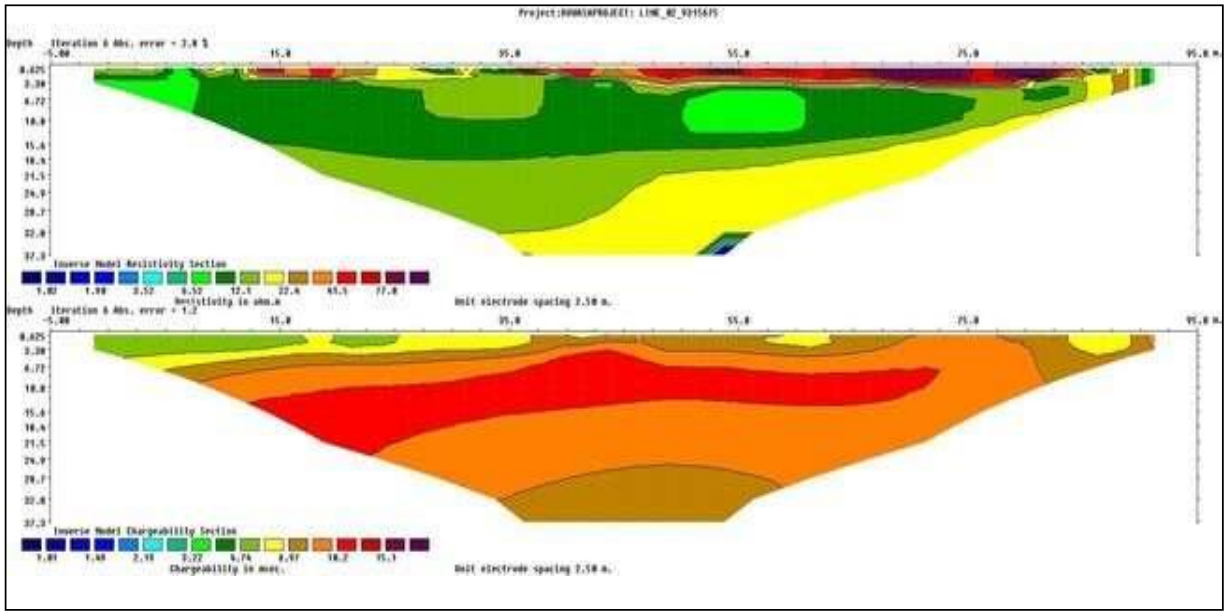


Figure 21: Inverted model ERT/ IP maps showing depth and local position Line 02.

Survey line 03:

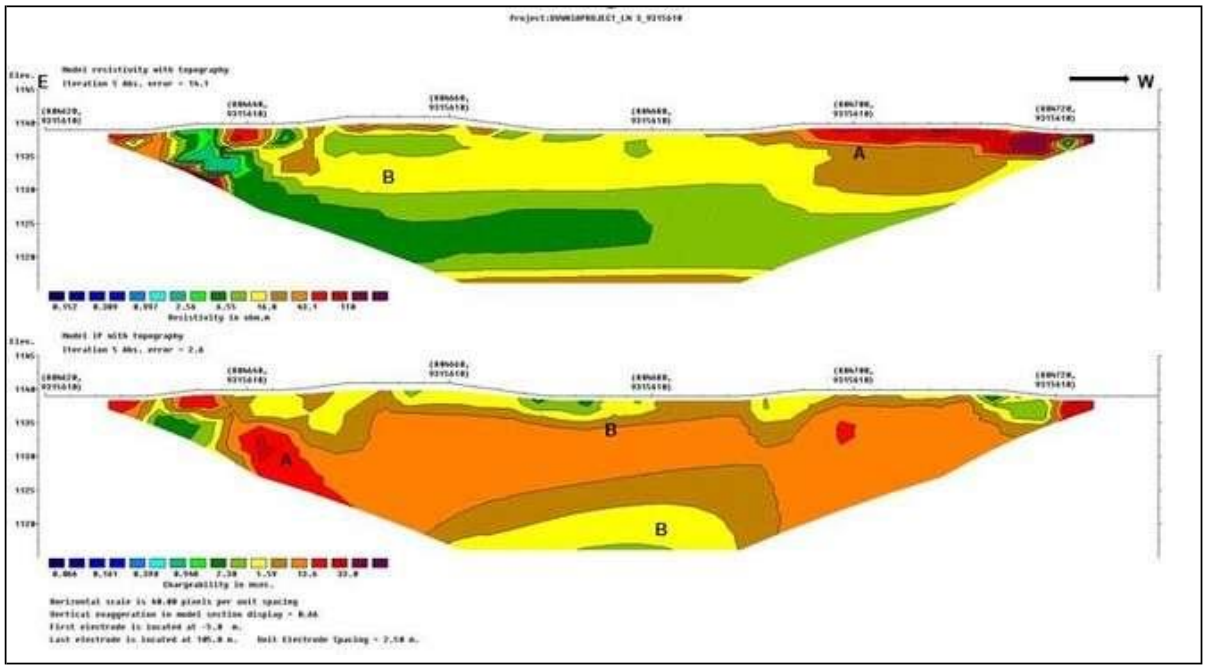


Figure 22: Inverted model ERT/IP maps with topography and coordinate Line 03

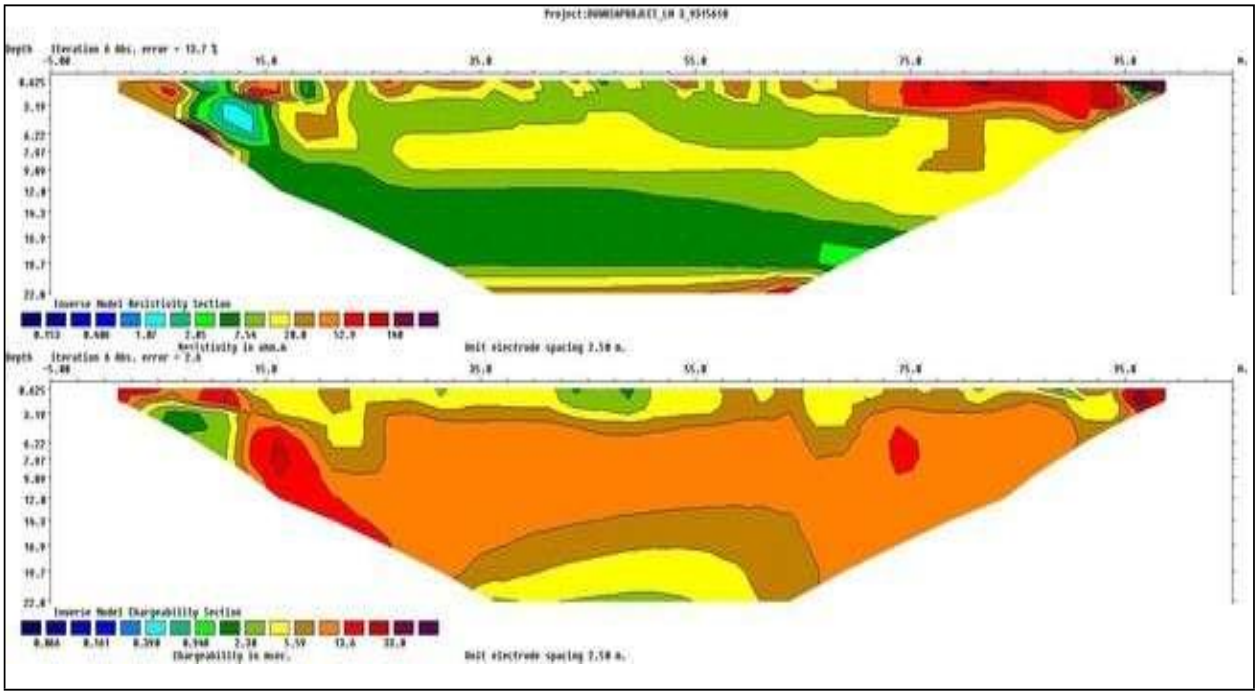
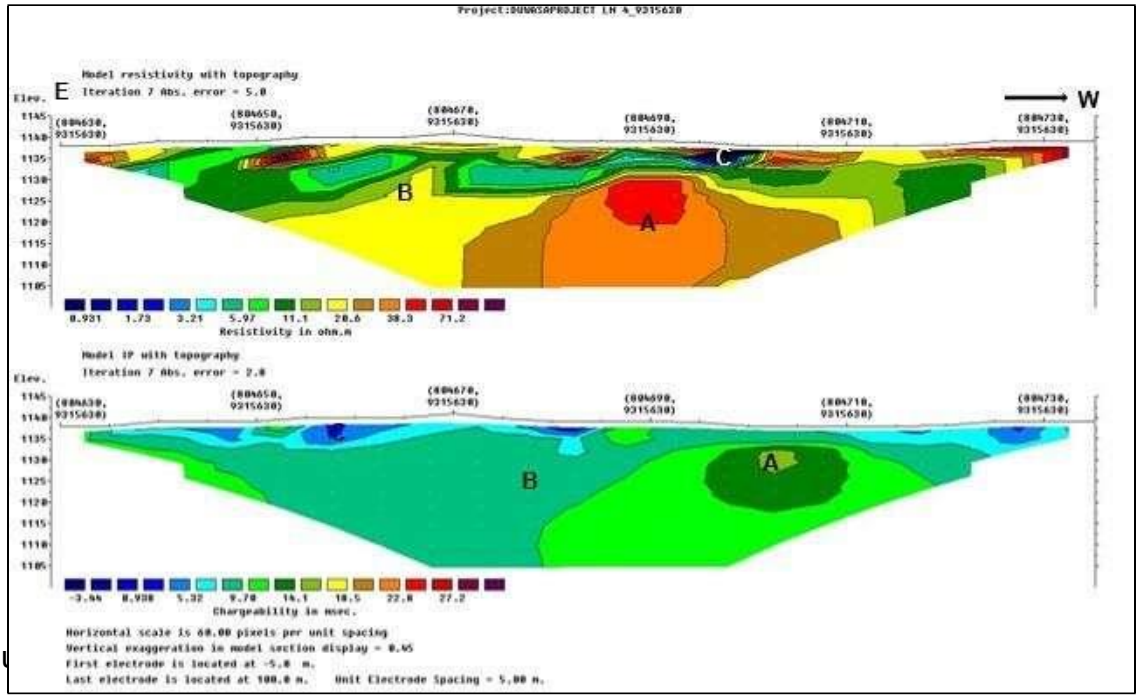


Figure 23: Inverted model ERT/ IP maps showing depth and local position Line 03.

Survey line 04:



Figu

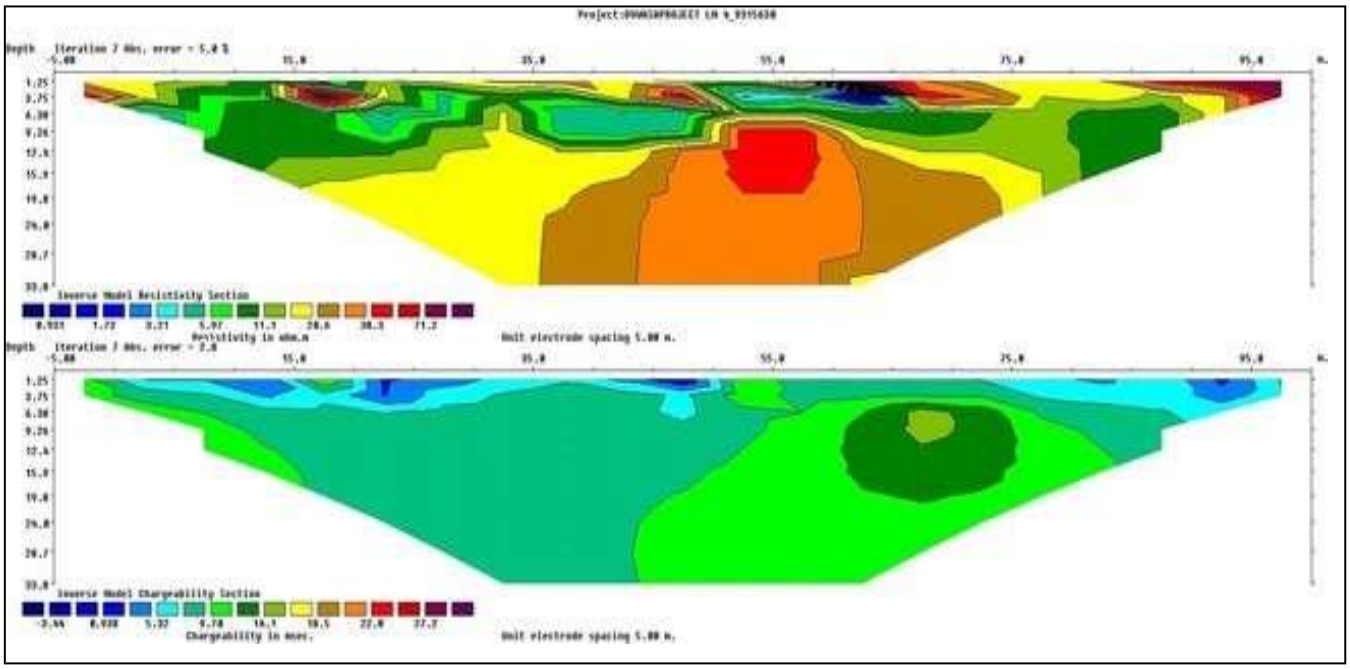


Figure 25: Inverted model ERT/ IP maps showing depth and local position Line 04

Observations (survey line 01 to survey line 04)

Three anomalous resistive zones appear in all the surveyed profile lines with varying resistivity values ranging from 0.524 Ohm.m to 7.81 Ohm.m low resistive zone marked as (zone C) in ERT Pseudo section models), moderate to intermediate resistivity values range from 4.82 Ohm.m to 52.90 Ohm.m (zone B) and high resistivity values range from above 20.6 Ohm.m to above 209.0 Ohm.m (zone A). Observed variations in restivities and chargeabilities at shallow depth appears with varying intensities spreading across the plot probably may be caused by underground infrastructures such as cable networks and other buried/waste metallic materials on the project area due to the nature of activities

Conclusion and Recommendations

Conclusion

The geoscientific investigation conducted in the project area reveals the following: -

i) The plot is located on moderately flat ground covered by topsoil deposits chiefly made up of clay minerals, silica sand and to a lesser extent oxides of iron on a tonalitic basement.

ii) Magnetic signature and ERT/IP show no prominent fault/shear which can affect

the anticipated construction project of structural buildings. There is a contrast response of high magnetic anomalies which probably are generated by tonalitic basement rocks and ferruginous superficial deposits

iii) The level of concentrations of toxic elements falls within the acceptable limits

iv) No serious geological threat, such as structures or any features encountered in the project area that can prohibit development activities.

Recommendations

GST recommends the following based on the findings of this geoscientific investigation: -

i) The project area is therefore suitable for construction purposes, including buildings of any kind, as the area is underlined by competent tonalite basement rock (granitoids).

ii) Construction of building structures in the project area should adhere to both engineering and geotechnical codes.

SADCAS

TEST-5 0043

F 7.8.2
Effective Date: March,2025

ANALYTICAL REPORT

Lab ref: 2023-24EX 2635 ®
Submitted by: DUWASA
Received date: 13/06/2025
Reported date: 26/06/2025
#Samples: SOIL
Pages: 10
Type of Samples: SOIL
Address: DODOMA

Copy

Notes

Management Signatory

UBA

R.WILLIAM

Technical Signatory

ISACK RUKWAKWA
KAMANA CAMILIUS
ELISA MPHURU

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Ministry of Minerals

SADCAS

TEST-5 0043

F 7.8.2
Effective Date: March,2025

ANALYTICAL REPORT

Lab Ref: 2023-24EX 2635®
Submitted by: DUWASA
Received date: 13/06/2025
Reported date: 26/06/2025
Type of Samples: SOIL
Samples: 10

Sample ID	*Au	SiO_2	Al_2O_3	Fe_2O_3	MgO	CaO	K_2O	SO_3	TiO_2	Ba	W
D01	-	77.97	14.51	2.80	0.39	0.70	1.11	0.28	0.19	550	170
D02	-	81.24	10.89	3.13	0.41	0.71	1.13	0.25	0.22	490	170
D03	-	78.76	14.11	2.30	0.38	0.79	1.23	0.27	0.18	510	160
D04	-	85.42	7.30	1.95	0.38	0.89	1.17	0.02	0.16	470	60
D05	-	86.15	8.08	3.02	0.38	0.60	0.99	0.02	0.20	620	80
D06	-	85.25	7.80	2.56	0.38	0.92	1.22	0.02	0.19	530	100
D07	-	84.77	8.78	2.43	0.45	0.82	1.17	0.02	0.18	530	60
D08	-	88.02	7.07	2.09	0.39	1.07	1.13	0.02	0.15	580	90
D09	-	84.48	7.62	2.94	0.35	0.56	1.00	0.02	0.20	480	90
D10	-	84.72	7.94	2.24	0.40	0.91	1.18	0.02	0.18	580	60
Method Code	***GA01***	***XRF01***	***XRF01***	***XRF01***	***XRF01***	***XRF01***	***XRF01***	***XRF01***	***XRF01***	***XRF01***	***XRF01***
Units	***g/ton***	***%***	***%***	***%***	***%***	***%***	***%***	***%***	***%***	***ppm***	***ppm***
Detection Limit	***0.003***	***0.01***	***0.01***	***0.01***	***0.01***	***0.01***	***0.01***	***0.01***	***0***	***0.1***	***0.1***
METHOD	***GST***	***GST***	***GST***	***GST***	***GST***	***GST***	***GST***	***GST***	***GST***	***GST***	***GST***

Sample ID	Pb	Bi	Zr	Sr	As	Zn	Cu	Mn	Cr	Cd	Ni
D01	20	30	100	130	5	50	160	90	60	10	150
D02	20	20	90	130	4.5	60	160	10	60	10	140
D03	30	20	100	150	6	50	160	100	40	10	120
D04	20	10	80	160	3.8	50	80	180	10	10	40
D05	20	10	100	130	5.2	50	90	150	40	10	40
D06	70	30	120	170	4	130	80	180	50	10	40
D07	20	20	120	160	5.1	30	90	120	50	10	10
D08	60	60	90	180	4.7	130	120	140	20	10	40
D09	20	10	80	110	4.9	40	100	120	40	10	40
D10	20	20	140	160	5.4	60	40	150	40	10	40
Method Code	***XRF01***	***XRF01***	***XRF01***	***XRF01***	***XRF01***	***XRF01***	***XRF01***	***XRF01***	***XRF01***	***XRF01***	***XRF01***
Units	***ppm***	***ppm***	***ppm***	***ppm***	***ppm***	***ppm***	***ppm***	***ppm***	***ppm***	***ppm***	***ppm***
Detection Limit	***0.1***	***0.1***	***0.1***	***0.1***	***0.1***	***0.1***	***0.1***	***0.1***	***0.1***	***0.1***	***0.1***
METHOD	***GST***	***GST***	***GST***	***GST***	***GST***	***GST***	***GST***	***GST***	***GST***	***GST***	***GST***

- not analysed | -- element not determined | I.S. insufficient sample | L.N.R. listed not received | * Accredited

Management Signatory

Technical Signatory

SADCAS

TEST-5 0043

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Effective Date: March,2025

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Submitted by: DUWASA
Received date: 13/06/2025
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Type of Samples: SOIL
Samples: 10

SAMPLE ID	Th	U	Hg
D01	-	-	-
D02	-	-	-
D03	-	-	-
D04	-	-	-
D05	-	-	-
D06	-	-	-
D07	-	-	-
D08	-	-	-
D09	-	-	-
D10	-	-	-
Method Code	***XRF01***	***XRF01***	***XRF01***
Units	***ppm***	***ppm***	***ppm***
Detection Limit	***0.1***	***0.1***	***0.1***
METHOD	***GST***	***GST***	***GST***

- not analysed | -- element not determined | I.S. insufficient sample | I.N.R. listed not received | * Accredited

Management Signatory

Technical Signatory