

THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY

TANZANIA COMMISSION FOR UNIVERSITIES



**ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) FOR
THE PROPOSED ESTABLISHMENT OF TANZANIA COMMISSION FOR
UNIVERSITIES (TCU) HEADQUARTERS OFFICE BUILDING ON PLOT
NO. 56/4 BLOCK E, KISASA B AREA, ILAZO MBUYUNI STREET,
IPAGALA WARD, DODOMA CITY COUNCIL IN DODOMA CITY**

**PROPONENT:
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EXECUTIVE SUMMARY

1. Background Information

The Tanzania Commission for Universities (TCU) is a body corporate that was established on 1st July 2005 under the Universities Act, Cap. 346 of the Laws of Tanzania to succeed the then Higher Education Accreditation Council (HAEC) which was established in 1995. TCU is a public institution under the Ministry of Education, Science and Technology (MoEST) of the United Republic of Tanzania.

TCU mandate is to regulate the provision of university education in Tanzania. Besides the regulatory function, TCU provides advisory and supportive functions. On the regulatory function, TCU recognises, approves, registers and accredits university institutions operating in Tanzania, and university level programmes being offered by registered university institutions in the country. TCU also ensures proper functioning of all university institutions in Tanzania so as to foster a harmonised higher education system in the country that produce nationally and globally competitive outputs in line with its vision and mission.

TCU is implementing the Higher Education for Economic Transformation (HEET) Project under the funding from the World Bank (WB). The Project Development Objective (PDO) is *to strengthen the learning environments and labour market orientation of programmes in priority disciplines and the management of the higher education system*. The project is carried out in five years (2020-2025). TCU is implementing one of the components of the Project, focusing on the following thematic areas:

- i) Strengthening accreditation and quality assurance including for Open, Distance and e-Learning programs through technical assistance to review and update curriculum design, quality assurance and accreditation guidelines and standards informed by international best practices;
- ii) Capacity building for academic staff and leadership at universities on the updated guidelines and standards to facilitate proper set up of institutional-level quality assurance units;
- iii) Facilitating development of labour market aligned programs at institutions by financing labour market surveys and stakeholder forums;
- iv) Promoting equity in the higher education system through the development of a national and institution-specific gender-sensitive admissions and university leadership policy and guidelines including on gender discrimination and GBV;
- v) Strengthening the capacity of university leadership on good governance practices and academic policies; and
- vi) Improving efficiency of data management in collaboration with the MoEST by upgrading the Tertiary Education Management Information System to online ICT systems and integrating management information systems.

Through the HEET Project, as one of the planned activities, TCU expects to construct a 5-storey Headquarters Office Building with the following minimum basic features: office space capable of accommodating 100 staff, conference room with a capacity of 100 people, parking space and other essential facilities. The building will be constructed on Plot No. 56/4, Block E, Kisasa B Area, Dodoma City.

The above development undertaking may have significant direct or indirect impacts on the environment and the lives of human beings in the vicinity of the project. Thus, it is mandatory to

undertake an Environmental and Social Impact Assessment (ESIA) in compliance with the provisions of the Environmental Management Act (EMA) of 2004 of Tanzania.

The World Bank's Environmental and Social Framework (ESF) outlines policies and standards to counteract anticipated environmental and social impacts in investment projects. ESS1 within ESF specifies requirements for Borrowers regarding the identification, assessment, and mitigation of such risks. In line with these guidelines, TCU submitted an Environmental and Social Impact Assessment (ESIA) application to NEMC, including a Scoping Report and Terms of Reference (TOR). As the procedure requirement the project was submitted to NEMC for registration and was allocated with project reference No. EC/EIA/2023/7352 with approved terms of reference (ToR) for a comprehensive ESIA study, aligning with the Environmental Management Act, Cap 191, Environmental Impact Assessment and Audit (Amendment) Regulations, 2018, and the project-specific Environmental and Social Management Framework (ESMF).

2. Location and Project Description

The project area for proposed development of TCU Headquarter building is located in the Kisasa B area, Ilazo Mbuyuni Street/Mtaa, Ipagala ward, Dodoma City Council in Dodoma city. The project area is bordered by TMDA Building in south-west side, Administration block office for Record and archives management department in western side, Martin Luther Primary School in southern side, NRC buildings in northern side, and Government oil station in Eastern side. Also, the proposed project area can be accessed by Morogoro-Dodoma Road about 0.2Km and Hombolo road about 5m. The road has safety sign for vehicles and pedestrian and is tarmacked. Furthermore, the project area is situated roughly eight kilometers (8 km) away from Dodoma's city center.

The proposed development of TCU Headquarter office building shall be designed and constructed to be climate-smart including considerations for persons with special needs. The design would ensure low energy use, adequate natural ventilation and lighting, and render low carbon footprint by increasing green spaces. The building design will also consider rainwater harvesting, and storm water and waste management systems. The building will be of 5-Storeys with capacity to accommodate 220 persons and the estimated net floor area is 795.1 m² excluding parking area for 14 vehicles and Guard post with 362.452 m² estimated net floor area.

Furthermore, the soil of the project area characterized with silty/clayey sand and sandy silt/clay result based on sieve analysis. The fine contents of the soil range 15% and 62% and the fines are of low plasticity. In designing of any foundation base, an important point to note is the permissible bearing pressure on the ground which corresponds to a service stress and its maximum value that can be supported without excessive deformation taking place.

3. Relevant Policies and Legislation

There are numbers of policies and legislations set out the legal and regulatory requirements which are relevant to the proposed establishment of TCU Headquarter Office Building at Kisasa B area, Ilazo Mbuyuni Street/Mtaa in Dododoma City Council. Additionally, there are pertinent standards governing environmental management and protection, health and safety. Relevant policies and legislations pertaining to development of the project mainly environmental management in terms of quality, health and safety, pollution of ground and surface water, pollution of soil, land and land use control among others, were examined to ensure that the proposed development project meets and abides by these regulations.

The policies and legal frameworks include;

- i. Environmental Management Act No. 20 of (2004), Cap. 191
- ii. The Water Supply and Sanitation Act No. 12 of 2009

- iii. Land Act no 4 (1999)
- iv. The Urban Planning Act (2007)
- v. Occupation Health Safety (2003)
- vi. Employment and Labour Relations Act No. 6 of 2004
- vii. Engineers Registration Act and its Amendments 1997 and 2007
- viii. The Contractors Registration Act (1997)
- ix. The Architects and Quantity Surveyors Act (1997)
- x. The HIV and AIDS (Prevention and Control) Act of 2008
- xi. The Local Government Laws (Miscellaneous Amendments) Act (1999)
- xii. The Tanzania 2025 Development Vision
- xiii. Environmental Impact Assessment and Auditing (amendment) Regulations (2018)
- xiv. The National Health Policy of 2008;
- xv. The Tanzania 2025 Development Vision
- xvi. The Employment and Labour Relations Act No. 6 of 2004

Furthermore, this ESIA study has complied with the World Bank Environmental and Social Framework which supports green, resilient, and inclusive development by strengthening protection for people and the environment and making important advances in areas such as labor, inclusion and non-discrimination, gender, climate change, biodiversity, community health and safety, and stakeholders' engagement. The following are six (6) out of 10 Environmental and Social standards (ESSs) of the World Bank which are relevant to the project;

- i. ESS1: Assessment and Management of Environmental and Social Risks and Impacts.
- ii. ESS2: Labor and Working Conditions.
- iii. ESS3: Resource Efficiency and Pollution Prevention and Management.
- iv. ESS4: Community Health and Safety.
- v. ESS8: Cultural Heritage.
- vi. ESS10: Stakeholder Engagement and Information Disclosure

4. Baseline Conditions

The proposed area for project implementation has few different plants species including indigenous trees which are short trees, shrubs with thorns & few cactuses were observed. During general searches it was observed that there is no species of the amphibians and reptiles that are included in the IUCN Red list of threatened species. Also, the project area is accessible to essential amenities like electricity, water supply, and telecommunication services.

The construction and operation of the TCU headquarter building may lead to an influx of students, staff, and other visitors potentially affecting the demographic composition of the area. The increased human activity may also put pressure on local resources and infrastructure, impacting the community's daily life. Additionally, the environmental changes associated with construction and development may influence the livelihoods of the nearby residents, especially if the project alters the landscape, water sources, or local ecosystems.

5. Stakeholders Engagement

Stakeholders' identification and engagement process was conducted based on EIA and Audit Regulations, 2005 and its amendment of 2018 and World Bank Environmental and Social Standards (ESS10), WB Prepare and disclose Stakeholders Engagement Plan (SEP) and Resettlement Action Plan (RAP) and UNDP (2002) EIA Training Manual Resource. Stakeholders encompass all individuals, groups, or organizations that could be impacted by or could impact the proposed project, either positively or negatively. In the preparation of the scoping report for the project situated in Kisasa B area, Ilazo Mbuyuni street/mtaa, Ipagala ward in Dodoma City, a public consultation process was undertaken. This process facilitated

the establishment of a communication channel for consultation at both local and national levels. The engagement of national and local authorities, as well as leaders in the project's sphere of influence, was integral to the process. The purpose of consultation was to get their views throughout the project lifespan. In addition, a mechanism was put in place to address grievances; Gender based Violence (GBV), Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH).

The consultation involved a diverse range of individuals and groups susceptible to or capable of influencing the proposed development, spanning various administrative levels such as zonal, regional, city council, and local levels. Notably, OSHA participated at the zonal level, while at the regional level, consultation included TCU staff, the Fire and Rescue Force, DUWASA, TANESCO, NGOs, CBOs, and Dodoma City Council. At the local level, consultation occurred with the Ipagala Ward Executive Officer (WEO), the Ilazo Mbuyuni Street/Mtaa Executive Officer (MEO), and community members. The key issues deliberated upon included the following;

- Environmental Pollution (Land, water and air resources)
- Waste management both general/domestic waste and hazardous waste
- Occupational health and safety issues
- Population dynamism
- Social and economic impacts, both positive and negative

6. Environmental Impact Assessment and Identification of Alternative

The project implementation will have environmental and social consequences at various stages throughout its lifecycle. The construction, operation, and closure phases of the proposed project will generate impacts. One of the most significant and noticeable impacts will be the pollution of the surrounding environment, affecting water, land, air, and vegetation. Despite the project being enclosed within a fence, there is still a possibility of direct or indirect impacts on these elements due to the project implementation.

6.1 Significant Social Impacts

Positive social impact of the project

- Job creation and employment opportunities
- Increased market opportunities and sources of income
- Improving growth of the economy
- Income to Local Suppliers and Service Providers
- Increase skills and impart knowledge to local communities

Negative social impact of the project

- Disruption of social activities
- Increased Traffic and road accidents
- Impact on Safety and Health risks
- Prevalence of Communicable diseases
- Increased level of crimes
- Influx of people/Population pressure
- Occupational Safety and Health Impacts
- Community Health, Safety and Security
- Conflicts and grievances
- Water shortage and scarcity
- Insecurity and theft

- Increased risk of GBV, SEA and sexual harassment
- Increased Traffic along the Access Road to the Main Morogoro-Dodoma Road and Hombolo road
- Loss of employment and revenues
- Loss of revenue to the government

6.2 Significant environmental impact of the project

Positive environmental impacts of the project

- Visual Impact/ Increased Aesthetic Value of the Project Area

Negative environmental impacts of the project

- Impact on natural resource
- Deteriorated / Impairment of Local Air Quality
- Noise Pollution
- Impact on climate change
- Impairment of air quality due to dust emission
- Increased vibration
- Increased generation of solid and hazardous waste
- Generations of Liquid Wastes
- Erosion of Exposed Surfaces
- Increased Water Pollution
- Storm water generation and overflow
- Impact from poor hygienic condition
- Loss of aesthetic value due to haphazard disposal of demolished waste

7. Mitigation Measures

The report also includes strategies and a monitoring strategy for reducing or avoiding any negative social and environmental effects. ESMP (**Chapter 7**) outlined in this report outlines the timetable for implementing the proposed strategies to mitigate these impacts, as well as plans for ongoing monitoring. It clearly defines the roles and responsibilities of various parties involved in mitigating and monitoring the adverse environmental and social effects.

TCU is accountable for project execution, including meeting environmental and social management obligations. The approved ESIA report will serve as a guide for TCU to implement and monitor social and environmental impacts of the proposed project.

8. Environmental and Social Management Plan (ESMP)

This report proposes strategies to reduce or avoid the negative social and environmental effects that have been identified. These strategies, along with a monitoring plan, are outlined in the ESMP (Table 8.1). Most of these measures align with well-established engineering and social practices. The ESMP also defines the roles and responsibilities of various stakeholders involved in the plan. During the construction phase, the primary actors responsible for implementation are the contractor and TCU. However, once the operation phase begins, TCU will take on the key role in implementing the mitigation measures. The estimated environmental costs for these actions amount to TZS 161,000,000.00.

9. Environmental and Social Monitoring Plan (ESMoP)

There are four types of monitoring activities: baseline monitoring, impact monitoring, compliance monitoring, and mitigation monitoring. The Contractor's safeguard team, consisting of environmental, social, and safety experts, will conduct the monitoring of environmental and social parameters during the construction phase, supervised by the Consultant's safeguard team. Once the operation phase begins, the responsibility for mitigation and monitoring will shift to the TCU. To assess the progress and address any emerging environmental issues, OSHA and/or NEMC will conduct annual EHS reviews, examining environmental concerns alongside the project implementation status and sensitivity. The estimated cost for implementing the proposed environmental monitoring program is TZS 57,000,000.

10. Cost Benefit Analysis

The Environmental Impact Statement (EIS) evaluates the project by considering its negative impacts in relation to the socioeconomic benefits that would be missed if the project were not carried out. The analysis of the environmental cost-benefit assesses the ratio between the negative and positive impacts. The project offers significant potential financial and social benefits, while the environmental impacts can be adequately mitigated. The financial resources required for mitigating the negative impacts are relatively small compared to the overall investment needed.

11. Decommissioning Phase

Decommissioning occurs when a project reaches its conclusion. It is expected that the life span of the proposed project will be 100 years basing on the technology to be used, also when the project reaches its end, all the facility and related infrastructure will be dismantled. This process will include the removal and demolition of buildings and equipment used, or even the complete demolition of the entire area, followed by the clearance of the site and transportation of all waste and debris to a disposal site. Subsequently, site restoration efforts will be undertaken to ensure that the area reverts to its original condition as it existed prior to the construction of the proposed buildings.

12. Conclusion

The EIA for the proposed TCU Headquarters Office Building in Dodoma City acknowledges the project's potential benefits for educational infrastructure and administrative efficiency but raises concerns about its environmental and social impact. These include disruptions of social and economic activities, increased traffic, and effects on community well-being. Hence, the report recommends implementing mitigation measures like sustainable building practices, waste management, traffic plans, and community engagement. Also, the EIA serves as a guide for decision-makers to balance developmental needs with environmental and social sustainability, emphasizing the importance of effective implementation and ongoing monitoring for the project's success.

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LIST OF ABBREVIATION

AIDS	Acquired Immune Deficiency Syndrome
BOQ	Bill of Quantities
CSO	Civil Society Organisation
CSR	Community Social Responsibility
CRDB	Cooperative and Rural Development Bank
DRM	Disaster risk management Plan
DUWASA	Dodoma Urban Water Supply and Sanitation Authority
EIA	Environmental Impact Assessment
ESIA	Environmental and Social Impact Assessment
EIS	Environmental Impact Statement
ESIS	Environmental and Social Impact Statement
EMA	Environmental Management Act
ESMP	Environmental and Social Management Plan
ESMF	Environmental and Social Management Framework
ESS	Environmental and Social Standard
GA	Government Authority
GBV	Gender Based Violence
GHO	Grievance Handling Officer
GRIC	Grievance Redress Integrity Committee
GOT	Government of Tanzania
GRM	Grievance Redress Mechanism
HEET	Higher Education for Economic Transformation
HIV	Human Immunodeficiency Virus
HSE	Health, Safety and Environment
ILO	International Labour Organisation
LGA	Local Government Authority
MoEST	Ministry of Education, Science and Technology
MEO	Mtaa Executive Officer
NEMC	National Environment Management Council
NGOs	Non – Government Organisation
OSHA	Occupational Safety and Health Authority
PAD	Project Appraisal Manual
PIU	Project Implementation Unit
POM	Project Operational Manual
SEA	Sexual Exploitation and Abuse
SH	Sexual Harassment
SEP	Stakeholders Engagement Plan
TAC	Technical Advisory Committee
TANESCO	Tanzania Electricity Supply Company
TCU	Tanzania Commission for Universities
ToR	Terms of Reference
TZS	Tanzanian Shillings
URT	United Republic of Tanzania
WB	World Bank
WEO	Ward Executive Officer

CHAPTER 1: INTRODUCTION

1.1 Background Information

The Tanzania Commission for Universities (TCU) is a body corporate that was established on 1st July 2005 under the Universities Act, Cap. 346 of the Laws of Tanzania to succeed the then Higher Education Accreditation Council (HAEC) which was established in 1995. TCU is a public institution under the Ministry of Education, Science and Technology (MoEST) of the United Republic of Tanzania.

TCU mandate is to regulate the provision of university education in Tanzania. Besides the regulatory function, TCU provides advisory and supportive functions. On the regulatory function, TCU recognises, approves, registers and accredits university institutions operating in Tanzania, and university level programmes being offered by registered university institutions in the country. TCU also ensures proper functioning of all university institutions in Tanzania so as to foster a harmonised higher education system in the country that produce nationally and globally competitive outputs in line with its vision and mission.

TCU is implementing the Higher Education for Economic Transformation (HEET) Project under the funding from the World Bank (WB). The Project Development Objective (PDO) is *to strengthen the learning environments and labour market orientation of programmes in priority disciplines and the management of the higher education system*. The project is carried out in five years (2020-2025). TCU is implementing one of the components of the Project, focusing on the following thematic areas:

- Strengthening accreditation and quality assurance including for Open, Distance and e-Learning programs through technical assistance to review and update curriculum design, quality assurance and accreditation guidelines and standards informed by international best practices;
- Capacity building for academic staff and leadership at universities on the updated guidelines and standards to facilitate proper set up of institutional-level quality assurance units;
- Facilitating development of labour market aligned programs at institutions by financing labour market surveys and stakeholder forums;
- Promoting equity in the higher education system through the development of a national and institution-specific gender-sensitive admissions and university leadership policy and guidelines including on gender discrimination and GBV;
- Strengthening the capacity of university leadership on good governance practices and academic policies; and
- Improving efficiency of data management in collaboration with the MoEST by upgrading the Tertiary Education Management Information System to online ICT systems and integrating management information systems.

TCU has received financial support from the World Bank (WB) through the Ministry of Education, Science and Technology (MoEST) under the project named Higher Education for Economic Transformation (HEET). Through the HEET Project, as one of the planned activities, TCU expects to construct a 5-storey Headquarters Office Building with the following minimum basic features: office space capable of accommodating 100 staff, conference room with a capacity of 100 people, parking space and other essential facilities. The building will be constructed on Plot No. 56/4, Block E, Kisasa B Area, Dodoma City.

The above development undertaking may have significant direct or indirect impacts on the environment and the lives of human beings in the vicinity of the project. Thus, it is mandatory to undertake an Environmental and Social Impact Assessment (ESIA) in compliance with the provisions of the Environmental Management Act (EMA) of 2004 of Tanzania.

1.2 Nature of the Project

The project is on the list of borderline projects that Environmental Impact Assessment is mandatory according to Environmental Management (Environmental Impact Assessment and Audit) (Amendment) Regulations 2018 to implement Environment Management Act No. 20 of 2004. This has been justified in the Third Schedule to the Environmental Management Act, Cap 191 and in the First Schedule Section

1.3 Rationale and Objective of the Project

1.3.1 Objective of the HEET project

Based on the HEET Project Appraisal Document (PAD) of 2021, the objective of the HEET project is to align with the broader goals of the HEET Project, including strengthening the learning environments and labor market orientation of programs in priority disciplines, and thereby contributing to the economic transformation of Tanzania through higher education. In complying with the World Bank's ESF (ESMF, POM, ESCP, SEP, LMP) and standards as well as the provisions of the EIA and Audit Regulations, GN No. 474 of 2018, the project beneficiary (TCU) has prepared this ESIA report which address: the nature of the project, its location main processes, material use, by products and their disposal, environmental impacts and their mitigation measures.

1.3.2 Rationale of the project

According to the 2021 Environmental and Social Management Framework (ESMF), Tanzania has made significant improvement in basic education, with primary enrollment increasing by 24.5% from 8,116,488 in 2015 to 10,111,671 pupils in 2018 (10,601,616 in 2019). The positive trend extends to secondary education, indicating a growing number of students transitioning to post-primary education in 2013/14. However, with a projected surge in demand for higher education by 2030, both public and private tertiary education systems must enhance capacity and quality (PAD, 2021). Despite progress in basic education, policymakers recognize the challenge of absorbing graduates into higher education. Immediate priorities include expanding infrastructure, facilities, and quality assurance systems, particularly in Engineering, Medical Science and Technology, Agriculture, Energy, Minerals, Forestry, and Natural Resource Management. Gender issues also warrant attention.

HEET Project Appraisal Document (PAD) of 2021 points out a number of challenges in the current higher education system. These include:

- Gender inequality in lower levels of education (especially upper secondary) that persists up to the university level, although the gender parity index in higher education has improved from 56.5 percent in 2013 to 67.4 percent in 2018.
- University graduates struggle to find jobs, at least in part due to skills mismatches.
- Demand-side considerations underscore the need for greater numbers of students in disciplines and programs sought after by employers, such as engineering, agribusiness, tourism, and climate change. The overall quality of post-secondary academic programs is

low and does not prepare university graduates adequately for current and future formal jobs or self-employment.

- Shortage of well-trained lecturers, and the majority of academic staff use traditional teaching methodologies
- Most of higher education institutions are not currently able to access or use modern technologies to deliver training.
- The global pandemic has reinforced the need for higher education institutions to develop thoughtful resiliency plans.

A more strategic mix of education, skills and technology will help Tanzania develop its productive sectors and create jobs for the growing number of youths entering the labor market (PAD, 2021). The Higher Education for Economic Transformation (HEET) Project aims to fund the enhancement of infrastructure, faculties, and quality assurance systems within higher education. This initiative, led by the Government of the United Republic of Tanzania, seeks to empower public universities with the operational capacity to serve as reliable catalysts for economic transformation.

The HEET project aligns with each university's institutional vision, mission, objectives, and core values, fostering a collaborative approach for sustainable economic growth. The establishment of the TCU Headquarters Office Building in Dodoma City is a critical step towards the successful implementation of the Higher Education for Economic Transformation (HEET) Project funded by the World Bank. This project is aimed at strengthening the learning environments and labor market orientation of programs in priority disciplines and enhancing the management of the higher education system in Tanzania. Currently, TCU operates from rented premises at Suma JKT building, which may not fully meet the specific requirements and functionality needed to oversee and coordinate the higher education system effectively.

1.4 Objectives of ESIA Study

The objective of the ESIA study was to ensure that environmental concerns are integrated into all the project activities to contribute to sustainable development. The specific objectives of conducting the Environment and Social Impact Assessment study concerning the project were to:

- To conduct environmental screening and scoping study to identify social and environmental risks and impacts in the project site and nearby environment;
- To identify, analyse and assess environmental and social risks and impacts of the proposed construction project;
- To describe the pertinent regulations and standards governing environmental quality, health, and safety, protection of sensitive areas, protection of endangered species, and land use control at international, national, regional, and local levels;
- To recommend cost-effective measures for minimising or eliminating adverse impacts of the proposed design, construction, operation, and maintenance of the project; and
- To prepare an Environmental and Social Management Plan, including Health and Safety Management for design, construction, operation, and maintenance phases of the Project.

1.5 Methodology and ESIA Team

The ESIA investigation utilized various participatory approaches to engage all relevant stakeholders. The methods employed align with the guidelines outlined in the Environmental Management Act,

Cap 191, and the Environmental Management (Environment Impact Assessment and Audit) (Amendment) Regulations of 2018.

The ESIA being a multidisciplinary field involved a team of experts, the key ones being EIA Expert (Team Leader), Environmental Engineer, Civil Engineer, Sociologist & GBV Specialist, Biodiversity expert, Occupational Health and Safety Specialist and GIS experts, who worked in close collaboration with the relevant stakeholders in Dodoma City Council, Ipagala ward officials carried out the ESIA study. Baseline data for the study area were collected using a combination of:

- Site Reconnaissance
- Analysis of Maps and Plans
- Review of Reports and background documents
- Checklists
- Field Studies
- Public Consultations

1.5.1 Desk Study

This involves the acquisition and review of project documents, reports, maps, and drawings relevant to the project. Other documents will include the following different pieces of national legislation, policies, guidelines, and regulations, as well as international policies, guidelines, and procedures. Examples of the information obtained from the different documents include project design and planned project activities. It also involved the review of documents on HEET Environmental and Social Management Framework (ESMF) report, ESMF (2021) and the World Bank Environmental and Social Standards on Assessment and Management of Environmental and Social Risks and Impacts (ESS1) were fully incorporated in this ESIA.

1.5.2 Site visits

This involved undertaking systematic assessments within and around the proposed project localities. All observations were analyzed and documented. Furthermore, experts' observations and technical methods related to the issues in question were explored as detailed in this report. To get wide scope of the existing situation on the site, appraisal was made on physical and environmental conditions of the proposed project and areas that may be impacted by the project, including land use and drainage system as well as assessment of other relevant socio-economic parameters.

1.5.3 Stakeholders Engagement

Identification of stakeholders

The stakeholders were identified based on their roles, relevance, and potential to be impacted or to impact the project. Most of the stakeholders that might be impacted by the project, e.g., nearby developments, local government authorities, Government Departments, Parastatal Organisation and TCU, were pre-determined and discussion, were conducted. The consulted stakeholders include:

- Ilazo Mbuyuni street/Mtaa and Kisasa B area
- Ipagala Ward
- Dodoma City Council
- Occupational Safety and Health Authority (OSHA)
- Fire and Rescue Force

- Tanzania National Electric Supply company (TANESCO)
- Dodoma Urban Water Supply Authority (DUWASA)
- Rural Water Supply Agency (RUWASA)

Involvement of stakeholders

The study team, in collaboration with the project proponent representative visited the proposed project area and neighboring community. Physical observations and stakeholder interviews were conducted to collect baseline data and issues of concern. The study applied different participatory methods to involve all relevant stakeholders. The interview with individuals is based on a list of available contents or questions and discussions. Focused group discussions were also used to gather information. In establishing the public's views concerning the proposed project, the consultants were provided with an introduction letter addressed to each stakeholder, briefing the project and asking them to raise their concerns to consultant freely.

Documentation of stakeholders' concerns

The stakeholders pointed out several issues and concerns. An individual or a group of people who raised an issue was cross-checked by discussing it with other groups. Key issues raised by each stakeholder group were summarized and further analysed in this report. For details of stakeholders consulted, the record of main issues raised (comments) and responses, see Chapter 5.

1.5.4 Baseline Data and Information

1.5.4.1 Physical Environment

Information was gathered on the existing physical environment, particularly as related to topography, soils, drainage and hydrology in general.

Climate, soils and topography

Information on the climate, geology, topography, soils, was obtained by compiling data from existing reports, and source agencies. Maps were also examined to obtain some of the data such as topography of the general area. Field work was carried out to augment and verify existing information relating to topography and soils and to obtain first-hand knowledge of the other physical aspects.

Hydrology and drainage

Surface and ground water characteristics were assessed using field investigation as well as maps and data from previous reports.

Noise and Vibration

Spot measurements were done on site to determine the current noise levels and vibration at the project site. Sound level meter device was used to record noise at the four corners of the project site (north, south, east and west) as prescribed in ISO 19961:2003 and ISO 3095:2001. On taking measurements, the meter was set to the "A" weighed measurement scale, which enables the meter to respond in the same manner as the human ear. The meter was held approximately 1.5 m above the ground and at least 0.5 m away from hard reflecting surfaces such as walls.

Ground vibrations were measured using a vibrometer data logger, which is designed to measure ground vibrations according to European standard EN 14253:2003. The meter has an accuracy of

±5%, acceleration of 200 m/S² , a wide frequency range of 10 Hz to 1 kHz for capturing almost all possible ground vibrations. On taking measurements, the accelerometer transducer was mounted on the ground to record both ambient and peak vibrations. To produce accurate results, the transducer was secured in direct contact with the ground. The same point used for noise measurements were also used for vibration.

Air quality

Spot measurements were done on site to determine the current ambient air quality in terms of particulate matter and pollutant gases at the project site. Particulate matters were measured at site in terms of TSP, PM₁₀, PM_{2.5} by using Dust Monitor, that measures dust particles of different dimensions (microns of 10, 5.0, 2.5, 10). The equipment complies with the EMC Directives. Ambient pollutant gas concentrations (i.e. CO, NO_x, NO₂, SO₂, H₂S, and VOC) were measured using gas analyzer. The ambient gases were measured in accordance with the manufacturer's procedure that meets ISO 9001:2008 protocol. The device was elevated at a height of 1.5 meters above the ground; once the device is switched ON, it performs an automatic calibration for three minutes by pumping in fresh air into the sensors so as set the toxic sensors to zero.

1.5.4.2 Biological Environment

The status of the flora and fauna of the study area was determined by a review of literature relevant to the area and field investigations. The vegetative communities were identified and classified into community types. Identification was carried out of dominant tree species. The vegetation was identified and described for their property. Information on fauna was gathered from existing literature on reported species as well as observations in the field. Observations were made particularly to assess the presence of birds in the general area. Information also was obtained from locals in the area about the presence of any significant species.

1.5.4.3 Socio-economic Environment

To determine the cultural and social factors associated with the construction and operation of the proposed project, members of the communities in the general vicinity of the project were interviewed and a review of economic and social literature was conducted. Further, rapid field appraisal techniques in conjunction with desk research were employed to investigations of the socio-economic considerations within the project area. These were undertaken to ascertain information to satisfy the following factors as outlined in the approved terms of reference provided:

- Population and settlement characteristics
- Land uses and livelihoods
- Community structure, employment and income
- Developments underway
- Infrastructure in place
- Water supply and other utilities
- Waste management practices
- Recreational activities
- Energy supply
- Public health and safety
- Access to and delivery of health, education and social services

1.6 Review of project documents and literature

This involved reviewing available information on the project to gain a basic understanding of the components and their operation. The documents consulted are presented in the list of references and bibliography of this report.

1.7 Policy, Legal and Institutional Arrangement

Policy, legal and institutional arrangement were compiled from review of documents: policies, legislation, guidelines and standards. Information and data on local by-laws, institutional structures and mandates/authority were obtained from Dodoma City Council.

1.8 Report Structure

The report is presented in accordance to the format given in Section 18 (1 and 2) of the Environmental Impact Assessment and Audit Regulations, 2005. This report is structured in the following style:

- i. Executive Summary
- ii. Table of Contents
- iii. List of Acronyms
 1. Chapter 1, Introduction;
 2. Chapter 2, Project description;
 3. Chapter 3, Policy, Legal and Institutional Framework;
 4. Chapter 4, Baseline Environmental and Social condition;
 5. Chapter 5, Stakeholder Engagement Plan and Grievances Redress Mechanism;
 6. Chapter 6, Identification and Assessment of Impacts and Project Alternatives Identification;
 7. Chapter 7, Environmental and Social Management Plan;
 8. Chapter 8, Environmental and Social Monitoring Plan;
 9. Chapter 9, Cost Benefit Analysis;
 10. Chapter 10, Decommissioning Plan;
 11. Chapter 11, Summary and Conclusions;

CHAPTER 2: PROJECT DESCRIPTION

2.1. Location and Accessibility

2.1.1 Location

The project area for proposed development of TCU Headquarter building is located in the Kisasa B area, Ilazo Mbuyuni Street/Mtaa, Ipagala ward, Dodoma City Council in Dodoma city. The project area is bordered by TMDA Building in south-west side, Administration block office for Record and archives management department in western side, Martin Luther Primary School in southern side, NRC buildings in northern side, and Government oil station in Eastern side.

Table 2.1: GPS Coordinate of the project area

Code	Latitude(S)	Longitude(E)
AQMS1	-6.1480936	35.8087608
AQMS 2	-6.1480935	35.8087609
AQMS 3	-6.1480968	35.8087604
AQMS 4	-6.1480967	35.8087605

2.1.2 Accessibility

The proposed project area can be accessed by Morogoro-Dodoma Road about 0.2Km and Hombolo road about 5m. The road has safety sign for vehicles and pedestrian and is tarmacked. Furthermore, the project area is situated roughly eight kilometers (8 km) away from Dodoma's city center.

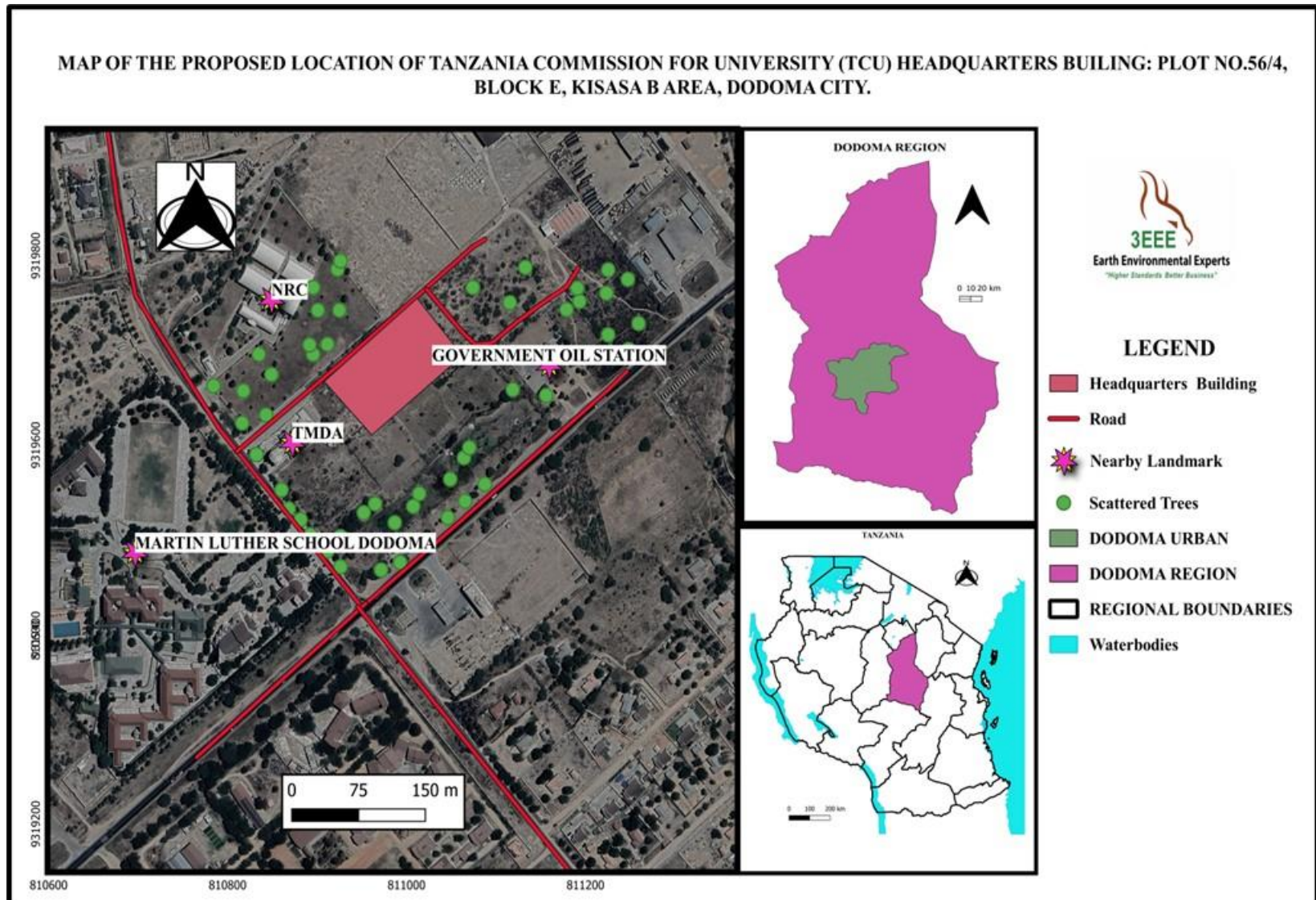


Figure 1.1: Location map of proposed site for TCU Headquarter Building in Dodoma City (Source: 3Es, October 2023)

2.2 Project Site Current Status

The project area for the proposed establishment is located in urban area and is 8 km from Dodoma city center. It is bordered by Hombolo tarmacked road which is 5m to the western side and developed land to the northern, southern, eastern and other western parts.

2.3 Land Ownership and Land Use Plan

Land for the proposed establishment of TCU Headquarters Office Building site is on a surveyed and shall be used for Office purposes only. Based on title deed (Appendix 2) state that the land and the buildings to be erected thereon shall be used for Office purposes only. Use Group 'G' Use classes (a) as defined in Urban planning (Use Groups and Use Classes) Regulation, 2018. The land is legally owned by TCU.

2.4 Project component and design

The proposed development of TCU Headquarter office building shall be designed and constructed to be climate-smart including considerations for persons with special needs. The design would ensure low energy use, adequate natural ventilation and lighting, and render low carbon footprint by increasing green spaces. The building design will also consider rainwater harvesting, and storm water and waste management systems.

2.4.1 Project component

a. TCU Headquarter Building Office

The building will be of 5-Storeys with capacity to accommodate 220 persons and the estimated net floor area is 795.1 m² excluding parking area for 14 vehicles and Guard post with 362.452 m² estimated net floor area.

The ground floor will consist of Reception, Registry, Head HRMA, Pool office for HRMA for 4 staff, Head PRO, Resource Centre, Conference Hall for 70 persons, Generator room, Drivers Lounge, and Wash Rooms. The first floor will consist of Director of Admission and Data Base Management Office, Director Office with Director washroom, Secretary office and Waiting area, Head of Admission office with Secretary office and Waiting area, Head of Data Base Management with Secretary office and Waiting area, Pool office Admission coordination, Pool office Data Base management office, Documentation office, Kitchenette, Janitor store, Flexible Office and Wash room. The second floor will consist of Director of Accreditation Office, Director Office, Director washroom with Secretary office and Waiting area, Head of Programme and Awards with Secretary office and Waiting area, Head of Institution accreditation, audit, monitoring and evaluation with Secretary office and Waiting area. The third floor will consist Director of Corporate Services Office with Director Office, Director washroom, Secretary office and Waiting area, Head of Procurement Unit with Secretary office and Waiting area, Pool office for PMU staff, Head of Planning and Research with Secretary office and Waiting area, Head ICT and Statistics office for 1 person, Chief Accountant and Finance for 1 person, Chief Internal Auditor for 1 person, Pool office internal auditor staff for 1 person, Pool office finance and account, Pool office ICT and Statistics, kitchenette, Janitor store, Flexible Office and Wash room. The fourth floor will consist Executive Secretary Office with ES Office, ES washroom, ES secretary office and Waiting Area, Assistant to ES office, Min Boardroom, Head Legal, Commission Chairperson office, Pool office Legal, Confidential Registry, Archive, kitchenette, Janitor store, Flexible Office and Wash room. The attic floor will consist Server Room 1, Server Room 2, Control Room, Water Tanks, Roof, and Skylight Covered Void.

Within the site there is few indigenous trees which are short trees, shrubs with thorns, and few cactuses were observed.



Plate 2.1: Proposed site for TCU Headquarter Building (Source: 3Es site visit in October, 2023)

2.4.2 Project design considerations

The overall design of the buildings will promote the use of construction materials that are environmentally friendly, durable, and vandal-proof and those that require minimal periodic maintenance. The buildings will be climate-smart and friendly to gender including considerations for persons with special needs (e.g., physical, learning impairment, emotional, and behavioral). The general design considerations will incorporate aspects of modern architecture, the current local government building policy guidelines and the latest standards developed by Contractors' Registration Board (CRB) and the Tanzania Commission for Universities (TCU) Architectural Metric Handbook which will include. The following are the design criteria that will be followed during the design of the buildings.

- **Sanitary facilities:** The selection of toilets and wash basins will be based on the number of workers and individuals with disabilities expected to use these amenities. The total number of toilets at the proposed establishment will be specified after completed of the project design.
- **Wastewater handling:** The wastewater will be managed through septic tank and soak away pit.
- **Functionality and Spatial Planning:** The consultant is required to collaborate with stakeholders to comprehend the unique needs of each building. The design should also incorporate features promoting natural ventilation, such as permanent air vents above doors and windows. Additionally, it should accommodate various energy-efficient lighting options, including fluorescent lamps and natural lighting through glass windows and doors for both security and illumination.
- **Sustainable Resource Utilization:** The building design will include landscaped gardens with suitable tree and shrub species to prevent ecological degradation and enhance the site aesthetic value. Landscaping will utilize excavated soil, reducing the need for off-site transport. The contractor should prioritize materials with low environmental impact, such

as recycled content, low VOC (Volatile Organic Compounds), and sustainably sourced wood.

- **Solid Waste Management:** The contractor will manage generated solid waste, while during the operational phase, TCU will handle its solid waste, especially domestic and institutional solid waste will be collected into the dust bins, before taken by the authorized contractor for final disposal to the Chidaya landfill.
- **Security and Safety Measures:** The contractor must adhere to local building codes, conduct thorough risk assessments, and incorporate earthquake-resistant designs and materials. Fire-resistant materials and systems should be implemented, along with well-planned evacuation routes and emergency exits for safe and swift evacuation. Robust security systems, including access control and surveillance, are also required.
- **Durable and Vandal-Proof Materials:** Consideration should be given to materials like concrete, brick, or metal cladding for external durability and vandalism resistance. Flooring options such as terrazzo, polished concrete, or durable commercial-grade carpeting are recommended. Impact-resistant glass and robust door hardware should be used for windows and doors. Graffiti-resistant coatings or easily cleanable surfaces are suggested for wall finishes, and sturdy, tamper-resistant furniture and fixtures are advised for common areas.
- **Founding conditions:** The proposed TCU Headquarter office building will require foundation on a good and uniform soil to avoid differential settlement. A full geotechnical investigation was conducted to ascertain the exact founding conditions of the building's structures.
- **Durability of the concrete:** Durability of any concrete is dependent on the cement being used, aggregates, admixtures, concrete mix design and curing. Rapid hardening cements will be avoided due to greater evolution of heat which can lead to increased shrinkage cracking.
- **Disaster Preparedness:** The consultant should design buildings with disaster-resilient features, including earthquake-resistant foundations and reinforced structures. Emergency evacuation plans and accessible routes must be established to facilitate safe evacuation during emergencies.
- **Climate Change Adaptation:** The building design should prioritize energy efficiency and sustainable materials to minimize the carbon footprint. Adequate insulation and natural ventilation systems can regulate indoor temperatures, reducing reliance on energy-intensive heating or cooling. Rainwater harvesting systems can be implemented to mitigate water scarcity during dry periods.
- **Inclusivity and Accessibility:** The building should be designed to meet the needs of all users, including those with disabilities and the elderly. Universal design principles should be adopted to ensure accessibility, user-friendliness, and equal opportunities for everyone, including barrier-free entrances, accessible restrooms, and consideration of diverse mobility needs.
- The building design will also include rainwater harvesting, drainage system for storm water management, and waste management systems.
- Replacement of planting trees that would be have knocked down during construction to conserve environment and implement Dodoma City Council policy for tree plantation.

2.4.2.1 Seismic Activities

Dodoma city is situated in a region where the eastern branch of the East African Rift System merges with the craton. This area experiences seismic activity ranging from low to moderate magnitude, occasionally accompanied by large earthquakes reaching up to magnitude 6.2, which have the potential to cause minor to moderate damage to buildings. Plot for TCU in Kisasa B area, located in the area, experiences ground vibrations amplification of up to five times compared to the source of earthquake activity reaching Dodoma. Nonetheless, during the implementation of proposed projects, it is imperative to construct buildings to a higher standard of construction adhering strictly to earthquake-based building codes.

The investigations as indicated by the geoscientific investigation of 2022 (Appendix 5) shows that, the plot lies on a low land area which is relative flat and filled with sediments primarily soil of Mbuga type with limited basements rocks exposure on surface. Moreover, assessment from high resolution airborne geophysical data and detailed ground magnetic data revealed that the plot is located in a region with very low magnetic field intensity. Likewise, ground magnetic survey and IP clearly shows low magnetic signature and low resistivity respectively particularly to the northeast part of the plot. These characteristics is the indication that the plot is located within thick sediments varying from 6m to 12m. However, magnetic signature and IP show no prominent fault/shear which can affect the proposed construction project of structural buildings. There are patches of high magnetic anomalies which probably are generated by ferricrete residues.

2.5 Description of Main Project Activities

Activities for the project will be implemented in five phases namely Mobilisation phase, Construction phase, Demobilisation phase, Operation and maintenance phase, and Decommissioning phase. Details of each of the phases will be provided in the sections that follow.

2.5.1 Mobilisation Phase

Planning phase for the project commenced in October 2023 and will be concluded in December 2023. Activities during mobilization phase will include.

2.5.1.1 Topographical Survey

A thorough examination of the natural and artificial characteristics of a specific area, known as a topographical survey, involves detailed mapping. This survey yields precise elevation information, often depicted through contour lines, revealing the land contours and inclines. This data is essential for construction endeavors, ensuring adequate drainage, appropriate grading, overall site suitability, and environmental awareness.

Surveyors conducted a topographical survey for upcoming projects to define boundaries and ground levels accurately. This process ensures compliance with property limits and aids in identifying and addressing potential environmental and social impacts highlighted in the ESIA report.

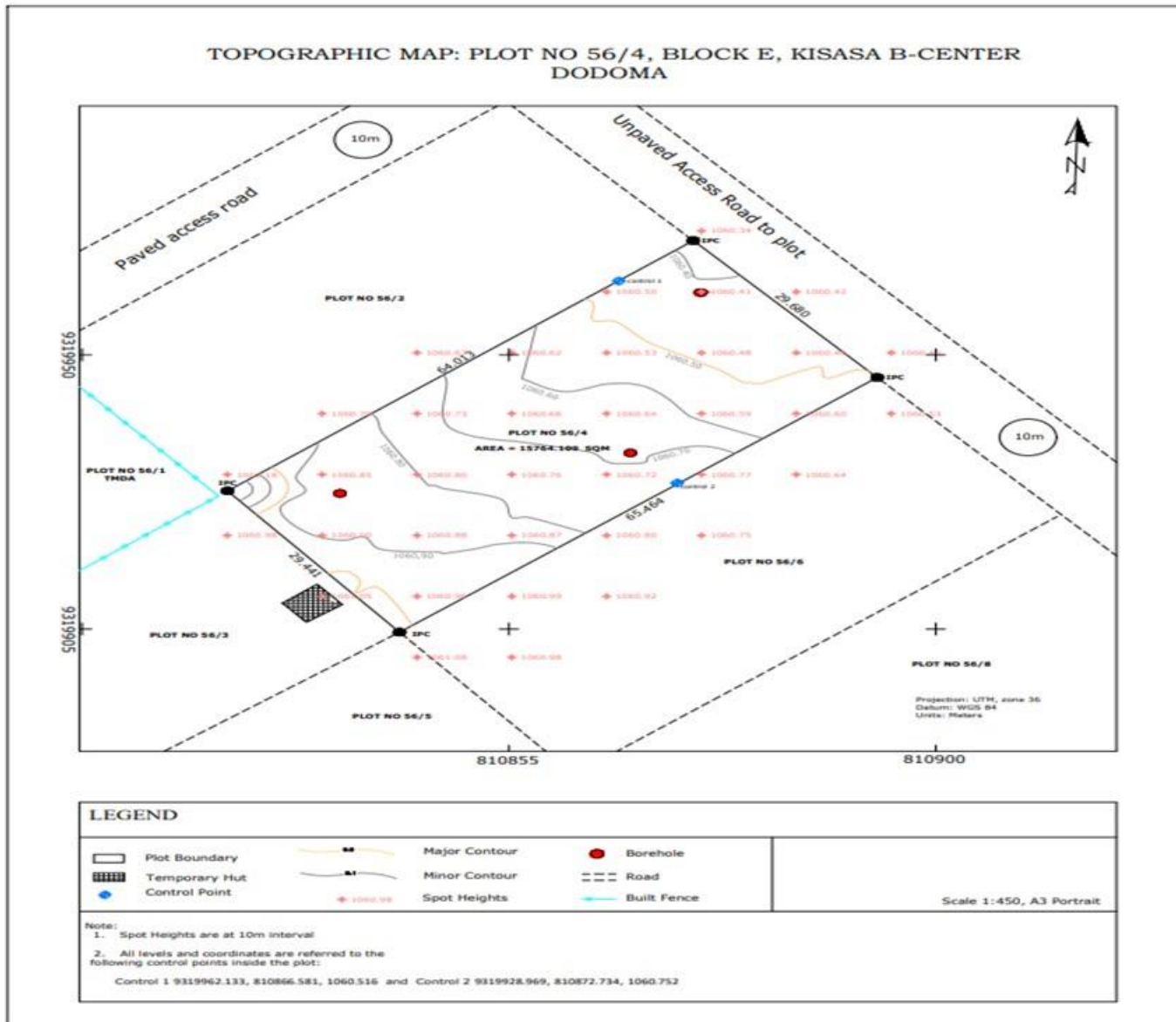


Figure 2.2: Topographical Map of TCU Headquarter Office Building (Source: TCU, November 2023)

2.5.1.2 Geotechnical investigations

The examination of the TCU Headquarter Office building site at TCU involved conducting a geotechnical investigation through excavation trial pits and in-situ testing with Dynamic Probing Light (DPL) for each building (Appendix 3). This investigation is crucial for evaluating the subsurface conditions in the project area and guaranteeing the structural integrity, stability, and safety of the intended construction. By analyzing soil and rock properties, groundwater conditions, and potential geohazards, the geotechnical investigation offers valuable insights for designing foundations capable of withstanding the specific geological challenges at the location. The acquired data assists in optimizing construction techniques, mitigating risks, and ensuring the durability and resilience of the proposed structures. Essentially, a comprehensive geotechnical investigation is an essential step in the pre-construction phase, significantly contributing to the overall success and sustainability of the planned building.

2.5.1.3 Architectural and Services Designs

The functionality and efficiency of a building are influenced by its architectural and structural designs, ensuring alignment with its intended purpose. Carefully planned architectural blueprints contribute to creating a conducive and purposeful environment, particularly for headquarters buildings. Additionally, the structural designs play a crucial role in guaranteeing the safety and long-term durability of the structure. Adequate engineering and structural considerations are indispensable to withstand environmental elements, natural disasters, and the passage of time.

2.5.1.4 Acquisition of various permits/ certificates

The procurement of different permits and certificates required for the planned project relies on the Environmental and Social Impact Assessment (ESIA) conducted at TCU. This encompasses obtaining certifications such as the ESIA certificate, building permit, land use permit, water resource use permit, waste management permit, Fire and Rescue certificate, and occupational health and safety certificate.

2.5.2 Construction Phase

The proponent intends to engage a contractor for the construction of the planned TCU headquarters office building. The contractor will handle tasks such as procuring raw materials, recruiting labor, and executing the construction work. It is expected that this phase will last for 18 months from the signing of the contract with the selected contractor. The following sections will explore different aspects connected to this timeframe;

2.5.2.1 Construction Activities

During the construction phase, activities will encompass site preparation, establishment of a workers' camp, erection of buildings, deployment of construction equipment, and acquisition of construction materials;

a. Site preparation

Activities involved in site preparation encompass clearing the land, grading, excavation, leveling, and marking the earth. It is essential for the proponent to preserve and planting exotic trees as feasible to maintain the environment of the project area.

b. Construction of worker's camp

The awarded contractor will construct a workers' camp within the project area (Kisasa B area). This facility will serve as housing for 20 workers and also function as storage space for various construction materials and equipment, as well as a workshop for servicing construction machinery. However, it's important to note that not all workers engaged in the project will be accommodated in this camp. The majority of workers, including unskilled and semiskilled laborers, will be recruited from Ilazo Mbuyuni street/mtaa and the Kisasa B area, both of which are in close proximity to the proposed project site.

c. Construction of Buildings

Some of the activities to be undertaken will include excavation of foundation footing, laying down a brick base, pouring a concrete slab, installation of framework, installation of plumbing workers, putting a wall frame, roofing, and finishing.

d. Construction Equipment

Different machinery will be used to construct the project facilities. These will include:

- Bull Dozers for clearing the site, removal of topsoil and vegetation materials, and pushing out stumps;
- Tippers/lorries for transporting construction materials and workers;
- Light machinery like pedestrian rollers for access road compaction;
- Front end loader for loading materials onto tippers and lorries;
- Several light equipment like wheel burrows, shovels, picks;
- Concrete mixers;
- Compactor;
- Wheelbarrow; and
- Hammers and bolt and nut fasteners, hand saw, electric and gas welders, electric saws and grinders, load roller, trucks, hand drills and drill bits, wire cutters, concrete mixer trucks, wheel loader, forklift, excavator etc.

e. Construction Materials

Different raw materials will be required during construction phase. Materials such as sand, gravel and quarry stone will be outsourced from different places. The building materials such as quarry stone, gravel and sand will be collected from approved sites.

Use of concrete blocks for construction of different infrastructures will be more environmentally friendly than use of burnt bricks, which contribute to deforestation.

Other materials such as cement, concrete block, paints, timber, roofing materials, windows, doors and other joinery, tilt and roller doors, wallboard and plasterboard, light fittings, fuel and oil, electricity, water, ceramic tiles, steel, pipes, adhesives, copper wires, gas (acetylene and oxygen), cardboard will also be outsourced for the project.

NB: A contractor who will be awarded the construction bid will have to adhere to Health, safety, and Environmental (HSE) standards as per construction regulations. TCU will have the key personnel who will be checking the Standard operation procedures (SOP) to comply with the legal requirement.

○ Sourcing of materials

Considering the project area location, the majority of construction materials will be obtained from both Dodoma City and areas beyond Dodoma City. The focus will primarily be on acquiring building materials locally, as outlined in Table 2.2. This approach not only makes economic sense but also aligns with environmental considerations by minimizing the negative effects of material transportation. This is achieved through shorter distances traveled by the transport vehicles, contributing to reduced environmental impact.

Table 2.2: List of material requirements

Requirement	Type	Source	Quantity (Estimated)	Mode of Transport
Building materials	Gravel	Authorised quarry in Dodoma City	1000 m ³	Trucks
	Sand	Authorised quarry in Dodoma City	1000-2000 m ³	Trucks
	Cement	Local Supplier from Dodoma City	1000 tons	Trucks
	Water	DUWASA	100-200 m ³	Trucks
	Timber	To be sourced from authorized local dealers in Dodoma City	5-10 tons	Trucks
Energy	Electricity	TANESCO (National Grid) proximity to the site	10,000-20,000 Units	
		Generator will be used in case of power outage	150 liters (Diesel fuel)	
Equipment/Machines	Bull Dozers	Contractor	1	Trucks
	Graders		1	Trucks
	Trucks /Tippers/lorries		1	
	Concrete mixers		1	Trucks
	Compactor		1	Trucks
	Excavator		1	Trucks
	Front end loader		1	Trucks
Manpower	Skilled	Contractor	15	Communal buses/Company cars
	Unskilled	Local people in Ilazo Mbuyuni street/mtaa	35	Communal buses

○ Transportation of materials

The contractor will be responsible for the transportation of all construction materials and equipment from point of sourcing to the site mainly by using Morogoro-Dodoma Road and Hombolo road.

2.5.3 Demobilisation Phase

The main activities to be undertaken during the demobilisation phase shall include the demolition of the storage facility. Rubble from construction activities, demolished storage facilities, and other waste from construction activities will be used as fillers during foundations. Any leftover solid

materials are likely to be composed of bricks, and crumbles of cement will be disposed by levelling off other degraded areas within the project area and within the surrounding communities.

Demobilization will further involve laying off construction workers, removal of construction equipment and leftover materials, dismantling of workers' camp and levelling the site, landscaping, and filling of borrow pits. Demobilisation phase will last for a period of two 1-3 months.

2.5.4 Operation and maintenance phase

Activities during operation and maintenance phase will include commissioning the use and regular maintenance of these new premises. During this phase different wastes both solid and liquid waste will be generated within the same period, which will need proper management. The activities that are expected to be done during the operation phase will include

- Daily operations activities
- Maintenance of the buildings and other infrastructures

2.5.5 Decommissioning Phase

Decommissioning occurs when a project reaches its conclusion. It is expected that the life span of the proposed project will be 100 years based on project design and on the technology to be used, also when the project reaches its end, all the facility and related infrastructure will be dismantled. This process will include the removal and demolition of buildings and equipment used, or even the complete demolition of the entire area, followed by the clearance of the site and transportation of all waste and debris to a disposal site. Subsequently, site restoration efforts will be undertaken to ensure that the area reverts to its original condition as it existed prior to the construction of the proposed buildings.

2.6 Manpower and Utility Requirements

2.6.1 Manpower Requirements

The proposed project will temporarily employ about 50 persons during the construction phase. Employment during the construction phase will be under contractor and will be in the form of skilled as well as unskilled laborer's considering all gender types. For the semiskilled and unskilled labourer's, the contractor will employ people from the nearby communities as a way of making sure that the project becomes beneficial and brings a sense of community ownership.

Also, the contractor is required to adhere to the wages order (2013) of the labor Institution, ensuring payment in accordance with relevant labor laws to prevent conflicts during the construction phase. Draft contracts must be collaboratively prepared by the contractor and the client, gaining approval from the WB and labor Officer. Additionally, the contractor has been provided with the laws outlined in the POM (2021) to prevent the involvement of child labor.

2.6.2 Power Supply

The TCU Headquarter office building will use energy from TANESCO and on top of that a backup generator (500KVA) will be used as an alternative source of power to run electrical facilities in case of a power outage from TANESCO.

Based on the power use, the average electricity demand for the building during construction and operation phase will be determined after project design. Also, contractor should have also backup generator in case of emergence during construction period.

2.6.3 Water Supply

The main and most dependable water source will be DUWASA, utilizing connections from the existing transmission line along Hombolo road. Also, contractor should have also water reserve tanks during construction period in case of emergence due to water scarcity in Dodoma city.

Also, the proponent intends to drill one borehole that will supply water to the proposed project facilities as well as sourcing water from DUWASA. The DUWASA management assured the consulting team that they have a prompt plan in place to enhance the water supply infrastructure in the region, aiming to guarantee a consistent provision of the service. It is expected that about 1000 liters per day of water will be used during operation phase.

2.7 Wastes Management

It is anticipated that the project will generate a variety of wastes during its construction and operational phases. The characteristics of the wastes are discussed in this section.

2.7.1 Solid Waste

2.7.1.1 Construction phase

Major wastes generation associated with the project construction and their treatment/ disposal methods are described in Table 2.3.

Table 2.3: Waste generation and treatment during construction Phase

Activity	Waste type	Amount	Treatment/ Disposal Method(s)
Clearing of top soil	Spoil Soil	Significant	This soil shall be stock piled along the foundation trenches for all structures and backfilled for pipes laying. The soils shall be used to reinstatement site at the end of the project, the spoiled materials shall be disposed to Chidaya landfill in Dodoma City
Biodegradable solid waste	Food remains	Not Significant	Collected and stored temporary through a dustbin then disposed Chidaya landfill in Dodoma City. These solid wastes are organic in nature and thus proper management is required in time to avoid bad odor if they are not disposed in time
Actual Construction	Rubbles	Not Significant	Will be stockpiled and used to fill cut sections
	Scrap metals	Not Significant	Sell to recyclers
	Timber	Not Significant	Provided to locals for re-use
	Cement bags	Not Significant	Sell to recyclers

2.7.1.2 Operational phase

The Dodoma City Council currently has plans in place for managing both solid and liquid waste in the project area for the proposed establishment of the TCU Headquarter office building in Dodoma City. During the operation phase, it is anticipated that the proposed TCU Headquarter building will generate municipal solid waste, including leftover food, cardboard, and paper.

Considering that waste collection is currently taking place in the neighborhood of the proposed project area, it is highly recommended that waste minimization techniques shall be implemented.

Solid waste will therefore be sorted and kept in skip buckets and waste bins for the time being. When it is no longer possible to retrieve treasures, the leftover rubbish will be taken to the final disposal in Chidaya landfill.

The total amount of solid waste generated is expected to be 0.077tons/day based on generation rates of 0.35kg/day/person and population projection about 220 people.

2.7.2 Hazardous waste

The main hazardous wastes that will be generated at the site are electrical equipment, concrete additives, tins, scrap metal etc. This waste will be collected within the designated dustbin then taken to the storage area and finally disposed by an authorised contractor at Chidaya landfill.

Also, E-wastes like computers, printers, and tonners will be disposed based on the Environmental Management (Control and Management of Electrical and Electronic Equipment Waste) Regulations of 2021.

2.7.3 Liquid waste

All wastewater generated during construction phase will be collected and disposed using best available onsite sanitation options/ septic tank and soak away pit. However, during operation phase foul water from the building will be gathered using various UPVC pipes, including sizes such as 75 mm and 150 mm, and directed to the septic tanks.

2.7.3.1 Construction phase

Assuming that;

- There will be 50 people (Worst case scenario)
- Water consumption = 40L/Capital/Day
- 80% of water consumed become waste water.
- 100% of the workers shall use University toilets
- Wastewater generation per day = $50 \times 40 \times 0.8$

Therefore, about 1.6 m³ per day of liquid waste will be produced from the project area during construction period. The wastewater will be collected and treated in onsite wastewater treatment facilities like disposable toilets/ or soak away pit.

2.7.3.2 Operation phase

Assuming that;

- There will be 220 people (Worst case scenario)
- Water consumption = 40L/Capital/Day
- 80% of water consumed become waste water.
- 100% of the students and workers shall use University toilets
- Wastewater generation per day = $220 \times 40 \times 0.8$

Therefore, about 7.04 m³ per day of liquid waste will be produced from the TCU Headquarter Office Building during Operation phase. The generated wastewater will be collected and treated through the septic tanks and the design will accommodate the entire operation period.

2.8 Stormwater management

Stormwater management involves overseeing the quality and quantity of rainwater in a specific project area. The design of the building and parking areas at the planned TCU Headquarter Office Building establishment plays a crucial role in how stormwater is handled, as it is expected to

change the natural flow of rainwater in the area, resulting in an increased volume of stormwater runoff.

Additionally, the management of stormwater is of utmost importance for ensuring the security and safety of the proposed building, parking and the road infrastructure. The road drainage system plays a pivotal role in efficiently removing water from both the road's surface and subsurface, along with the adjacent areas that contribute to water accumulation. This drainage system is indispensable for maintaining the durability and longevity of the roads by reducing moisture levels.

2.9 General repairs and maintenance

Regular maintenance and repairs will be conducted on the buildings and related facilities throughout the project operational phase. These activities encompass fixing building walls and floors, maintaining electrical devices and equipment, repairing refrigeration systems, addressing leaks in water pipes, painting, and replacing worn-out materials, among other activities.

2.10 Occupational Health and Safety (OHS)

2.10.1 OHS During the Construction Phase

TCU is committed to collaborating closely with the main consultant to deliver regular occupational health and safety training to both permanent and temporary staff. This includes sharing crucial information about various outbreaks and pandemics like Cholera, COVID-19, and HIV/AIDS. Throughout the construction phase, the contractor will supply essential protective gear such as helmets, heavy-duty gloves, jackets, and boots. They will also ensure the necessary infrastructure, like signboards and a first-aid station, is in place, and arrange emergency transport when needed. The awarded contractor will conduct training sessions for persons near the proposed establishment to facilitate their daily commute. Speed limits will be strictly enforced, not exceeding 50km/h within the specified area and 10km/h in designated zones. All drivers employed by the contractors will be well-informed about these limits to uphold safety within the project area. Moreover, clear identification and labeling of both entrance and exit areas will be implemented. Also, it explains the mitigation measures for hazards and risks associated with health and safety which include the following;

2.10.1.1 Slips and falls

- Maintain a clean and organized workplace by promptly cleaning up spills, debris, and clutter.
- Regularly sweep, mop, and vacuum floors to remove dust, dirt, and liquids that can create slip hazards.
- Repair or replace damaged flooring promptly to eliminate tripping hazards.
- Choose flooring materials with appropriate slip resistance for different areas. For example, use non-slip flooring in areas where liquids are commonly present.
- Clearly mark wet floors or areas under maintenance with warning signs and cones to alert workers and visitors.
- Use high-visibility tape or paint to mark steps, ramps, and changes in floor level.
- Ensure adequate lighting in all work areas, including stairwells and hallways, to improve visibility and reduce tripping hazards.
- Provide regular training to employees about slip and fall hazards and the importance of following safety procedures.
- Encourage workers to report hazards promptly so that they can be addressed.

- Maintain walking surfaces, including outdoor walkways and parking lots, to prevent uneven surfaces and tripping hazards.
- Conduct regular workplace inspections to identify and address potential slip and fall hazards promptly.
- Use scaffolds, ladders, and elevated platforms with proper guardrails and fall protection equipment.
- Establish clear evacuation routes and procedures in case of an emergency to prevent panic and rushing that could lead to slips and falls.

2.10.1.2 Working at height

- Erect and dismantle scaffolds according to manufacturer guidelines and industry standards.
- Regularly inspect scaffolding for stability and structural integrity.
- Install safety nets where feasible to catch falling workers or objects.
- Regularly inspect equipment, scaffolding, and other structures for damage, wear, or defects.
- Select the right ladder for the job and ensure it's in good condition.
- Place ladders on stable, level surfaces and secure them to prevent slipping.
- Provide workers with appropriate personal protective equipment (PPE) such as helmets, gloves, and footwear designed for working at heights.
- Train workers on the proper use of fall protection equipment, safe work practices, and emergency procedures.
- Assign a competent supervisor to oversee work at heights and ensure safety procedures are followed.
- Establish effective communication methods between workers at different heights and ground level.

2.10.1.3 Moving machinery

- Install appropriate guards, barriers, and shields on machinery to prevent workers from coming into contact with moving parts.
- Ensure that guards are properly designed, secured, and in place before starting any machine.
- Provide comprehensive training to operators and maintenance personnel on safe machine operation, maintenance procedures, and hazard recognition.
- Conduct regular inspections of machinery to identify worn-out parts, malfunctioning components, or potential hazards.
- Follow manufacturer recommendations for routine maintenance and ensure that machinery is serviced by qualified technicians.
- Conduct thorough risk assessments before implementing new machinery or making changes to existing processes to identify potential hazards.
- Establish a reporting system for near misses, incidents, and safety concerns related to machinery. Investigate these reports and take corrective actions as needed.
- Provide appropriate PPE such as gloves, goggles, helmets, and hearing protection based on the machinery's hazards.

2.10.1.4 Diseases prevention

- Encourage frequent handwashing with soap and water for at least 20 seconds. Provide hand sanitizers in common areas.
- Promote proper respiratory etiquette by covering coughs and sneezes with a tissue or the inside of the elbow.

- Regularly clean and disinfect frequently touched surfaces, such as doorknobs, light switches, shared equipment, and restrooms.
- Maintain good indoor air quality by ensuring proper ventilation and air circulation within the workplace.
- Conduct health screenings, including temperature checks and symptom assessments, for employees and visitors before they enter the workplace.
- Implement safety measures in cafeteria, such as limiting the number of occupants and maintaining physical distancing and good housekeeping.
- Provide education and training to employees about disease prevention, proper hygiene practices, and the importance of adhering to safety protocols.
- Create a comprehensive COVID-19 safety plan tailored to your project, including policies, procedures, and protocols.
- Conduct a thorough risk assessment specific to the construction site.
- Assign a responsible person or team to oversee and enforce COVID-19 safety measures.
- Require all workers to wear appropriate personal protective equipment (PPE), including masks, gloves, and eye protection.
- Set up handwashing stations or hand sanitizing stations at key locations on-site.
- Encourage frequent handwashing and provide hand sanitizer.
- Increase the frequency and thoroughness of cleaning and disinfecting common areas, tools, and equipment.
- Improve ventilation in enclosed spaces to increase air circulation.
- Implement daily health screenings for all workers, subcontractors, and visitors. This may include temperature checks and symptom questionnaires.
- Encourage workers to report symptoms or exposure to COVID-19 immediately.
- Maintain open lines of communication with workers, subcontractors, and stakeholders about COVID-19 developments and safety measures
- Use signage and digital communication methods to remind everyone of safety protocols.

2.10.1.5 Being struck by objects

- Regularly inspect the environment to identify potential hazards related to falling objects.
- Assess the risk associated with each hazard, taking into account factors such as object weight, height, and frequency of exposure.
- Use warning signs, cones, and barricades to alert individuals to the presence of falling object hazards.
- Clearly mark exclusion zones in areas where there's a risk of objects falling.
- Use toe boards on scaffolding and elevated platforms to prevent tools and materials from slipping off.
- Conduct regular inspections of equipment, storage areas, and structures to identify and address potential hazards.
- Ensure that any damaged or deteriorating structures are repaired promptly.
- Keep work areas clean and organized to minimize the risk of tripping over objects or inadvertently causing objects to fall.
- Ensure that objects are stored securely when not in use.
- Use appropriate personal protective equipment (PPE) such as hard hats, safety goggles, and steel-toed boots in areas with falling object hazards.
- Ensure that PPE is in good condition and worn consistently.

2.10.1.6 Over-exertion

- Conduct ergonomic assessments of workstations and tasks to identify potential over-exertion risks.
- Modify workstations and equipment to minimize physical strain and discomfort
- Contractor should train employees on proper lifting techniques, including bending at the knees, keeping the load close to the body, and using leg muscles instead of back muscles.
- Reduce the weight of materials, tools, or equipment when possible.
- Provide mechanical aids such as lifting devices, conveyor belts, or adjustable height workstations to reduce manual lifting and carrying.
- Design workstations and workflows to minimize the need for repetitive or forceful movements.
- Contractor should make a job rotation or task alternation to reduce the repetitive nature of physically demanding tasks and provide rest periods.
- Employees should ensure to maintain good posture while working, which includes sitting or standing with a straight back and avoiding excessive twisting or bending.

2.10.1.7 Ergonomics injuries and illness

- Ensure that workstations are designed with ergonomics in mind, taking into account the user's body size, shape, and tasks.
- Provide adjustable chairs, desks, and computer monitors to accommodate various users and allow for proper positioning.
- Implement stretching and exercise programs tailored to the specific needs of employees to improve flexibility and reduce muscle tension.
- Implement job rotation or task variation to reduce repetitive motions that can lead to overuse injuries.
- Encourage short, frequent breaks to allow employees to rest, stretch, and change positions during the workday.
- Provide ergonomic tools and accessories such as ergonomic keyboards, chairs and footrests to reduce strain on wrists and hands.
- Develop and enforce safe lifting and material handling procedures, including the use of appropriate lifting equipment like dollies or forklifts for heavy objects.
- Conduct regular health screenings and assessments to identify and address ergonomic-related health issues early.
- Offer access to healthcare professionals who can provide guidance on managing and treating ergonomic injuries and illnesses.

2.10.2 OHS During the Operation Phase

All safety concerns will be addressed comprehensively, encompassing the establishment of emergency gathering points and the creation of plans and protocols to anticipate and lessen potential project-related accidents. A detailed document will outline various potential accidents or emergencies, as well as their corresponding responses and strategies for mitigating environmental risks. Additionally, it will cover Occupational Health and Safety hazards pertinent to daily operations, such as the risks of fire or explosions, with the placement of powder foam fire extinguishers and fire hose reels at strategic locations, regularly maintained for optimal functionality.

2.11 Disaster risk management

DRM for the proposed establishment of the TCU Headquarters Office Building in Dodoma City involves a comprehensive approach to identify, assess, and mitigate potential environmental and social risks associated with the project. The primary goal is to enhance the project's resilience to natural and man-made hazards, ensuring the safety and well-being of the community and the environment.

ESIS for the TCU Headquarters outlines a systematic DRM plan. This includes a thorough risk assessment to identify vulnerabilities and potential impacts on the project site. The assessment considers factors such as geological hazards, climate-related risks, and socio-economic vulnerabilities specific to the region.

The DRM plan incorporates both structural and non-structural measures. Structural measures may involve engineering solutions to enhance the building's resilience to earthquakes, floods, or other natural disasters. Non-structural measures focus on community awareness, early warning systems, and emergency response plans to minimize potential impacts on human life and property. Also, community engagement and stakeholder consultation are integral components of the DRM plan, ensuring that local knowledge and concerns are considered in the risk management process. The plan emphasizes the importance of incorporating environmentally friendly and sustainable practices in the construction and operation of the TCU Headquarters to mitigate long-term risks. Furthermore, the DRM plan aligns with national and international standards, reflecting the commitment to best practices in disaster risk reduction. Continuous monitoring and periodic review of the DRM plan will be conducted to adapt to changing circumstances and emerging risks over the project's lifecycle.

2.12 Gender inclusivity

In alignment with ESMF (ESS 10) and national standards, the ESIS outlines specific measures to ensure gender inclusivity throughout the project lifecycle. The proposed TCU headquarters is committed to providing equal opportunities for all genders in employment, including recruitment, training, and career advancement. The project recognizes the importance of fostering a workplace culture that values and respects gender diversity, actively working towards minimizing any gender-based disparities.

Furthermore, the ESIS addresses the potential social impacts of the project on the local community, particularly focusing on gender-related aspects. It highlights strategies to engage with local communities, ensuring that the voices of all genders, including women and marginalized groups, are heard and considered in the decision-making processes. The TCU is committed to collaborating with relevant stakeholders to identify and address any gender-specific challenges that may arise due to the project.

In terms of the physical environment, the ESIS underscores the importance of creating infrastructure that is accessible and accommodating to individuals of all genders. This includes considerations for gender-segregated facilities, ensuring that the building design adheres to principles of universal accessibility.

2.13 Seismic Activities

Dodoma city is situated in a region where the eastern branch of the East African Rift System merges with the craton. This area experiences seismic activity ranging from low to moderate

magnitude, occasionally accompanied by large earthquakes reaching up to magnitude 6.2, which have the potential to cause minor to moderate damage to buildings. Plot for TCU in Kisasa B area, located in the area, experiences ground vibrations amplification of up to five times compared to the source of earthquake activity reaching Dodoma. Nonetheless, during the implementation of proposed projects, it is imperative to construct buildings to a higher standard of construction adhering strictly to earthquake-based building codes.

The investigations as indicated by the geotechnical survey report of 2022 shows that, the plot lies on a low land area which is relative flat and filled with sediments primarily soil of Mbuga type with limited basements rocks exposure on surface. Moreover, assessment from high resolution airborne geophysical data and detailed ground magnetic data revealed that the plot is located in a region with very low magnetic field intensity. Likewise, ground magnetic survey and IP clearly shows low magnetic signature and low resistivity respectively particularly to the northeast part of the plot. These characteristics is the indication that the plot is located within thick sediments varying from 6m to 12m.

However, magnetic signature and IP show no prominent fault/shear which can affect the proposed construction project of structural buildings. There are patches of high magnetic anomalies which probably are generated by ferricrete residues.

2.14 Project Boundaries

Identification of boundaries within which the ESIA study is undertaken is an important component of the environmental and social assessment study. There are three types of boundaries which are institutional, temporal, and spatial boundaries.

2.14.1 Institutional boundaries

Institutional boundaries refer to those institutions and sectorial boundaries in which the project lies or rests. These will be determined from political boundaries, Acts, regulations and institutional mandates and administrative structures. The proposed establishment of TCU Headquarters Office Building on Plot No. 56/4, Block E, Kisasa B Area in Dodoma City. The key institutions that will oversee the implementation of the project activities will include;

- Dodoma City Council
- Fire and Rescue Force.
- Occupational Safety and Health Authority (OSHA)
- DUWASA
- TANESCO
- Ilazo Mbuyuni street/mtaa
- Wami/Ruvu Basin Water Board Office

These institutions will be consulted in this ESIA process, as the key stakeholders with interest in the development at TCU for environment and economic prosperity of the local people and Tanzanians in general.

2.14.2 Temporal boundaries

Temporal boundaries refer to the lifespan and reversibility of impacts. For example, the impact of construction work for the affordable housing project may be short-lived, but the presence of these buildings in the selected site may have implications that stretch far into the future until when

decommissioning is undertaken. In addition to that, consideration needs to be given to what happens when the project ends, where there is a need for site restoration and decommissioning of the proposed facility. Therefore, some of the impacts that may occur during construction, e.g., noise caused by bulldozers will disappear as soon as the construction phase is completed. The construction period will last while the operational phase will be designed for several years unless an unforeseen event occurs.

2.14.3 Spatial boundary

The spatial dimension encompasses the geographical spread of the impacts regardless of whether they are short-term or long-term. The spatial scale considers the receptor environmental component and can be local or broader. Two zones of impact namely core impact zone and influence impact zone are considered.

- Starting with the core impact area (where the project is located). In this case, the core impact area for the project will be Ilazo Mbuyuni Street/ Mtaa (where project will be located) and its nearby areas as where the impact will be felt.
- The second area is the immediate impact area. This is the area surrounding the core area and bears relatively some of the impacts. In case of the proposed project, the immediate impact area will be the neighboring area within Dodoma City Council in general which will benefit from revenues paid by the investor and from different social economic activities.
- The other area is area known as the area of influence. In terms of spatial dimension, this is the outer most area that consists of centers of decision making that can influence the development of proposed project.

2.15 Project cost and Duration

TCU has received financial support from the World Bank (WB) through the Government of the United Republic of Tanzania (GoT) under the project named Higher Education for Economic Transformation (HEET) which is about **4,100,000,000.00 TZS**. The project implementation is estimated to take **18 months** after commencement Specifically, under this project TCU intends to establish Headquarter office building with 5-storeys.

CHAPTER 3: POLICIES, LEGAL AND INSTITUTIONAL FRAMEWORK

3.1 Introduction

In Tanzania, there exist multiple structures in policy, law, and administration that oversee the conduct of environmental and social impact assessments (ESIA). The administrative requirements dictate that any new projects with potential environmental impacts must undergo an environmental impact assessment and be submitted to the National Environment Management Council (NEMC). The primary goal is to assess the environmental and social repercussions of the proposed development and propose suitable measures for mitigation.

Throughout the establishment of the envisioned project, various environmental issues may emerge at different stages, from site selection to decommissioning. It is imperative to address these issues to ensure that the project operations do not compromise the integrity of the environment and align with Tanzania policies, legal framework and World Bank policies and standard. To facilitate the effective implementation of the proposed project, it is advisable for the TCU to adhere to the pertinent environmental management policies, legislation, and administrative considerations outlined below. This chapter specifically covers the policies, laws, and regulations applicable to the proposed project at Plot no. 56/4 Block E, Kisasa B area, Ilazo Mbuyuni Street/Mtaa, ipagala ward, Dodoma City Council in Dodoma City.

3.2 Policies Relevant to the Project

The following are relevant sectoral and cross-sectoral policies which stipulate the need for the ESIA and provide directives on how projects should be operated in Tanzania. The TCU will need to observe these policies in the course of designing and implementing the proposed project activities;

Table 3.1: Policy Compliance

S/N	POLICY	REQUIREMENT	COMPLIANCE STATUS
1	The National Environmental Policy, 2021	The NEP appropriately sets broad goals committing Tanzania to ensure environmental conservation and sustainable development of its natural resource's heritage. The policy provides the framework for the formulation of plans, programmes and guidelines for the achievement of sustainable development. Instruments for implementation include the use of Environmental Audit (EA), development of national standards and indicators, and the preparation of appropriate legislation. NEP encourages good land and water resources management to reduce undesirable environmental impacts such as soil salinity, water pollution and spread of water borne diseases.	TCU has observed one of the requirements of the national environmental policy by putting measures to control and minimizing pollution that will happen during constructions and operations period.
2	The National Land Policy (2019)	The National Land Policy aims to establish a secure land tenure system, promote optimal land resource utilization, and foster broad-based social and economic development while preserving ecological balance. It emphasizes safeguarding land from degradation for sustainable development, mandating project consideration of land capability to prevent erosion and contamination. Pertinent sections include 2.4, promoting socioeconomic development through land use; 2.8, protecting land resources; and section 4, addressing land tenure. Section 4.1.20 outlines compensation for acquired land, and 4.2.0 provides guidance on land administration. The policy underscores sustainable land management to support national development objectives while mitigating environmental harm.	TCU comply with this policy because the proposed building project is located within the area planned for institutions and as such it is compatible with the land use in the project area as required by the National Land Policy
3	The Construction Industry Policy (2003)	This policy promotes among other things, application of cost effective and innovative technologies and practices to support socio-economic development including utilities and ensure application of practices, technologies and products which are not harmful to both the environment and human health. This EIA is undertaken to ensure that TCU uses technologies and products not harmful to both the environmental and human health by providing feasible alternatives and appropriate mitigation measures. Through this EIA, the proponent is expected to abide to the relevant provisions of the policy and standards to ensure conformity with any proposed construction development.	The project aligns with the policy by employing advanced technology in construction and operation. It aims for cost-effective and eco-friendly practices, minimizing resource wastage, particularly in building materials, water, and energy.
4	The National Employment Policy (2008)	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 that deals with tendencies of private industries to employ expatriate seven where there are equally competent nationals.	TCU shall abide by this policy by employing Tanzanians who have the required qualifications as well as unskilled.
5	The 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 is relevant to the project as	This project shall ensure that women will be adequately involved

S/N	POLICY	REQUIREMENT	COMPLIANCE STATUS
		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. It also requires that women and men are given equal employment opportunities in the project, whenever possible.	at all levels of project planning to implementation.
6	National Policy on HIV/AIDS (2001)	The policy aims to guide the National response to HIV/AIDS by fostering leadership and coordination across various sectors. It emphasizes active participation from public, private, NGO, faith-based, and community groups. Discrimination based on HIV status is prohibited in areas such as education, employment, and healthcare. Pre-employment HIV screening is banned, and existing employees cannot be subjected to screening. HIV-positive individuals are considered fit to work, and termination based solely on HIV status is prohibited. Social welfare benefits are extended to HIV/AIDS patients like any other. Workplace interventions include education targeting both employees and employers on HIV/AIDS behavior and attitudes.	The proponent will adhere to the policy by availing HIV/AIDS information and voluntary screening services to its workers as well as observing other provisions of the policy.
7	The Energy Policy of Tanzania (2015)	The policy aims to harness diverse energy sources sustainably, including water, forests, gas, coal, petroleum, solar, and wind, prioritizing environmentally friendly methods. Recognizing energy's vital role across all economic sectors, it emphasizes its necessity for successful development efforts. Within industry, it targets reducing reliance on imported energy through demand management, mitigating the risks associated with petroleum imports. Energy auditing and conservation in industries are encouraged, with the TCU tasked with addressing major losses and proposing cost-effective solutions. Overall, the project aligns well with the energy policy's objectives, emphasizing sustainability and efficiency	TCU will adhere to the policy by planning to integrate solar panel and backup generator as alternative energy source in the proposed establishment.
8	The National Water Policy (URT, 2002)	The policy aims to create a sustainable framework for managing Tanzania's water resources amidst increasing scarcity, misuse, and ecological threats. It acknowledges issues like uncontrolled water abstraction, lack of quality monitoring, and competition among socio-economic activities during droughts. There's a need for prioritization of water use, especially during scarcity, with domestic supply and ecosystem preservation taking precedence. The policy also highlights the disconnect between water and land development, exacerbated by liberalization. It calls for coordination mechanisms to bridge this gap and ensure smooth integration of water management into broader development initiatives	The planned facility prioritizes water conservation through efficient plumbing fixtures and practices, aiming to minimize water usage and prevent pollution of water sources during construction and operation.
9	The National Health Policy (URT 2003)	The Policy emphasizes enhancing community engagement in health development, prioritizing improved access and equity in health services. Its core aim is to guarantee universal availability and accessibility of health services nationwide, spanning urban and rural regions. Encouraging basic hygienic practices, promoting safe water usage,	The Proponent/Contractor shall observe this policy by providing good hygienic condition to the workers and shall continue to be

S/N	POLICY	REQUIREMENT	COMPLIANCE STATUS
		constructing and utilizing latrines, and maintaining cleanliness in workplaces are key initiatives. Additionally, it advocates for conducive work environments to ensure satisfactory performance. This policy is pertinent to projects tasked with ensuring safety during implementation, necessitating adherence to safety measures, regulations, and precautions for both workers and the surrounding community.	provided with appropriate PPE's based on their working sections.
10	Education Training Policy (2014)	The education training policy, 2014 stressed that for improvement of the quality of education in Tanzania there should be a shift from using many text books into using single text book for each subject. The policy also emphasizes all private schools need to have affordable school fees on the basis of "Unit per course" and analyse its operation as well. The school fees should relate with the service offered by the school. This project is in-line with this policy as will modernize education training and put in place the state-of-the-art equipment for training. Also, the school fees will be affordable to all people.	TCU through HEET will increase teaching and learning infrastructure which at the end will to increase enrolment of the students.
11	National Mineral Policy (2009)	The National Mineral Policy also addresses that the mining activities should be undertaken in a sustainable manner. Reclamation of lands after mining activities is recommended. As far as this project is concerned, mining activities is directed to quarrying activities for obtaining stones and aggregates.	No mining activities will be undertaken by proponent within the project area as raw materials (Fine and coarse aggregates) for the proposed establishment shall be bought from authorized vendors

3.3 Relevant Legal Framework

In addition to the above policies, there are a number of legal and regulatory frameworks that the proposed project must comply with and which this ESIA study has taken into consideration. The Environmental Management Act (No. 20), 2004 is the principal legislation governing all environmental management issues in the country. Within each sector, there are sectoral legislations that deal with specific issues pertaining to the environment. Some of the relevant legislation and regulations that are relevant in the management of the environment include the following;

Table 3.2: Legislation Compliance

S/N	LEGISLATION	REQUIREMENT	COMPLIANCE STATUS
1	Environmental Management Act Cap 191 No. 20 of 2004	The Environmental Management Act, Cap 191 establishes a legal framework for sustainable environmental management aligned with the National Environmental Policy. It ensures the continuity of the National Environmental Management Council (NEMC), empowering it for enforcement, compliance, and monitoring of environmental impact assessments. Proponents must also heed Environment Management Act Cap 72 concerning land use responsibilities and sustainability	All section shall continue to be observed by Proponent in order to protect the environment against any sort of pollution (refer to the Environmental Management Plan of this report).
2	The Local Government (Urban Authorities) Act, [Cap.288 R.E 2019]	The Act establishes Urban authorities for local governance, outlining their functions and related matters. Section 55 lists these functions, including preventing public nuisances and hazards to public health or order. It also regulates trades or businesses that pose risks or are in the public interest to control, issuing licenses or permits for regulation, and imposing associated fees. This framework enables Urban authorities to manage and regulate various aspects of community life effectively	The project will seek planning consent and building permits from relevant authorities.
3	The Land Act, [Cap.113 R.E 2019]	The Act seeks to control the land use and clarify issues pertaining to ownership of land and land-based resources, transactions on land and land administration. 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 land is owned by the project proponent and title deed (certificate of occupancy) for the proposed establishment land is attached in appendix 1
4	Occupational Health and Safety Act (2003)	This Act deals with the protection of human health from occupational hazards. It specifically requires the employer to ensure the safety of workers by providing safety gears at the work place	The Proponent/Contractor will acquire a certificate of registration of a workplace from OSHA to abide to the law
5	Employment and Labour Relations Act, R.E 2019	The Act ensures fundamental labor rights and sets employment standards, offering extensive protection against discrimination. It mandates equal opportunity, prohibiting discrimination based on various factors including gender, pregnancy, marital status, disability, and age. Employers must take affirmative action to ensure a safe and healthy workplace for all genders.	The Proponent commits to enforcing labor laws, ensuring workplace equality, fostering economic justice, and upholding labor rights
6	The Engineers Registration Act of 2007	The Act establishes an Engineering Registration Board (ERB) to regulate engineers' conduct, registration, and related matters. It mandates that only registered engineers can engage in professional engineering work, including consultation, planning, designing, or supervision related to public utilities, buildings, machines, etc., safeguarding public interest, health, and property. Non-registered engineers cannot be employed.	TCU shall engage registered engineers to observe the provisions of the Act when executing its activities.
7	The Contractors Registration	This Act establishes the Contractors Registration Board (CRB). CRB has a mandate to register contractors, regulate the conduct of the contractors and for related matters. Among other things CRB is required to take legal action against unregistered contractors	The proponent shall therefore appoint a registered contractor and

S/N	LEGISLATION	REQUIREMENT	COMPLIANCE STATUS
	(Amendment) Act of 2008	who undertake construction, installation, erection or alteration works; ensure that all construction sites are hoarded; and labour laws, occupational health and safety regulations in the construction industry are adhered to. On executing its construction activities.	make sure that the provisions of the Act are adhered to.
8	The Architects and Quantity Surveyors, Act 2010	This Act was enacted by the parliament to provide for establishment of a board to regulate the conduct of Architects and Quantity surveyors and architectural and quantity surveying consulting firms in Tanzania. The board is vested with powers to inspect premises or construction sites to verify whether the rules and regulations of carrying out construction projects are adhered by consulting firms. This is aimed at ensuring that appropriate professionals who are registered by the board are involved in undertaking works as required by the law.	Therefore, the proponent shall abide by this Act by carrying out construction by adhered consulting firm.
9	Public Health Act, 2009	The Act provide for the promotion, preservation and maintenance of public health with a view to ensuring the provisions of comprehensive, functional and sustainable public health services to the general public and to provide for other.	The Proponent will observe this Act by promoting and preserve the public health.
10	Fire and Rescue Force Act, 2007	The act empowers the commissioner general of the force or his agent to enter premises to ascertain any contravention of provisions of the Act and obtain information required for firefighting purposes. A court may issue an order for a closure or prohibit the use of any premises for human habitation or storage in case there is failure to comply with fire prevention regulations. The Act also obliges the owners and managers of the structures to set aside places with free means of escape, and install fire alarm and detection systems, or such other escape and rescue modalities in the event of fire	The Proponent abide to this Act by making sure that the awarded Contractor and their employees undergo fire and rescue training and must have a certificate for compliance. Also, should make sure all the design structure and the site layout plan shall be submitted to Fire and Rescue Force for approve.
11	Water Resources Management Act, 2009	The Act provides for the protection of the water resources and the user so that there is a balance between different uses. The provisions of the Act will be adhered to during implementation by ensuring that surface and ground water sources are protected. Furthermore, water to be sourced from a borehole which will be drilled within the project area shall be used wisely at the project site and from the river shall have water use permit. And if the project area has wastewater treatment plant, the proponent shall have discharge permit from responsible authority.	TCU will strive to comply with the provisions of the new Water Resource Management Act of 2009.
12	Energy and Water Utilities Regulatory Authority Act, No 11, of 2011	The Energy and Water Utilities Regulatory Authority (EWURA), was established under the EWURA Act, No 11, of 2011, with responsibility inter alia for regulation of the water and sewerage services. Section 28 of the Water Supply and Sanitation Act confers EWURA among others powers to exercise licensing and regulatory functions in respect of water supply and sanitation services; establishment of guidelines on tariffs chargeable	TCU will comply with the act by increasing efficiency in the use energy and water utilization.

S/N	LEGISLATION	REQUIREMENT	COMPLIANCE STATUS
		for provision of water and sanitation services; monitoring water quality and standards of performance for provision of water supply and sanitation services.	
13	The Workers Compensation Act, 2015	An Act to provide for the compensation to employees for disablement of death caused by or resulting from injuries or diseases sustained or contracted in the course of employment, to establish the Funds for administration and regulation of worker's compensation and to provide for related matter. It applies to both workers in the private and public sectors.	The Proponent shall comply with this act by ensuring that all workers from Contractor shall be compensated accordingly in this manner and registered to WCF.
14	Prevention and Control of HIV/AIDS Act, 2008	The Act primarily addresses prevention, treatment, and support for HIV/AIDS, promoting public awareness, reducing transmission, and providing community-based services. Section 4(1) emphasizes awareness and protection rights, while Section 19(2) focuses on community-based services, potentially impacting local HIV transmission dynamics.	The Proponent shall operate within the requirements of this legislation in addition to those of the HIV policy.
15	The Law of the Child Act, 2019	This act reforms and consolidates laws regarding children's rights, welfare, and protection. It addresses adoption, custody, employment regulations, and prohibits child labor exploitation by individuals or companies.	Contractor and TCU together will ensure that no child under fourteen years is involved as an employee in any kind of work during the project implementation.
16	The Roads and Fuel Toll Act, [Cap.220 R.E.2019]	The Roads Act covers financing, development, maintenance, and management. Key clauses include constructing access roads, notifying affected landholders, and regulating weight, speed, and dimensions. It also addresses offenses, penalties, and recovery procedures	TCU shall observe relevant section of the Act by ensuring that his project don't affect the roads which is near the project site.
17	The Road Act, 2007	Part IX of the Act provides for offences and penalties against the contravention of the provisions of the Act. Furthermore, the Act stipulates that the Road authority shall be compensated in respect of the expenses incurred while repairing the road damaged by any person.	The project proponent shall observe relevant section of the Act by ensuring that his project will be located outside the road reserve.
18	The Electricity Act No 10 of 2008	The Act regulates all aspects of electric energy from generation to distribution, including cross-border trade and rural electrification planning. Section 25 outlines Power Purchase Agreements (PPAs) post-Act enactment. Licensees can form agreements under Authority rules, facilitating competitive electricity trade with standardized agreements and tariffs, primarily supplied by TANESCO in Tanzania	Proponent shall adhere to the requirement of this Act in the process of the Electricity purchase from TANESCO.
19	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 centre (for cities and municipalities) respectively. By this law, the authorities have mandates to formulate bylaws to enhance environmental management within their district/urban authorities.	Proponent shall observe the bylaws set by Dodoma City Council.

S/N	LEGISLATION	REQUIREMENT	COMPLIANCE STATUS
20	The Local Government (Urban Authorities) Act, Cap. 288 R.E 2009]	Tanzania is implementing the Local Government Reform Programme (which has instituted "Decentralization by Devolution". District and Urban councils have extensive powers under the two acts, both in governance aspects and in the management of natural resources and land in their respective jurisdictions. The administrative aspects of valuation and payment of compensation are assigned to local government authorities' and regional administration.	It is on the basis of this Act that, the proponent is determined to ensure continuous conservation of the project site while maintaining environmental and public health safety.
21	Universities Act No. 7 of 2005	Universities Act No. 7 of 2005 provides for establishment of the Tanzania Commission for Universities (TCU) to provide the procedure for accreditation of institutions of higher learning and other related matters. The proposed project at TCU will be regulated by the TCU for ensuring that quality education is offered, which meets the needs of all the stakeholders in line with this Act.	TCU shall provide procedures to higher education accreditation in the institution of the project, which will bring to the people related to on the project.

3.4 Relevant Regulations and Guidelines

Table 3.3: Regulation Compliance

S/N	REGULATIONS	REQUIREMENT	COMPLIANCE STATUS
1	The Environmental Management (Environmental Impact Assessment and Audit) (Amendment) Regulations, 2018	The Environmental Management (Environmental Impact Assessment and Audit) Amendment Regulations, 2018, are part of Tanzania Environmental Management Framework, building on the EIA and Audit regulations from 2005 under the Environmental Management Act No. 20 of 2004. These regulations establish procedures for conducting Environmental Impact Assessments (EIA) and Audits for development projects with significant environmental impacts. They outline steps like project registration with NEMC, screening, scoping, and producing an ESIA report, which must consider environmental, social, cultural, economic, and legal factors. The regulations are relevant to the TCU project, requiring its registration and EIA study to comply with specified guidelines	Proponent has carried out this ESIA, hence, the requirements of these regulations are observed.
2	The Environmental Management (Fees and Charges) Regulations, 2021	The National Environment Management Council (NEMC), established under the Environmental Management Act Cap 191, oversees enforcement, compliance, and monitoring of environmental impact assessments, research, and awareness. Mandated by relevant regulations, it monitors industries for environmental effects, charging fees for compliance monitoring and audits, which are non-refundable as per the Environmental Management (Fees and Charges) Regulations, 2021.	TCU complies with regulation by paying review fees as required by the NEMC Council.
3	The Environmental Management (Registration and Practicing of	Section 83 of the EMA (2004) stipulates that the Environmental Impact Assessment shall be conducted by experts or firms of experts whose names and qualifications are registered by NEMC. The NEMC maintain a registry of EA and EIA experts. These	This study has been carried out by the registered expert by NEMC.

S/N	REGULATIONS	REQUIREMENT	COMPLIANCE STATUS
	Environmental Experts) Regulations, 2021	regulations also set the code of practice of the experts for which the Environmental Impact Assessment experts for this project subscribe.	
4	Environmental Management (Air Quality Standards) Regulations, 2007	This standard aims to establish baseline air quality parameters, enforcing NEMC-prescribed standards for industries, promoting eco-friendly technologies to safeguard human health and the environment from pollution sources. Compliance with 2007 regulations is crucial.	TCU will ensure that all emissions will be within recommended standard level.
5	Environmental Management (Soil Quality Standards) Regulations, 2007	This standard sets limits for soil contaminants in agriculture and habitat, ensuring adherence to minimum soil quality standards to sustain, restore, and enhance soil productivity. It also regulates expansion projects to prevent environmental contamination	TCU complies by maintaining trucks and excavators to prevent oil spills and directing wastewater from washrooms to septic tanks.
6	Environmental Management (Water Quality Standards) Regulations, 2007	The objective of this standard is to enforce minimum water quality standards prescribed by the NEMC. It ensures all discharges of pollutants take account the ability of the receiving waters to accommodate contaminants without detriment to the uses specified for the waters concerned, so as to protect human health and conservation of the environment. The project will take into account all acceptable practices and regulations.	TCU abiding to this regulation by ensuring that all liquid waste generated from proposed project are treated properly within the septic tanks without harm the environment.
7	The Environmental Management (Standards for Control of Noise and Vibration Pollution) Regulations, 2015	The regulation prohibits a person to make any loud, unreasonable, and unnecessary on unusual noise that annoys, disturbs, injures or endangers the comfort, repose, health or safety of others and of the environment describes the permissible noise levels from different facilities. The provisions of these regulations will guide in ensuring that noise and vibration levels do not exceed the maximum thresholds specified.	TCU ensures that these regulations are adhered by ensuring noise and vibrations produced during construction period are within acceptable limit.
8	The Urban Planning (Use Groups and Use Classes) Regulations, 2018	These regulations have been made under section 77(1)(i) of the Urban Planning Act (Act No. 8 of 2007). This regulation is made for the purposes of planning and the control of development, all uses of land and buildings are categorized in the use groups and use classes in the First Schedule. Land for the proposed establishment of TCU Headquarters Office Building site is on a surveyed and shall be used for Office purposes only. Based on title deed (Appendix 3) state that the land and the buildings to be erected thereon shall be used for Office purposes only. Use Group 'G' Use classes (a) as defined in Urban planning (Use Groups and Use Classes) Regulation, 2018. The land is legally owned by TCU.	The Proponent abide to the requirement of the regulations because the lands shall be used solely for Office purposes and for the other purposes ancillary thereto.
9	The Urban Planning	These regulations, pursuant to section 77(1)(o) of the Urban Planning Act (Cap. 355), mandate that all development within the Planning Area must obtain planning consent	TCU will abide to the requirement of the regulations

S/N	REGULATIONS	REQUIREMENT	COMPLIANCE STATUS
	(Application for Planning Consent) Regulations, 2018	from the Planning Authority. Additionally, they require specific documentation including block plans, elevation plans, floor plans, and site plans for proposed developments.	
10	The Urban Planning (Planning Space Standards) Regulations, 2018	The Urban Planning Space Standards offer guidelines for efficient space use, aiming for sustainable development. Applied to the HEET project at TCU, these standards informed building design and site selection. They dictate building heights, setbacks, plot coverage, and provision for transport systems, including roads, parking, and pedestrian walkways.	TCU HEET project integrates urban planning space standards into building design, ensuring efficient project area utilization throughout implementation.
11	The Urban Planning (Zoning of Land Uses) Regulations, 2018	The regulations, based on section 77(1)(d) of the Urban Planning Act (Cap. 355), detail permissible land uses in different zones. Residential, commercial, industrial, institutional, public utilities, beach, open spaces, recreational, transportation, communication, agricultural, water bodies, conservation, and economic development uses are specified. Institutional zones allow central and local government offices, educational institutions, cultural and religious centers, medical facilities, recreational areas, utilities, and essential staff quarters, among other uses, subject to specific criteria.	TCU will abide to the requirement of the regulations during design and construction period.
12	The Environmental Management [Control of Ozone Depleting Substances] Regulations, 2007	Regulations identify products with ozone-depleting potentials, including automobile and truck conditioning units, refrigeration, and air conditioning equipment containing controlled substances. This encompasses refrigerators, freezers, dehumidifiers, water coolers, ice machines, and air conditioning units. Dust emissions may occur during material handling, especially during construction at TCU.	MU should adhere to this regulation so as not to participate in ozone depleting and pay pollution cost when needed.
13	The Environmental Management (Solid Waste Management) Regulation, 2009 as amended in 2016	The regulation has been made under section 114, 115, 116,117, 118, 119, 120,121, 122 and 230 of Environmental Management Act, 2004. These regulations apply to all matter pertaining to solid waste management. They aimed among other things at setting standard for permit to operate solid waste disposal sites, permit to transport solid waste, permit to dispose solid waste and license to own or operate solid waste disposal site.	TCU abides by the regulations by ensuring that all solid waste generated during construction and operation phase are handled properly and does not lead pollution to the surrounding environment.
14	Environmental Management Act (Hazardous Waste Control) Regulations, 2021	This regulations under the Environmental Management Act, 2004, mandate Tanzanian residents to protect the environment from hazardous waste. They must report any hazardous waste activities to authorities. These rules cover hazardous waste handling, including generation, storage, and disposal, within mainland Tanzania. Principles of environmental sustainability like precautionary, polluter pays, and producer extended responsibility guide waste management.	TCU will abide to the requirement of the regulation.

S/N	REGULATIONS	REQUIREMENT	COMPLIANCE STATUS
	<p>The Environmental Management (Control and Management of Electrical and Electronic Equipment Waste) Regulations, 2021</p>	<p>The Regulations apply to all categories of electrical and electronic equipment wastes with respect to generation, collection, storage, transportation, importation, exportation, distribution, selling, purchasing, recycling, refurbishing, assembling, dismantling and disposal of electrical and electronic equipment waste or components, and their movement into or outside Mainland Tanzania. The amount of waste electrical and electronic equipment (widely known as WEEE or e-waste) generated every year in Tanzania is increasing rapidly.</p> <p>Waste from electrical and electronic equipment includes a large range of devices such as computers, printers, fridges and mobile phones at the end of their life. This type of waste contains a complex mixture of materials, some of which are hazardous. These can cause major environmental and health problems if the discarded devices are not managed properly. These regulations require the separate collection and proper treatment of WEEE and sets targets for their collection as well as for their recovery and recycling.</p>	<p>Thus, TCU shall ensure compliance with all these requirements during the implementation of the project.</p>

3.5 Relevant National Plans/Strategies

In order to guide national development more effectively and systematically, Tanzania has prepared a number of strategies aiming at operationalizing the various policies in key sectors. Some of the strategies that have a bearing on the proposed project are:

3.5.1 The Tanzania Development Vision 2025

The Composite Development Goal for the Tanzania Development Vision 2025 foresees the alleviation of poverty through improved socio-economic opportunities, good governance, transparency, and improved public sector performance. These objectives not only deal with economic issues, but also include social challenges such as education, health, the environment and increasing involvement of the people in working for their own development. The thrust of these objectives is to attain a sustainable development of the people. The Vision 2025 seeks to mobilize the people, the private sector, and resources of the nation towards achievement of shared goals and achieving a sustainable middle market economy by 2025. The vision outlines Tanzania plans and strategic goals covering all sectors of the economy and outlines institutional changes that must take place to enable Tanzania to make the progress suggested in the vision. The proposed project will stimulate local economic growth and will contribute towards realisation of the Vision 's objectives.

3.5.2 The Five Years Development Plan (FYDP) 2021/2022-2025/2026

FYDP III focuses on stimulating an inclusive and competitive economy, strengthening industrial production capabilities and service delivery, promoting investment and trade, bringing development to the citizens and building human resource capacity. By investing on this project, TCU is promoting the development in Tanzania which is the main focus of the FYDP III.

To facilitate its implementation, this plan has been developed in line with the implementation Strategy which is divided into three implementation plans. First, is the Action Plan which outlines all activities and objectives intended for whole period of implementation. The second is the Financing Strategy (FS) that shows how to avail funding for development projects as well as other strategic steps outlined in the Plan. The latter has prepared a Monitoring and Evaluation Strategy (MES) for monitoring the implementation of projects to know whether the intended results are being met and prompt corrective measures whenever needed to ensure delivery of the intended results. Through the slogan of the Sixth Phase Government of Kazi Iendelee, each of us has a responsibility to fulfill assigned responsibilities effectively in order to achieve effective implementation of this Plan.

3.5.3 Project Operational Manual

The Project Operational Manual (POM) sets forth all the operational and procedural steps which will guide the implementation of the Higher Education for Economic Transformation Project (HEET) at TCU. The Operational Manual offers a brief description of the components, details the results expected to be achieved through HEET and outlines the operational and financial reporting arrangements, procurement and disbursement processes, standard formats for biannual and annual reporting and amendment procedures. The manual is supported and complimented by a series of technical documents which will provide further guidance on key project components, and shall be used in conjunction with the recent versions of the Project Appraisal Document (PAD), Legal Agreement, and Environmental and Social Management Framework (ESMF).

The primary users of the POM will be the technical, financial, operational and administrative staff at TCU, consultants, contractors and any other agency tasked with implementing and monitoring any part of HEET-TCU.

3.5.4 Project Appraisal Document (PAD)

This document provides the project formulation underpinning. It describes the strategic context, project description including its project development objectives, components, beneficiaries and rationale for the World Bank involvement and role of partners. Further, the document outlines the implementation arrangements. Grievance redress services as well as the key risks and results framework and monitoring have also been presented in PAD. The projects under TCU will be implemented in line with the requirements by PAD.

3.6 Relevant International Agreements, Conventions and Treaties

International agreements, convention and treaties which are relevant to this project include:

- United Nations Framework Convention on Climate Change (1992)
- Paris Agreement (2015)
- The Convention on Biological Diversity (1992)
- Stockholm Convention (2001)
- United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification (UNCCD-1994)
- International Labour Convention

3.6.1 United Nations Framework Convention on Climate Change (1992)

The objective of the United Nations Framework Convention on Climatic Change (UNFCCC) is to stabilize the concentration of greenhouse gas (GHG) in the atmosphere, at a level that allows ecosystems to adapt naturally and protects food production and economic development.

Since Tanzania is a Party to the Convention, she will have to account for all sources of GHG in her future National Communications. Undertaking of this ESIA study will enable the country to identify some of the GHG that will be emitted by the project activities.

Compliance: *TCU project will abide with the requirements on control and prevention of greenhouse gases by emphasizing use of soft copies as opposed to hard copies in teaching and learning.*

3.6.2 Paris Agreement (2015)

The Paris Agreement aims to hold global temperatures ‘well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C’ (Art. 2.1.(a)) Since Tanzania is among the parties to the agreement, she will make profound changes to its economy to achieve this goal.

Compliance: *TCU project will abide with the requirements to reduce greenhouse gas emissions, at least to a point where there is a balance between emissions and sequestration by discouraging the use of soild biomass fuels and encourage utilisation of clean, sustainable energy fuels including Liquefied Petroleum Gas (LPG), electricity and sustainable biomass.*

3.6.3 The Convention on Biological Diversity (1992)

The Convention on Biological Diversity (1992) has three objectives which are; the Conservation of biological diversity; sustainable use of biodiversity components, and the fair and equitable sharing of the benefits arising from the utilisation of genetic resources.

Tanzania ratified the convention on biological diversity in 1996 and launched the National Biodiversity Strategy and Action Plan with a sectoral approach. The Government has committed to ambitious national targets for biodiversity conservation.

Compliance: *TCU project will abide with the requirements to safeguard biological diversity by enhancing protection of different plant and animal species around the university; and take measures for vulnerable ecosystems against climate change.*

3.6.4 United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification (UNCCD-1994)

The objective of the Convention, provided in article 2, is "to combat desertification and mitigate the effects of drought in countries experiencing serious drought and/or desertification, particularly in Africa, through effective action at all levels, supported by international cooperation and partnership arrangements."

Tanzania ratified the UNCCD in 1997 with the obliged to implement the provisions of the Conventions within her respective capacity in support of sustainable development.

Compliance: *TCU project will abide with the requirements to combat desertification and mitigate the effects of drought by undertaking different measures to control floods, minimize deforestation, manage water resources and induce water harvesting technologies.*

3.6.5 International Labour Conventions

International Labor Organisation (ILO) Conventions ratified by Tanzania include: C138 Minimum Age Convention of 1973, which prohibits child labor, and C182 Worst Forms of Child Labor Convention of 1999. As the conventions have been adopted by the Tanzania Government, TCU project will abide by them and ensure that no child labor is practiced throughout the project. Other relevant agreements include ILO Convention C148 Working Environment (Air Pollution, Noise and Vibration) Convention of 1977, which protects workers against occupational hazards in the working environment due to air pollution, noise and vibration. The proposed project will ensure workers work in safe environment.

3.7 Institutional Framework

The institutional arrangement for environmental management in Tanzania is well spelt out in the Environment Management Act (EMA) Cap 191. 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 Cap 191 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 7 legal institutions for environmental management in the country include; the National Environmental Advisory Committee; the Minister responsible for Environment; the Director of Environment; the National Environment Management Council (NEMC); Sector Ministries; Regional Secretariat; and Local Government Authorities (Municipal, Ward, Mtaa).

The Environmental Management Act (EMA, Cap 191) give mandate to NEMC to undertake enforcement, compliance, review and monitoring of environmental impact assessment and has a role of facilitating public participation in environmental decision-making, exercise general supervision and coordinating overall matters relating to the environment. The Act empowers NEMC to determine whether a proposed project should be subjected to an EIA, approves consultants to undertake the EIA study, invites public comments and also has the statutory authority to issue the certificates of approval via the Minister responsible for environment. NEMC is currently the designated authority to carry out the review of ESIA including site visit and handling TAC meeting, monitoring and auditing of environmental performance of the project (periodic and independent re-assessment of the undertaking). Table 3.4 provides key institutions to the proposed project.

Table 3.4: Legal and Institution framework

Level	Institution	Role and responsibility
National Level	Vice Presidents Office (Division of Environment)	<ul style="list-style-type: none"> ○ Coordinate the implementation of the National Environmental Policy. ○ Coordinate various environment management activities in Tanzania. ○ Advise the Government on legislative and other measures for the management of the environment. ○ Advise the Government on international environmental agreements. ○ Monitor and assess activities, being carried out by relevant agencies in order to ensure that the environment is not degraded. ○ Prepare and issue a report on the state of the environment in Tanzania.
	Vice Presidents Office (NEMC)	<ul style="list-style-type: none"> ○ Coordinate Environmental Management Policy, Act and EIA guidelines. ○ Approval of ToR, Review of ESIA. ○ Issuing an Environmental Certificate. ○ Review and recommend for approval of environment impact statements. ○ Enforce and ensure compliance of the national environmental quality standards. ○ Initiate and evolve procedures and safeguards for the prevention of accidents which may cause environmental degradation and evolve remedial measures where accidents occur. ○ Undertake in co-operation with relevant key stakeholders' environmental education and public awareness;
	Ministry of lands, housing and human settlements development	<ul style="list-style-type: none"> ○ Authority over the national land including the project area. ○ Enforce law and regulations in the area of influence of the project.
	Ministry of Education, Science	<ul style="list-style-type: none"> ○ To develop and implement Policies on Education, Research, Library Services, Science, Technology,

Level	Institution	Role and responsibility
	and Technology (MoEST)	<p>Innovation, Skills, Training Development and their implementation;</p> <ul style="list-style-type: none"> ○ To improve Basic Education Development through Teachers Training Accreditation and Professional Development; ○ Teachers Professional Standards Development; ○ Schools Accreditation and Quality Assurance; ○ Development of Local Experts in Science, Technology and Innovation; ○ Coordinates roles of Departments, Parastatal Organisations, Agencies, Programmes and Projects under the Ministry.
	Occupational Safety and Health Authority (OSHA)	<ul style="list-style-type: none"> ○ Issuing certificates of compliance. ○ Designated Authority for occupational safety issues. ○ Registration of workplace.
Project Proponent	Tanzania Commission for University (TCU)	<ul style="list-style-type: none"> ○ Project investment and project cycle implementation, monitoring and auditing; Conducting ESIA study and follow-up on ESIA certificate. ○ Land acquisition and payment of compensations. ○ Paying of applicable taxes and charges. ○ Project operation and decommissioning
Project Financier	World Bank	<ul style="list-style-type: none"> ○ Project financing
Regional Level	Dodoma City	<ul style="list-style-type: none"> ○ Oversee and advice on implementation of national policies at regional level. ○ Oversee enforcement of laws and regulations. ○ Advice on implementation of development projects and activities at the regional level.
Local Government Authorities and Communities	Dodoma City Council	<ul style="list-style-type: none"> ○ Oversee and advise on the implementation of national policies at the district level. ○ Oversee enforcement of laws and regulations. ○ Advice on implementation of development projects and activities at the district-level
	Ilazo ward office and Street/Mtaa office at Dodoma city	<ul style="list-style-type: none"> ○ Project monitoring (as watchdogs for the environment, ensuring the well-being of residents) and participate in project activities. ○ To extend administrative assistance and advice on the implementation of the project. ○ Managing the community's relations
	Local communities, NGOs, CSOs, and FBOs	<ul style="list-style-type: none"> ○ Project monitoring (as watchdogs). ○ Provides assistance and advice on the implementation of the project. ○ Part of the project beneficiaries through employment opportunities, income generation, and CSR projects.

3.7.1 Principal Participants in the Implementation of the Proposed Project

The TCU role is to ensure that the implementation of the ESMP and mitigation measures aligns with national policies, legislations, and World Bank ESS1. It operates through the Project Implementation Unit (PIU), overseeing project construction activities. During operation, the PIU, in collaboration with other departments, manages all project activities, falling under the TCU's purview. Chaired by the Vice Chancellor, management meetings provide guidance and oversight to the PIU. Within the PIU, three specialists (Environmental, Social, and Gender) monitor environmental and social aspects throughout the project phases. These specialists hold various qualifications, including a PhD in environment technology, a BA in Sociology, and a PhD in Management Science and Engineering, with the Gender specialist serving as the focal gender person. Additionally, the TCU commissions consulting engineers to supervise contractors on environmental and social issues during construction, as outlined in Table 3.5 detailing roles and responsibilities.

Table 3.5: Institutions Responsibility in the Implementation of the Proposed Project

S/N	Institutions/ Position	Roles and responsibilities in HEET Project
1	World Bank	<ul style="list-style-type: none"> ○ Review sub-project screening including risk level categorization; ○ Review the ESIA, ESMPs and site specific ESMPs; ○ Review quarterly reports by the implementing agencies; ○ Monitor compliance with the ESMF; and ○ Undertake implementation support missions.
2	MoEST	<ul style="list-style-type: none"> ○ E&S monitoring and surveillance of all project components investments that will be undertaken by project. ○ The ministry will report results of this monitoring to the World Bank.
3	NPIU Environmental and Social Team	<ul style="list-style-type: none"> ○ Coordinate different activities to ensure that, the project meets the country legal and World Bank requirements with regard to Environment and Social Framework
4	TCU-PIU	<ul style="list-style-type: none"> ○ Coordinate specialist/consultants for any support missions or attend different meetings and provide any guidance in the bid to ascertain that the different challenges identified for each sub-project/activity are duly covered from risk. ○ Support the procurement officer at respective project implementing institutions in making sure that the bidding documents clearly cover the health, safety and environmental component with appropriate provisions of the same for the contractors to bid. ○ Coordinate preparation of ESIA and environmental and social management plans (ESMPs) done by consultant and sitespecific ESMPs (SSESMP). ○ Ensure implementation of the ESMP and mitigation measures aligns with pertinent national policies, legislations, and the World Bank Environmental and Social Standard (ESS1). TCU oversees the Project Implementation Unit (PIU), tasked with supervising and monitoring the implementation of project construction activities. ○ Ensure that contractors have an Environmental Health and Safety Officer (EHS), who are familiar with the compliance requirements, including WB EHS guidelines. ○ Review progress reports by the supervision engineer/consultant during civil works and conduct inspection of the sites. ○ During project operation, overall management falls under the PIU, collaborating with other departments and units as per the activity's

S/N	Institutions/ Position	Roles and responsibilities in HEET Project
		<p>nature. Generally, the PIU operates under the day-to-day management of TCU.</p> <ul style="list-style-type: none"> ○ The PIU is overseen by management meetings chaired by the Director General, providing support, guidance, and oversight. Additionally, the PIU designates Environmental and Social Safeguard Specialists for the supervision and monitoring of project implementation.
	Supervision Engineer/ Consultant	<p>a. Environmental specialist(s)</p> <ul style="list-style-type: none"> ○ They shall guarantee that contractors employ an Environmental Health and Safety Officer (EHS) who is well-versed in compliance requirements, including World Bank Environmental Health and Safety (WB EHS) guidelines. ○ Assist the PIU to ensure that the necessary environmental, health and safety authorizations and permits have been obtained; ○ Maintain open and direct lines of communication between the PIU and contractor(s) with regard to environmental matters; ○ Review and approve the contractor’s site-specific construction ESMPs (CESMP), Waste Management Plans together with the PIU; ○ Conduct regular site inspections of all work areas to ensure compliance with CESMPs and E&S specifications for contractors Assist the contractor in finding environmentally responsible solutions to problems; ○ Instruct the contractor(s) to stop activities which generate adverse impacts, and/or when the contractor(s) fails to implement the ESMP requirements / remedial actions; ○ Monitor the contractor’s environmental awareness training program for all personnel working onsite; ○ Prepare written reports for the PIU such as weekly report of non-compliance issues; summary monthly report covering key issues and findings from supervision activities; and consolidated summary report from contractor’s monthly report. <p>b. Gender and Social specialist(s)</p> <ul style="list-style-type: none"> ○ Facilitating dialogue between project stakeholders, including local communities, to address concerns and ensure their perspectives are considered. ○ Ensuring project activities adhere to Tanzanian regulations, policies, and World Bank standards related to social safeguards and community well-being. ○ Providing training and support to project staff and community members on social issues, grievance mechanisms, and community development initiatives. ○ Regularly monitoring project activities to assess their social impacts, effectiveness of mitigation measures, and compliance with agreed-upon standards and regulations. ○ Compiling and submitting regular reports on social performance, community engagement activities, and compliance with regulatory requirements to relevant stakeholders, including the PIU and World Bank.

S/N	Institutions/ Position	Roles and responsibilities in HEET Project
		<ul style="list-style-type: none"> ○ Identifying and mitigating social risks associated with the project, such as conflicts with local communities, land acquisition issues, and cultural heritage preservation. <p>c. Health and Safety Officer (EHS)</p> <ul style="list-style-type: none"> ○ Ensure that all construction activities adhere to World Bank Standards, Tanzanian regulations, and relevant policies and legislations concerning health and safety. ○ Regularly inspect construction sites to monitor compliance with safety standards and identify any deficiencies that need addressing. ○ Provide training to the contractor on the EHS requirements to be followed; ○ Review and approve the contractor’s site-specific construction ESMPs (CESMP), Health and Safety Management Plan, Waste Management Plan, Labour Management Plans and Traffic Management Plans together with the PIU; ○ Monitor protocols for handling accidents or emergencies on construction sites from contractor, including immediate response procedures and post-incident investigations. ○ Monitor the contractor’s environmental awareness training program for all personnel working onsite; ○ In case of any accidents or incidents, immediately notify the PIU and support the process of documenting and reporting the case to the WB; ○ Conduct thorough risk assessments of construction sites to identify potential hazards and develop mitigation strategies to prevent accidents and injuries. ○ Prepare written reports for the PIU such as weekly report of non-compliance issues; summary monthly report covering key issues and findings from supervision activities; and consolidated summary report from contractor’s monthly report. ○ Maintain comprehensive records of safety inspections, incident reports, and compliance documentation, and submit required reports to PIU and project stakeholders.
	Design Consultant	<ul style="list-style-type: none"> ○ Understand the sub-project setting and site-specific requirements with discussions with the PIU; ○ Incorporate the issues identified in the ESIA, ESMPS into the project design. ○ Provide cost estimates for implementing the design requirements.
	Contractor	<p>a. Environmental Specialist (s)</p> <ul style="list-style-type: none"> ○ Compliance with relevant environmental and social legislative requirements (project-specific, district- and national level), including allocating adequate budget for implementation of these requirements; ○ Prepare CESMPs based on the ESMP in the bidding documents and contracts; ○ Work within the scope of contractual requirements and other tender conditions; ○ In case of non-compliances/discrepancies, carry out investigation and submit proposals on mitigation measures, and implement remedial measures to reduce environmental impact; o Propose and

S/N	Institutions/ Position	Roles and responsibilities in HEET Project
		<p>carry out corrective actions in order to minimize the environmental impacts;</p> <ul style="list-style-type: none"> ○ Provide training to project personnel on environmental best practices and build capacity for effective environmental management. ○ Develop contingency plans and response protocols to address environmental emergencies or incidents that may arise during construction ○ Implement monitoring programs to track environmental parameters during construction activities; o Maintain accurate documentation of environmental compliance activities and ensure that all necessary permits and approvals are obtained. ○ Identify opportunities for improving environmental performance and implement measures to minimize negative impacts and enhance sustainability. ○ Send weekly reports of non-compliance to the Supervision Engineer/consultant; and ○ Send monthly progress reports to the Supervision Engineer/consultant. <p>b. Gender and Social specialist(s)</p> <ul style="list-style-type: none"> ○ Ensure adherence to World Bank Standards and Tanzanian regulations, policies, and legislation concerning social aspects of construction projects. ○ Developing mitigation strategies to address social risks and impacts. ○ Facilitate meaningful engagement with local communities, government agencies, NGOs, and other stakeholders affected by the project throughout the project lifecycle. ○ Monitoring project activities to ensure compliance with social safeguards. ○ Providing capacity building and training to project stakeholders on social issues. ○ Collaborating with relevant government agencies to ensure alignment with national policies and legislations. ○ Reporting on social performance and addressing grievances from affected communities. ○ Ensuring transparency and accountability in project implementation, promoting sustainable development goals. ○ Continuously review and improve social management strategies and practices to enhance project outcomes and minimize negative impacts on communities. <p>c. Health and Safety Officer (EHS)</p> <ul style="list-style-type: none"> ○ Prepare and implement the contractor’s site-specific construction ESMPs (CESMP), Health and Safety Mangement Plan, Labour Management Plans and Traffic Management Plans. ○ Organize and facilitate regular safety training sessions about EHS (including relevant WBG EHS Guidelines) for all personnel involved in the project to enhance awareness and ensure adherence to safety protocols.

S/N	Institutions/ Position	Roles and responsibilities in HEET Project
		<ul style="list-style-type: none"> ○ Perform frequent site inspections with the PIU and Environmental Supervision Engineer/consultant to monitor compliance with safety regulations, identify any unsafe practices or conditions, and take corrective actions as necessary. ○ Develop and implement emergency response plans to effectively manage accidents, injuries, or other emergencies that may arise during construction activities. ○ Carry out any corrective actions instructed by the Supervision Engineer/consultant; ○ Provide training to the labourers on the EHS requirements to be followed; ○ Monitoring and reporting covers details of fatalities, injuries, crash types, and locations. ○ Maintain comprehensive records of safety inspections, incidents, and corrective actions taken, and ensure timely reporting to relevant authorities as per regulatory requirements. ○ Foster a culture of safety among all project stakeholders, encouraging active participation and accountability for maintaining a safe work environment. ○ Liaise with relevant government agencies, regulatory bodies, and other stakeholders to ensure alignment with health and safety standards and facilitate inspections or audits as needed. ○ Continuously monitor and evaluate safety performance, identify areas for improvement, and implement measures to enhance safety standards throughout the project lifecycle.

3.8 World Bank Environmental and Social Management Framework (ESMF)

The World Bank Environmental and Social Policy for Investment Project Financing sets out the requirements that the Bank must follow regarding projects it supports through Investment Project Financing. The Environmental and Social Standards set out the requirements for Borrowers relating to the identification and assessment of environmental and social risks and impacts and mitigation measures associated with projects supported by the Bank through Investment Project Financing.

In that context, the World Bank has set out the E&S standards that must comply with in the implementation of any project. These standards among others aim to

- i. Support borrowers in achieving good international practice relating to environmental and social sustainability.
- ii. Assist borrowers in fulfilling their national and international environmental and social obligations,
- iii. Enhance non-discrimination, transparency, participation, accountability, and governance; and
- iv. Enhance the sustainable development outcomes of projects through ongoing stakeholders' engagement.

Table 3.6 presents how the 10 Environmental and Social Standards (ESS) Standards of the World Bank are taken on board on ensuring that all HEET projects to be implemented at TCU are environmentally and socially sensitive.

Table 3.6: World Bank Environmental and Social Standards

Environmental and Social Standards (ESS)	Applicability	Requirements
ESS1: Assessment and Management of Environmental and Social Risks and Impacts	YES	The standard focuses in helping project beneficiaries to manage and reduce both environmental and social risks and enhance project positive impacts. The proposed project for TCU will use this requirement to strengthen the environmental and social framework for the assessment, development, and implementation of World Bank-financed projects where appropriate.
ESS2: Labour and Working Conditions	YES	The standard focuses on the adoption of standard labour practices that consider the acceptable working conditions for the people to be employed in the execution of the project activities. It requires the Borrower to prepare and adopt labour management procedures. Among others the standard call for provisions on the treatment of direct, contracted, community, primary supply workers, and government civil servants. It further calls for fair terms and conditions of work, non-discrimination and equal opportunity and workers organizations. Provisions on child labour and forced labour. Requirements on occupational health and safety, in keeping with the World Bank Group's Environmental, Health, and Safety Guidelines (EHS).
ESS3: Resource Efficiency and Pollution Prevention and Management	YES	The standard aims at enhancing effective use of resources and control of pollution. It further requires an estimate of gross greenhouse gas emissions resulting from project (unless minor), where technically and financially feasible. Requirements on management of wastes, chemical and hazardous materials, and contains provisions to address historical pollution. ESS3 refers to national law and Good International Industry Practice, in the first instance the World Bank Groups' EHSs.
ESS4: Community Health and Safety	YES	The standard aims at protecting local communities against any health risks and ensures their safety against project activities. It requires infrastructure to consider taking safety and climate change, and applying the concept of universal access which are technically and financially feasible. It requires further on traffic and road safety, including road safety assessments and monitoring. It calls for addressing risks arising from impacts on provisioning and regulating ecosystem service. Measures to avoid or minimize the risk of water-related, communicable, and non- communicable diseases. Requirements to assess risks associated with security personnel, and review and report unlawful and abusive acts to relevant authorities.

Environmental and Social Standards (ESS)	Applicability	Requirements
ESS5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	NO	This standard is not applicable in this proposed project because land is legally owned by TCU (Appendix 3)
ESS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	NO	The area of the proposed establishment of TCU Headquarter building is located in urban area where there is no any sensitive habitat/ species
ESS7: Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	NO	This standard is not applicable in this project because there is no any requirement related to ESS7.
ESS8: Cultural Heritage	YES	This standard is applicable for the proposed project due to chance finds of physical cultural resources during excavation activities for new construction.
ESS9: Financial Intermediaries (FIs)	NO	This standard is not applicable in this project because there is no any requirement related to ESS9.
ESS10: Stakeholders' Engagement and Information Disclosure	YES	The standard aims at making stakeholders part of the project through continuous sharing of information and updates. The standard call for stakeholder engagement throughout the project life cycle, and preparation and implementation of a Stakeholder Engagement Plan (SEP). It requires early identification of stakeholders, both project-affected parties and other interested parties, and clarification on how effective engagement takes place. Stakeholder engagement to be conducted in a manner proportionate to the nature, scale, risks and impacts of the project, and appropriate to stakeholders' interests.

3.8.1 Assessment and Management of Environmental and Social Risks and Impacts (ESS1)

The proposed establishment of TCU Headquarter Office building at Kisasa B area in Dodoma City will involve clearance of some secondary vegetation. This Environmental and Social Standard is applicable to this project due to its potential adverse environmental risks and impacts on site and in the areas of influence. These include impacts on environment such as air, water, land, human health and safety. Thus, TCU shall analyse project activities and associated environmental and social risks and impacts during construction and operation phase.

The project has prepared an Environmental and Social Impact Assessment (ESIA) and/or Environmental and Social Management Plans (ESMPs). Therefore, the project components have been screened to determine potential adverse impacts and mitigation measures for their planned activities. The asbestos materials will be disposed according to NEMC's guidance.

Based on the social relations between TCU and the nearby building office like TMDA, the social services like churches, mosques, and accommodation facilities can be pressurized due to the increased number of workers and labourers. Thus, the current social services provision at Ilazo Mbuyuni street/mtaa needs to be rechecked to prevent pressure on local accommodation and rents.

3.8.2 Labour and Working Conditions (ESS2)

The standard recognizes the importance of employment creation and income generation in the pursuit of poverty reduction and inclusive economic growth. ESS2 is applicable to the project given that the project will employ/engage both skilled and non-skilled workers, including through contractors/subcontractors, and primary suppliers, to undertake various activities. To comply with the provisions of ESS2, TCU will take worker safety seriously by laying out internal controls and procedures that will protect workers employed or engaged in relation to the project from occupational hazards during all relevant project phases. All works will be done in compliance with relevant environmental and health and safety standards to minimize impact on workers as well as the local area and citizens. The ESIA contains robust procedures for worker safety, requiring plans for accident prevention as well for health and safety of workers and communities, which are also part of contracts for civil works.

TCU will ensure that the contractor and sub-contractors operate under policy-led objectives that promote gender equality, non-discrimination and fair treatment in recruitment and employment, respect for national labour laws, including prohibiting child and forced labour, and combatting gender-based violence, in particular sexual harassment.

The Contractors/subcontractors, primary suppliers and sub-contractors shall ensure equal employment opportunity and not discriminate anyone based on colour, nationality, tribe, social origin, political opinion, religion, gender, pregnancy, marital status/family responsibility, disability, HIV/AIDS, age or station of life, sexual orientation, or union membership.

MUCE will ensure that workplace sexual harassment of any nature by workers directly hired, or project workers engaged through contracts/subcontracts companies shall be prohibited, and those determined to be guilty will be subject to disciplinary action, including summary dismissal.

3.8.3 Resource Efficiency and Pollution Prevention and Management (ESS3)

This ESS3 sets out the requirements to address resource efficiency and pollution prevention and management throughout the project lifecycle. In order to ensure the efficient use of resources, TCU

projects will source construction materials from government authorized sources and water from DUWASA throughout the project implementation. TCU has a total area of 1947m² out of which 1157.552m² will be used by the project.

Moreover, the project will utilize the pollution prevention and emergency response plan drafted as part of the ESIA to mitigate any potential source of pollution from the planned activities. The risks identified for strengthening the system for complying with ESS1 are applicable to ESS3.

3.8.4 Community Health and Safety (ESS4)

The ESS4 requires beneficiary to avoid or minimize safety and health risks and impacts of the project, with particular attention to people who, because of their circumstances, may be vulnerable. Implementation of project components has the health and safety risks and impacts on project-affected communities. These risks and impacts could include increased rates of crime, and social conflict and violence, increases in traffic accidents, increased pressure on local accommodation and rents, increased transmission of HIV/STDS, as well as increases in gender-based violence.

The project will ensure compliance with national law requirements regarding the COVID-19 situation. TCU shall work closely with street leaders to communicate to local communities' related health and safety risks and preventive measures for accidents associated transportation of materials and other human health issues including covering mitigation measures to GBV risks and prevention of HIV and AIDS during construction. All works will be done in compliance with relevant environmental and health and safety standards to minimize impact on workers and the local area. During the project's operational phase, waste will be disposed to Chidaya landfill.

In order to ensure safety during project implementation, TCU will ensure that contractors and sub-contractors enclose all project sites in fencing for safety and security reasons. Where required, adequate safety clearance zones can be established on sites where neighbouring activities may affect project operation. Appropriate safety signage shall be put in place to warn potential dangers associated with trespassing or accessing the enclosure with no supervision. The ESIA process shall contain robust procedures for accident prevention as well for health and safety of project affected communities.

3.8.5 Cultural Heritage (ESS8)

This recognizes that cultural heritage provides continuity in tangible and intangible forms between the past, present and future. People identify with cultural heritage as a reflection and expression of their constantly evolving values, beliefs, knowledge and traditions. In that regard, it echoes out the need to protect cultural heritage from the adverse impacts of project activities and support its preservation.

Hence, the project will ensure measures defined in the ESMF and contracts are followed by contractors during excavations (if any) to avoid impacts to cultural heritage and also ensure that chance find procedures will be enforced. HEET project will consult Division of Antiquities in the Ministry of Natural Resources and Tourism on application of the ESS8. However, no specific cultural sites were identified within the plot at Kisasa B area.

3.8.6 Stakeholders' Engagement and Information Disclosure (ESS10)

Effective stakeholders' engagement improves the environmental and social sustainability of projects, enhance project acceptance, and make a significant contribution to successful project design and implementation. The proposed project has engaged stakeholders as per SEP developed for HEET project. The engagement will cover all phases of the project. Implementing agencies will provide stakeholders with timely, relevant, understandable, and accessible information, and consult with them in a culturally appropriate manner, which is free of manipulation, interference, coercion, discrimination and intimidation. *See chapter five for comprehensive Stakeholders Engagement Plan for this project.*

3.9 Environmental, Health and Safety General Guidelines

The World Bank Groups Environmental, Health, and Safety (EHS) Guidelines are technical reference documents with general and industry specific examples of Good International Industry Practice (GIIP). EHS Guidelines are applied as required by their respective policies and standards. These industry sector EHS guidelines are designed to be used together with the General EHS Guidelines document, which provides guidance to users on common EHS issues potentially applicable to all industry sectors. The EHS Guidelines contain the performance levels and measures that are generally considered to be achievable in new facilities by existing technology at reasonable costs. Application of the EHS Guidelines to existing facilities may involve the establishment of site-specific targets, with an appropriate timetable for achieving them. The applicability of the EHS Guidelines should be tailored to the hazards and risks established for the project in accordance to the proposed project activities. The circumstances that skilled and experienced professionals may find when evaluating the range of pollution prevention and control techniques available to a project may include, but are not limited to, varying levels of environmental degradation and environmental assimilative capacity as well as varying levels of technical feasibility. The applicability of specific technical recommendations should be based on the professional opinion of qualified and experienced persons. Other world banks instruments applicable to this Project are the following:

- Community Health and Safety:
<http://documents.worldbank.org/curated/en/290471530216994899/ESF-Guidance-Note-4-Community-Health-and-Safety-English.pdf>
- Gender based violence:
<http://documents.worldbank.org/curated/en/399881538336159607/Environment-and-Social-Framework-ESF-Good-Practice-Note-on-Gender-based-Violence-English.pdf>

CHAPTER 4: BASELINE ENVIRONMENTAL AND SOCIAL CONDITION

4.1 Introduction

This chapter describes the existing environmental setting of the proposed development and its immediate surroundings. This includes the physical environmental condition comprising air, water and land components, the biological environment and social – economic environment. Attributes of the physical environment like water, soil and noise quality in the surrounding area that were assessed primarily through analysis of sample collected from the field. Surveys were carried out to understanding, record the biological environment prevailing in the area, and were verified against published information and literatures reviews. The social-economic environment has been studied through consultations with various stakeholders in the area within the project site.

4.2 Components and Parameters for Baseline Environment Study

The various components studied as a part of the baseline study are discussed in the following sections components:

- Physical Environment
- Biological Environment
- Baseline Measurement (Air, Noise and Water Environment)
- Socio-Economic Environment

4.2.1 Biophysical Environment

4.2.1.1 Climate

In Dodoma, the wet season is overcast, the dry season is windy and mostly clear, and it is warm year-round. Over the course of the year, the temperature typically varies from 58°F to 87°F and is rarely below 55°F or above 92°F. (Source: Weather-and-climate.com, 2023).

The construction and operation of the headquarters may lead to habitat disruption and loss of green spaces, contributing to the overall reduction of the city's natural resilience to climate change. Additionally, the increase in built-up areas and infrastructure may lead to altered surface temperatures, potentially creating localized heat islands. The construction process itself may result in carbon emissions and other pollutants, affecting air quality. Furthermore, changes in land use and water runoff patterns may impact local hydrology, potentially leading to increased risks of flooding or other water-related issues.

a. Temperature

Ilazo Mbuyuni street/Mtaa in Ipagala ward experience the hot season lasts for 2.5 months, from October 9 to December 24, with an average daily high temperature above 85°F. The hottest month of the year in Dodoma is November, with an average high of 87°F and low of 66°F. The cool season lasts for 2.4 months, from June 8 to August 20, with an average daily high temperature below 80°F. The coldest month of the year in Dodoma is July, with an average low of 58°F and high of 78°F. (Source: Weather-and-climate.com, 2023).

Dodoma city experiences a semi-arid climate with high temperatures, and this environmental factor can significantly impact the construction and operation of the proposed headquarters. High temperatures may affect the choice of construction materials, necessitating the selection of materials that can withstand the region's heat and resist degradation over time. Additionally, the project's energy consumption and cooling requirements for the office building will be influenced by the local temperature patterns. Adequate measures such as proper insulation, energy-efficient

cooling systems, and sustainable design considerations should be incorporated into the project to mitigate the potential environmental impact of increased energy demand.

b. Precipitation

Ilazo Mbuyuni street/Mtaa in Dodoma City Council experience a wet day is one with at least 0.04 inches of liquid or liquid-equivalent precipitation. The chance of wet days in Dodoma varies significantly throughout the year. The wetter season lasts 4.6 months, from December 2 to April 22, with a greater than 22% chance of a given day being a wet day. The month with the most wet days in Dodoma is January, with an average of 12.3 days with at least 0.04 inches of precipitation. The drier season lasts 7.4 months, from April 22 to December 2. The month with the fewest wet days in Dodoma is August, with an average of 0.0 days with at least 0.04 inches of precipitation. Among wet days, we distinguish between those that experience rain alone, snow alone, or a mixture of the two. The month with the most days of rain alone in Dodoma is January, with an average of 12.3 days. Based on this categorization, the most common form of precipitation throughout the year is rain alone, with a peak probability of 43% on January 1. (Source: Weather-and-climate.com, 2023).

The amount and frequency of precipitation in the region, particularly during the construction phase, can influence various aspects of the project. Heavy rainfall may lead to soil erosion and sedimentation, potentially affecting the stability of the construction site. Additionally, precipitation can impact water quality in nearby rivers or water bodies, raising concerns about potential contamination. The proposed project should consider measures to mitigate these effects, such as implementing erosion control practices and proper drainage systems to manage stormwater runoff. Furthermore, the social aspects may include potential disruption of local communities due to adverse weather conditions, ensuring that construction activities do not pose risks to the well-being of residents from Kisasa B area and Ilazo Mbuyuni Street/Mtaa. Adequate planning and mitigation strategies, considering the specific precipitation patterns in Dodoma, will be crucial for the sustainable development of the TCU Headquarters Office Building.

c. Rainfall

Dodoma City Council show variation within the months and not just the monthly totals, we show the rainfall accumulated over a sliding 31-day period centered around each day of the year. Dodoma experiences extreme seasonal variation in monthly rainfall.

The rainy period of the year lasts for 6.0 months, from November 3 to May 4, with a sliding 31-day rainfall of at least 0.5 inches. The month with the most rain in Dodoma is January, with an average rainfall of 4.3 inches. The rainless period of the year lasts for 6.0 months, from May 4 to November 3. The month with the least rain in Dodoma is August, with an average rainfall of 0.0 inches. (Source: Weather-and-climate.com, 2023).

Rainfall can significantly affect various components of the project, including construction activities, stormwater management, and potential implications for the local environment. Excessive rainfall could lead to construction delays and may necessitate additional measures to ensure the safety and stability of the building site. Moreover, proper stormwater drainage systems must be incorporated to prevent soil erosion, flooding, and waterlogging, which could pose environmental risks and compromise the structural integrity of the proposed headquarters. The ESIA should thoroughly assess the susceptibility of the project area to extreme weather events,

evaluate the adequacy of proposed mitigation measures, and propose strategies to minimize negative environmental and social impacts associated with rainfall, ensuring the sustainable development of the TCU Headquarters in Kisasa B area.

d. Humidity

We base the humidity comfort level on the dew point, as it determines whether perspiration will evaporate from the skin, thereby cooling the body. Lower dew points feel drier and higher dew points feel more humid. Unlike temperature, which typically varies significantly between night and day, dew point tends to change more slowly, so while the temperature may drop at night, a muggy day is typically followed by a muggy night.

Dodoma City Council experiences significant seasonal variation in the perceived humidity. The muggier period of the year lasts for 4.9 months, from November 29 to April 25, during which time the comfort level is muggy, oppressive, or miserable at least 8% of the time. The month with the muggiest days in Dodoma is March, with 9.7 days that are muggy or worse. The month with the fewest muggy days in Dodoma is July, with 0.0 days that are muggy or worse. (Source: Weather-and-climate.com, 2023).

The level of humidity in the region can significantly influence various aspects of the project. High humidity levels may contribute to environmental challenges such as mold growth, which can affect indoor air quality and the structural integrity of the building. Additionally, elevated humidity might impact the choice of construction materials and techniques, requiring measures to prevent moisture-related issues. Socially, the comfort of occupants within the building may be compromised if humidity is not adequately controlled, affecting their overall well-being and productivity. Furthermore, high humidity levels can contribute to the proliferation of disease vectors, potentially impacting public health in the surrounding area. Therefore, a comprehensive analysis of humidity-related factors is essential to ensure the sustainability and resilience of the proposed TCU Headquarters in Kisasa B area.

e. Wind

In the City Council, winds usually blow across the City Council from southeast to northwest of the Council. This section discusses the wide-area hourly average wind vector (speed and direction) at 10 meters above the ground. The wind experienced at any given location is highly dependent on local topography and other factors, and instantaneous wind speed and direction vary more widely than hourly averages.

The average hourly wind speed in Dodoma experiences significant seasonal variation over the course of the year. The windier part of the year lasts for 7.1 months, from May 4 to December 7, with average wind speeds of more than 10.0 miles per hour. The windiest month of the year in Dodoma is October, with an average hourly wind speed of 13.4 miles per hour. The calmer time of year lasts for 4.9 months, from December 7 to May 4. The calmest month of the year in Dodoma is February, with an average hourly wind speed of 6.5 miles per hour. (Source: Weather-and-climate.com, 2023).

Dodoma City, being characterized by varying wind patterns, necessitates careful consideration of wind effects on the structural integrity and energy efficiency of the building. Wind can influence the design and layout of the structure, affecting factors such as orientation, ventilation systems, and overall building resilience. Additionally, the wind's potential impact on local ecosystems,

including flora and fauna, must be evaluated to ensure minimal disruption. Mitigation measures such as windbreaks or modified landscaping may be required to protect the environment. Furthermore, the social aspect involves assessing how wind patterns might affect the well-being and comfort of individuals working within the building and its surroundings. Overall, a comprehensive evaluation of the wind's influence is essential to create a sustainable, resilient, and socially responsible infrastructure for the TCU Headquarters in Kisasa B area.

4.2.1.2 Topography and Drainage

The geographical coordinates of Dodoma City Council are -6.172 deg latitude, 35.739 deg longitude, and 3,691 ft elevation. The topography within 2 miles of Dodoma contains significant variations in elevation, with a maximum elevation change of 630 feet and an average elevation above sea level of 3,731 feet. Within 10 miles contains significant variations in elevation (1,499 feet). Within 50 miles contains very significant variations in elevation (4,423 feet). The area within 2 miles of Dodoma is covered by artificial surfaces (81%), within 10 miles by shrubs (42%) and cropland (38%), and within 50 miles by shrubs (43%) and cropland (30%) (Source: Weather-and-climate.com, 2023).

The proposed project area for the TCU headquarters office building in Kisasa B area on Ilazo Mbuyuni Street/Mtaa is heavily influenced by the topography and drainage characteristics of the project area. The physical features of the land, known as topography, play a crucial role in determining how structures are laid out and their foundation designs. For instance, steep slopes may necessitate special foundation techniques to ensure stability.

Furthermore, considering drainage is essential to prevent water accumulation and potential damage to structures. It is imperative to implement effective drainage systems to handle rainwater runoff and prevent waterlogging, which could compromise the building's integrity. Therefore, a thorough understanding of the existing topography and drainage conditions is essential during the planning and execution of construction projects. Proper management of construction activities, including measures for erosion control and stormwater management, is vital to minimize adverse effects on the natural features of the site and ensure the long-term sustainability of the built environment.

4.2.1.3 Soil

The soil in Dodoma City Council is generally characterized as having limited fertility, a lack of organic material, moderate to poor water permeability, shallow depth, and a relatively high salt content. In certain regions, salt pans can even develop beneath the topsoil. These soils consist of variations of sand, clay, sandy loam, and clay, with a reddish-brown or dark loam appearance. (Source: Strategic plan II for the year 2017/18 – 2021/22).

The result from sieve analysis reveal that the site is characterized with silty/clayey sand and sandy silt/clay. The fine contents of the soil range 15% and 62% and the fines are of low plasticity. In designing of any foundation base, an important point to note is the permissible bearing pressure on the ground which corresponds to a service stress and its maximum value that can be supported without excessive deformation taking place. Therefore, the type and shape of the loading are the ones, which determine the shape of foundation (Appendix 3).

The type and quality of soil in the area can significantly impact the structural stability of the building, influencing foundation design and construction methods. Additionally, soil characteristics can have environmental implications, affecting water drainage, erosion control, and

the potential for soil contamination. A thorough soil analysis is essential to ensure that the construction adheres to environmental standards and regulations, preventing negative consequences such as soil degradation or water pollution. Moreover, understanding the soil profile is crucial for landscaping and green space planning around the headquarters, promoting ecological balance and social well-being in the vicinity. Therefore, a comprehensive assessment of the soil conditions is imperative for making informed decisions and mitigating potential environmental and social impacts associated with the establishment of the TCU Headquarters Office Building in Kisasa B area.

4.2.1.4 Vegetation cover

Dodoma City Council and DONET are actively working to safeguard the environment by engaging in afforestation and reforestation initiatives that include the planting of trees (Source: Strategic plan II for the year 2017/18 – 2021/22).

Different and few scattered vegetation types dominate the project area, including short acacia trees and thin shrubs covering the entire site. The vegetations are mainly native as less planted vegetation were found.

4.2.1.5 Catchment and Hydrology

The City Council doesn't have any permanent rivers, but it has gullies and seasonal streams that gather water from the nearby hills and create swampy areas during the rainy seasons. These gullies have great potential for gardening once the rainy season begins. Currently, most people use the water from these gullies for household purposes, and only a small number of individuals utilize it for irrigation. (Source: Strategic plan II for the year 2017/18 – 2021/22).

The catchment area, which refers to the geographical area draining water to a common point, will influence the site water resources and drainage patterns. Changes in land use, such as constructing a new building, can alter the natural flow of water, potentially leading to increased runoff, erosion, and changes in groundwater recharge. Additionally, the hydrology of the area, including rainfall patterns and existing water bodies, will impact the project's sustainability. Adequate consideration must be given to stormwater management, flood risk, and water availability for construction and operational needs.

4.2.2 The Biological Environmental

The ESS6 addresses all habitats, categorized as 'modified habitat', 'natural habitat', and 'critical habitat', along with 'legally protected and internationally and regionally recognized areas of biodiversity value' which may encompass habitat in any or all of these categories. Terrestrial habitat in the project area for the proposed establishment of TCU Headquarter office building at Kisasa B area will be categorized as Modified habitat in accordance with the methodology and requirement of IFC NP6/ ESS6 defined as follows:

Modified habitat; are areas that may contain a large proportion of alien animal and/or plant species and/or where human activity has significantly altered the primary ecological functions and species composition.

4.2.2.1 Flora and Fauna

The proposed area for project implementation has few different plants species including indigenous trees which are short trees, shrubs with thorns such as *Acacia nilotica* (Common Acacia), and *Ziziphus spina-christi* (Christ's Thorn Jujube), and few cactuses such as *Opuntia*

ficus-indica (Indian Fig Opuntia) were observed. During general searches it was observed that there is no species of the amphibians and reptiles that are included in the IUCN Red list of threatened species.

4.2.2.2 Unique and Endangered species

There are neither unique nor endangered species of concern that were observed during site assessment.

4.2.3 Baseline Data on Air Quality, Noise and Vibrations

This includes measuring recommended parameters to be used as a baseline for monitoring practices during project construction and operation phases. For our proposed project, baseline measurement will consider air quality measurement for particulate matter and gaseous emission, noise level measurement and vibration.

4.2.3.1 Ambient pollutant gases

Levels of ambient pollutant gases were measured in line with manufacturer's procedure and ISO 11042-1: 1996(E) protocol that meet the European standards (say EN 61779, EN 50104 and EN 45544). Generally, the results show that all measured noxious gases concentrations for all sites of the proposed project were within permissible limits corresponding to limits prescribed by Local Standard (TBS limits) and international limits (WHO/IFC limit) for ambient air quality (Appendix 3).

4.2.3.2 Dust (Particulate matter) concentrations in terms of PM₁₀ and PM_{2.5}

Dust levels were measured using Particulate Matter/Dust Monitor that complies with the EMC Directive 89/336/EEC of the European Union in accordance to manufacturer procedure and applicable local standards and/or international environmental guidelines. The device has been tested according to the standard delivery schedule and complies with the EN 50081-1:1992 and EN 50081-2:1993 standards. Based on the results, all recorded data for PM₁₀ and for PM_{2.5} were within the standards prescribed by TBS and IFC/WB Group limits at each location (Appendix 4).

4.2.3.3 Noise levels

Noise data were recorded at the same stations used to measure ambient pollutant gases, dust and one offsite point were recorded. At each station, noise levels were measured in accordance to ISO 1996-1:2003 using a Digital Sound Level Meter, with measurement range of 30 to 130dB (A). Based on findings, the average noise level indicate that the existing status of the project area and the nearby community are within the acceptable noise levels prescribed by WB/IFC limit and TBS limit (Appendix 5).

4.2.3.4 Ground Vibration

The ground vibration levels measured were compared with Occupational Safety and Health (Working Environment) Regulations, 2016 limit of 5 mm/s PPV. Also, the results were compared with British Standard of 0.3mm/s and 0.15 mm/s PPV (Peak Particle Velocity) as levels that human beings and/or animals can detect or may experience stress resulted to vibrations. The vibration of the area is insignificant as it did neither exceed the 0.15 mm/sec PPV criteria established to evaluate the extent that can easily be detected by human nor exceed 5 mm/sec PPV criteria established for conducive working environment for a person at work (Appendix 6).

4.2.4 Existing Land Uses in the Project Area

The current land-use of the TCU site is shrub land that has no any built structures. The site has defined pathways for accessibility. According to the title deed, the planned area has a total area of 1947m² out of which about 1157.552m² will be used by the project.

4.2.5 Socio-Economic Environment

The Socio-economic aspects that were studied in the project area included;

4.2.5.1 Population

During the 2022 national census, Dodoma city council had a total population of 765,179 with 373,440 males and 391,739 females. The 2022 National Population Census reveals that Ipagala ward had a population of 49,289, consisting of 23,175 males and 26,114 females, with a population growth rate of 2.1 percent. (Source: NBS, 2022). Also, during the construction phase, the population will increase due to migration of contracted workers and after more staff will increase due to the accomplishment of the project.

Hence, this project is poised to have multifaceted effects on the local population throughout the construction and operational phases. During construction, residents may experience disruptions such as noise, traffic congestion, and temporary changes in accessibility. The operational phase could bring about increased economic activities but may also lead to heightened traffic and potential changes in the local landscape. Also, the influx of TCU staff and visitors during the operational phase could affect local businesses and services, leading to changes in demand and potentially affecting the local economy.

4.2.5.2 Cultural Heritage, Aspirations, Traditions and Religion

In Dodoma City Council, the predominant ethnic groups are Gogo, Rangia and Sandawe, also there are small Indian minorities. Additionally, Swahili is the official language of Tanzania and is commonly used in Dodoma City Council. Other languages spoken in the district include Gogo, Rangia and Sandawe. In terms of religion, the majority of the population adheres to Islam and Christian.

The construction of a modern office building may impact the cultural heritage of the area, potentially altering the aesthetic and historical landscape of Kisasa B area. This transformation may prompt a reassessment of the value placed on local landmarks and historical sites, potentially leading to a redefinition of cultural identity. Aspirations within the community may be influenced by the economic opportunities and development associated with the project, potentially fostering a sense of progress and ambition. However, the preservation of local traditions might be challenged as modern infrastructure and administrative facilities replace or overshadow traditional practices. Additionally, the project's impact on religion could vary, with potential disruptions to local religious sites or practices, necessitating careful consideration and mitigation efforts to address any conflicts that may arise.

4.2.5.3 Health Services

Healthcare services in Dodoma City Council are delivered by a combination of government agencies, non-governmental organizations (NGOs), and an increasing number of privately-run clinics and pharmacies. The city organizes mobile clinics in remote areas to reduce maternal and infant mortality rates, as well as to control the spread of HIV and AIDS. Currently, the City Council

oversees a total of 5 hospitals, 14 health centers, 56 dispensaries, and 3 specialized clinics. Out of the 76 operational health facilities, 52% are under the ownership of Dodoma City Council, 15% are run by government institutions, and 16.4% are operated by faith-based organizations, with 8 additional facilities in various stages of construction. To address the growing demand for healthcare facilities, Dodoma City Council is collaborating with private and faith-based organizations to provide primary healthcare services through a public-private partnership (PPP). (Source: Strategic plan II for the year 2017/18 – 2021/22).

The construction and subsequent operation of a large office building could lead to increased demand for healthcare services due to potential health and safety risks associated with the project. Construction activities may generate noise, dust, and other pollutants, impacting air and water quality, which could have adverse effects on the health of nearby residents and workers. Additionally, the influx of people to the area, attracted by employment opportunities or business related to the TCU, may strain existing healthcare facilities, potentially leading to increased pressure on local health services.

Therefore, the proposed establishment of the TCU headquarters office building is expected to have both short-term and medium-term impacts on health services in the area. During the construction phase, there may be disruptions to the routine healthcare services due to increased traffic, noise, and potential logistical challenges. Additionally, dust and air pollution from construction activities could pose health risks to the local population. In the operational phase, the impact on health services may include changes in traffic patterns and increased demand for healthcare facilities and services due to the presence of TCU headquarters. The significance of these impacts is both direct, as they affect the immediate vicinity of the construction site, and indirect, as they may influence healthcare utilization patterns in surrounding areas. The cumulative effect over time could lead to a shift in healthcare demand and resource allocation.

4.2.5.4 Education

Dodoma City Council has 122 Primary Schools. Among them 93 are public owned Schools and 29 private owned Schools. Also, has 55 Secondary Schools of which 37 are Public/community owned and 18 Private Schools. (Source: Strategic plan II for the year 2017/18 – 2021/22). From 122 primary school, 1 primary school was located nearby the project area at Ilazo Mbuyuni called Ilazo primary school.

The proposed project of TCU headquarters office building in Ilazo Mbuyuni Street/Mtaa is likely to have significant effects on education services in the area. During the construction phase, there may be disruptions to the normal functioning of educational institutions in proximity to the construction site, potentially impacting students, teachers, and administrative staff. The noise, traffic, and logistical challenges associated with construction activities could lead to temporary inconveniences and adjustments. In the operational phase, the establishment of the TCU headquarters may bring both positive and negative impacts. On the positive side, it could contribute to the local economy by generating employment opportunities and fostering economic growth. However, there may be challenges such as increased traffic, changes in the local landscape, and potential strain on existing infrastructure and services.

4.2.5.5 Occupation and Income

Ilazo Mbuyuni street/Mtaa in the Dodoma City Council is characterized as a building office area as many offices have been established in the area. Most of the people in the project area involve

themselves as either employed or self-employed. In that case the buildings in the project area have used for office purpose only. Some of economic activities involved in the project area are;

- Hotels
- Transportation services e.g. daladala (Communal buses), Three wheeled motor vehicle (Bajaji), motorcycle (bodaboda) and taxi
- Shops
- Agribusinesses
- Livestock keeping especially chicken and dam cattle

These activities play a significant role to the Dodoma City economy in terms of revenue and in provision of job opportunities to the residents. The proposed project will enhance the number of economic activities in Dodoma City to the National level.

4.2.5.6 Other commercial activities

In the project area at Ipagala ward most of local persons they engage in other economics activities like Shopkeeper, banking agent, M-Pesa agent, Tigo Pesa agent, Airtel money agent and Halopesa agent, food vendor (Mama lishe/Baba lishe), due to the presence of different building offices and school.

4.2.5.7 Housing

Life forms at the proposed project site are mixed, such that there are residential, institutional and commercial activities. Housing and settlement in the area shows that the majority of buildings have houses roofed with corrugated iron sheets with carrot colour. The walls of building are of concrete blocks. Around the project area, there are building offices with different design.

4.2.6 Economic Infrastructure

4.2.6.1 Road network

The proposed project area can be accessed by Morogoro-Dodoma Road and Hombolo road. The road has safety sign for vehicles and pedestrian and is tarmacked. Furthermore, the project area is situated roughly eight kilometers (8 km) away from Dodoma's city center.

The proposed establishment of TCU Headquarter building will inevitably impact the road network services during both the construction and operational phases. The construction phase is likely to cause disruptions such as road closures, detours, and increased traffic congestion in the vicinity. This could lead to delays for commuters and businesses in the area. Once operational, the increased presence of TCU headquarters may further contribute to ongoing traffic patterns and necessitate adjustments in the local road infrastructure to accommodate the heightened activity.

4.2.6.2 Energy and Power Supply

The proposed TCU Headquarter Office Buildings will get its electricity from the TANESCO National Power Grid and on top of that backup generator will be used during emergency. Hence, standby generators will be procured and installed to supply electricity to proposed building during operation phase. Since the problem of power cuts is a nation-wide issue, the TCU should look for more economic and reliable source of power supply, such as installation of Solar Panels.

In addition to that, this project will likely have a notable impact on the Energy and Power Supply services in the area. During the construction phase, there may be disruptions to the local energy grid and power supply as the necessary infrastructure is put in place. Additionally, the operational phase could lead to increased energy demand from the new facility, potentially straining the

existing power resources. The significance of this impact is both direct, affecting the immediate vicinity of the construction site, and indirect, influencing the broader Dodoma City Council area.

4.2.6.3 Telecommunication

Telecommunication is the transmission of signs, signals, messages, words, writings, images and sounds or intelligence of any nature by wire, radio, optical or other electromagnetic systems. Telecommunication occurs when the exchange of information between communication participants includes the use of technology. It is transmitted either electrically over physical media, such as cables, or via electromagnetic radiation.

Dodoma city council is well served with Internet connectivity, telephone services (both cellular and land line telephone services) and postal services. The region is well served with a number of telephone companies, including Tanzania Telecommunication Company, Vodacom, Airtel, Tigo, and Halotel. Therefore, due to this the project area is well catered for by telecommunication networks receiving service from 4 privately-owned mobile service providers i.e., Vodacom, Airtel, Halotel, Tigo and TTCL owned by public.

4.2.6.4 Financial Institutions

In Dodoma City Council, several Financial Institutions are conducting business operations. Some of these are National Microfinance Bank (NMB), National Bank of Commerce (NBC), Postal Bank and Cooperative Rural Development Bank (CRDB). However, in the project area there is no any financial institutions although there are Bank agents.

CHAPTER 5: STAKEHOLDERS ENGAGEMENT PLAN AND GRIEVANCE REDRESS MECHANISM

5.1 Introduction

This chapter provides an overview of the stakeholder engagement efforts conducted so far, encompassing the identification process of stakeholders. It emphasizes the stakeholders who have been identified and consulted, the consultation methods employed, and the concerns and issues raised by stakeholders regarding the construction activities of different facilities at TCU. The chapter concludes with a review of how these issues have been addressed. The primary aim of stakeholder engagement is to articulate how TCU will involve stakeholders throughout the development of the proposed project.

The engagement activities associated with the Environmental and Social Impact Assessment (ESIA) present an opportunity for individuals interested in or affected by the project to express their opinions and concerns regarding the project's impacts and mitigation measures. The project will carefully consider and respond to these inputs during the ESIA process. Moreover, the engagement activities facilitate relevant authorities in ensuring that concerns and comments from various stakeholders are taken into account while developing the Environmental and Social Management Plan (ESMP) and an Environmental Monitoring Plan for the project. Stakeholder consultation will persist during the disclosure of the ESIA report and throughout the implementation of the proposed project.

5.2 Stakeholders Identification and Analysis

Stakeholders encompass all individuals, groups, or organizations that could be impacted by or could impact the proposed project, either positively or negatively. In the preparation of the scoping report for the project situated in Kisasa B area, Ilazo Mbuyuni street/mtaa, Ipagala ward in Dodoma City, a public consultation process was undertaken. This process facilitated the establishment of a communication channel for consultation at both local and national levels. The engagement of national and local authorities, as well as leaders in the project's sphere of influence, was integral to the process.

The consultation involved a diverse range of individuals and groups susceptible to or capable of influencing the proposed development, spanning various administrative levels such as zonal, regional, city council, and local levels. Notably, OSHA participated at the zonal level, while at the regional level, consultation included TCU staff, the Fire and Rescue Force, DUWASA, TANESCO, NGOs, CBOs, and Dodoma City Council. At the local level, consultation occurred with the Ward Executive Officer (WEO), the Street/Mtaa Executive Officer (MEO), and community members.

5.3 Requirement of Stakeholder Engagement

According to the Environmental Management Act Cap 191, the Environmental Management (Environment Impact Assessment and Audit) (Amendment) Regulations of 2018, and the World Bank ESS10 (Stakeholder Engagement and Information Disclosure), it is necessary to include Stakeholder Engagement and Information Disclosure as integral parts of project planning and implementation in order to develop good relationships and gather their views on issues that could affect the project throughout the project life.

The Environmental Management (Environment Impact Assessment and Audit) (Amendment) Regulations of 2018 along with the ESIA emphasize the importance of stakeholder engagement and provide the guidelines on when and how the public should be notified during key stages of the ESIA process. Specifically, stakeholder engagement is required during the ESIA Scoping stage and after the completion of impact analyse. The project proponent is also obligated to inform the public at the commencement of scoping activities and upon submission of the Draft ESIA to NEMC (National Environmental Management Council).

5.4 Objectives of Stakeholder Engagement

The general objective of the Stakeholder Engagement Plan (SEP) is to guarantee a consistent, thorough, coordinated and culturally suitable approach to engaging stakeholders and disclosing project information. The objective is to showcase the commitment of the TCU to following internationally recognized best practice in engagement. Following the standards of current international best practices, the stakeholder engagement for this project seeks to ensure that the engagement process is conducted without manipulation and interference. TCU is fully dedicated to adhering to Tanzania national environmental policy and legislation, and World Bank Environmental and Social Policy.

This Stakeholder Engagement plan identifies the key stakeholder and establishes effective mechanisms for obtaining stakeholder feedback and demonstrates how it will be integrated into the broader ESIA process. The plans ensures that concerns raised by key stakeholders are addressed both in the ESIA and during project decision making and design phase. It also serves as a documentation of the engagement process and outlines the responsibilities of the project proponent in accordance with Tanzania legislative requirements and international best practices. Considering this context, the specific objectives of this stakeholder engagement plan are as follows;

- Provide relevant, timely, accessible and appropriate information regarding hydroelectric power plant related developments, in an appropriate manner and understandable format to all stakeholders. Information will be disclosed as early and as comprehensively as possible.
- Consult stakeholders on their opinions, concerns, preferences and perceived gains and risks with respect to the project planning and implementation, including the design and proposed management and mitigation measures to reduce potential impacts and to enhance possible benefits.
- Provide all stakeholders with the means to address concerns and grievances with the project, in a structured, reliable and responsive manner.

5.5 Stakeholders Engagement and Disclosure Methodologies

Various communication techniques are employed during stakeholder engagement. Essentially, community meetings serve as the primary methods for involving the public, other method are focus group discussion and interview. These methods are utilized to generate initial awareness, encourage participation, and facilitate long-term information sharing. However, the selection of specific methods depends on the level and purpose of engagement, as well as the specific stakeholder group being targeted. In the ESIA process, the ESIA Consultants employed the following methods to engage the public.

5.5.1 Community Meetings

This method facilitates sustained information exchange between the proponent and the relevant public, including women and vulnerable groups. Community meetings were organized to disseminate information to individuals who could potentially be impacted by the project, as well as to gather their comments and address any queries they may have. These meetings involved a presentation followed by a session for questions and answers. The main goals were to clarify the project details and seek opinions regarding both positive and negative impacts of the project.

5.5.2 Formal Meetings

Formal meetings with elected officials and government functionaries were held to provide information about the project to agency representatives, and to solicit their comments and questions. The meetings consisted of a short formal presentation followed by a question-and-answer period.

5.5.3 Focus Group Discussions

Consultants employed FGD when aiming to bring together stakeholders with the same interests or common characteristics into a meeting to discuss specific topics or project components in a focused manner. FGD were employed to explore issues that are relevant to specific groups or sub-groups of a community – such as youth, the elderly, women, students and people with disabilities. The intention of using this approach is centred upon establishing of similarities and differences among people of the same or different groups.

5.5.4 One on one interviews

The interviews will aim to give chance to individuals to air concerns on project depending on the issues to be addressed.

5.5.5 Site visits

These visits are focused to identify and discuss stakeholder concerns and to disclose project information within communities.

5.5.6 Disclosure

- TCU will made accessibility of ESIA report, along with other pertinent project documents to the public.
- The complete set of documents will be physically accessible in local offices and project offices. Electronically copies will be available on the TCU website.
- Summary information will also be provided at Ward and Village offices situated in the project area.

Table 5.1; Summary of Stakeholders Communication methodology

S/N	Stakeholders Group	Language	Communication means
1	Government Institutions and Agencies (OSHA, TANESCO, DUWASA, RUWASA, FIRE AND RESCUE FORCE)	Kiswahili & English	<ul style="list-style-type: none"> ○ Phone and Email ○ Meetings ○ Roundtable discussions
2	Local government (Dodoma City Council, Ipagala ward,	Kiswahili	<ul style="list-style-type: none"> ○ Community Meeting ○ Roundtable discussions

	Ilazo Mbuyuni Street and Kisasa B area		
4	TCU Staff	Kiswahili & English	<ul style="list-style-type: none"> ○ Phone and Email ○ Meetings ○ Roundtable discussions
5	Vulnerable Groups (women, youth and elders)	Kiswahili	<ul style="list-style-type: none"> ○ Community Meeting ○ Roundtable discussions
6	Others (NGOs, CBOs, and private sector etc.)	Kiswahili & English	<ul style="list-style-type: none"> ○ Phone and Email ○ Meetings ○ Roundtable discussions

5.6 Stakeholders Concerns

Generally, all government all consulted stakeholders consulted had no objections regarding the proposed project and appeared to be content with its objectives leading to its initiation. They all urged the proponent to abide by the relevant rules and regulations guiding her project operations. All raised issues from consulted stakeholders are pointed and noted

Table 5.2: Details of Stakeholders concerns (Source; Consultation with stakeholders on October 2023)

Level	Institution/ Group	Views and Concerns of Stakeholders	Response to concerns
Regional Level	OSHA	<ul style="list-style-type: none"> ○ The proponent and contractor should make sure the project is registered under the Workplace Information Management System (WIMS) before pre- construction and construction phases. ○ The proponent should make sure that the awarded Contractor should have registered HSE representatives and First Aiders at all project phases, as well as First Aid Kits with all necessary facilities. ○ Medical examination should be done to all workers before and after construction and operation phases as well as during operation phase. ○ The proponent and contractor should conduct Risk Assessment before construction and prepare a Risk Assessment report. ○ The contractor should have accident book for the workers in order to keep accident records for those workers who had accidents during construction period. ○ The proponent and contractor should prepare the Occupational Health and Safety Policy both in English and Swahili languages, and it should be displayed in an accessible place within a work place. ○ The contractor should provide sufficient Personal protective equipment's (PPE) to all workers at the site and enforce them to use it all the time at the project site. ○ Contractor should provide Induction training to workers on health and safety and the appreciation of safety gear will be done. ○ The proponent should ensure temporally or portable toilet are in place within the project site if the existing toilet facilities are distant from the proposed project site. 	<ul style="list-style-type: none"> ○ TCU and Contractor shall register the proposed establishment of new buildings at OSHA. ○ TCU and Contractor shall ensure that HSE representatives and trained first aiders are in place for the proposed development. ○ Contractor shall conduct medical examination (Pre and Post medical) for the employees and labours to ensure health and safety of workers as per OSHA regulations. ○ Contractor shall conduct risk assessment and shall have accident book. ○ TCU and contractor shall have health and safety management plan to ensure safety of workers within the project area. And the first aid kits shall be provided in an area where it will be easily visible and accessible. ○ Personal Protective Equipment (PPE) must be supplied to all workers due to the inherent nature of construction tasks and the associated hazards. ○ TCU and contractor should explain the nature of the project to

Level	Institution/ Group	Views and Concerns of Stakeholders	Response to concerns
		<ul style="list-style-type: none"> ○ The proponent should ensure temporarily or portable toilet are in place within the project site. ○ The project area should have a provision of changing room during construction phase. 	<p>the surrounded community and people living within the project area.</p> <ul style="list-style-type: none"> ○ Refer ESMP, Table 7.2
	Dodoma Fire and Rescue Force	<ul style="list-style-type: none"> ○ Architecture drawings should be submitted to fire office for approval before the commencement of the construction. ○ Contractor who responsible for drawing should be aware with building regulation. ○ Contractor or Proponent must install the exit signs throughout the project site and a fire assembly point. ○ Fire detections system must be provided. Its components such as smoke detectors, heat detectors, beam detectors, sounders, beacons, manual call points, control panel, alarms and others must be in acceptable standards. Installation should be done by recognized and qualified institution. ○ Adequate Portable Fire Extinguishers must be provided, installed properly and maintained in accordance with acceptable standards by authorised personnel during all phases of the proposed project. 	<ul style="list-style-type: none"> ○ The TCU shall submit drawings to Fire and rescue force and shall adhere to details regulation of the architect designs. ○ TCU shall adhere this in order to ensure compliance and avoid unnecessary incident or accident. ○ The design group shall incorporate and revise all the addressing concerns in the drawings in order to enhance their functionality.
	TANESCO	<ul style="list-style-type: none"> ○ The office is positive with the implementation of the proposed establishment ○ The contractor should consult TANESCO at the earliest stage in order to assess the proposed site and to see list of registered electrical engineers/firms verified by TANESCO. ○ The proponent should install solar panel as alternative energy if its within their budget due to cost, but if it fails to do that it's better to use backup generator as alternative energy. 	<ul style="list-style-type: none"> ○ The contractor shall consult TANESCO at earliest stage of project implementation. ○ TCU shall award contractor with registered electrical engineers. ○ TCU shall install backup generator as alternative energy

Level	Institution/ Group	Views and Concerns of Stakeholders	Response to concerns
	DUWASA	<ul style="list-style-type: none"> ○ The office is positive with the project implementation. ○ The proposed project area is connected with DUWASA system for water supply; however, water is available all the time hence contractor or proponent should find alternative source of water to ensure availability of water in all phases of project implementation. ○ Contractor should install pipe for water supply for proposed building should be settled into the ground at least 1m depth to avoid pipe blockage due to any activities that will be conducted near the project area. 	<ul style="list-style-type: none"> ○ Contractor shall use water from DUWASA and shall have water storage tanks to avoid shortage of water during project implementation. ○ Contractor shall consider 1m depth during installation of pipe network system for water supply.
	Wami Ruvu Basin Water Board	<ul style="list-style-type: none"> ○ The project that is set to begin is significant and must be carried out. ○ The proponent should conduct geophysical and hydrogeological survey to determine exactly location of borehole before project implementation in order to alter site layout plan based on the project design 	<ul style="list-style-type: none"> ○ TCU will conduct geophysical and hydrogeological survey before project implementation.
Local Level	Dodoma City Council (Building control officer, Environmental Management Officer, Land Planning Officer, Community Development Officer & Social	<ul style="list-style-type: none"> ○ The proponent is the legal owner of the land. ○ The proponent should take building permit from City council. ○ The proponent should ensure that the proposed building should consider City building standard like colour code of rooftop based on ward in order to reduce white rooftop in the city and should be visible without any eye damage. Hence regarding this the colour code of Ipagala ward is carrot colour. ○ The proponent should follow and implement city policy and program for tree plantation. Number of trees to be planted it based on land size, and should be shadow or fruit trees. ○ The proponent should conduct geotechnical study for the proposed development area before project implementation. ○ Proponent should consider rainwater harvesting system 	<ul style="list-style-type: none"> ○ TCU shall take building permit from City council. ○ TCU and contractor shall consider rooftop colour code. ○ TCU shall plant shadow and fruits trees within the project area. ○ TCU shall conduct geotechnical study for the project area before project implementation. ○ TCU shall consider rainwater harvest in the project design. ○ TCU and contractor shall ensure proper management of solid, liquid and hazardous waste.

Level	Institution/ Group	Views and Concerns of Stakeholders	Response to concerns
	Welfare Officer)	<p>during the design stage to ensure water availability and avoid water scarcity for the proposed building.</p> <ul style="list-style-type: none"> ○ Contractor should ensure that the building materials are available within the project area due to scarcity of some building materials in Dodoma city. ○ The proponent and contractor should ensure solid and hazardous waste are managed properly throughout the project lifespan. ○ Insist on health and safety of workers during and after the construction period so as to prohibit the complaints from the community after project implementation ○ Wastewater from the proposed building should be well managed and disposed into designed septic tank to prevent the outbreak of diseases. ○ Employment priority should be given to the local community surrounding the project for both skilled and unskilled labour. ○ Also, they talked about the gender issue that during the construction period women should participate in all aspects as long they accept what they assigned by a contractor ○ During construction period safety issue must be enhanced and health education e.g., AIDS and malaria. ○ The proponent and contractor should rise awareness on transmission diseases like HIV/AIDS, COVID19 during project implementation. ○ Contractor should not employ child during construction period. ○ Sensitization and trainings on finance management should be given to laborers. 	<ul style="list-style-type: none"> ○ TCU and Contractor shall ensure health and safety during and after construction period. ○ TCU shall manage wastewater from proposed building through the septic tanks which will be established during project implementation. ○ The proponent and contractor shall provide employment for local residents near the project area for both skilled and unskilled laborers. ○ The contractor shall consider gender balance in provision of employment during construction phase. ○ The contractor shall provide and enhance health education e.g. HIV&AIDS and COVID19. ○ Child labor shall be avoided. ○ Contractor shall provide trainings on finance management to laborer's during demobilization and decommissioning of the project.
	Street/Mtaa Office- Ilazo	<ul style="list-style-type: none"> ○ The project is worth being undertaken and accepted. 	<ul style="list-style-type: none"> ○ The proponent and contractor shall provide employment for

Level	Institution/ Group	Views and Concerns of Stakeholders	Response to concerns
	Mbuyuni area (MEO, Youth chairmen, and community members)	<ul style="list-style-type: none"> ○ The land for proposed establishment is legally owned by TCU. ○ Employment priority should be given to the local community surrounding the project for both skilled and unskilled labour. ○ The proponent and contractor should ensure proper management of any type of wastes including solid and hazardous waste that will be generated during project implementation in all phases. ○ The contractor should provide contract to workers and payment are prepared timely. 	<ul style="list-style-type: none"> ○ local residents nearby the proposed project for both skilled and unskilled labourers. ○ The proponent and contractor shall ensure proper management of solid and hazardous waste during project implementation. ○ The contractor shall prepare contracts for workers and the payment will be issued on time as per contract.

5.7. Stakeholders Engagement Plan (SEP)

Effective stakeholder engagement improves the environmental and social sustainability of projects, enhance project acceptance, and make a significant contribution to successful project design and implementation. The proposed project has engaged stakeholders as per SEP developed for HEET project.

The engagement plan will be reviewed and updated throughout the project implementation. During this process, the focus and scope of the SEP may change to reflect the varying stages of project implementation and to encompass any changes in project design and lessons learnt from previous phases of the Project.

Table 5.3: Stakeholders Engagement Plan

Stakeholder Name	Stakeholder Type	Engagement Objective	Engagement Method	Frequency/Timing	Expected Outcome
TCU staff	Internal	Ensure project aligns with university goals and objectives.	Meetings Regular progress update	Throughout project duration	<ul style="list-style-type: none"> ○ Clear communication channels, support for project objectives
Local community (Ipagala Ward)	External	Minimize construction related inconvenience	Community meeting	Mobilization and Construction phase	<ul style="list-style-type: none"> ○ Mitigation measure for dust, noise and traffic. ○ Responsiveness to concerns

Stakeholder Name	Stakeholder Type	Engagement Objective	Engagement Method	Frequency/Timing	Expected Outcome
Construction Contractor	External	Efficient and timely project delivery	Regular progress meeting. Site visits	Throughout construction phase	<ul style="list-style-type: none"> ○ Clear project requirement. ○ Adherence to construction schedule
Government Authority and Agencies (OSHA, TANESCO, DUWASA, RUWASA, FIRE AND RESCUE FORCE)	External	Comply with regulations and obtain necessary permits.	Project registration. Permit application process. Regular updates	Mobilization phase	<ul style="list-style-type: none"> ○ Timely approval of permits, adherence to regulations
Environmental Agencies (Division of Environment, and NEMC)	External	Minimize Environmental and Social Impact	Environmental and Social Impact Assessment, consultation sessions	Mobilization phase	<ul style="list-style-type: none"> ○ Mitigation measure for Environmental concerns. ○ Compliance with regulation
Donors/Funding Agencies (World Bank)	External	Accountability and transparency in fund utilization	Reporting mechanisms. Project presentations	Throughout project duration	<ul style="list-style-type: none"> ○ Clear financial reporting, alignment with World Bank requirement.

5.8 Grievance Redress Mechanism

A Grievance Redress Mechanism (GRM) is a formal system established to address and resolve complaints or grievances raised by stakeholders or affected group. This is designed to provide an avenue for stakeholders or affected group to engage with the project on issues of concern or unaddressed impacts. In order to make this aim a reality, TCU will develop a grievance handling mechanisms and procedures to address grievances associated with the establishment of TCU Headquarter Office building including grievances related to PAP and contractor grievances.

Grievances are any complaints or suggestions about the way a project is being implemented, and they may take the form of specific complaints for damages/injury, concerns around resettlement and compensation, concerns about routine project activities, or perceived incidents or impacts.

Stakeholder engagement operates as a bidirectional procedure. Thus, it is crucial to establish a feedback mechanism system that allows stakeholders who are impacted by or have an interest in the proposed project to express their input (like opinions, requests, suggestions, and grievances) for review and, if necessary, seek resolution. It is important to acknowledge that not all grievances may be considered valid or applicable to the proposed project context. Nonetheless, the feedback mechanism should operate in a non-judgmental manner and document all received feedback.

The implementation of a Grievance Mechanism Procedure guarantees that complaints are properly documented and treated well with fairness and appropriateness. TCU strives for ongoing enhancements to this procedure. The Grievance Mechanism was communicated to the relevant parties during the public consultation sessions. The Grievance Handling Officer (GHO) appointed by TCU has the responsibility for handling all types of grievances arising from implementation of all projects and sub-projects under the HEET project including work related grievances and managing the Grievance Register. Complaints can be submitted in written or verbal form either directly by the complaint or through TCU employees, Contractor, Consultant and Dodoma City Council.

5.8.1 Purpose

The aim of a Grievance Mechanism document is to effectively handle complaints and grievances raised by communities and local stakeholders in equitable, fair, timely and transparent manner. Also, it fosters mutual confidence and trust by providing a platform to address stakeholder concerns, gather information about their issues, and serve as an early warning system to tackle problems before they potentially becoming more challenging and costly to resolve. It is crucial to address these grievances in a timely manner to ensure the smooth execution of the project.

The Grievance Mechanism has been developed alongside the Stakeholder Engagement Plan (SEP) because of the interconnectedness between these planning mechanisms. Its design ensures compliance with Tanzania laws and regulations, as well as the World Bank Environmental and Social Standards (ESS) requirements for grievance management. It's important to note that employee grievances are not handled within this mechanism, as its primary focus is on managing interactions with external stakeholders.

Hence, the main purpose of this GRM is to offer instructions and support to TCU employees and Contractors in handling and resolving community complaints or grievances arising from TCU operations and activities associated with the project.

5.8.2 Scope

The grievance mechanism will be utilized to address complaints and grievances from stakeholders whether they perceived or actual, that are connected to the actions of TCU and its contractors in regards to the planned establishment of the TCU Headquarter Office building, in Kisasa B area, Ilazo Mbuyuni Street/Mtaa, Ipagala ward, Dodoma City Council. A complaint or grievance refers to any matter, concern or problem (Whether they perceived or actual) that an individual stakeholder or community group has regarding the operations and activities of TCU and its contractors.

5.8.3 Features of Grievance Redress Mechanism

The features of a grievance redress mechanism should include;

- **Accessibility;** the mechanism should be easily accessible to affected group or stakeholders, ensuring that they can submit their grievances conveniently.
- **Clear Procedures;** there should be well defined procedures for submitting, reviewing, and resolving grievances. This includes the steps involved, required documentation and timelines for resolution.
- **Impartiality and Fairness;** the mechanism should be impartial and treat all grievances with fairness, without bias or favoritism towards any party involved.
- **Confidentiality;** Confidentiality should be maintained to protect the privacy and identity of individuals involved, especially when dealing with sensitive matters. For example, in case of complaints related to GBV, grievances will be treated with due confidentiality. Specific provisions will be included for complaints related to SEA and SH, that could be derived from the project to ensure the survivor's confidentiality and rights.
- **Timely Response;** the mechanism should aim to provide timely responses to grievances, ensuring that individuals are kept informed about the progress of their complaints.
- **Resolution and Remedies;** the mechanism should have provisions for resolving grievances effectively and providing appropriate remedies to the aggrieved parties. This includes corrective actions, compensation, policy changes or other forms of resolution.
- **Feedback and Monitoring;** Regular feedback and monitoring of the grievance redress mechanism are essential to identify areas for improvement and ensure its effectiveness over time.

5.8.4 Grievance Mechanism Process or Procedures

The responsibility of managing the grievance mechanism at TCU will rest with Project Coordinator, who will allocate resources to the Grievance Handling Officer for handling correspondence, facilitating internal resolutions, maintaining a record of grievances, and providing reports both internally and externally. The Grievance Handling Officer will collaborate, assist, and cooperate with other work groups to develop appropriate solutions and responses. It is crucial to follow the approval process for external communication and reporting to ensure consistency with TCU policies and approved key messages. The following are procedures that should be followed throughout the entire process to ensure complete resolutions of a grievance;

- **Receive and Register/Logging Grievance**

Every grievance will be registered using the Grievance Receipt and Resolution Form for HEET Project Affected Person (PAPs). PAPs shall file the grievance through a special e-mail established for receiving grievances, suggestion boxes, meetings or directly to the GHO who will record

grievances/complaints receipt and resolution form and MoEST GHO. The GHO is responsible for reading and explaining the recorded information to the complaint to ensure accurate representation of the complaint or grievance. If a grievance is reported to someone other than the GHO, all forms must be promptly transferred to the GHO within 24 hours of receipt or as soon as practically possible.

In situations where the grievance is of an urgent nature and demands immediate action, it is important to guide the complaint to the GHO and promptly inform the Project Coordinator. Such urgent matters may include environmental concerns, safety issues, or complaints regarding human rights violations related to security. Each grievance will be assigned a unique case number, and all communication and consultations related to the grievance will be documented and securely stored. Regular monitoring of the database will enable the identification of recurring grievances, facilitating the development of suitable measures for addressing them effectively.

o 6.6.2 Acknowledging Receipt of a Grievance

The GHO will promptly acknowledge receipt of any complaint or grievance, ensuring that is done within a maximum of 5 day from the submission date. The complaint will be informed of the expected timeframe for receiving a response. The Grievance Acknowledge the resolution form should contain a unique reference number and contact information, such as a phone number or alternative method for reaching the TCU. Additionally, the project commits to providing a response within a specified period which is about 2 weeks after the grievance is logged. The acknowledgement will include a summary of the grievance, details of how the TCU intends to address it, and an estimated timeframe for delivering the final response.

Also, the response will either accept or refute responsibility for the grievance and next step will be the investigation and resolution or immediate actions to be taken.

Screen

Upon receiving a grievance, it will undergo a screening process ranging from level 1 to 3, as defined in table below, to ascertain the suitable course of action. The GHO will be in charge of assigning a grievance owner who will be responsible for engaging with the external stakeholder and finding a resolution. The screening of grievances will depend on their level of severity, determining the appropriate grievance owner and approach for addressing the grievance.

Therefore, the proponent (TCU) has no Grievance redress mechanism that is connected with the building projects. The grievance redress mechanisms at TCU will involve three levels which are described below;

Table 5.4: Grievance Screening

Level	Issue Description	Management Approach
Level 1	A grievance that is limited in scope, occurring as a single occurrence and primarily affecting a specific location and involving one person filing the complaint. Please note that certain isolated grievances, despite being singular in nature, may be deemed substantial enough to be classified as level 1 grievances, such as instances where a violation of national or international law has taken place.	Grievance Handling Officer will notify the management of TCU and subsequently employ authorized solutions to address and manage the response.
Level 2	A grievance that arises repeatedly within the local community or region, and is deemed to have the potential to disrupt TCU operations or	Develop a plan for addressing grievances and create a response to be reviewed and approved by

Level	Issue Description	Management Approach
	generate unfavourable attention from local information or other stakeholders.	TCU and other relevant management.
Level 3	A grievance that is extensive and recurring, causing long-lasting harm and/or receiving unfavourable attention from local media, or is perceived to have the possibility of generating negative media on TCU operations and comments from local stakeholders.	Give priority to issues management, legislative and regulatory advocacy process, and establish a suitable management strategy.

○ **Assess and Investigating a Grievance**

The Grievance Handling Officer will conduct a thorough investigation of all submitted grievances, engaging other departments, contractor and TCU management as necessary to fully comprehend the circumstances that give rise to the grievance. The GHOs aims at completing investigation within two (2) weeks of the grievance first being logged and will involve the aggrieved person or people in this investigation to ensure their views are incorporated. Also, the GHO is responsible for keeping the complainant informed about the progress the progress of the review. If additional time is required to examine the grievance, the complainant will be notified in writing, along with an indication of when a resolution will be provided.

○ **Grievance Resolution**

Based on the findings from the investigation, the GHO attempts to resolve the grievance through dialogue, negotiation or other appropriate means. The objective is to find a satisfactory solution that addresses the concerns raised. However, if complainant is satisfied, the GHO should seek their sign off and determine if any follow up is needed to monitor resolution implementation. Once the measures have been implemented the grievance should be closed. Also, if the grievance still stands then the GHO will initiate further investigation and determine the steps for future action. And If the PAP is not satisfied with decision of GHOs, the grievance is referred to the Grievance Redress Integrity Committee (GRIC) respond within 2 weeks' time from the submission.

○ **Third party appeal**

If the complainant is dissatisfied with the solution proposed by the Grievance Redress Integrity Committee (GRIC) and requires broader consultation, grievances will be referred to an impartial third party for review and final decision. The Chairman of the GRIC, in consultation with the project coordinator, will forward the issue to the next level (third party). This third party should be neutral, respected, and agreed upon by both TCU and the affected parties. Potential third-party reviewers may include public defenders, District Commissioners, Regional Commissioners, Legal Advisors, local or international NGOs, or technical experts.

The third party will assess the case and determine if further reasonable actions can be taken. If all reasonable and justifiable corrective actions have been exhausted, a written notice will be provided to the complainant, formally closing their grievance. The notice may include supporting documents such as paid invoices, written agreements, photographs, emails, etc., as evidence of the resolution actions taken and adherence to the Grievance Mechanism Procedure. In cases where the complainant's address is unavailable, they may be notified by telephone or in person.

○ **Follow up and Close Out**

Once resolutions have been approved and agreed upon by the complainant, it is the responsibility of the GHOs to promptly initiate the administrative process to redress the grievance. The details

of the resolution, including the action plan, and the target timeframe for closure must be updated in the Complaint/Grievance Register. The case is considered "resolved" only when the agreed resolution has been implemented, and it then transitions to a "closed" status.

To acknowledge the receipt of the resolution, the GHOs must request the complainant to sign the form in three designated places. The complainant's signature signifies their acknowledgment of the receipt, satisfaction with the outcome (or notification of alternative escalation mechanisms if unsatisfied, with a maximum activation timeframe of 30 days), and confirmation that they have been respectfully informed about the outcome of the reviews without objections.

In situations where complainants are hesitant to sign any forms or when no forms are used, the GHOs verbally seeks feedback on the satisfaction with the process and outcome. For example, they may ask if there are any suggestions for process improvement or if the complainant is content with how the process was handled. With the consent of all parties present, this interaction can be recorded on a voice recorder.

5.8.5 Monitoring and Reporting

It is important to consistently monitor and evaluate the performance of the grievance mechanism throughout the duration of the project. This monitoring aims to enhance both the system itself and the overall project. All reported grievances should be promptly recorded in the designated system, along with the corresponding target resolution dates. The management of TCU will routinely monitor grievances as part of their broader project management responsibilities, maintaining comprehensive records of raised complaints throughout the project's lifecycle. Upon receiving grievances, electronic notifications must be distributed to the management team. Grievance records should be accessible to management at all times. The GHOs will compile monthly internal reports, which will be shared with the management team. These reports will include the following information:

- The number of grievances logged in the previous period, categorized by level and type.
- The number of stakeholders who have expressed dissatisfaction with the resolution after 30 days.
- The number of grievances that remain unresolved after 60 days, categorized by level and type.
- The number of grievances resolved directly between the GHOs and the complainant, without the involvement of legal or third-party mediators, categorized by level and type.
- The number of grievances concerning the same or similar issues.
- The Grievance Officer's responses to the concerns raised by various stakeholders.
- The actions taken to incorporate these responses into the project's design and implementation.

These reports, along with other relevant records, will be available for external review if necessary. A suitable grievance report should be included in TCU annual reporting, which will be accessible to the public. A hard copy of the report will be kept at the TCU offices, and an electronic version will be made available online.

5.8.6 Storing of Grievance

TCU will securely file all records, such as grievance forms, investigation notes, interview records, and meeting minutes, to uphold the privacy and confidentiality of all parties involved.

CHAPTER 6: IMPACTS IDENTIFICATION, ASSESSMENT AND PROJECT ALTERNATIVES

6.1 Introduction

The UNDP's EIA training resource manual (2002), specifically pages 152-179, forms a foundational guide for systematically identifying, predicting, and evaluating impacts at each stage of the proposed project. Chapter Seven outlines comprehensive enhancement and mitigation measures. MoEST, collaborating with TCU, commits to proactive measures, preventing, eliminating, or mitigating identified adverse impacts. The study's overarching goal is to establish a strategic roadmap, ensuring project investments align with environmental and social best practices. This involves meeting the stringent requirements of World Bank Environmental Standards (ESS), Environmental and Social Management Framework (ESMF), and Government of Tanzania legislation. The study aims to create a robust foundation for environmental sustainability and social acceptability, ensuring that project investments contribute to sustainable development while upholding the highest environmental and social standards.

Chapter eight details the suggested steps for mitigation and enhancement measures (Table 8.1), which MoEST, through TCU, is dedicated to implementing. The objective is to avoid or minimize the adverse effects identified. This study aims to ensure that the investments funded by this project adhere to both the World Bank Environmental Standards (ESS) and the Government of Tanzania (GoT) legislations in an environmentally and socially responsible way.

- The environmental risk assessment covered adherence to WB Environmental Health and Safety Guidelines (EHSGs), evaluating community safety risks, addressing climate change concerns, preserving natural habitats, and assessing impacts on ecosystem services and natural resource utilization.
- Social risk assessment included identifying threats to human security like crime, analyzing risks disproportionately affecting specific groups, and evaluating negative economic and social consequences linked to involuntary land acquisition or restrictions on land use.

6.1.1 Nature of Impact

There are two basic natures of impacts; impacts that tends to be beneficial or useful to the environment or social-economic aspects are termed as Positive Impacts and those which tends to affect the environment or social-economic aspects in a negative way are termed as Negative Impacts.

6.1.2 Duration of Impact

The duration of impacts defines the timeframe by which the impact will be felt or the time by which the positive or negative impacts related to the project will continue to occur. In other writings, they are termed as temporal scale. This duration can either be short term, medium term, long Term or permanent.

6.2 Environmental Impact Rating Scale

In order to guarantee a fair and accurate comparison among different studies conducted by ESIA teams, a uniform assessment approach was employed to evaluate the significance of the identified impacts. The assessment of impact significance, which refers to the importance of the impact within the larger context of the affected system, was based on specific criteria.

- **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 last;
- **Degree of certainty:** the degree of confidence in the prediction;
- **Likelihood:** an indication of the risk or chance of an impact taking place;

The impact assessment involves analyzing of the overall effect within the surrounding environment to determine the significant of the impact. This assessment considers various factors such as social, cultural, historical, economic, political and ecological aspects. As a result, the severity or benefit of an impact is initially assessed within a specific field of expertise before evaluating its significance on a larger scale. This requires two separate rating scales, one to determine the severity or benefit and another to determine the environmental significance.

6.2.1 Severity/Benefit

The severity of impacts is determined by experts who use their professional judgement to assess the degree of change that negative impact would have on the existing conditions, or the level of benefits that positive impacts would bring to a specific affected system or specific affected group (Table 6.1).

Table 6.1: Severity rating scale

Negative Impacts	Positive Impacts
<p>Very severe An irreversible and permanent change to the affected system(s) or party(ies) which cannot be mitigated. For example, change in topography.</p>	<p>Very Beneficial A permanent and very substantial benefit to the affected system(s) or party(ies), with no alternative to achieve this benefit. For example, the creation of a large number of long-term jobs.</p>
<p>Severe Long-term impacts on the affected system(s) or party(ies) that could be mitigated. However, this mitigation would be difficult, expensive or time consuming or some combination of these.</p>	<p>Beneficial A long-term impact and substantial benefit to the affected system(s) or party(ies). Alternative ways of achieving this benefit would be difficult, expensive or time consuming, or some combination of these. For example, an increase in the local economy.</p>
<p>Moderately severe Medium- to long-term impact on the affected system(s) or party(ies), that could be mitigated. For example, constructing a narrow road with an area with low conservation value.</p>	<p>Moderately beneficial A medium- to long-term impact of real benefit to the affected system(s) or party(ies). Other ways of optimising are equally difficult, expensive and time consuming (or a combination of these), as achieving them in this way.</p>
<p>Slight Medium- to short term impacts on the affected system(s) or party(ies). Mitigation is very easy, cheap, less time consuming or not necessary.</p>	<p>Slightly beneficial A short- to medium-term impact and negligible benefit to the affected system(s) or party(ies). Other ways of optimising the beneficial effects are easier, cheaper and quicker, or some combination of these.</p>
<p>No effect The system(s) or party(ies) is not affected by the proposed development.</p>	<p>Don't know/Can't know In certain cases, it may not be possible to determine the severity of the impact.</p>

The extent of the impacts can be assessed both with and without measures to minimize them in order to illustrate the gravity of the impact if no action is taken. The term mitigation encompasses more than just compensation and encompasses concepts of control and remedy. When it comes to positive effects, optimisation refers to any approach that can enhance those benefit. Both mitigation and optimisation should be realistic, technically feasible and economically viable.

6.2.2 Spatial scale

The Spatial scale defines the extent or area over which the impact will take place. Environmental Impacts due to the proposed underground transmission cables can affect the environment or social-economic aspects at Household level, Localized, at a study area, District, Regional, National or International Level. See Table 6.2.

Table 6.2: Spatial scale

Individual	Individuals in the area that could be affected
Households	Households in the area could be affected
Localized	A few hectares in extent (from the site). The specific area to which this scale refers is defined for the impact to which it refers.
Study Area	Includes the entire project area.
District	Includes areas around the project includes Ilazo Mbuyuni Street/Mtaa within Ipagala ward in Dodoma City Council
Regional	The impacts will be of such a nature that it may affect the Dodoma City.
National	The impacts will be of such a nature that it may affect the entire Tanzania.
International	The impact would affect resources and processes outside the borders of Tanzania.

6.2.3 Temporal scale

The temporal scale defines the times over which the impacts would continue to occur (Table 6.3).

Table 6.3: Temporal scale

Temporal scale	Explanation
Short term	Less than 5 years.
Medium term	Between 5 and 20 years
Long term	Between 20 and 40 years, and from a human perspective essentially permanent
Permanent	More than 40 years, and resulting in a permanent and lasting change.

6.2.4 Criteria and Significance Rating

The significance of the impact, considering all the assessment criteria mentioned earlier, serve as an indication of its overall importance. The assessment of significance was conducted within the appropriate context, recognizing that an impact can be relevant to either the ecological environment, the social-economic environment. This can be achieved by ensuring that all ESIA team followed the mentioned objective criteria, subjectivity was minimized to the greatest extent possible (Table 6.4). Nevertheless, it is important to acknowledge that there will always be an element of judgement involved that cannot be entirely eliminated from the assessment of significance.

The importance of an impact does not always correlate directly with its severity, even though one would anticipate a direct relationship, meaning that a severe impact would typically be considered highly significant. However, this is not always true. For instance, alterations to the geology could be significant in terms of their severity, but their significance is perceived as low because society does not consider the environmental changes to be important.

Table 6.4; Significance of an Impacts

Significance	Explanation
High	These impacts will usually result in long-term effects on the natural and/or social environment that will only be mitigated over very long periods of time. At times, this is not possible and it is up to the government to decide if this is acceptable when considering the benefits of the Project.
Moderate	These impacts will usually result in medium to long term effects on the natural and/or social environment. These impacts do exist but not substantial, and usually result in moderately severe effects or moderately beneficial effects. The emphasis for moderate impact is on signifying that the impact has been reduced to a level that is as low and reasonably practicable
Minor	These impacts will usually result in medium to short term effects on the natural and/or social environment. The environmental and/or social conditions will be affected, but the impact is small enough that it is unlikely to be a concern to the government, communities and organisations.
Negligible	There are no primary or secondary effects at all that are significant to scientists or the public. Also, this means that the existing environmental and social conditions will not be affected or the effect is not detectable. A negligible impact is likely to be of no concern to the government, communities and organizations.

6.3 Potential Impacts During the Mobilization and Construction Phase

A. POSITIVE SOCIAL IMPACTS

6.3.1 Job Creation and employment opportunities

The pre-construction phase significantly influences local employment and economic prospects in Ilazo Mbuyuni Street/Mtaa, Ipagala Ward. The project is likely to induce employment through various activities such as site preparation, construction, and logistics, thus directly contributing to job creation in the local community. Additionally, there may be indirect and cumulative effects as the project progresses, potentially leading to sustained employment opportunities through the engagement of local suppliers and service providers. This engagement reduces social issues like alcoholism and theft, leading to positive social changes. This impact is substantial during the mobilization and construction phase, particularly benefiting the immediate community.

These impacts are moderate, localized, temporary, induced, with direct and indirect effects. The significance of this impact is expected to be moderate, providing a boost to the local economy and supporting livelihoods in the short to medium term.

6.3.2 Increased market opportunities and sources of income

The construction activities in Ilazo Mbuyuni Street/Mtaa, Ipagala Ward, Dodoma City Council, is set to boost local economic opportunities. Increased demand for goods and services, including construction materials, food, accommodations, and transportation, directly contributes to income generation for residents.

This impact can be considered both direct and indirect, with immediate effects during the mobilization phase and throughout construction. Directly, local businesses, such as construction material suppliers and labor providers, may experience increased demand, leading to higher income generation. Indirectly, the influx of workers and associated economic activity could stimulate demand for goods and services in the local economy, creating further opportunities for entrepreneurship and income generation. This impact is of moderate to high significance, particularly in the short to medium term, as it contributes to economic growth and development within the project area.

6.3.3 Improving growth of the economy

During the mobilization and construction phase, utilizing locally sourced materials like cement and timber in construction stimulates economic growth. This process will generate employment, contributes to the Gross Domestic Product (GDP), and boosts government revenue through taxes like VAT. Ilazo Mbuyuni Street/Mtaa residents benefit from increased economic activity, the impact is predominantly induced and direct, with moderate to high significance. The mobilization of resources, including labor, materials, and equipment, for construction activities stimulates economic growth by creating employment opportunities, boosting local businesses, and generating income for individuals and businesses involved in the project.

Additionally, the construction phase contributes to infrastructure development, enhancing the overall economic environment of Dodoma City. While the impact is primarily short to medium-term during the construction period, its cumulative effect over time further amplifies its significance in fostering economic growth in the region. The impact primarily benefits Ilazo Mbuyuni Street/Mtaa and Dodoma City Council, potentially influencing the broader region.

B. NEGATIVE SOCIAL IMPACTS

6.3.4 Disruption of social activities

The construction activities may lead to disturbances in the local community's social life, such as increased noise levels, traffic congestion, and restricted access to certain areas. Truck movements on Morogoro-Dodoma Road and Hombolo Road, transporting supplies and construction equipment, will disrupt daily routines for various groups near Ilazo Mbuyuni Street/Mtaa and Dodoma City Council. Although temporary, the disturbance may affect food vendors, public transportation users, drivers, and students at Martin Luther and Ilazo Primary School.

However, the disruption is expected to be short to medium-term, its significance could range from moderate to high, depending on the extent of the disruption and the measures implemented to mitigate it. It's essential for the project stakeholders to carefully manage this impact to minimize inconvenience to the surrounding community and ensure smooth project implementation. The impact is direct, affecting local residents, and indirect, extending to businesses and schools. Despite short-term disruptions, the reversible nature is high, with potential for long-term positive effects post-construction.

6.3.5 Increased Traffic and road accidents

The proposed project, located in a busy area, will increase heavy vehicle traffic along Morogoro-Dodoma Road and Hombolo Road during material mobilization. Although not anticipated to significantly impact traffic volumes, it may affect peak hours. Access points along Hombolo Road may experience high traffic during mobilization.

This impact is primarily induced and direct, resulting from the influx of construction vehicles and workers into the Kisasa B area. The construction phase is expected to generate a higher volume of traffic than usual, potentially leading to congestion and an elevated risk of road accidents in the vicinity of the project site. While the impact is considered short-term, its significance is moderate, requiring appropriate mitigation measures to manage traffic flow and ensure safety during the construction period.

6.3.6 Impact on Safety and Health risks

The mobilization and construction phase of the TCU Headquarters Office Building project in Dodoma City poses health and safety risks for workers and the public, including moving vehicles, noise, vibration, and accidents. Non-compliance may result in fatalities or serious injuries. Risks like noise and altered traffic patterns threaten the health of Kisasa B area and Ilazo Mbuyuni Street/Mtaa residents.

These impacts can range from direct consequences such as occupational hazards for workers, induced effects like increased traffic leading to road accidents, to indirect outcomes such as noise pollution affecting nearby residents' well-being. Cumulatively, these impacts can exacerbate over time, especially concerning long-term health risks from exposure to construction materials or stressors induced by prolonged construction activities. Given the significance of this project, which involves the construction of a key institutional building, the impacts on safety and health risks are of moderate to high significance, requiring careful management and mitigation strategies to safeguard both workers and the surrounding community throughout the project lifecycle.

6.3.7 Prevalence of Communicable diseases

The TCU Headquarters Office Building project in Kisasa B area, Ilazo Mbuyuni Street/Mtaa, Dodoma Municipal Council, will pose a risk of infectious diseases, notably HIV/AIDS. The influx of job seekers and increased commercial activities may elevate disease risks, particularly associated with prostitution.

The impact is expected to be primarily indirect and short-term with moderate significance. Also, the influx of workers and machinery may lead to temporary disruptions in local sanitation systems and increased exposure to dust and pollutants, potentially contributing to a transient rise in communicable diseases. However, with proper mitigation measures such as sanitation protocols for construction sites and health monitoring for workers, the overall impact can be managed effectively, limiting its duration and significance.

6.3.8 Increased level of crimes

The TCU Headquarters project in Ilazo Mbuyuni Street/Mtaa, Kisasa B area, Dodoma, may induce moderate population growth, altering community values and practices, raising concerns about increased crime rates. Despite positive aspects like employment and local economic development, the influx of people could heighten the risk of crime.

Also, the influx of workers, delivery trucks, and machinery during the construction phase could attract criminal activities such as theft, vandalism, and trespassing. Additionally, the temporary

disruption of local infrastructure and increased population density may strain existing law enforcement resources, potentially leading to a temporary rise in criminal incidents. However, with appropriate security measures and community engagement strategies implemented by the project developers, the negative impact on crime levels can be mitigated effectively. This impact would be considered indirect, short to medium-term, and of moderate significance.

C. NEGATIVE ENVIRONMENTAL IMPACTS

6.3.9 Impact on natural resource

The extraction of construction materials for the TCU Headquarters project may minimally impact local resources, with authorized sources likely preventing depletion. Water and energy demands are expected to be negligible, given the project's scale. Positive economic impacts include employment opportunities, benefiting the local community. However, this may temporarily elevate living costs due to heightened demand. The impact is primarily local, affecting Kisasa B Area, Ilazo Mbuyuni Street/Mtaa, and Dodoma City Council, with regional significance. The consequences contribute to local development but entail short-term disruptions. The impact, while regionally significant, lacks global significance, emphasizing the need for localized mitigation strategies.

6.3.10 Deteriorated / Impairment of Local Air Quality

During the mobilization phase of the proposed establishment of TCU Headquarters Office Building, the installation and construction equipment, along with vehicles mobilizing materials to the project site, are expected to emit gases such as CO₂, NO_x, SO_x, particulate matter, and hydrocarbons into the local atmosphere. Despite utilizing the best available technologies, these emissions constitute residual air pollution. The anticipated low frequency of vehicle movements (approximately 2–3 vehicles per day), limited use of equipment and machinery, and adherence to good maintenance practices are expected to mitigate the impact. However, the emission of dust and particulate matter during this phase may elevate the risk of respiratory diseases for both on-site workers and the neighboring community in Kisasa B area and Ilazo Mbuyuni Street/Mtaa. The overall effect on local air quality is predicted to be negative, cumulative, short-term, and of moderate significance, contingent on weather conditions during the mobilization period. It's noteworthy that the impact is expected to be localized and not significantly affect global air quality.

6.3.11 Noise Pollution

The noise and vibration associated with on-site equipment operation, including trucks and welding machines, will be generated, impacting nearby receptors/offices and working personnel. While this noise is not deemed excessive according to established standards, it may still lead to disturbance and annoyance among individuals in Kisasa B area, Ilazo Mbuyuni Street/Mtaa, and Dodoma City Council. The negative effects include potential disruptions to daily activities, increased stress levels, and decreased quality of life for the local residents and workers.

Positively, the project may contribute to the local economy through job creation and increased business activities during the construction phase. The new TCU Headquarters could also enhance the city infrastructure and administrative capabilities, positively affecting Dodoma development in the long run.

In terms of significance, the noise pollution impact is primarily direct, resulting from construction activities. Its duration is expected to be short-term, limited to the mobilization phase. The impact

is reversible upon project completion, as noise levels are likely to subside. While the impact is local, affecting the immediate vicinity of the construction site, its significance lies in its potential to influence the well-being and daily lives of the residents and workers in the project area. It is crucial for mitigation measures to be implemented to minimize negative effects and ensure sustainable development.

6.3.12 Impact on climate change

The mobilization -related activities, including site formation, material transportation, and tree cutting, are expected to release pollutants such as CO₂, NO_x, and fine particulates. These emissions, primarily from diesel-powered trucks and the removal of vegetation, could have environmental repercussions, leading to global warming. The impact is considered indirect, as it arises from the construction activities. It is a local impact, affecting the immediate areas of Kisasa B area and Ilazo Mbuyuni Street/Mtaa. The consequences are likely to be both short term and long term, with potential permanence in terms of climate change effects. The impact is generally irreversible, especially concerning the long-term consequences of climate change and the alteration of local ecosystems.

A. NEGATIVE SOCIAL IMPACTS

6.4 Influx of people/Population pressure

An influx of people is expected as individuals seek employment opportunities in skilled, semi-skilled, and unskilled labor. However, efforts will be made to prioritize hiring from local communities such as Ilazo Mbuyuni Street/Mtaa and Kisasa B area, it is anticipated that job seekers from outside these areas may migrate, leading to heightened competition for employment. This influx has a negative, short-term, and of major significance impact on the local residents, particularly in terms of job competition.

For residents of Kisasa B area, Ilazo Mbuyuni Street/Mtaa, and Dodoma City Council, the impact is twofold. Positively, there may be increased economic opportunities through job creation and business activities related to the construction activities. However, negatively, local residents may face stiff competition for jobs, potentially resulting in increased unemployment rates and strained local resources.

In terms of significance, the impact is direct as it directly affects the employment dynamics in the project vicinity. It is also indirect as it stems from the construction activities rather than being the primary focus of the project. Cumulatively, the impact can be major, especially when considering the broader regional competition for jobs. The duration is short-term, limited to the construction phase, and the impact is reversible as labor demand decreases post-construction. The scope is regional, extending beyond the immediate vicinity to encompass the broader labor market in Dodoma City.

6.4.1 Occupational Safety and Health Impacts

Construction workers face daily hazards, ranging from machinery accidents to exposure to hazardous materials, posing direct risks to both the workers and the community of Ilazo Mbuyuni Street/Mtaa and Kisasa B area. Local community will get job and economic opportunities as a result of this project; however, some social implications may arise due to potential disruptions, noise, and dust affecting the daily lives of residents.

The significance of these impacts is both direct, involving immediate effects on workers, and indirect, affecting the broader community. The duration of OSH impacts is short-term, confined to the construction period. While some effects are reversible, such as job opportunities, others, like accidents, may have irreversible consequences. The scope is primarily local, impacting Ilazo Mbuyuni Street/Mtaa, Kisasa B area, and the Dodoma City Council.

6.4.2 Community Health, Safety and Security Impacts

The influx of skilled and non-skilled workers, including imported construction labor residing in camps, may lead to challenges such as uncontrolled movement of workers, heightened risk of communicable diseases (e.g., COVID-19, HIV/AIDS), and increased social issues like crime, prostitution, and alcohol abuse. The construction-related traffic surge may elevate road accident risks, particularly on local roads used by trucks and equipment. In Kisasa B area, heightened social interactions between construction workers and local communities may increase the risk of sexually transmitted diseases.

The people of Kisasa B area, Ilazo Mbuyuni Street/Mtaa, and Dodoma City Council will be affected both positively and negatively. Positively, there may be temporary economic gains for local businesses due to increased demand during construction. However, negative impacts include potential health hazards, elevated living costs, social issues, and increased risks of accidents. The significance of these impacts lies in their direct consequences on the immediate community, indirect effects on the local economy, and cumulative consequences over time.

The duration of these impacts is expected to be long term, given the nature of construction activities and potential lasting effects on health and social dynamics. Some aspects, such as increased traffic and social issues, may be reversible after construction completion, but certain health impacts may have enduring consequences. The scope of these impacts is primarily local, affecting the immediate vicinity of the project, but with indirect regional implications due to potential economic and social ripple effects. The project's local focus is essential for understanding and mitigating the specific challenges faced by the residents of Kisasa B area, Ilazo Mbuyuni Street/Mtaa, and Dodoma City Council.

6.4.3 Conflicts and grievances

These conflicts could stem from cultural differences, particularly in the conservative context of the area, leading to concerns about construction workers interacting with married women and schoolchildren. Additionally, issues related to construction activities such as dust and flying stones may exacerbate tensions. The lack of established channels to address grievances from various stakeholders could intensify conflicts, potentially causing delays in project activities and increasing costs. This impact is considered local, direct, negative, short-term, reversible, and of minor significance.

People from Kisasa B area, Ilazo Mbuyuni Street/Mtaa, and Dodoma City Council will experience both positive and negative social impacts. Positively, the construction project may provide employment opportunities for local residents, boosting the local economy. However, negative effects may include disruptions to daily life due to construction noise, dust, and increased traffic. Social cohesion could be strained during the construction phase, particularly if conflicts between construction workers and the local community escalate. Additionally, the project might lead to temporary inconveniences and decreased accessibility in the immediate vicinity.

In terms of impact significance, the direct component involves immediate effects on the local community during construction. Indirect impacts may result from changes in social dynamics and economic activities. Cumulatively, the project overall impact is likely to be of short-term duration, with reversibility upon project completion. While the impact is predominantly local, the indirect effects may extend regionally as economic changes influence neighboring areas. However, on a global scale, the impact is minimal.

6.4.4 Gender Discrimination

During the construction phase of the proposed TCU Headquarters Office building in Kisasa B area, gender discrimination negatively affects local women and girls in Ilazo Mbuyuni Street/Mtaa, Dodoma City Council. Typically, construction sectors have been known to foster a male-dominated work environment, with limited opportunities for women. This may result in gender-based disparities in employment, wages, and job roles. This discrimination results in reduced employment opportunities, heightened vulnerability to sexual harassment, and potential psychological harm. The consequences extend to long-term effects such as early pregnancies, school dropouts, and an increased risk of sexually transmitted diseases. The impact is direct, prolonged, localized, and potentially irreversible.

For the residents of Kisasa B area, Ilazo Mbuyuni Street/Mtaa, and Dodoma City Council, the social impacts of gender discrimination can vary. Positively, the project might create job opportunities for local residents, including women, thereby promoting economic empowerment. However, negatively, if gender biases persist in hiring and job allocation, women might face challenges accessing equal opportunities, limiting their social and economic advancement.

In terms of significance, the direct impact of gender discrimination during construction is observable through employment practices, while indirect effects may emerge from the perpetuation of traditional gender roles. Cumulatively, these factors can shape long-term societal dynamics, influencing gender relations in the community. The reversibility of these impacts depends on subsequent efforts to promote gender equality in the workforce and may range from reversible to partially reversible. The scope is primarily local, affecting the immediate community, but with broader regional implications for gender norms within the construction sector.

6.4.5 Prevalence of Communicable diseases

The interaction between construction workers and the local community in Kisasa B area and Ilazo Mbuyuni Street/Mtaa poses a risk. Construction workers may be tempted to engage in risky sexual behaviors with women and young girls in the project area, and the presence of workers may attract prostitutes, increasing the likelihood of STDs, including HIV/AIDS. This impact is direct, short-term, and local, with the potential for irreversible consequences on the health of both workers and the affected communities.

The residents of Kisasa B area, Ilazo Mbuyuni Street/Mtaa, and Dodoma City Council will be affected both positively and negatively in social aspects. Positively, the construction project may bring economic opportunities, job creation, and infrastructural development to the region, enhancing the overall quality of life. However, negative effects include the potential spread of communicable diseases, disruption of daily activities, and social tensions arising from the influx of construction workers.

In terms of impact significance, the direct component involves the immediate health risks during the construction phase, while the indirect component encompasses social and economic changes. The cumulative aspect considers the long-term effects of disease prevalence and social dynamics. The duration of the impact is primarily short-term during construction. The scope is local, affecting the immediate project area, but the ramifications may extend regionally if disease transmission occurs beyond the construction phase.

6.4.6 Child labour

During the construction phase of the TCU Headquarters Office Building in Kisasa B area, there is a potential risk of child labor involvement in project-related activities. Child labor poses a threat to the well-being of children, subjecting them to conditions that are mentally, physically, socially, or morally dangerous. To mitigate this risk, the labor management plan must strictly prohibit the employment or engagement of individuals under the age of 18 in connection with the project.

The people residing in Kisasa B area, Ilazo Mbuyuni Street/Mtaa, and Dodoma City Council will experience both positive and negative impact. On the positive side, the project may create job opportunities for adults, contributing to local economic development. However, the negative aspect involves the potential exploitation of children, jeopardizing their education and overall welfare.

In terms of impact significance, the direct component involves the immediate consequences of child labor during construction, such as compromised childhoods and potential harm. The indirect component encompasses broader societal implications, including disrupted community dynamics and social fabric. Cumulatively, over the short to medium term, these effects can lead to long-term consequences, impacting the affected individuals and the community's well-being. The impact is potentially reversible through strict adherence to labor management plans and the enforcement of regulations preventing child labor. However, if not adequately addressed, the consequences may become irreversible, affecting the affected children's futures permanently.

6.4.7 Insecurity and theft

During the construction phase of the proposed TCU Headquarters Office Building in Dodoma City, an anticipated impact is the heightened insecurity and theft due to the influx of new people, including both project workers and locals. This situation may lead to the pilfering of project materials and equipment, potentially compromising the quality of work, causing delays, and increasing project costs. The impact will extend beyond the project site to the Ilazo Mbuyuni street/mtaa, resulting in an overall negative effect on the community.

The people of Kisasa B area, Ilazo Mbuyuni Street/Mtaa, and Dodoma City Council will be affected differently. Positively, there may be increased job opportunities and economic activity due to the construction, benefiting the local workforce and businesses. However, negatively, the heightened insecurity and theft may lead to a sense of vulnerability among residents, impacting their daily lives and potentially causing stress and anxiety.

In terms of significance, the impact is direct as it directly affects the security and theft situation during construction. Indirectly, it influences the social well-being of the local community. Cumulatively, the long-term effects of compromised security and theft may persist even after the construction phase. The impact is reversible with proper security measures in place but requires sustained efforts. The duration is primarily short-term during construction but may have lingering

effects in the medium to long term. The scope is local, encompassing Ilazo Mbuyuni street/mtaa and the immediate vicinity of Dodoma City.

6.4.8 Food Insecurity

The influx of construction workers is expected to create increased demand for food and services, leading to shortages and inflation of prices. The local community expressed concerns about chaos and rising costs during the development, impacting both residents and businesses negatively. Positively, there may be temporary economic opportunities for locals due to increased demand for goods and services. This impact is primarily direct during the construction phase, with potential indirect effects on the availability and affordability of food. The duration is likely short-term, corresponding to the construction timeline. However, the impact is reversible once the construction is complete, its significance lies in its immediate consequences on the local economy and food security. The scope is primarily local, affecting the immediate vicinity of the project site.

B. NEGATIVE ENVIRONMENTAL IMPACTS

6.4.14 Impairment of air quality due to dust emission

The impairment of air quality during the construction phase of the TCU headquarters in Kisasa B area, Dodoma City Council, will have both positive and negative effects on the affected communities. Negatively, residents of Kisasa B, Ilazo Mbuyuni Street/Mtaa, and Dodoma City Council may experience respiratory issues and discomfort due to elevated levels of PM2.5 and PM10 from fugitive dust. Construction workers and those near sand and aggregate collection areas face health hazards. Positively, the project may stimulate the local economy through job creation and infrastructure development. The impact is direct during construction, with indirect effects on public health and local fauna. It is of short-term duration, reversible with proper mitigation measures, and predominantly local in scope, affecting the immediate vicinity rather than broader regions.

6.4.15 Increased Noise level

The construction-related noise, stemming from various activities such as power picks, mechanical shovels, cranes, transportation vehicles, and the use of explosives, is likely to disturb the daily lives of the affected population. This disturbance may lead to a decline in the overall quality of life for residents, affecting their well-being, sleep patterns, and potentially causing stress. Additionally, the noise impact could disrupt normal operations activities to the nearby building offices and school due to the proximity of the construction site at Kisasa B area.

In terms of significance, the direct component of this impact is substantial during the construction phase, with noise levels exceeding the established WHO and Tanzania Standard Limits guidelines. The indirect impact involves disturbances to operations activities in nearby offices. Cumulatively, the noise may have a lasting effect on the affected communities, particularly if not adequately mitigated. The duration of the impact is considered short-term, limited to the construction phase, and is potentially reversible once the construction is complete. While the noise impact is local in scope, its consequences extend beyond the immediate construction site to impact the daily lives of residents in Kisasa B area, Ilazo Mbuyuni Street/Mtaa, and Dodoma City Council.

6.4.16 Increased vibration

The construction phase of the TCU Headquarters Office Building in Dodoma City may lead to an increased vibration level. This impact is primarily attributed to construction vehicles, machinery, and activities such as blasting and impact pile driving for foundations. The heightened vibration poses potential disturbances to neighbors and risks causing physical damage to properties near the construction site due to the amplified intensity of activities and the increased number of operational vehicles.

The people in Kisasa B area, Ilazo Mbuyuni Street/Mtaa, and Dodoma City Council will experience both positive and negative effects. Negatively, the heightened vibration may lead to discomfort, disturbances, and potential damage to nearby structures, impacting the social well-being and property values of the affected individuals. On the positive side, the project's construction phase may generate employment opportunities and contribute to local economic development.

In terms of significance, the impact of increased vibration during construction has direct consequences on the immediate surroundings, indirect effects on social and economic aspects, and cumulative implications over the construction duration. The duration is generally short-term, limited to the construction phase, and reversible upon project completion. However, the local scope is significant, affecting the immediate community and neighboring areas within Dodoma City Council.

6.4.17 Generations of Solid waste

During construction phase of the TCU Headquarters Office Building in Kisasa B area, Ilazo Mbuyuni Street, Dodoma City Council is anticipated to result in the generation of solid wastes with potential environmental and social impacts. The waste materials, including hazardous substances like paints and cleaning solvents, non-biodegradable items such as plastic containers, and food wastes, could lead to pollution and pose health risks if not properly managed. The local residents of Kisasa B area, Ilazo Mbuyuni Street/Mtaa, and Dodoma City Council may experience negative effects, such as compromised air and water quality, increased fly and bird populations, and potential health hazards. On a positive note, the construction project may bring short-term employment opportunities for the local community.

The significance of the impact involves both direct and indirect components. Direct impacts encompass immediate effects on the local environment and community health, while indirect effects may manifest over time through cumulative environmental degradation. The duration of the impact is expected to be short-term during the construction phase. The reversibility of the impact depends on the effectiveness of waste management practices; if well-implemented, some aspects may be reversible. However, non-biodegradable waste and potential contamination of land and water resources may have long-term or irreversible consequences. The scope of the impact is primarily local, affecting the immediate surroundings of the construction site, but its ramifications could extend regionally, particularly if pollution affects water resources that are interconnected with broader ecosystems.

6.4.18 Generations of Liquid waste

The proposed establishment of TCU Headquarter office building is anticipated to result in the generation of liquid wastes, including sewage, grey water, and process water. Sewage effluent,

originating from sanitary facilities on-site, and septic waste from scattered sites may pose health risks if not properly managed. Grey sewage, produced in camps, and wastewater from batching plants and equipment maintenance centers can contribute to environmental pollution, impacting sanitation and human well-being.

Residents of Kisasa B area, Ilazo Mbuyuni Street/Mtaa, and Dodoma City Council may experience both positive and negative effects. Positively, the project may enhance local infrastructure and job opportunities. However, the improper disposal of liquid wastes can negatively affect their environment, leading to unhygienic conditions and aesthetic nuisances.

The impact's significance includes direct health risks, indirect environmental pollution, and cumulative effects over the construction phase. The duration is short to medium term, with the potential for irreversible harm if proper waste management practices are not implemented. The scope is primarily local, influencing the immediate vicinity, but the environmental repercussions may extend regionally.

6.4.19 Erosion of Exposed Surfaces

Inadequate compaction and resurfacing, combined with factors such as rain, trampling, and vegetation clearance, increase the risk of erosion and sediment load in runoffs, especially if construction takes place during the rainy season.

The residents of Kisasa B area, Ilazo Mbuyuni Street/Mtaa, and Dodoma City Council will likely experience both positive and negative effects due to the erosion of exposed surfaces. Negatively, increased sediment load in runoffs may lead to soil degradation and water pollution, affecting local ecosystems. Positively, measures taken to mitigate erosion, such as proper construction practices and erosion control measures, could enhance environmental sustainability.

In terms of significance, the impact has directed consequences on local ecosystems and water quality, indirectly affecting communities relying on these resources. The duration of the impact is likely short-term during the construction phase, with potential long-term effects if not properly addressed. The reversibility depends on the effectiveness of erosion control measures implemented during construction. The scope is primarily local, with direct implications for the immediate vicinity of the construction site, but it could indirectly influence the region through water quality and ecosystem changes.

6.4.20 Impact on climate change

Construction activities will lead to emissions emanated from fuel powered equipment i.e., vehicles engines and construction equipment etc. Exhaust contains pollutants notably carbon dioxide (CO₂) plus small quantities of noxious gases such as nitrogen oxides (NO_x), sulphur dioxides (SO_x), hydrocarbons and particulate matters (PM). These Green House Gases (GHGs) are known to interfere with temperature system and cause climate change effects. The impact is considered to be local, negative, short-term duration and of minor significance.

6.4.21 Visual Impact/ Increased Aesthetic Value of the Project Area

The landscape will be affected as construction activities remove existing features, such as trees, and replace them with concrete and gravel surfaces, impacting the views from homes, offices, and surrounding areas. Nighttime construction may exacerbate the situation by increasing light pollution. On the positive side, the project could enhance the overall urban character of the area.

The people of Kisasa B area, Ilazo Mbuyuni Street/Mtaa, and Dodoma City Council will likely experience negative effects in terms of altered landscapes and views during construction, while the urban transformation may be viewed positively.

In social aspects, the negative impacts include potential dissatisfaction among residents due to altered views and landscape changes. Environmental consequences involve the removal of natural features and increased light pollution. Positively, the project may contribute to urban development and improved infrastructure.

The significance of the impact is direct during construction, indirect in terms of altered urban character, and cumulative as it adds to other construction-related changes in the region. The duration is short-term during construction but may have long-term implications for the visual aesthetics of the area. Reversibility is limited, as certain changes may be irreversible once construction is complete. The scope of the impact is primarily local, with potential ripple effects on the regional landscape.

6.4.22 Impact on natural resource (Energy and water)

The project will rely on fossil fuels, predominantly diesel, to power transport vehicles and construction machinery. This non-renewable energy source poses environmental risks, affecting its availability, pricing, and long-term sustainability. Additionally, there will be a heightened demand for electricity, necessitating prudent usage to mitigate negative effects on natural resources. In terms of water consumption, the project will utilize water from DUWASA for various purposes such as concrete mixing, curing, sanitation, and washing. Excessive water usage during construction may adversely affect local water sources and compromise their sustainability.

Residents of Kisasa B area, Ilazo Mbuyuni Street/Mtaa, and Dodoma City Council will experience both positive and negative social and environmental consequences due to the project's impact on energy and water resources. Positively, the construction phase may provide employment opportunities for local residents, fostering economic development. However, negatively, the increased use of fossil fuels may contribute to air pollution, impacting the community's health and well-being. Additionally, potential disruptions in water availability from DUWASA may affect daily activities and exacerbate existing water scarcity issues.

The impact on natural resources (energy and water) during the construction phase of the TCU Headquarters is significant, with direct, indirect, and cumulative components. The duration of the impact is primarily short-term, coinciding with the construction period. While some aspects, such as air quality, are reversible once construction ceases, others, such as potential water source contamination, may have lasting effects. The impact's scope is primarily local, with immediate repercussions felt by residents in Kisasa B, Ilazo Mbuyuni Street/Mtaa, and Dodoma City Council. However, the indirect and cumulative effects may extend regionally, particularly if unsustainable practices lead to long-term environmental degradation.

6.5 Possible Potential Impacts during Demobilisation Phase

There will be need to demolish the temporary structures that will be used for storage and pit latrines for the construction workers. The construction rubble and construction wastes will have to be cleared from the site in readiness for the operation phase of the project.

A. POSITIVE SOCIAL IMPACT

6.5.1 Reduced noise levels

As heavy machinery and construction workers leave the site, the noise generated by construction activities will diminish. This reduction in noise levels is reversible, providing a positive impact on the immediate surroundings and communities. Residents of Kisasa B area, Ilazo Mbuyuni Street/Mtaa, and Dodoma City Council will experience positive effects, such as decreased disturbance and improved ambient noise conditions. However, the temporary departure of construction workers may have a negative social impact, affecting local businesses that benefit from their presence. Environmental benefits include reduced stress on local fauna due to lower noise disturbance.

In terms of significance, the impact is direct as it directly correlates with the construction demobilization. It has indirect effects on the local economy due to changes in worker presence. The duration is short-term, occurring during the demobilization phase. The impact is reversible, as noise levels can be restored once construction activities cease. The scope is local, primarily affecting the immediate vicinity of the project site, including Kisasa B area, Ilazo Mbuyuni Street/Mtaa, and Dodoma City Council.

B. NEGATIVE SOCIAL IMPACT

6.5.2 Loss of employment

The demobilization phase of the proposed establishment of TCU Headquarters Office Building project will lead to the loss of employment for 50 construction workers. This immediate consequence will result in a temporary but significant economic setback, causing a loss of income and livelihood for the affected workers. The negative impact on the local community, including Kisasa B area, Ilazo Mbuyuni Street/Mtaa, and Dodoma City Council, will be evident in both social and environmental aspects. On the positive side, the completion of the project may open up opportunities for local businesses to provide ongoing services to the TCU. However, the negative effects will be felt in terms of increased unemployment and potential socio-economic challenges for the affected workers and their families.

The significance of this impact is notable in its direct effect on the construction workers, indirect consequences for local businesses, and cumulative impact on the overall socio-economic fabric of the community. The duration of this impact is short-term, with the potential for reversibility if alternative employment opportunities are created. While the scope of the impact is primarily local, the interconnectedness of social and economic systems implies broader regional implications.

6.5.3 Loss of business opportunities

Local traders engaged in selling construction materials will face economic setbacks, losing their primary source of income. Additionally, small-scale entrepreneurs providing food and fruits to construction workers will be adversely affected, impacting their livelihoods. The repercussions will be particularly pronounced among local construction material vendors and food suppliers to the construction workforce.

Residents of Kisasa B area, Ilazo Mbuyuni Street/Mtaa, and Dodoma City Council will experience both positive and negative effects. Positively, there may be short-term employment opportunities for locals during the construction phase. However, the negative impacts, such as the loss of business opportunities for construction material and food vendors, will overshadow these benefits.

Socially, the community may experience heightened tensions and economic strain due to the disruption of established livelihoods.

In terms of significance, the impact is direct, as it directly affects the income and livelihoods of local traders. The indirect impact involves the broader community, influencing social dynamics and economic activities. Cumulatively, the repercussions intensify as multiple businesses are affected. The duration is likely short to medium term, primarily linked to the demobilization phase. The reversibility of the impact is variable – while the immediate economic losses may be irreversible for some businesses, the community may adapt over time by exploring alternative economic activities.

The scope of the impact is predominantly local, concentrating on the Kisasa B area, Ilazo Mbuyuni Street/Mtaa, and Dodoma City Council. However, the interconnected nature of economic activities implies potential ripple effects at the regional level, affecting neighboring communities. Globally, the impact is minimal, as it is localized and unlikely to have far-reaching consequences beyond the immediate vicinity.

C. NEGATIVE ENVIRONMENTAL IMPACTS

6.5.4 Dust and noise pollution from demolishing works

The demolition activities, involving machinery such as excavators, electric grinders, and mixers, will emit dust particles, primarily particulate matter (PM), contributing to air pollution. This may pose health hazards to site workers and residents in neighboring areas, while also reducing visibility. The people in Kisasa B area, Ilazo Mbuyuni Street/Mtaa, and Dodoma City Council will experience negative impacts due to potential health risks associated with inhaling dust particles and noise disturbances during the demolition. On the positive side, the construction project may generate employment opportunities for local residents.

The significance of this impact lies in its direct effect on the immediate vicinity during the demolition phase, with potential indirect consequences on the broader community's health and well-being. The duration of the impact is short-term during the demolition activities. The impact is reversible with appropriate mitigation measures, such as dust suppression methods and noise control measures during construction. However, if not managed properly, the long-term cumulative effects on air quality and public health could be substantial. While the primary scope is local, considering the proximity of the affected areas, the repercussions may extend regionally if the pollutants disperse, albeit not on a global scale.

6.6 Possible Potential Impacts during Operations Phase

During operation phase there are number of effects, these effects will affect the natural environment of the vicinity as described below:

A. POSITIVE SOCIAL IMPACT

6.6.1 Job creation and Employment Opportunities

The establishment of the TCU Headquarters Office Building is anticipated to have a significant impact on job creation and employment opportunities during its operation phase. Direct jobs will emerge in operational services like accountants, procurer etc., while indirect jobs will span various sectors, including cleanliness, food vendors and commercial activities. Additionally, there will be positive ripple effects on energy, and the water sector, contributing to the creation of indirect jobs.

People in Kisasa B area, Ilazo Mbuyuni Street/Mtaa, and Dodoma City Council will experience positive social and economic impacts through increased employment opportunities.

The significance of these impacts lies in their direct and indirect components, with the potential for cumulative effects over the long term. The reversibility of these impacts may vary, with some being reversible in the short term, while others may be more enduring or irreversible. The scope of the impact extends from the local level, benefiting the immediate community, to the regional and national levels, influencing economic sectors and contributing to overall economic development.

6.6.2 Government Revenue Collection and economic growth

Different governmental regulatory authorities such as NEMC, Dodoma City Council, TANESC, DUWASA, FIRE and Rescue Force, and OSHA will benefit from the collection of revenues from the proposed establishment of TCU Headquarter Office Building. The collected amount of money is used to develop the national economy and improving the living standard of people. This impact is considered as Regional, positive, long term and of high significance.

B. NEGATIVE SOCIAL IMPACT

6.6.3 Increased incidences of diseases and ill health

The concentration of a large number of people within the proposed project area could contribute to increased levels of communicable diseases such as Sexually Transmitted Diseases (STDs), HIV/AIDS, TB, COVID-19 and other ailments due to interaction and concentration of people from various places. Workers tend to be tempted to engage in sexual relationships with women and young girls in the project area. The beneficiaries of some of the activities within the proposed project especially youth and women are the most vulnerable group to that social interaction due to their social economic background. In addition to that, prostitutes may be attracted to the area due to the presence of workers who are usually perceived to possess a lot of money. This impact is medium, local and will be long term.

6.6.5 Health and Safety hazards

Five categories of Health and Safety hazard are likely to cause harm to environment and human. These are;

- Physical Hazards (involve environmental and can cause harm),
- Chemical Hazards (Caused by exposure to chemicals),
- Biological Hazards (Pose a threat to the health of living organisms primarily at the human),
- Ergonomic Hazards (related to efficiency and comfort at the workplace),
- Psychological Hazards (Affect the mental well-being/Health of the employees) The following table 6.5 describes the key hazards and risks associated with the proposed project,

Table 6.5: Health and Safety Hazards and associated risks

Category	Type of Hazard	Associated risk
Physical Hazard	Fire and electrical	Loss of properties, injuries and death
	Noise and Vibration	Loss of hearing and body discomfort
	Moving parts/Mechanical	Injuries and death

Category	Type of Hazard	Associated risk
	Slippery	Injuries and death
Chemical Hazard	Liquid, vapor and solvents	✓ Respiratory diseases
	Fumes and gases	✓ Damage of lungs
	Acids	✓ Injuries and death
Biological Hazard	Microorganisms	✓ Skin irritations
	Virus, Fungus and bacteria	✓ Allergies
	Insects and parasites	✓ Infections
Ergonomic Hazard	Manual Handling	✓ Awkward postures
	Repetitive movements	✓ Back pain
	Lifting	✓ Eye strain
	Sitting Positions	✓ Fatigue and stress
Psychological Hazard	Overwork and tiredness	Health effect on human body
	Abuse and Harassments	Mental illness
	Discrimination	Mental illness

Source: 3Es 2023)

6.6.6 Increased risk of GBV, SEA and SH

During operational phase of TCU Headquarter Office Building there is potential risks of staff and service providers. This could result in adverse long-term impacts such as a culture, decreased engagement, and limitations on personal and professional growth. Addressing GBV requires proactive measures, including awareness campaigns, robust policies, and an inclusive environment, to ensure the safety, well-being, and success of the TCU Headquarter office building. Gender-based violence, including workplace harassment and unequal treatment among staff.

6.6.7 Increased Traffic along the Access Road to the Main Morogoro-Dodoma Road and Hombolo road

Based on the nature and size of the operation of the proposed TCU Headquarter Office Building, it is inevitable that traffic in and out of the project site will increase. The additional number of vehicles per day will have an impact on the traffic along the area. Inadequate entrance and exits in/to the building area may cause traffic congestions along the access road. However, this increase in traffic is considered to be within acceptable limits and will not cause any undue hindrance to the normally free-flowing and scarce traffic in the area. Moreover, most of this traffic will occur during the daytime thereby not affecting the night rest time of the residents of the neighbouring receptors. The impacts are considered negative, cumulative, residual, long-term and of moderate significance.

6.6.8 Increased Water Demand

Increased water demand during the operation phase of the proposed establishment of TCU Headquarter office building will have environmental and social consequences. This impact may strain local water resources and affect communities in within Kisasa B area, Ilazo Mbuyuni Street/Mtaa within Dodoma City Council. This is indirect impact, medium term, local and potentially reversible depends on water resource management measures.

6.6.9 Increased Energy Demand

The proposed establishment of TCU Headquarter Office Building may lead to energy consumption during its operation. This impact is characterized by a significant increase in energy consumption, particularly in the energy-intensive operations involving equipment, climate control, and lighting. As a result, there will be a surge in the overall demand for energy resources, potentially leading to a greater carbon footprint and strain on existing energy infrastructure. This is direct impact, medium term, local and potentially reversible depends on energy resource management measures.

6.6.10. Water shortage and Scarcity

The increased demand for water resources due to the daily functioning of a five-storey office building, including water usage for sanitation, cooling systems, and landscaping maintenance, could strain the local water supply in the Dodoma region. This strain may exacerbate existing water scarcity issues, leading to reduced availability of clean water for both residential and commercial purposes in the surrounding communities. Additionally, the extraction of water for building operations could negatively impact local ecosystems and wildlife habitats dependent on the same water sources.

The significance of this impact would likely be considered moderate to high, depending on the severity of water scarcity experienced and the degree of disruption to local communities in Ilazo Mbuyuni Mtaa. It could have both short-term and long-term effects, potentially reversible with appropriate water management strategies but could also induce cumulative impacts if not adequately addressed. Given the central importance of water resources for sustainable development, the impact of water shortage during the operations phase of this construction project merits careful consideration and mitigation efforts to minimize adverse consequences

A. NEGATIVE ENVIRONMENTAL IMPACTS

6.6.10 Increased Water Pollution

Wastewater from TCU is managed and treated through septic tank/soak pit. Water pollution will mainly be caused if sanitation systems used during project operation will be inadequate. Onsite sanitation systems always cause groundwater and surface water pollution. It should also be noted that oil spills on the soil have the potential to pose longterm threats to groundwater quality. Thus, the risk of water degradation is assessed as important, which may have an indirect impact on the surface water too. This impact is moderate, local and will be medium term.

6.6.11 Storm Water Generation and Overflow

The area for the proposed establishment has no any existing facilities and is covered by few vegetation hence no stormwater will be generated. However, due to the establishment of building office a lot of storm water will be generated due to presence pavements, concrete surfaces and building roofs. The structures will tend to compromise the infiltration capacity of the land surface hence rendering water free to the environment. The storm water generated might have impacts on structures downstream as well as being a factor for soil erosion and poor water quality.

6.6.12 Impact from poor hygienic condition

Poor cleanliness of supporting facilities such as toilets and washrooms may invite flies that are agent of diseases like cholera and diarrhoea. Bad odour and bad visual is the outcome of poor hygienic condition that may impact human health condition. This impact is localized, negative, short-term and of moderate significance.

6.6.13 Generation of solid wastes

The construction and subsequent operation of the proposed TCU Headquarter office building is expected to generate a significant amount of waste from cardboard, boxes, cardboard, food scraps and plastic bottles, and voucher items. The significance of these impacts is complex, with direct consequences affecting the immediate environment and indirect and cumulative effects that can spread over a wider area. In the short term, weeds improper management may result in local environmental degradation and pollution, not only in the project area but in the surrounding ecosystem. posing challenges to local environmental sustainability Whether the impact is reversible or irreversible depends on how waste management is implemented during and after the operation phase improve effectively.

6.6.14 Generation of Liquid waste

The establishment of TCU Headquarter office building is expected to generate liquid waste from different sources such as rainwater runoff, sanitation systems, and laboratory water usage. This liquid waste is foreseen to have a negative impact, persisting over an extended period. Despite its longevity, the overall significance of this impact is projected to be relatively low. It is emphasized to implement plans for managing and reducing this impact during the development phase. This impact it is expected to be direct, short term, local and potentially reversible.

6.6.15 Exposure to earthquakes

Exposure to earthquakes during the operations phase of the proposed construction of a five-storey (G+4) office building for Tanzania Commission for Universities (TCU) headquarters could have significant consequences. Dodoma Region, where the project is located, is susceptible to seismic activity due to its proximity to the East African Rift System. In the event of an earthquake, the structural integrity of the building could be compromised, leading to potential collapse, damage to property, and harm to occupants. Moreover, earthquakes may disrupt regular operations, causing delays, increased costs for repairs, and potential safety hazards for employees and visitors.

The significance of this impact is high, as it poses risks to the safety and functionality of the building and its occupants. It is also a long-term concern, as seismic activity can occur unpredictably over the lifespan of the building. While certain measures can be taken to mitigate earthquake risks during construction, such as adhering to seismic design standards, the potential for seismic events remains a significant consideration throughout the building's lifespan.

6.7 Possible Potential Impacts during Decommissioning Phase

The life span of the proposed project is 100 years. However, if effective operation and maintenance is in place may last for a very long time. During a certain period, it is possible that infrastructure facilities will be retrofitted at the sites, so major structural changes and expansions may be necessary. At the end of the building life, a scheduled building will be necessary to remove the site component, a process referred to as decommissioning. The decommissioning works will involve occupational health and safety risks similar to those of the construction phase. However, in case of decommissioning the following impacts may be happened.

A. NEGATIVE SOCIAL IMPACT

6.7.1 Loss of employment and business opportunities

Loss of employment and business opportunities during the decommissioning phase of the TCU Headquarters Office Building project will have a profound impact on individuals directly

employed by the project, leading to job losses with enduring consequences for them and their families. Furthermore, businesses that provide various services and goods to the project, such as security and cleaning companies, as well as suppliers of food and stationery, will face a decline in opportunities. The negative repercussions of this impact are considered long term and moderately significant. In terms of social aspects, residents of Kisasa B area, Ilazo Mbuyuni Street/Mtaa, and Dodoma City Council will experience both positive and negative effects. However, some may benefit from new opportunities associated with the project, others will bear the brunt of job losses and reduced business activities, impacting the social fabric of the community.

The significance of this impact is notable in its direct effect on project employees, indirect consequences for service and goods suppliers, and cumulative effects on the wider community. The duration is considered long term, as the repercussions persist even after the decommissioning phase. The reversibility is generally low, as finding alternative employment and business opportunities may take time. The impact is local, primarily affecting the immediate vicinity of the project site in Dodoma City.

6.7.2 Loss of revenue and business opportunities

Ending the project means losing revenues to both TCU and government agencies such as TANESCO, DUWASA, Dodoma City Council, NEMC. As discussed above both local and central government are receiving revenue/annual fees from the project. In case of the decommissioning of the project, revenue generated will cease. This impact is negative, short-term and of minor significance.

B. NEGATIVE ENVIRONMENTAL IMPACT

6.7.3 Loss of aesthetic value due to haphazard disposal of demolished waste

The potential need for future demolitions and the inadequate disposal of waste could lead to soil and water contamination. This impact is assessed as moderate, local, and medium to long term. The residents of Kisasa B area, Ilazo Mbuyuni Street/Mtaa, and Dodoma City Council will experience both positive and negative social effects related to this impact. Negatively, the haphazard disposal of waste may disrupt the local environment, affecting the community's visual aesthetics and potentially leading to health concerns. Positively, if proper waste management measures are implemented, residents may benefit from improved environmental conditions and a healthier living environment.

In terms of significance, the impact has directed consequences on the local community, with indirect effects on the broader region. Cumulatively, improper waste disposal practices can exacerbate environmental degradation over time. The duration is considered medium to long term, and the impact is potentially reversible through appropriate waste management practices. However, if not addressed promptly, it may become irreversible. The scope is predominantly local, with implications for the immediate surroundings, although the cumulative effects could have regional.

6.7.4 Dust and noise pollution from demolishing works

In the event of future rehabilitations and upgrading, the building needs to be demolished necessitating disposal of demolition waste. The noise pollution and air quality will be most affected during the demolition work with the emission of dust particles from machinery like excavators,

electric grinders and mixer. The impact receptors are likely to include site workers and residents in the neighboring areas. The substances which will most significantly contribute to air pollution will be particulate matter (PM₁₀ and PM_{2.5}). PM₁₀ and PM_{2.5} may cause health hazards when inhaled in significant amounts and can also reduce the visibility. This impact is moderate, local and will be short term.

6.7.5 Healthy hazards to workers from demolishing work

Demolishing works will include activities that may generate substantial amounts of dust and may also pose workers to risks of accidents. Pulling down a structure, engineered foundations, and other structures will all lead to generation of dust, noise and may cause accidents to operators. This impact is considered as negative, short-term, adverse, reversible and of moderate significance.

6.7.6 Soil and Water Pollution

The potential impacts on the soil and groundwater environment during demolition activities may include: dust churned up from the demolition/removal of structures within project site; changes in soils and groundwater regime due to excavation works during the demolition activities; contamination of soil and groundwater quality with hazardous materials such as accidental spillages of fuel, oil and chemicals. The impact is considered to be negative, short-term duration and of low significance.

Table 6.6: Summary of Potential Environmental and Socio-economic Impacts

S/N	Identified Impacts	Description of Impacts	Mobilization phase	Construction Phase	Demobilization Phase	Operation Phase	Decommissioning Phase
Socio-Economic Impacts							
1	Job Creation and employment opportunities	The impact is direct, indirectly, inducive, cumulative and reversible	+2	+2	0	+3	0
2	Increased market opportunities and sources of income	The impact is direct, indirectly, inducive, cumulative and reversible	+2	+2	0	+3	0
3	Improving growth of the economy	The impact is direct, indirectly, inducive, cumulative and reversible	+2	+2	0	+3	0
4	Government Revenue Collection and economic growth	The impact is direct, indirectly, inducive, cumulative and reversible	+2	+2	0	+3	0
4	Disruption of Economic and Social Activities	The impact is direct, indirectly, inducive, cumulative and reversible	-2	-2	0	-2	0
5	Increased Traffic and road accidents	The impact is direct, reversible, cumulative and inducive	-1	-2	0	-2	-1
6	Prevalence of Communicable diseases	The impact is direct, indirectly, inducive, cumulative and partially reversible	-1	-2	0	+2	0
7	Increased level of crimes	The impact is direct, indirectly, inducive, cumulative and reversible	-2	-2	0	-2	-1
8	Income to local suppliers and service providers	The impact is direct, indirectly, and inducive	+1	+2	0	+3	0
9	Increased skills and impart knowledge to local communities	The impact is direct, indirectly, and inducive	0	+2	0	+3	0

S/N	Identified Impacts	Description of Impacts	Mobilization phase	Construction Phase	Demobilization Phase	Operation Phase	Decommissioning Phase
11	Influx of people/ Population pressure	The impact is direct, indirectly, and inducive	0	-3	0	-1	0
12	Occupational Safety and Health Impacts	The impact is direct, indirectly, and inducive	0	-3	-1	-2	-2
13	Community Health, Safety and Security impacts	The impact is direct, indirectly, and inducive	0	-3	-1	-2	0
14	Conflicts and grievances	The impact is direct, indirectly, and inducive	0	-2	0	-2	0
15	Gender Discrimination	The impact is direct, indirectly, and inducive	0	-2	0	-2	0
16	Child labor	The impact is direct, indirectly, and inducive	0	-1	0	0	0
17	Insecurity and theft	The impact is direct, indirectly, and inducive	0	-2	0	-1	0
18	Food Insecurity	The impact is indirectly and inducive	0	-2	0	-1	0
19	Increased incidences of diseases and ill health	The impact is direct, indirectly, and inducive	0	-2	0	-2	0
20	Increased risk of GBV, SEA and sexual harassment	The impact is direct, indirectly, partially reversible, cumulative and inducive	-1	-3	0	-2	0
21	Increased Water Demand	The impact is direct, indirectly, partially reversible, cumulative and inducive	0	-1	0	-2	0
22	Increased Energy Demand	The impact is direct, indirectly, partially reversible, cumulative and inducive	0	-1	0	-2	0
23	Water shortage and Scarcity	The impact is direct, indirectly, partially reversible, cumulative and inducive	-1	-3	0	-3	0
24	Loss of employment and business opportunities	The impact is direct, indirectly, inducive, and reversible	0	0	-1	0	-3

S/N	Identified Impacts	Description of Impacts	Mobilization phase	Construction Phase	Demobilization Phase	Operation Phase	Decommissioning Phase
25	Loss of revenue to institutions and the government	The impact is direct, indirectly, inducive, and reversible	0	0	-3	0	-3
Environmental Impacts							
26	Impact on natural resource	The impact is direct, indirectly, inducive and irreversible	-2	-1	0	0	0
27	Deteriorated / Impairment of Air Quality	The impact is direct, indirectly, inducive, and reversible	0	-2	-2	0	-2
28	Noise Pollution	The impact is direct, indirectly, inducive, and reversible	0	-2	0	0	-1
29	Impact on climate change	The impact is direct, indirectly, inducive, and reversible	0	-1	0	0	-1
30	Increased vibration	The impact is direct, indirectly, inducive, and reversible	0	-2	0	0	-1
31	Generation of solid and hazardous wastes	The impact is direct, indirectly, inducive, and reversible	0	-3	0	-3	-1
32	Generation of liquid waste	The impact is direct, indirectly, inducive, and reversible	0	-3	0	-1	-1
33	Erosion of Exposed Surfaces	The impact is direct, indirectly, inducive, and reversible	-1	-2	0	0	-1
34	Exposure to earthquakes	The impact is direct, indirectly, inducive, and irreversible	-1	-3	-2	-3	-1
35	Visual Impact/ Increased Aesthetic Value of the Project Area	The impact is direct, indirectly, inducive, and reversible	0	-2	0	0	-2
36	Increased water pollution	The impact is direct, indirectly, inducive, and reversible	0	-2	0	-2	0
37	Increased Storm Water Generation and Overflow	The impact is direct, indirectly, inducive, and reversible	0	0	-1	-1	0

S/N	Identified Impacts	Description of Impacts	Mobilization phase	Construction Phase	Demobilization Phase	Operation Phase	Decommissioning Phase
38	Impact from poor hygienic condition	The impact is direct, indirectly, inducive, and reversible	0	-1	-1	-2	0
39	Loss of aesthetic value due to haphazard disposal of demolished waste	The impact is direct, indirectly, inducive, and reversible	0	0	0	0	-2

KEY

+1	Minor positive impact	-1	Minor negative impact
+2	Moderate positive impacts	-2	Moderate negative impacts
+3	High positive impacts	-3	High negative impacts
0	Negligible		

6.8 Cumulative Impacts

Cumulative impacts are impact that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project. They occur when impacts from the proposed project have an additive effect on the impact resulting from existing major facilities, or from reasonably foreseeable future projects within the project area. Cumulative impacts identified for the proposed project are presented below for each scenario.

6.8.1 Cumulative Impacts from existing major facilities

6.8.1.1 Noise

The noise impact assessment described was performed using the baseline assumption that noise impacts from construction and operating proposed project were additive to the noise sources already in existence area from all existing nearby operation, commercial activities and other noise sources. The cumulative effects of the existing operation and other noise sources, together with the project, are assessed to not exceed the recommended ambient noise levels.

6.8.1.2 Socio economic Issues

The cumulative impact on the Tanzania and Dodoma City economy will be strongly a positive one. Significant additional resources will be realized by the result of this project, which is consistent with the government's long term development plan. The additional licensing income, among other sources of additional income, will add to the already increasing government revenues and economic growth resulting from expanded and diversified business development in Dodoma City Council.

6.8.1.3 Increase of traffic congestion

Increase of traffic congestion will be a result from increase number of cars of people who will be living in proposed project. This impact will add the present problem of traffic on road leading to the site. To manage this impact the proponent should install appropriate traffic warning signs instructing occupants and visitors to reduce speed, will be placed at the vicinity of the entrance to the site.

6.9 Project alternatives

The discussion and analysis of alternatives in Environmental Impact Assessments should consider other practicable strategies that will promote the elimination of negative environmental impacts identified. This section is a requirement of The Environmental Management (Environmental Impact Assessment and Audit) (Amendment) Regulations, 2018, and is critical in consideration of the ideal development with minimal environmental disturbance.

In analyzing the environmental impacts, there are usually two or more development alternatives to consider for each issue. The alternatives may encompass a wide range of consideration and can represent a choice between the construction and operation of a development and the non-development option. With this in mind, the general principle involved in identifying the option(s) of the proposed project development is to ensure that the option chosen would result in optimal social, economic and environmental returns. In effect the option chosen should corroborate well not only for the proponent, but also for the environment and stakeholders in the area. The option with the highest cost benefit factor, the most technically feasible and with least residual impact is identified as the preferred option. The following alternatives have been identified and have been

discussed with project proponent as means of reducing environmental effects. They are discussed in further detail below:

6.9.1 Alternative Site

Using an alternative site in addition to the suggested one was also taken into account. Nevertheless, the suggested location was found to offer several benefits compared to others.

- Ownership of the project area. This area for the proposed establishment is the property of the TCU as such it does not involve complicated issues of displacing people, compensation and settlement.
- The land located meets the user requirements for developing TCU Headquarter Office Building
- Currently the proponent does not have any other alternative site allocated for this project
- The site is easily accessible from many parts of the Dodoma City and is connected to all utilities needed such as electricity and road infrastructure.
- Land is general flat therefore allow economical construction and design of building.
- The site is within the area where there are a lot of office buildings in the surroundings.

Based on the above, the recommended alternative is the “Proposed Alternative” because it recognizes the viability and need for the proposed development, is designed to address environmental issues and concerns, meets all local regulatory requirements and supports communication and close relations during all stages of the development between the developers and the surrounding communities.

6.9.2 Alternative of liquid waste management

During the operational phase, it is anticipated that the daily wastewater about 7.04 m³ will be produced. The estimation is based on the assumption that an average individual generates approximately 80% of wastewater per day. Therefore, it is crucial to address the appropriate management and disposal of this wastewater volume. Given that the majority of areas in ILazo Mbuyuni Street/Mtaa use septic tanks/ soak pit to treat and manage all waste water generated within the buildings. Alternative options such as utilisation of septic tanks and wastewater stabilisation ponds have been considered and will be discussed as follows;

Alternative one: Use of Stabilization Ponds/Lagoons

This refers to the use of a series of ponds/lagoons which allow several biological processes to take place, before the water is released back to the water body. Speaking of space this method requires a larger field for natural treatment to take place which is not available at the project site. Furthermore; lagoons will present vulnerable situations due to trespassers. They are usually a nuisance to the public because of smell from the lagoons/ponds. However, with strict and professional management, they are the most economical and environmentally sound in the long term.

Alternative two: Use of septic tanks

Use of septic tanks to manage wastewater was one of the options that were considered. Advantages of using septic tanks over wastewater stabilisation ponds (WSP) include;

- a) Septic tanks are easier to operate than WSP as such they do not require personnel to manage its operations except when there are blockages;
- b) Septic tanks do not generate odor as they are usually under cover;

- c) Septic tanks do not require a lot of space as compared to WSP; and
- d) Septic tanks are not left open as the case is with WSP which become breeding ground for vector insects and pose as potential hazards to the general public and children in case of drowning.

The main disadvantage of using septic tanks is that they need periodic emptying, and this could raise the operation cost over time. With the large volume of effluents that will be discharged from the project during operation, the septic tanks will need to be emptied time and again making the alternative not viable.

Alternative three: Ecological Sanitation

Another innovative and new solution to sanitation problems will be ecological sanitation. Ecological sanitation, also known as ecosan or eco-san, is a sanitation process that uses human black water and sometimes immediately eliminates fecal pathogens from any still present wastewater (urine) at the source. Different types of ecosan exist including Urine Diversion Toilet (UDT). The appropriate ecological sanitation that can be used is urine diversion technology. The technology has found wide application in Scandinavian countries including Sweden and Denmark. The system is simple. Urine is separated from faeces through the UDT, which is built atop a substructure that houses 2 half-drum containers lined with plastic bags for urine and faeces. These containers are stored for a period of time to allow pathogen die-off before they are collected and converted into soil conditioner or fertilizer. Retention time (dehydration and pathogen destruction) for fecal material is between 6-12 months while urine can be stored for 30 days before being applied as fertilizer.

Alternative four: Constructed Wetland Constructed

Wetlands are engineered system designed and constructed to mimic natural processes taking place in the natural wetlands. Constructed Wetlands remove pollutants in wastewater through the combination of physical, biological and chemical processes. Two types of constructed wetlands exist based on the flow of wastewater through them. They are either subsurface flow where the flow is below the surface of soil or surface flow where the flow of wastewater is above the soil.

Conclusion

Considering that the project area for proposed TCU building at Kisasa B area has no enough space. Hence, alternatives two was thought to be the best alternative solution to wastewater management for the proposed TCU building.

6.9.3 Solid Waste Management Alternatives

The proposed project will generate some quantities of domestic and office solid wastes from the proposed premises. An integrated solid waste management system is recommendable.

Alternative one: Source reduction

First, the project will give priority to reduction at source of the materials. This option will demand a solid waste management awareness programme in the management and the employees.

Alternative two: Recycling

Secondly, recycling, reuse and compositing of the waste will be the second alternative in priority. This will call for a source separation programme to be put in place. The recyclables will be sold to waste buyers within the surrounding areas especially paper etc.

Alternative three: Transportation of waste

Involve transportation of huge amounts of waste to the Chidaya landfill. The generated amount will be collected and transported by authorized contractor to Chidaya landfill. Therefore, alternative three was preferred due to distance and time.

6.9.4 Water Supply Alternative

Water is becoming a scarce resource by the day in the area and generally in Dodoma City. Therefore, the proponent looked into methods of sustaining water supply.

Alternative one: Water Supply (surface water) from the operating water utility company

Water Supply (surface water) from the operating water utility company DUWASA, the option is considered to be appropriate as the water supply network has been recently rehabilitated and therefore can guarantee reliable, clean and safe water supply to the TCU Headquarter office Building. The DUWASA water supply has to be considered the major source of water supply to the project.

Alternative Two: Groundwater Extraction

Statistics from Dodoma City and within the vicinity of the proposed project area suggest that groundwater is another alternative option for water supply and can supplement the water supply at the project at such times of water shortage and scarcity.

Alternative Three: Rainwater Harvesting

This is another option that has to be looked at. The rainwater will be harvested from both roof and land catchment. It will entail the design of rainwater harvesting system.

Conclusion: The proponent will use water from DUWASA and Borehole.

6.9.5 Alternative Energy Sources

The main source of energy for the TCU Headquarter office building is Electricity, supplied by the national grid. For the proposed infrastructure, the building considered four alternative sources of energy namely; electricity, diesel power generators, and solar energy.

- ***Alternative one - Electricity:*** As it is the case in most of developing countries, supply of electricity from national grids is not reliable as it mostly originates from hydroelectric power generators, which depend on rainfall frequency, intensity and pattern.
- ***Alternative two - Diesel generators:*** These utilize fossil fuels, which tend to emit greenhouse gases especially when operated for a long time. As such, diesel generators are used as standby power supply during outages.
- ***Alternative three - Solar energy:*** the last alternative considered was the installation of solar panels to harvest solar energy. It is intended that the solar energy be used for lighting within the buildings. It is also intended to install solar lights in various locations along the streets.

Conclusions: an evaluation of the three alternatives based on capital costs, availability of adequate supply, reliability, and environmental protection revealed that at least three options could be used together. Therefore, it is planned to connect the proposed building to electricity from the National grid as a basic power supply and backup generator. Provisions will be made for installing solar panels in the future. Hence, contractor during design period of the proposed establishment should consider space for installation of solar panels in the future. However, number of solar panels to be installed is not estimated.

6.9.6 No Project/Action Alternative

The no project alternative entails retaining the current status quo (No construction of the proposed TCU Headquarter Office buildings at Kisasa B area). Adopting the No Project alternative, this

option would mean avoiding the predicted impacts of the project implementation, and missing the predicted positive impacts of the project.

The “No Action Alternative” is likely to have the greatest implications on the socio-economic environment of the area and surrounding communities and the country at large. Due to the proposed quality of the development, it is anticipated that it would provide a major opportunity for employment, foreign exchange revenue, benefits associated with the building office and potentially significant business opportunities for existing and new induced support businesses. If this alternative were adopted, the proponent would need to find an alternative site for the development. Hence, the proposed establishment has many potential benefits as compared to negative ones that can be easily mitigated.

CHAPTER 7: ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

7.1 Introduction

The Environmental and Social Management Plan (ESMP) is presented below in table 7.1. This ESMP for the proposed project and based on the assessment undertaken as part of the ESIA, a series of mitigation measures have been identified which aim to reduce and / or eliminate the predicted impacts of the project. These mitigation measures will be appropriately applied to the project mobilization, construction and operation, decommissioning and this management plan provides a strategic framework for their implementation. The Proponent and Contractor shall implement components relevant to design, mobilization of materials and machines and actual construction. The estimated costs for implementing the mitigation measures are just indicative. Additionally, the ESMP include an estimate of the costs of the measures so that the project proponent can budget the necessary funds. Appropriate bills of quantities should clearly give the actual figures. In any case the consultant used informed judgment to come up with these figures.

7.2 Purpose of the ESMP

The purpose of the ESMP is to describe the measures that should be implemented by the proponent during the implementation of the project to eliminate or reduce to acceptable levels key potential impacts, social and health impacts related to project activities. The specific measures set out in the ESMP must be fully adhered to by all the project parties. In particular, the project must strive to avoid significant impacts on the bio-physical, socioeconomic or health aspects during implementation. Avoidance through good detailed design of site-specific works and through preparation of the detailed site specific ESMPs will be key to success in this area. Where impacts cannot be avoided, they must be mitigated against using appropriate measures. The ESMP has been developed:

- To bring the project to comply with Government of Tanzania applicable national environmental and social legal requirements social policies and procedures;
- To outline the mitigating/enhancing, monitoring, consultative and institutional measures required to prevent, minimize, mitigate or compensate for adverse environmental and social impacts, or to enhance the project beneficial impacts.
- To provide an operational reference and tool for environmental management during project rehabilitation and operation activities.

7.3 ESMP Implementation Responsibility

The environmental and social mitigation measures incorporated in the detailed engineering design shall be handed over to the contractor during construction period. The contractor shall take stock of the contents of the Environmental and Social Management Plan of the Project. TCU holds the ultimate responsibility for meeting the requirements outlined in EMA 2004, Tanzania's Environmental Legislation. The primary obligation for executing these requirements rests with the contractor, who will appoint safeguard specialists overseen by a contractor resident engineer. The project proponent is tasked with ensuring the presence of adequate resources, skills, training, capacity-building programs, communication processes, and documentation control systems to ensure the effective implementation and integration of ESMP requirements. This involves having competent staff with sufficient training and experience to cover the ESIA requirements for the HEET project in the designated project area.

TCU-Project Implementation Unit (TCU-PIU) is responsible for assessing the management and execution of the ESMP through monitoring and environmental audits. Any identified non-compliance during the evaluation requires corrective action by the contractor. The TCU-PIU oversees the implementation and monitoring of the ESMP, with overall responsibility for supervising all environmental management activities, aided by consultants (WB POM, 2021). It is essential to note that the ESMP is not the sole document or management system tasked with addressing project impacts. Instead, each project-related subcontractor or material supplier must establish their own management systems to minimize and prevent environmental and social risks.

Therefore, the contractor must integrate the ESMP into their "project management system," which serves as the framework for managing their activities and prepare C-ESMP. This system defines responsibilities, internal reporting requirements, relationships for mitigation and monitoring actions related to the ESMP, and precise mechanisms for monitoring and evaluating the implementation of various ESMP requirements. The contractor is also obligated to ensure that project implementation complies with national and international EHS legislation and regulations, as well as contractual technical and quality specifications in line with the project's quality plan if required. Also, the contractor shall appoint an Environmental, Social, Health and Safety Officer to oversee the E&S aspects who are familiar with the compliance requirements, including WB EHS guidelines (WB POM, 2021).

The successful execution of this plan will necessitate extensive self-monitoring and regular reporting to the PIU. It is anticipated that, throughout the project implementation stage (construction), both the TCU and contractor will enlist the services of consultants, including environmental and social specialists, as well as environmental health and safety officers (EHS). These personnel will be appointed based on the specifications outlined in the following table for effective management and monitoring.

7.4 Environmental and Social Cost

The costs for implementing the mitigation measures have been estimated based on previous similar projects and engineering judgment. The estimated cost for environmental and social management of an establishment is to be included in the Contractor's Bill of Quantities (BOQ) during decommissioning. Also, the principal environmental and social cost includes the cost for implementing the mitigation measures proposed. Additional costs for implementing environmental and social management measures have been estimated and TCU shall cover all the costs proposed in the ESMP.

Table 7.1: Proposed Environmental Social Management Plan (ESMP for planning phase, construction phase, demobilisation phase, operation phase and decommissioning phase.

S/N	Environmental & Social concerns	Mitigation/Management/ Enhancement measures	Responsible part	Estimated cost (TZS) Per Annum
MOBILISATION PHASE				
POSITIVE SOCIAL IMPACTS				
1	Job Creation and employment opportunities	<ul style="list-style-type: none"> ○ The contractor will be urged to hire as much local labor that is unemployed but willing to work hard as possible, up to a maximum of 50% unskilled labor. This will guarantee that the initiative benefits the local population better. ○ Employment should be based on the idea that everyone should have equal access to opportunities. ○ Communities close to the project site will be urged to develop high-quality goods and services. ○ Opportunities for employment will be made available in accordance with qualifications, accepted interviewing procedures, and grading systems. ○ Conduct fair and transparent recruitment processes to ensure equal opportunities for all interested individuals, promoting inclusivity and diversity Local communities shall be encouraged to produce quality goods and services for the project. ○ Implement training programs to enhance the skills of the local workforce, ensuring they acquire the necessary qualifications for available job opportunities. ○ Ensure strict adherence to labor standards and regulations, providing a safe and supportive working environment for all employees ○ Both professional and unskilled laborers hired for the project should receive fair remuneration. 	Contractor/ Consultant/ TCU-PIU	N/A Part of its project
2	Increased market opportunities and source of incomes	<ul style="list-style-type: none"> ○ Encourage the project to prioritize the procurement of goods and services from local businesses. This can include construction materials, equipment, and various services required during the mobilization phase. ○ Implement training programs to equip local residents with skills relevant to emerging market opportunities. This can include workshops on entrepreneurship, vocational training, and business management. 	Contractor/ Consultant/ TCU-PIU	N/A Part of its project

S/N	Environmental & Social concerns	Mitigation/Management/ Enhancement measures	Responsible part	Estimated cost (TZS) Per Annum
		<ul style="list-style-type: none"> ○ Promote environmentally and socially sustainable business practices to ensure that the increased market opportunities contribute to long-term economic and community well-being ○ Implement fair and transparent procurement processes to ensure that local suppliers have equal opportunities to participate. This can include clear guidelines, open bidding processes, and fair evaluation criteria Ensure monitoring of labour standards among contractors, sub-contractors, workers and service providers; and ○ Qualified local vendors/ entrepreneurs should be given priorities to supply different goods and services to the project. 		
NEGATIVE SOCIAL IMPACTS				
3	Disruption of Social Activities	<ul style="list-style-type: none"> ○ Inclusion of local leaders (Ward/sub-ward chairpersons/executive officers or /and councilors. ○ Introduction of traffic management plan and routing traffic flow to alternative roads will reduce the impact. ○ Exploring alternative routes or diversions with proper simulation before implementation. ○ Provision of temporary traffic lights and flagmen will also reduce the impact. ○ Contractor shall Develop and implement a comprehensive traffic management plan to minimize disruptions along the road. This plan should include designated routes for construction vehicles and scheduling deliveries during non-peak hours ○ Contractor shall conduct awareness programs for the local community, including food vendors, passengers, drivers, and students, to inform them about the upcoming disruptions. Provide information on alternative routes and timing to minimize inconvenience ○ Environmental and Social Specialists of TCU should explore the possibility of temporarily relocating key services, such as food vendors or public transportation, to less affected areas during the mobilization phase. This can help maintain essential services without significant interruption 	Contractor/ Consultant/ TCU-PIU	5,000,000

S/N	Environmental & Social concerns	Mitigation/Management/ Enhancement measures	Responsible part	Estimated cost (TZS) Per Annum
		<ul style="list-style-type: none"> ○ Establish effective communication channels between the construction team and the local community to address concerns and provide real-time updates on construction activities. This fosters transparency and community engagement. ○ Introduction of traffic management plan and routing traffic flow to alternative roads will reduce the impact 		
4	Increased Traffic and road accidents operators and drivers	<ul style="list-style-type: none"> ○ The contractor should ensure the proper selection of appropriate transportation route with consultations with stakeholders, avoiding large agglomerations as well as good Site Practices such as signage and signal personnel where appropriate and vehicle lighting (front and back). ○ Contractor shall develop a comprehensive traffic management plan to regulate the flow of vehicles and minimize congestion during the mobilization phase. ○ Contractor should coordinate and schedule deliveries of building materials and equipment during off-peak hours to reduce the impact on regular traffic. ○ Implement reduced speed limits in construction zones and install clear signage to alert drivers about the presence of construction-related activities ○ Conduct public awareness campaigns to inform local residents, businesses, and commuters about the upcoming construction activities and potential traffic disruptions. ○ Work closely with local traffic authorities to monitor and manage traffic flow effectively, ensuring the safety of both construction personnel and the general public ○ Encourage and facilitate alternative transportation methods for construction workers to reduce the number of individual vehicles on the road. ○ Establish emergency response protocols to promptly address and manage any road accidents that may occur. 	Contractor/ Consultant/ TCU-PIU	N/A Part of its project cost
5	Impact on Safety and Health risks	<ul style="list-style-type: none"> ○ Implement comprehensive training programs for workers to raise awareness about potential hazards and safe work practices 	Contractor/ Consultant/ TCU-PIU	5,000,000

S/N	Environmental & Social concerns	Mitigation/Management/ Enhancement measures	Responsible part	Estimated cost (TZS) Per Annum
		<ul style="list-style-type: none"> ○ Enforce strict compliance with health and safety regulations to ensure the well-being of workers and the general public. ○ Regularly monitor and audit the site to confirm adherence to safety protocols ○ Mandate the use of appropriate PPE, such as helmets, gloves, and safety boots, to minimize the impact of potential accidents ○ Develop and communicate clear traffic management plans to minimize disruptions and risks associated with changes in traffic patterns during mobilization. ○ Implement temporary traffic control measures to ensure the safety of both workers and local residents. ○ Install noise and dust control measures to mitigate the immediate risks posed to the safety and health of local residents. ○ Regularly monitor environmental conditions to identify and address any emerging hazards promptly. ○ Establish and communicate emergency response plans to address accidents or unforeseen incidents promptly. ○ Ensure that workers are adequately trained on emergency procedures to enhance preparedness. 		
6	Prevalence of Communicable diseases	<ul style="list-style-type: none"> ○ Provide awareness to public on pathways communicable diseases. ○ Provide Voluntary Counselling and Testing (VCT) centers for HIV/AIDS at TCU and the surrounding communities. ○ Work close to government and private institutions that deal with the spread of communicable diseases ○ Provide more healthcare services and medical equipment for treatment. ○ Provide easy access to free or affordable condoms on the construction site and within the local communities to encourage safe sexual practices and reduce the risk of STDs, including HIV/AIDS. ○ Establish regular health screening programs for construction workers to detect and address any potential communicable diseases early. This can include HIV testing, counseling, and access to medical care. ○ Foster community involvement in promoting health awareness and responsible behavior. Engage community leaders to support initiatives 	Contractor/ Consultant/ TCU-PIU	5,000,000

S/N	Environmental & Social concerns	Mitigation/Management/ Enhancement measures	Responsible part	Estimated cost (TZS) Per Annum
		<p>that discourage risky behaviors and emphasize the importance of health in the long term.</p> <ul style="list-style-type: none"> ○ Implement campaigns to reduce the stigma associated with HIV/AIDS and other communicable diseases. This can help create a supportive environment for affected individuals to seek testing and treatment without fear of discrimination. ○ Increase security measures to discourage the influx of sex workers to the construction area. This may involve collaboration with local law enforcement to maintain a safe and secure environment. 		
7	Increased level of crimes	<ul style="list-style-type: none"> ○ Employ people from the surrounding areas to reduce number of migrant workers. ○ Establish community-based security in collaboration with mtaa/ward leaders. ○ The contractor shall establish his own security to protect his properties and should establish community policing to support insufficient police force. ○ The community should be encouraged to participate in security matters by providing information on suspects. This can only be done by making community to own the project as well. ○ The cooperation of local people together will help to lessen criminal incidents and maintain security of people and their properties. ○ Participatory community security measures (ulinzi shirikishi) should be encouraged in the surrounding communities of Ilazo Mbuyuni Street/Mtaa and Kisasa B area ○ Deploy trained security personnel to monitor the construction site, deterring potential thieves and enhancing overall security. ○ Install surveillance cameras strategically across the construction site to monitor activities and provide evidence in case of theft or security incidents. ○ Implement strict access control measures, limiting entry points and ensuring that only authorized personnel have access to the construction site. 	Contractor/ Consultant/ TCU-PIU	2,000,000

S/N	Environmental & Social concerns	Mitigation/Management/ Enhancement measures	Responsible part	Estimated cost (TZS) Per Annum
		<ul style="list-style-type: none"> ○ Install adequate lighting around the construction site to minimize areas of darkness, reducing the likelihood of unauthorized access and theft. ○ Foster a positive relationship with the local communities by involving them in the construction process, creating a sense of ownership and reducing the likelihood of theft. ○ Establish secure storage facilities for construction materials and equipment, ensuring they are locked and well-protected when not in use. ○ Conduct regular security audits to identify vulnerabilities and make necessary improvements to the security infrastructure 		
NEGATIVE ENVIRONMENTAL IMPACTS				
8	Impact on natural resource	<ul style="list-style-type: none"> ○ Contractor or procurement shall obtain construction materials only from authorized sites or suppliers. ○ Avoiding losses due to spillage and leakage. ○ Set clear policies that support and promote the efficient use of water and energy resources. 	Contractor/ Consultant/ TCU-PIU	N/A Part of its project cost
9	Deteriorated / Impairment of Local Air Quality	<ul style="list-style-type: none"> ○ Control unnecessary vehicle trips ○ Refilling fuel tanks in the afternoon ○ Minimizing idling of engines ○ Implement the use of cleaner fuels and advanced technologies for construction machinery and transportation to reduce emissions of CO₂, NO_x, and fine particulates 	Contractor/ Consultant/ TCU-PIU	4,000,000
10	Noise Pollution	<ul style="list-style-type: none"> ○ Hours of working should be restricted to day light. ○ Maintenance of vehicles and machinery to avoid noise. ○ Maintain a minimum distance from sensitive receptors. ○ Facemasks with appropriate filters for dust removal and air purification (Chemical, mists, vapors and gases). 	Contractor/ Consultant/ TCU-PIU	3,000,000
12	Impact on climate change	<ul style="list-style-type: none"> ○ Implement the use of cleaner fuels and advanced technologies for construction machinery and transportation to reduce emissions of CO₂, NO_x, and fine particulates. ○ Prioritize the preservation of existing vegetation and implement a comprehensive tree planting program to offset the loss of trees during construction. 	Contractor/ Consultant/ TCU-PIU	3,000,000

S/N	Environmental & Social concerns	Mitigation/Management/ Enhancement measures	Responsible part	Estimated cost (TZS) Per Annum
		<ul style="list-style-type: none"> ○ Install and enforce effective emission control devices on diesel-powered trucks to minimize the release of pollutants into the air. ○ Optimize construction site management practices to minimize the duration and intensity of activities that contribute to air pollution, such as efficient scheduling and material storage. ○ Conduct awareness campaigns for the local community and workers regarding the environmental impact of air pollution and climate change, promoting sustainable practices. ○ Establish a comprehensive monitoring system to regularly assess air quality and emissions during construction. Report findings to relevant authorities and the community 		
CONSTRUCTION PHASE				
POSITIVE SOCIAL IMPACTS				
1	Jobs creation and Employment opportunities	<ul style="list-style-type: none"> ○ Ensure that the contractor prioritizes the hiring of local residents, both skilled and non-skilled, Ilazo Mbuyuni Street/Mtaa and Kisasa B area ○ Collaborate with local employment agencies to identify qualified candidates within the community. ○ Implement training programs to enhance the skills of the local workforce, enabling them to qualify for skilled positions and fostering long-term employability ○ Establish contractual agreements with the contractor to adhere to the employment targets, ensuring the stipulated number of skilled and non-skilled laborers are hired from the local community. ○ Facilitate the growth of self-employment opportunities by encouraging the establishment of businesses such as restaurants, food vendors and motorcycles to meet the increased demand generated by the project. ○ Encourage the contractor to contribute to community economic development initiatives, such as supporting local businesses and entrepreneurs, thereby fostering long-term economic resilience. ○ Implement a monitoring and reporting system to track the employment impact throughout the construction phase, ensuring compliance with the outlined measures 	Contractor/ Consultant/ TCU-PIU	N/A Part of its project cost

S/N	Environmental & Social concerns	Mitigation/Management/ Enhancement measures	Responsible part	Estimated cost (TZS) Per Annum
2	Income to local suppliers and service providers	<ul style="list-style-type: none"> ○ Purchasing materials from as many local suppliers. ○ Prioritize hiring local workers for various construction-related tasks, contributing to increased employment opportunities in Kisasa B area and Ilazo Mbuyuni Street/Mtaa. ○ Provide training and support to local suppliers and service providers to enhance their capacity to meet the increased demand ○ Actively involve and engage local suppliers for construction materials needed during the establishment phase. ○ Provide training and support to local suppliers and service providers to enhance their capacity to meet the increased demand. ○ Implement fair and transparent procurement processes to ensure that local suppliers have equal opportunities to participate in supplying materials and services for the project. ○ Integrate environmentally sustainable practices in construction to minimize negative impacts on the local environment, ensuring long-term benefits for the community. ○ Maintain open and transparent communication with local suppliers and service providers to address any concerns and ensure that they are well-informed about project developments 	Contractor/ Consultant/ TCU-PIU	N/A Part of its project cost
3	Increased skills and impart knowledge to local communities	<ul style="list-style-type: none"> ○ Develop and implement structured training programs for both skilled and non-skilled laborers in the local communities. ○ Contractor shall provide on job skills and training. ○ Actively engage the local workforce in construction activities, providing hands-on experience with new equipment and technologies ○ Implement capacity building initiatives to equip individuals with essential skills required for their roles in the construction process. ○ Establish a system for continuous monitoring and evaluation of the training programs to ensure their effectiveness ○ Involve local communities in the planning and execution of skill development initiatives to ensure relevance and sustainability. ○ Implement a monitoring and evaluation system to track the effectiveness of the skills transfer programs. 	Contractor/ Consultant/ TCU-PIU	N/A Part of its project cost

S/N	Environmental & Social concerns	Mitigation/Management/ Enhancement measures	Responsible part	Estimated cost (TZS) Per Annum
		<ul style="list-style-type: none"> Regularly assess the impact on individuals and the community to make necessary adjustments for continuous improvement. 		
4	Improved quality of life and living standard	<ul style="list-style-type: none"> Conducting awareness programs to promote understanding and tolerance among the diverse workforce. Encouraging cultural exchange initiatives to foster positive interactions between the local community and newcomers. Conducting awareness programs to promote understanding and tolerance among the diverse workforce. Providing temporary housing solutions for construction workers to minimize any strain on local resources and infrastructure 	Contractor/ Consultant/ TCU-PIU	N/A Part of its project cost
NEGATIVE SOCIAL IMPACTS				
5	Influx of people	<ul style="list-style-type: none"> Contractor shall establish workers camps separated from local communities with strict protocols for interaction with local communities in order to avoid project impacts from labor influx. Enhance efforts to prioritize hiring from local communities to minimize external migration for employment. Implement skills training programs for the local population to enhance their employability and competitiveness for construction-related jobs Organize job fairs and information sessions to ensure transparent communication about employment opportunities, reducing misinformation and speculation Establish regular communication channels with the local communities to address concerns, provide updates, and gather feedback on employment-related issues Collaborate with local authorities to develop and enforce policies that regulate the influx of people during construction, ensuring a balanced impact on the local population. Implement monitoring mechanisms to ensure fair hiring practices and adherence to the preference for local employment, with penalties for non-compliance. Implement job rotation programs and skill development initiatives to ensure a diverse range of individuals can participate in the construction activities, reducing intense competition for specific roles 	Contractor/ Consultant/ TCU-PIU	N/A Part of its project cost

S/N	Environmental & Social concerns	Mitigation/Management/ Enhancement measures	Responsible part	Estimated cost (TZS) Per Annum
6	Occupational Safety and Health impacts	<ul style="list-style-type: none"> ○ Institute good site practices include preventing public access to the construction site by securing equipment and demarcating excavation, using warning signs with appropriate text (local language) and graphic displays. ○ The contractor should make sure the project is registered under the Workplace Information Management System (WIMS) ○ Contractor should have registered and qualified health and safety personnel in the project during construction phase. ○ Contractor should conduct Risk Assessment before construction and prepare a Risk Assessment report. ○ Develop and implement health and safety management plan ○ The contractor should have accident book for the workers in order to keep accident records for those workers who had accidents during construction period ○ Implement traffic management and safety initiatives, such as heavy truck operator and driver training and testing, speed limit enforcement, maximum load limitations, and adherence to all Tanzanian transportation laws and standards. ○ Awareness campaigns /Education on HIV and STDs shall be provided to workers; ○ Appropriate working gear (such as nose, ear and mouth mask and clothing) and good construction site management shall be provided. ○ The contractor is responsible for barricading the building site, maintaining it hygienically, and providing enough facilities, such as trash cans, fire extinguishers, and a clean, safe water supply. ○ A well-stocked First Aid kit (administered by medical personnel) shall be maintained at the construction site. The medical personnel shall also be responsible for primary treatment of ailments and other minor medical cases as well as providing health education to the workforce. ○ The establishment of reporting systems for the public to voice concerns or grievances over perceived hazards to their health and safety caused by the construction operation. 	Contractor/ Consultant/ TCU-PIU	5,000,000

S/N	Environmental & Social concerns	Mitigation/Management/ Enhancement measures	Responsible part	Estimated cost (TZS) Per Annum
		<ul style="list-style-type: none"> ○ There will be proper signs on site to warn workers of safety requirements as regards machines with moving parts and other equipment at site. ○ Develop and implement an emergency plan including spill response. ○ Safe scaffoldings and railings will be provided at heights. ○ Creating a thorough health and safety plan and educating all contractor employees on it. 		
7	Community Health, Safety and Security impacts	<ul style="list-style-type: none"> ○ Contractor should have registered and qualified health and safety personnel in the project during construction phase. ○ Develop and implement community health and safety management plan ○ Establish a health and safety monitoring system to ensure that workers comply with health protocols and minimize the risk of communicable diseases, including regular health check-ups and screenings. ○ Implement a comprehensive training program for all construction workers, emphasizing the importance of adhering to safety protocols, respecting local communities, and following a code of conduct to minimize negative impacts. ○ Implement disease prevention programs, including awareness campaigns and access to healthcare facilities, to address potential increases in diseases such as COVID-19 and HIV/AIDS. ○ Collaborate with local law enforcement to enhance security around construction sites, addressing concerns related to crime, prostitution, and alcohol abuse. Implement security measures within labor camps to ensure the safety of workers and the community. ○ Develop a comprehensive traffic management plan to mitigate the risks associated with increased traffic volume during the construction phase. This includes speed limits, road signage, and coordination with local authorities to enforce safety measures. ○ Conduct regular health impact assessments to monitor and address any emerging health issues within the project area, ensuring a prompt response to potential risks. ○ Properly manage labor camps to ensure adequate living conditions, sanitation facilities, and medical services for imported skilled workers, reducing the likelihood of negative impacts on local communities. 	Contractor/ Consultant/ TCU-PIU	5,000,000

S/N	Environmental & Social concerns	Mitigation/Management/ Enhancement measures	Responsible part	Estimated cost (TZS) Per Annum
		<ul style="list-style-type: none"> ○ Work closely with local authorities to monitor and regulate prices of goods and services to prevent unjustified increases, ensuring that the local community is not adversely affected by inflation. ○ Foster collaboration with local authorities, community leaders, and relevant stakeholders to jointly address emerging challenges, promote transparency, and ensure that the project's social impacts are effectively managed. ○ Creating drainage channels to direct storm water movement. 		
8	Conflicts and grievances	<ul style="list-style-type: none"> ○ Contractor shall prepare and implement GRM ○ Conduct workshops and awareness programs for construction workers on cultural norms and local sensitivities, emphasizing respectful behavior towards married women and school children. ○ Implement a structured grievance resolution mechanism that allows local community members to express concerns related to construction activities. This mechanism should ensure prompt and fair resolution of issues ○ Implement effective dust control measures, such as water spraying and covering construction materials, to minimize the impact on the local environment and address concerns about dust and flying stones ○ Organize regular meetings between construction project representatives and the local community to discuss ongoing activities, address concerns, and foster open communication ○ Appoint a dedicated community liaison officer who serves as a point of contact between the construction team and the local community, facilitating communication and addressing grievances promptly ○ Ensure timely and transparent communication about the construction schedule, potential disruptions, and any necessary adjustments to minimize surprises and conflicts ○ Implement regular monitoring of construction activities to ensure adherence to guidelines and regulations, with penalties for non-compliance, thereby promoting responsible conduct among construction workers. 	Contractor/ Consultant/ TCU-PIU	3,000,000

S/N	Environmental & Social concerns	Mitigation/Management/ Enhancement measures	Responsible part	Estimated cost (TZS) Per Annum
9	Gender Discrimination	<ul style="list-style-type: none"> ○ Conduct awareness programs for all project stakeholders, including workers, community members, and decision-makers, emphasizing the importance of gender equality and discouraging discriminatory practices. ○ This project will ensure that there is involvement of women in project activities. ○ Ensure that the Code of Conduct and corresponding training concerning commitment of labour towards the community and the different behaviour that should be avoided emphasizes zero tolerance of gender-based violence i.e. sexual harassment, sexual exploitation and sexual abuse, ○ Provide specific training sessions for project staff on recognizing and addressing gender biases. This includes promoting fair treatment and equal opportunities for both men and women. ○ Implement transparent and inclusive hiring practices that ensure equal opportunities for men and women in employment and project-related activities. 	Contractor/ Consultant/ TCU-PIU	2,000,000
10	Prevalence of Communicable diseases	<ul style="list-style-type: none"> ○ Provide awareness to public on pathways communicable diseases. ○ Provide Voluntary Counselling and Testing (VCT) centers for HIV/AIDS at TCU and the surrounding communities. ○ Work close to government and private institutions that deal with the spread of communicable diseases ○ Provide more healthcare services and medical equipment for treatment. ○ Provide easy access to free or affordable condoms on the construction site and within the local communities to encourage safe sexual practices and reduce the risk of STDs, including HIV/AIDS. ○ Establish regular health screening programs for construction workers to detect and address any potential communicable diseases early. This can include HIV testing, counseling, and access to medical care. ○ Foster community involvement in promoting health awareness and responsible behavior. Engage community leaders to support initiatives that discourage risky behaviors and emphasize the importance of health in the long term. 	Contractor/ Consultant/ TCU-PIU	3,000,000

S/N	Environmental & Social concerns	Mitigation/Management/ Enhancement measures	Responsible part	Estimated cost (TZS) Per Annum
		<ul style="list-style-type: none"> ○ Implement campaigns to reduce the stigma associated with HIV/AIDS and other communicable diseases. This can help create a supportive environment for affected individuals to seek testing and treatment without fear of discrimination. ○ Increase security measures to discourage the influx of sex workers to the construction area. This may involve collaboration with local law enforcement to maintain a safe and secure environment. 		
11	Child labor	<ul style="list-style-type: none"> ○ Conduct regular monitoring of project workers in relation to health, working conditions, hours of work, minimum age, and the other requirements of national law. ○ Develop and enforce a comprehensive Labor Management Plan that strictly adheres to local and international labor laws and standards, particularly those related to the employment of minors. ○ Establish educational support programs to encourage children to stay in school and pursue their education. This can include scholarships, tutoring services, and awareness campaigns promoting the value of education. ○ Control school dropout by collaborating with the local government and schools in the Ilazo Mbuyuni Street/Mtaa and Kisasa B area. ○ Cooperate with relevant authorities like Ministry of Labor to control child labor. ○ Create awareness raising to the communities on the importance of education to the children. ○ The local authorities should develop bylaws to control the engagement of children in petty business or work in project related activities 	Contractor/ Consultant/ TCU-PIU/LGA	2,000,000
12	Insecurity and theft	<ul style="list-style-type: none"> ○ Deploy trained security personnel to monitor the construction site, deterring potential thieves and enhancing overall security. ○ Install surveillance cameras strategically across the construction site to monitor activities and provide evidence in case of theft or security incidents ○ Implement strict access control measures, limiting entry points and ensuring that only authorized personnel have access to the construction site. 	Contractor/ Consultant/ TCU-PIU/LGA	2,000,000

S/N	Environmental & Social concerns	Mitigation/Management/ Enhancement measures	Responsible part	Estimated cost (TZS) Per Annum
		<ul style="list-style-type: none"> ○ Install adequate lighting around the construction site to minimize areas of darkness, reducing the likelihood of unauthorized access and theft. ○ Foster a positive relationship with the local communities by involving them in the construction process, creating a sense of ownership and reducing the likelihood of theft. ○ Establish secure storage facilities for construction materials and equipment, ensuring they are locked and well-protected when not in use. ○ Conduct regular security audits to identify vulnerabilities and make necessary improvements to the security infrastructure 		
13	Food Insecurity	<ul style="list-style-type: none"> ○ Develop a comprehensive plan in collaboration with local communities to ensure sustainable food sources during the construction phase. ○ Strengthen local supply chains for food by working with local farmers and vendors to meet the increased demand. ○ Implement mechanisms to monitor and control the prices of essential goods, especially food items. ○ Conduct awareness campaigns to educate the community about the potential impacts on food prices and steps being taken to mitigate the situation. ○ Ensure efficient construction management to complete the project within the stipulated timeframe, minimizing the duration of increased demand for resources 	Contractor/ Consultant/ TCU-PIU	N/A Part of its project cost
NEGATIVE ENVIRONMENTAL IMPACTS				
14	Impairment of air quality due to dust and gases emission	<ul style="list-style-type: none"> ○ Implement effective dust suppression techniques, such as using water sprays or dust suppressants on construction sites to minimize the release of fugitive dust. ○ Prioritize the preservation of existing vegetation during construction to reduce the need for extensive clearance, minimizing the disturbance that contributes to dust emission. ○ Cover sand and aggregate stockpiles to prevent wind erosion and reduce the dispersion of particulate matter into the air. ○ Opt for construction practices that minimize soil disturbance and dust generation, such as limiting heavy machinery movement. 	Contractor/ Consultant/ TCU-PIU	3,000,000

S/N	Environmental & Social concerns	Mitigation/Management/ Enhancement measures	Responsible part	Estimated cost (TZS) Per Annum
		<ul style="list-style-type: none"> ○ Provide workers with appropriate PPE, including masks and respiratory protection, to safeguard their health against potential exposure to airborne particulate matter. ○ Conduct awareness programs for the local community to educate them about the temporary nature of the air quality impact, its potential health risks, and the implemented mitigation measures. ○ Establish a monitoring system to regularly assess air quality during construction, ensuring that concentrations of PM2.5 and PM10 remain within acceptable limits. ○ Develop a responsive action plan to promptly address any exceedance of emission limits or unexpected air quality issues, ensuring a proactive approach to mitigation. 		
15	Increased Noise level	<ul style="list-style-type: none"> ○ Implement construction activities during specific time windows to minimize disruption during sensitive hours, such as early mornings or late evenings when community activities are at a minimum. ○ Install temporary acoustic barriers or soundproofing measures around noisy machinery and construction sites to contain and reduce the propagation of noise. ○ Ensure that all construction equipment undergoes regular maintenance to reduce noise emissions. Well-maintained machinery tends to operate more quietly. ○ Providing ear protection materials for the workers in noisy area. ○ Proactively communicate construction schedules and potential noise impacts to the local community. Seek feedback and address concerns to foster understanding and cooperation ○ Provide training to construction workers on the importance of minimizing noise pollution and adopting practices that contribute to a quieter working environment 	Contractor/ Consultant/ TCU-PIU	3,000,000
16	Increased vibration	<ul style="list-style-type: none"> ○ Explore and implement advanced construction techniques that minimize vibrations. This may include the use of specialized equipment designed to reduce ground vibrations during activities like blasting and impact pile driving. 	Contractor/ Consultant/ TCU-PIU	2,000,000

S/N	Environmental & Social concerns	Mitigation/Management/ Enhancement measures	Responsible part	Estimated cost (TZS) Per Annum
		<ul style="list-style-type: none"> ○ Establish effective communication channels with the local community to provide timely information about construction schedules and activities that may cause vibrations. This helps residents to take necessary precautions and prepares them for potential disruptions. ○ Install vibration monitoring devices in key locations to continuously monitor ground vibrations during construction. This real-time data can be used to assess the impact and adjust construction methods accordingly to stay within acceptable limits ○ Modify construction methods to minimize vibration generation. For example, consider alternative pile driving techniques or adjust blasting procedures to reduce the intensity of vibrations ○ Foster an open dialogue with the local community to address concerns and gather feedback. This engagement can help in refining mitigation measures based on community input and building a collaborative approach to managing the impact 		
17	Generation of Solid waste	<ul style="list-style-type: none"> ○ Contractor shall provide waste handling facilities such as waste bins and skips for temporarily holding domestic waste generated at the site. ○ Implement a comprehensive waste segregation system to separate recyclable materials from hazardous and non-biodegradable waste. ○ Adhere to proper disposal methods for hazardous substances and materials, following established guidelines and regulations. ○ Employ certified waste disposal services to ensure safe handling of hazardous waste ○ A special focus on waste minimization will be made in order to cut down on the amount of solid waste generated during site preparation and construction. ○ Topsoil shall be stockpiled and used for reclamation or re-vegetation at the site during landscaping. ○ Develop a detailed waste management plan that outlines proper disposal methods, recycling procedures, and strategies for reducing waste generation. ○ Ensure adherence to the waste management plan throughout the construction and operational phases 	Contractor/ Consultant/ TCU-PIU	1,000,000

S/N	Environmental & Social concerns	Mitigation/Management/ Enhancement measures	Responsible part	Estimated cost (TZS) Per Annum
		<ul style="list-style-type: none"> ○ Conduct training sessions for construction and operational staff on proper waste handling, segregation, and disposal practices. ○ Unusable construction trash, including broken pipes, formwork, and other building supplies, will be disposed at a designated area 		
18	Generations of Liquid Wastes	<ul style="list-style-type: none"> ○ Enforce and adhere to best practices in waste management to ensure that all liquid wastes are handled and disposed of in an environmentally responsible manner, minimizing health risks and pollution ○ Conduct awareness programs for the local community in in Ilazo Mbuyuni Street/Mtaa and Kisasa B area educating residents about the importance of proper waste disposal and its impact on health and the environment. ○ Contractor shall be instructed to put in place acceptable procedure for handling hazardous waste such as oils, lubricants and non-combustible waste. ○ Wastewater will be discharged directly to the septic tanks/soak pit. ○ Establish a monitoring system to regularly assess the effectiveness of waste management practices during construction. Enforce strict compliance measures to ensure that all generated liquid wastes are treated and disposed of according to established standards. ○ Collaborate with local environmental regulatory authorities to ensure that the construction activities comply with existing regulations and standards for waste management. ○ Develop and implement an emergency response plan to address any unforeseen incidents or spills during the construction phase, minimizing the potential for long-term environmental damage. ○ Explore opportunities for reusing or recycling treated water where applicable, reducing the overall volume of liquid waste generated and promoting sustainable water management practices. 	Contractor/ Consultant/ TCU-PIU	1,000,000
19	Erosion of Exposed Surfaces	<ul style="list-style-type: none"> ○ Implement thorough compaction and resurfacing techniques during construction to minimize exposed surfaces prone to erosion. ○ Introduce erosion control measures such as the use of erosion control blankets, sediment barriers, and vegetative cover to reduce the impact of rain, trampling, and vegetation clearance. 	Contractor/ Consultant/ TCU-PIU	N/A Part of its project cost

S/N	Environmental & Social concerns	Mitigation/Management/ Enhancement measures	Responsible part	Estimated cost (TZS) Per Annum
		<ul style="list-style-type: none"> ○ Construction will be done as per engineering design and procedure of which a maximum requirement of compaction strength is achieved during the construction. That is maximum dry density (MDD) specified in the design manual by consultant. ○ Maintain gravel fill and/or re-vegetate around the structures. ○ Plan construction activities considering weather conditions to avoid exacerbating erosion during periods of heavy rainfall. ○ Most of construction activities will be done during dry weather. ○ Community engagement with local communities in in Ilazo Mbuyuni Street/Mtaa and Kisasa B area to raise awareness about the potential impacts of construction and involve them in decision-making processes. ○ Implement measures to protect local resources during construction to minimize disruptions to the communities. ○ Establish a monitoring system to track erosion control measures and enforce compliance with construction guidelines to prevent excessive sedimentation in runoffs. ○ Develop plans for post-construction restoration, including replanting vegetation and rehabilitating affected areas to promote ecosystem recovery. 		
20	Visual Impact/ Increased Aesthetic Value of the Project Area	<ul style="list-style-type: none"> ○ Avoidance and minimizing strategies for disposed wastes. ○ All structures should adhere to set standards in terms of quality, shapes, height, color etc. ○ Integrate landscaping initiatives and create green spaces within and around the project site. Planting trees and maintaining natural elements will help preserve the visual appeal and soften the urbanized look. ○ Implement visual barriers such as construction fences, temporary screens, or artistic panels to shield construction activities from direct view. This will minimize the visual intrusion experienced by residents ○ Enforce strict construction schedules to limit noisy and visually disruptive activities to specific hours, reducing the impact on the community during peak times. 	Contractor/ Consultant/ TCU-PIU	2,000,000

S/N	Environmental & Social concerns	Mitigation/Management/ Enhancement measures	Responsible part	Estimated cost (TZS) Per Annum
		<ul style="list-style-type: none"> ○ Foster open communication with the local community to gather feedback and address concerns related to visual changes. This involvement can help tailor mitigation efforts to meet community expectations. ○ If nighttime construction is necessary, use low-impact lighting to minimize light pollution. Shielding and directing lights away from residential areas will preserve the night sky's visual quality. ○ Develop comprehensive plans for the post-construction period, including the restoration of altered landscapes. This may involve replanting native vegetation and restoring natural features to enhance the visual aesthetics 		
14	Impact on climate change	<ul style="list-style-type: none"> ○ Implement the use of renewable and cleaner energy sources for construction equipment to minimize the emission of greenhouse gases. This could involve using electric or hybrid machinery powered by sustainable energy. ○ Install and enforce the use of emission control technologies on fuel-powered equipment to reduce the release of carbon dioxide and noxious gases into the atmosphere during construction activities. ○ Optimize construction practices to minimize the overall carbon footprint, such as efficient waste management, recycling of materials, and reducing energy-intensive processes where possible ○ Raise awareness among local residents in Ilazo Mbuyuni Street/Mtaa and Kisasa B area about the potential impacts of construction on climate change. Engage with the community to foster understanding and support for sustainable construction practices. ○ Adhere to green building standards and certifications that promote environmentally friendly construction practices. This includes designing and constructing buildings that are energy-efficient and have minimal environmental impact. ○ Implement a robust monitoring system to track and report greenhouse gas emissions during construction. This will help in identifying areas for improvement and ensuring compliance with emission reduction measures. ○ Ensure strict adherence to local environmental regulations and standards governing construction activities. Regular inspections and enforcement 	Contractor/ Consultant/ TCU-PIU	N/A Part of its project cost

S/N	Environmental & Social concerns	Mitigation/Management/ Enhancement measures	Responsible part	Estimated cost (TZS) Per Annum
		measures can help prevent excessive emissions and promote responsible construction practices. <ul style="list-style-type: none"> ○ Plan for post-construction rehabilitation efforts to offset any environmental impact caused during the construction phase. This could involve planting trees, restoring natural habitats, or other measures to enhance the local environment. 		
22	Impact on natural resource (Energy and water)	<ul style="list-style-type: none"> ○ Promote the use of renewable energy sources, such as solar or wind power, to reduce reliance on fossil fuels. Optimize machinery and vehicle operations to minimize fuel consumption. ○ Implement recycling and reuse systems for water used in construction activities. Utilize alternative water sources, such as rainwater harvesting, to reduce dependency on DUWASA. ○ Establish a comprehensive monitoring system to track energy and water usage throughout the construction phase ○ Conduct awareness campaigns to educate the local community about the importance of resource conservation during construction ○ Implement strict regulations and guidelines to ensure responsible resource management. Regularly assess and audit resource consumption to identify areas for improvement. ○ Ensure that the construction complies with environmentally friendly building standards. Implement rainwater harvesting, energy-efficient lighting, and insulation to reduce overall resource impact 	Contractor/ Consultant/ TCU-PIU	3,000,000
DEMOBILISATION PHASE				
POSITIVE SOCIAL IMPACT				
1	Reduced noise level	<ul style="list-style-type: none"> ○ Removing all working and damaged construction mechanical equipment's 	Contractor/ Consultant/ TCU-PIU	2,000,000
NEGATIVE SOCIAL IMPACTS				
2	Loss of employment	<ul style="list-style-type: none"> ○ Implement skill development programs to enhance the employability of the affected workers. ○ Provide training in areas with high demand in the local job market. ○ Informing workers, the project duration when employing them. 	Contractor/ Consultant/ TCU-PIU	N/A Part of its project cost

S/N	Environmental & Social concerns	Mitigation/Management/ Enhancement measures	Responsible part	Estimated cost (TZS) Per Annum
		<ul style="list-style-type: none"> ○ Establish job placement services to assist displaced workers in finding alternative employment opportunities. ○ Educating the labour force on the need to save part of their wages. ○ Paying severance benefit to all laid off workers according to the provision of the labour laws. ○ Establish community support programs to provide financial assistance or counseling services to those facing immediate economic challenges. 		
3	Loss of business opportunities	<ul style="list-style-type: none"> ○ Offer training programs to local traders and entrepreneurs to diversify their products and services. This can help them adapt to changing circumstances and explore alternative business opportunities beyond construction-related activities ○ Establish clear communication channels between the construction project management and local businesses. This ensures that businesses are informed about the project timeline, allowing them to plan for potential disruptions and adjust their operations accordingly. ○ Encourage collaboration among local businesses to create a network that can collectively address challenges and explore new business opportunities. This can foster resilience and community support ○ Facilitate the establishment of support services for construction workers, such as designated areas for purchasing food from local entrepreneurs. This ensures that some business activities can continue despite the temporary disruptions. ○ Advocate for and facilitate access to government assistance programs for affected businesses. This could include tax relief, low-interest loans, or other financial support measures. ○ Work with local authorities and businesses to develop long-term plans for economic resilience, considering potential future construction projects and identifying strategies to minimize the impact on local businesses. 	Contractor/ Consultant/ TCU-PIU	N/A Part of its project cost
NEGATIVE ENVIRONMENTAL IMPACTS				
4	Dust and noise pollution from	<ul style="list-style-type: none"> ○ Employ dust control technologies such as water spraying systems to minimize the release of dust particles during demolition activities. This will help maintain better air quality 	Contractor/ Consultant/	5,000,000

S/N	Environmental & Social concerns	Mitigation/Management/ Enhancement measures	Responsible part	Estimated cost (TZS) Per Annum
	demolishing works	<ul style="list-style-type: none"> ○ Implement noise reduction strategies, including the use of sound barriers, noise-dampening equipment, and scheduling noisy activities during specific times to minimize disruption to nearby residents. ○ Provide workers with personal protective equipment (PPE) such as masks and ear protection to mitigate health risks associated with dust inhalation and prolonged exposure to high noise levels ○ Conduct awareness programs for local residents, informing them about the demolition schedule, potential impacts, and measures being taken to mitigate dust and noise pollution. This foster understanding and cooperation ○ Establish a monitoring system to regularly assess air quality and noise levels. Implement a reporting mechanism to promptly address any deviations from acceptable standards, allowing for quick corrective actions ○ Explore and utilize demolition methods that generate less dust and noise, such as mechanical methods that are more controlled and produce fewer airborne particles. 	Project Implementation Team	
OPERATIONS AND MAINTANANCE PHASE				
POSITIVE SOCIAL IMPACTS				
1	Job creation	<ul style="list-style-type: none"> ○ Implement skill development programs and training initiatives to enhance the employability of local residents. This could include vocational training in areas relevant to the institution's operations, such as hospitality, agriculture, and business management. ○ Prioritize the hiring of local residents for various positions within the institution. This can be facilitated through collaboration with local employment agencies or community outreach programs to connect potential employees with job opportunities. ○ Foster partnerships with local businesses in the cleanliness, stationery, catering, and commercial sectors to ensure a mutually beneficial relationship. This can stimulate economic growth in the community and create additional job opportunities. ○ Establish initiatives or support existing programs that promote entrepreneurship within the community. This could involve providing 	TCU-PIU	N/A

S/N	Environmental & Social concerns	Mitigation/Management/ Enhancement measures	Responsible part	Estimated cost (TZS) Per Annum
		<p>mentorship, or resources to aspiring entrepreneurs, thereby creating new businesses and job opportunities.</p> <ul style="list-style-type: none"> ○ Engage with the local community through regular communication channels to inform them about job opportunities, skill development programs, and other initiatives. Educate the community on the long-term benefits of the institution and how they can actively participate in and benefit from its operations. 		
2	Government Revenue Collection and economic growth	<ul style="list-style-type: none"> ○ The project will allocate a portion of its generated revenue to various governmental regulatory authorities such as the NEMC, DUWASA, TANESCO, FIRE and Rescue Force, and OSHA. This financial support will enable these authorities to carry out their functions effectively and contribute to overall regional development. ○ Local authorities should identify the new sources of revenue in the area. ○ Strengthening revenue collection mechanisms. ○ Awareness creation for the people in the area on the importance of paying revenues. 	TCU-PIU	N/A
NEGATIVE SOCIAL IMPACTS				
3	Increased incidences of diseases and ill health	<ul style="list-style-type: none"> ○ Implement proactive health interventions during and after the project to address the specific health concerns of the local communities. This may include vaccination programs, health education, and access to healthcare services. ○ A safety, health and environment induction course shall be conducted to all students and workers, putting more emphasis on HIV/AIDS, which has become a national disaster as well as other emerging pandemics such as COVID 19 and dengue fever. ○ The proponent shall conduct medical examinations for their workers annually. ○ TCU should be registered by OSHA to ensure compliance ○ The project shall include information education and communication component (IEC) in its budget. This will help to raise more awareness on HIV/AIDS, and means to suppress its incidence. ○ Introduce preventive measures to reduce the likelihood of disease transmission. This could involve promoting hygiene practices, ensuring 	TCU-PIU	10,000,000

S/N	Environmental & Social concerns	Mitigation/Management/ Enhancement measures	Responsible part	Estimated cost (TZS) Per Annum
		<p>clean water and sanitation facilities, and establishing protocols for waste disposal to minimize environmental health risks.</p> <ul style="list-style-type: none"> ○ Engage with local communities to raise awareness about the importance of health and hygiene. Encourage community participation in health programs and empower them to take ownership of their well-being. ○ Establish a robust system for monitoring and surveillance of health conditions in the affected areas. This includes early detection of potential outbreaks, tracking disease trends, and implementing timely responses. ○ Collaborate with local health authorities and organizations to leverage their expertise and resources. This partnership can enhance the effectiveness of health interventions and ensure a coordinated response to health challenges. ○ Develop and implement emergency response plans to handle any sudden increases in disease incidences. This includes having protocols in place for rapid deployment of medical teams and resources in the event of an outbreak. 		
4	Health and safety risks due to fire hazards	<ul style="list-style-type: none"> ○ Adequate number of portable fire extinguishers shall be placed at strategic locations. ○ Regular fire and other disaster drills and awareness training shall be conducted. ○ Fire detectors and sprinkler systems shall be installed in the buildings. ○ The proponent shall insure buildings against fire Hazards. ○ Workers will be sensitized on appropriate fire prevention measures ○ Good housekeeping shall be maintained at all sites to reduce the fire risk. ○ The design of the buildings shall strictly adhere to the Fire Safety Standards. 	TCU-PIU	2,000,000
5	Increased risk of GBV, SEA and sexual harassment	<ul style="list-style-type: none"> ○ Plan that ensures project awareness raising strategy (for workers and community members), a list of GBV service Providers to which GBV survivors will be referred, revisions to the GRM to ensure it can address GBV complaints, and information on GBV allegation procedures in the workplace. 	TCU-PIU	3,000,000

S/N	Environmental & Social concerns	Mitigation/Management/ Enhancement measures	Responsible part	Estimated cost (TZS) Per Annum
		<ul style="list-style-type: none"> ○ Implement comprehensive awareness programs within in Ilazo Mbuyuni Street/Mtaa and Kisasa B area to educate residents about the importance of gender equality, consent, and the prevention of GBV. ○ Promote community dialogues to address cultural norms contributing to GBV and encourage positive behavioral changes ○ Establish and enforce clear policies at TCU to prevent and address GBV among students and staff. ○ Provide support services such as counseling and helplines within TCU to assist those affected by GBV. ○ Conduct training sessions for TCU staff on recognizing and responding to signs of GBV. ○ Equip community leaders and relevant stakeholders with the skills to identify and address GBV issues effectively. ○ Create safe spaces within TCU Headquarter office building and the surrounding community where individuals can seek refuge and support. ○ Implement security measures to enhance the safety of students and residents, particularly during vulnerable times. ○ Establish a robust monitoring and evaluation system to track the effectiveness of interventions in reducing GBV. ○ Regularly assess the incidence of GBV and adjust strategies accordingly to address emerging challenges. ○ Collaborate with local authorities and law enforcement to ensure a swift response to reported cases of GBV. Also, foster partnerships with local organizations working on GBV prevention to leverage resources and expertise ○ Empower students with the knowledge and skills to advocate against GBV and contribute to a safer community. ○ Support community-led initiatives that empower individuals, especially women, to challenge and overcome GBV 		
12	Increased Traffic along the Access Road to the Main Morogoro-	<ul style="list-style-type: none"> ○ Develop a comprehensive traffic management plan that considers the anticipated increase in vehicular and non-motorized traffic during the operational phase. This plan should outline specific measures to mitigate congestion and enhance safety in the surrounding areas. 	TCU-PIU	3,000,000

S/N	Environmental & Social concerns	Mitigation/Management/ Enhancement measures	Responsible part	Estimated cost (TZS) Per Annum
	Dodoma Road and Hombolo road	<ul style="list-style-type: none"> ○ Strategically place additional signboards to guide and inform road users about the changes in traffic patterns, entrances, and other relevant information. Clear signage can help prevent confusion and improve overall traffic flow. ○ Implement coordinated traffic control measures to optimize the flow of vehicles and ensure smooth operation near building entrances. This may involve the deployment of traffic personnel during peak hours or special events to manage the increased traffic. ○ Launch a public awareness campaign to inform the community, including students, faculty, and local residents, about the expected changes in traffic conditions. This could include distributing informational materials, organizing workshops, and using digital platforms to educate the public. ○ Explore the use of technology, such as smart traffic lights or traffic monitoring systems, to enhance traffic flow efficiency. These solutions can be integrated with the existing infrastructure to dynamically manage traffic based on real-time conditions. ○ Establish a feedback mechanism for the community to report any issues related to traffic disruption. This allows for continuous monitoring and adjustment of the traffic management plan based on feedback from the users. 		
15	Increased Water Demand	<ul style="list-style-type: none"> ○ Install water conserving taps that turn- off automatically when water is not in use. ○ Encourage water reuse/recycling during occupation phases. ○ Roof catchments of building blocks should be provided with rainwater harvesting systems (gutters, down pipes and water storage facilities) to enhance collection and storage of the resulting run-off. Such water can be used in watering flower gardens, general cleaning etc. ○ Implement comprehensive water resource management strategies to ensure sustainable use. ○ Monitor water sources regularly to assess the impact on local water availability. 	TCU-PIU	40,000,000

S/N	Environmental & Social concerns	Mitigation/Management/ Enhancement measures	Responsible part	Estimated cost (TZS) Per Annum
		<ul style="list-style-type: none"> ○ Promote water-efficient technologies and practices within the establishment to minimize consumption. ○ Implement water conservation measures such as rainwater harvesting and reuse/recycling ○ Conduct awareness programs to educate local communities about responsible water usage. ○ Involve local communities in the planning and implementation of water management initiatives. ○ Establish a robust monitoring and reporting system to track water usage, community impacts, and the effectiveness of mitigation measures. And share regular updates with stakeholders and the public to maintain transparency. 		
16	Increased Energy Demand	<ul style="list-style-type: none"> ○ Put off all lights immediately when not in use or are not needed. ○ Use energy conserving electric lamps for general lighting. ○ Integrate energy-efficient technologies and equipment in laboratory operations, focusing on reducing energy consumption without compromising functionality. ○ Implement advanced climate control systems that optimize heating, ventilation, and air conditioning (HVAC) to ensure energy is used more efficiently, adapting to specific needs and usage patterns ○ Replace traditional lighting systems with energy-efficient LED lighting and incorporate motion sensors to automatically control lighting based on occupancy, reducing unnecessary energy consumption. ○ Invest in renewable energy sources, such as solar panels or wind turbines, to supplement the energy demand and decrease reliance on traditional, carbon-intensive sources. ○ Conduct awareness programs to educate staff on energy conservation practices, encouraging them to adopt behaviors that contribute to energy efficiency in their daily operations. ○ Implement protocols and procedures to enhance operational efficiency, minimizing idle time for equipment and ensuring that energy-intensive processes are streamlined for maximum productivity. 	TCU-PIU	N/A

S/N	Environmental & Social concerns	Mitigation/Management/ Enhancement measures	Responsible part	Estimated cost (TZS) Per Annum
		<ul style="list-style-type: none"> ○ Conduct regular energy audits to identify areas of improvement and track energy performance over time. This will help refine energy-saving strategies and address any emerging issues promptly. ○ Engage with local energy providers to explore collaborative measures, such as demand-response programs or incentives for adopting energy-efficient practices. 		
17	Water shortage and scarcity	<ul style="list-style-type: none"> ○ Conduct an initial assessment of water availability and demand in the project area. ○ Regularly assess the impact of the project on local water resources and adjust management strategies accordingly. ○ Explore the feasibility of utilizing alternative water sources like groundwater wells or recycled water for non-potable purposes. ○ Develop a contingency plan for accessing alternative water sources during periods of water shortage. ○ Install a greywater recycling system to treat and reuse wastewater from sinks and showers for non-potable purposes. ○ Explore opportunities for recycling and reusing water within the building, such as for cooling systems or cleaning purposes. ○ Develop an emergency response plan to address potential water supply disruptions or emergencies, including protocols for water rationing and contingency measures for ensuring essential water needs are met. ○ Establish regular reviews and evaluations of the water management plan to identify areas for improvement and implement necessary adjustments 	TCU-PIU	10,000,000
NEGATIVE ENVIRONMENTAL IMPACTS				
18	Increased water pollution	<ul style="list-style-type: none"> ○ Collaborate with local communities in Kisasa B area and Ilazo Mbuyuni Street/Mtaa to create awareness about the environmental consequences of water pollution. And involve community members in monitoring activities and reporting any observed anomalies in water quality. ○ Develop and implement emergency response plans to address any accidental spills or releases of hazardous substances into the wastewater system. 	TCU-PIU	1,000,000

S/N	Environmental & Social concerns	Mitigation/Management/ Enhancement measures	Responsible part	Estimated cost (TZS) Per Annum
19	Increased storm water generation and overflow	<ul style="list-style-type: none"> ○ The design of storm water drainage will be given a high priority for the buildings. ○ The design shall provide sufficient greenery area for facilitating soil infiltration. ○ Creating rainwater management systems can help prevent runoff and promote infiltration. This may include the use of rainwater harvesting tanks, drainage systems, and water retention areas for collecting and distributing rainwater ○ Installing permeable pavements to promote infiltration and reduce runoff. ○ Constructing retention and detention basins to temporarily store stormwater and control the release of runoff into the drainage system. ○ Incorporating vegetative swales and buffer strips to slow down and filter stormwater, promoting natural infiltration and reducing soil erosion ○ Utilizing green roofs on buildings to absorb and slow stormwater runoff, reducing the volume and velocity of water entering the drainage system 	TCU-PIU	N/A
20	Impact from poor hygienic condition	<ul style="list-style-type: none"> ○ Provision of adequate toilets for students and workers. ○ Sensitisation of workers on understanding of potential health and safety issues related to poor hygienic condition. ○ Regular Inspection and maintenance of the waste water system network ○ Improve dust suppression mechanisms within the TCU premise 	TCU-PIU	2,000,000
21	Generation of solid wastes	<ul style="list-style-type: none"> ○ Provision of dust bins or rubbish pits for the wastes produced. ○ Implement a comprehensive waste segregation system to categorize different types of waste materials. ○ Establish recycling facilities or system to process recyclable materials such as paper, cardboard, plastics, and metals. ○ Implement a waste segregation system that separates waste into different categories such as recyclables (paper, plastic, glass, metal), organic waste (food scraps, yard waste), and non-recyclables. Provide clearly labeled bins for each category in easily accessible areas. ○ Implement a system for collecting and properly disposing of electronic waste (e-waste) such as old computers, printers, and other electronic devices. 	TCU-PIU	1,000,000

S/N	Environmental & Social concerns	Mitigation/Management/ Enhancement measures	Responsible part	Estimated cost (TZS) Per Annum
		<ul style="list-style-type: none"> ○ Implement secure storage facilities with appropriate containment measures to prevent leaks or contamination ○ Regularly monitor waste generation, segregation, and disposal practices on TCU Headquarter office building 		
22	Generation of Liquid waste	<ul style="list-style-type: none"> ○ Ensure that the wastewater is properly treated and managed through septic tank/soak pit ○ Develop and implement comprehensive waste management plans specifically targeting liquid waste generated. This includes proper disposal methods, recycling initiatives, and the use of environmentally friendly practices. ○ Optimize sanitation systems to minimize liquid waste production. This may involve the installation of water-efficient fixtures, regular maintenance to address leaks, and the use of technologies that reduce water usage in sanitation facilities. ○ Implement strategies to control and manage rainwater runoff to prevent contamination. This could involve the installation of permeable surfaces, green infrastructure, and drainage systems designed to capture and treat runoff before it enters water bodies. ○ Promote water-efficient practices in laboratories to reduce water consumption. This may include the use of advanced equipment that minimizes water usage, recycling systems for laboratory water, and the adoption of best practices in water conservation. ○ Establish monitoring programs to regularly assess liquid waste generation and ensure compliance with environmental regulations. This involves conducting regular inspections, implementing corrective actions when necessary, and maintaining records to track the effectiveness of mitigation measures ○ Conduct training programs for staff involved in construction and operation to raise awareness about the importance of liquid waste management. Promote a culture of environmental responsibility and provide guidelines for responsible waste disposal. ○ Develop and implement emergency response plans to address unforeseen spills or incidents related to liquid waste. This includes having the 	TCU-PIU	2,000,000

S/N	Environmental & Social concerns	Mitigation/Management/ Enhancement measures	Responsible part	Estimated cost (TZS) Per Annum
		necessary equipment and trained personnel to respond promptly to minimize the impact on the environment.		
23	Exposure to earthquakes	<ul style="list-style-type: none"> ○ Ensure that the building design and construction meet or exceed seismic building codes and standards set by relevant authorities. Use earthquake-resistant materials and construction techniques to strengthen the building's resilience against seismic activities. ○ Develop an emergency response plan specifically tailored to earthquakes. This plan should outline evacuation procedures, emergency communication protocols, designated assembly points, and responsibilities of key personnel during an earthquake. ○ Identify vulnerable areas, structural weaknesses, and potential hazards. ○ Conduct regular training sessions and drills to educate employees and occupants about earthquake preparedness and response procedures. This includes proper evacuation techniques, sheltering strategies, and first aid training. ○ Install seismic monitoring equipment and early warning systems to detect seismic activity and provide advanced notice to occupants. These systems can help trigger automatic responses such as shutting down utilities or activating emergency alarms. ○ Implement a routine maintenance schedule to inspect and maintain the structural integrity of the building. Regular inspections should identify any signs of wear and tear, structural damage, or vulnerabilities that could compromise earthquake resilience. ○ Work closely with local government agencies, emergency responders, and seismic experts to stay informed about seismic risks in the region. Collaborate on emergency preparedness initiatives and share information about best practices for earthquake mitigation. 		5,000,000
DECOMMISSIONING PHASE				
POSITIVE IMPACT				
NEGATIVE SOCIAL IMPACTS				
1	Loss of employment and	○ Seminars shall be conducted on alternative means of livelihood after termination of job.	TCU-PIU	N/A

S/N	Environmental & Social concerns	Mitigation/Management/ Enhancement measures	Responsible part	Estimated cost (TZS) Per Annum
	business opportunities	<ul style="list-style-type: none"> ○ Implement comprehensive employment transition programs for affected workers, including skill development and retraining initiatives to enhance their employability in alternative sectors. ○ Establish a support mechanism for local businesses affected by the decommissioning, providing training, and resources to adapt to new market conditions ○ Conduct regular and transparent communication with stakeholders, including affected communities, to keep them informed about the decommissioning process, potential impacts, and mitigation measures. ○ Work closely with local government authorities to identify and implement measures to offset the negative impact on the affected persons, such as creating alternative employment opportunities or initiating community development projects 		
2	Loss of revenue and business opportunities	<ul style="list-style-type: none"> ○ Explore alternative revenue streams to compensate for the loss incurred from the discontinued project. ○ Identify and develop new projects or initiatives that can generate income for both institutions and the government ○ Implement economic development programs in in Ilazo Mbuyuni Street/Mtaa and Kisasa B area to stimulate local economic opportunities. ○ Encourage entrepreneurship and job creation to offset the negative economic impact on residents. ○ Engage with the affected communities to understand their needs and concerns. ○ Implement social support programs or initiatives to assist individuals and businesses impacted by the loss of economic opportunities 	TCU-PIU	N/A
NEGATIVE ENVIRONMENTAL IMPACTS				
4	Loss of aesthetic value due to haphazard disposal of demolished waste	<ul style="list-style-type: none"> ○ Formulate a comprehensive waste management plan specifically tailored for the decommissioning phase. And, clearly outline procedures for the segregation, collection, transportation, and disposal of demolished waste. ○ Implement demolition techniques that minimize the generation of waste and reduce environmental impact. ○ opt for methods that allow for the salvage and reuse of materials, thereby decreasing the amount of waste generated. 	Contractor/ Consultant/ TCU-PIU	N/A

S/N	Environmental & Social concerns	Mitigation/Management/ Enhancement measures	Responsible part	Estimated cost (TZS) Per Annum
		<ul style="list-style-type: none"> ○ Conduct a thorough site characterization and assessment to identify potential environmental sensitivities and vulnerabilities. This will aid in determining appropriate disposal methods and areas, preventing contamination of soil and water bodies. ○ Identify and designate specific areas for waste disposal, ensuring they are environmentally suitable and comply with regulations. ○ Implement measures to prevent leachate from entering soil and water bodies. ○ Establish a monitoring and inspection program to assess the effectiveness of waste disposal measures. ○ Regularly inspect the disposal areas to identify and address any issues promptly. ○ Engage with the local community to raise awareness about the importance of proper waste disposal during decommissioning. Also, encourage community participation in waste management initiatives 		
	<p>Dust and noise pollution from demolishing works</p>	<ul style="list-style-type: none"> ○ Restrict demolition activities to specific time periods during the day when noise impact is likely to be less disruptive, such as during normal working hours. This can help minimize the disturbance to both site workers and residents ○ Inform and engage with residents and workers in the surrounding areas about the timing and nature of the demolition work. Providing regular updates and addressing concerns can contribute to better community understanding and cooperation. ○ Implement a comprehensive air quality monitoring system to track the emission of dust particles during demolition. This can help identify any exceedances of air quality standards and trigger immediate corrective actions. ○ Dust suppression techniques, such as water spraying or misting systems, to control the release of dust particles into the air. This can help mitigate the impact on air quality and reduce potential health hazards. ○ Provide site workers with appropriate PPE, such as masks or respirators, to minimize their exposure to airborne particulate matter and protect their health during the demolition activities. 	<p>Contractor/TCU</p>	<p>5,000,000</p>

S/N	Environmental & Social concerns	Mitigation/Management/ Enhancement measures	Responsible part	Estimated cost (TZS) Per Annum
		<ul style="list-style-type: none"> ○ Ensure strict adherence to local regulations and standards related to noise and air quality during demolition. This includes obtaining necessary permits and approvals, as well as complying with established limits for noise and air pollutant emissions 		
	Health hazards to workers from demolishing work	<ul style="list-style-type: none"> ○ Personal protective equipment (PPE), e.g., helmets, boots, goggles, earplugs, gloves and others will be provided and their use enforced to all workers involved in demolishing of structures during closure. ○ Contractor shall have registered and qualified HSE personnel to ensure health and safety of workers within the project area. ○ All workers involved in the demolishing work will be provided with training on health and safety matters ○ In case of injuries, a well-equipped first aid kit will be onsite and injured workers will be provided first aid service by a trained first aider ○ Hygienic conditions within the working areas will be maintained and enforced 	Contractor/TCU	6,000,000
Total cost of mitigation measure (TZS)				161,000,000

CHAPTER 8: ENVIRONMENTAL AND SOCIAL MONITORING PLAN

8.1 Introduction

The correct and successful implementation of impact mitigation measures in order to reduce adverse impacts on environmental conditions needs to be ensured by a proper monitoring programme. This chapter presents the Environmental and social monitoring plan (ESMoP) that will be carried out throughout the project implementation to mitigate the impacts and enhance the benefits of the project. The ESMP outlines the specific actions that shall be undertaken to ensure that the Project complies with all applicable laws and regulations related to environmental impacts and impact mitigation. The ESMP deals with all mitigation required for the physical, biological and socio-economic impacts and focuses on the impacts of higher significance as provided in Table 7-1 above.

8.1.1 Objectives of ESMoP

The EMP applies to and will be implemented throughout all phases of the project: mobilization, construction, operation, and decommissioning. The objective of the ESMP is to set out clearly the key components of environmental and socio-economic management for the proposed project and thereby ensure that the following concepts are realized throughout the mobilization, construction, operation, and decommissioning.

- Negative impacts on the physical, biological and socio-economic environments are mitigated.
- Benefits that will arise from the development of the proposed project are enhanced;
- Support smooth implementation of project with minimum losses to environmental and social infrastructure.
- Compliance and guided by National, International laws, standards and guidelines e.g. effluents standards, noise level standards, occupational and safety standards etc. and best practice is achieved; and
- Good will and good relations with communities, and governments at local and national levels are maintained.

8.2 Monitoring Frequency and reporting

Monitoring frequency is proposed for each critical parameter depending on the likelihood and level of change over time. Some parameters take longer time to show changes while others would change in very short time. Ambient air levels of pollutant gases in and around the project should be measured annually. Air emissions should be monitored after the air pollution control device for particulate matter (or alternatively an opacity level of less than 10%). Frequent sampling for parameters should be undertaken during start-up and continue throughout the operation and decommissioning phase. Some monitoring may have to continue even beyond decommissioning for impacts such as effects of the wastewater discharged into the environment.

Other parameters such as income, revenue, employment, changes in livelihoods, use of resources (water, energy) and changes in norms and values will be monitored on annual basis, so as to allow for change to take place.

Monitoring data should be analyzed and reviewed at regular intervals and compared with the operating standards so that any necessary corrective actions should be taken. Proponent is required to maintain records of air emission, effluents, hazardous waste sent off site as well as other parameters, fires, emergencies, accidents and ill health that may impact on the environment or workers. Records of monitoring results should be kept in an acceptable format and easily accessible, and information reviewed and evaluated to improve the effectiveness of the environmental protection.

8.3 Monitoring Plan

The proposed monitoring plan (Table 9.1) will be used by the proponent or the hired consultant for monitoring the proposed facilities during construction period and contains the following;

- The predicted impacts to be monitored as per schedule.
- Main parameters to be monitored.
- The sampling area.
- Where possible units or methods to be applied are indicated.
- The levels or target standards to be observed are also shown.
- The approximate costs. However, costs might change with the fluctuations of the shilling and cost escalations.

Table 8.1: Proposed Environmental and Social Monitoring Plan (ESMP) for mobilization and construction phase, demobilisation phase, operation phase and decommissioning phase

Potential Impacts	Monitoring Indicator	Monitoring Action	Monitoring Frequency	Means of verification	Target level/ Standards	Responsibility	Estimated cost (TZS) per annum
MOBILISATION AND CONSTRUCTION PHASE							
Disruption of social activities	Number of complaints	<ul style="list-style-type: none"> ○ Regularly assess the effectiveness of communication channels between the project management and the local community ○ Conduct periodic assessments to identify and evaluate any unforeseen disruptions to social activities caused by the mobilization activities. ○ Engage with community representatives to gather feedback on the perceived impact on their daily routines and activities. ○ Monitor the effects of mobilization on local livelihoods, especially those dependent on activities that might be temporarily interrupted (e.g., agriculture, small businesses, transportation services). ○ Establish and maintain an accessible and transparent grievance mechanism to address concerns raised by the community regarding disruptions to social activities 	Daily	Observation	No disrupted activities	Consultant/TCU-PIU	N/A
Job Creation and Employment Opportunities	Number of local consultants employed	<ul style="list-style-type: none"> ○ Systematic monitoring of the recruitment processes, ensuring compliance with employment quotas for local residents, and verifying that job opportunities are accessible to both formal and informal sectors 	Once, on commencement of assignment	Employment records	N/A	Consultant/TCU-PIU	N/A

Potential Impacts	Monitoring Indicator	Monitoring Action	Monitoring Frequency	Means of verification	Target level/ Standards	Responsibility	Estimated cost (TZS) per annum
		<ul style="list-style-type: none"> ○ Assessing the fulfillment of commitments made in the ESIA report regarding job creation during the mobilization phase. ○ Regular reporting and documentation of employment data, including the number of jobs created, the demographic profile of the workforce, and any challenges faced ○ Regular tracking of employment statistics, verifying that the promised jobs are being created as planned, and assessing the distribution of employment benefits among local residents ○ Evaluating the quality of jobs, ensuring fair wages and safe working conditions. ○ Stakeholder engagement and feedback mechanisms will be utilized to address concerns promptly 					
Increased Traffic and road accidents	Number of accidents or near miss	<ul style="list-style-type: none"> ○ Regular monitoring of road infrastructure, traffic flow, and accident occurrences ○ Monitoring team will analyze data on traffic volume, road conditions, and incidents to identify trends and potential risks associated with the increased activity during the mobilisation phase. ○ Implementing traffic management plans, enhancing road safety measures, and conducting awareness campaigns, may be initiated based on the monitoring findings to minimize the impact of 	Daily	Observation	No traffic/ Accidents	Consultant/ TCU-PIU	2,000,000

Potential Impacts	Monitoring Indicator	Monitoring Action	Monitoring Frequency	Means of verification	Target level/ Standards	Responsibility	Estimated cost (TZS) per annum
		increased traffic and reduce the likelihood of road accidents.					
Safety and health risks	Number and type of safety equipment such as mask, helmet gloves, safety boot and earplugs	<ul style="list-style-type: none"> ○ Regular inspections of the construction site, equipment, and work practices to identify and mitigate potential hazards. ○ Safety protocols and procedures will be monitored for adherence, and any deviations will be addressed promptly. ○ Health monitoring of workers will be conducted to detect and manage any occupational health issues. ○ Emergency response plans will be reviewed and tested, and feedback from workers and the local community will be actively sought to enhance the overall safety performance. 	Weekly	Observation	<ul style="list-style-type: none"> ○ Fire system ○ Water reservoir tank ○ Assembly area with sign ○ Clear warning signs (Warning-No Smoking, No Naked Lights, Danger) ○ PPE evaluation report ○ CO2 and sand fire extinguisher 	Consultant/TCU-PIU	2,000,000
Generation of solid and liquid wastes	Solid and Liquid waste (Kg for Solid waste, Litres for Liquid waste)	<ul style="list-style-type: none"> ○ Monitoring the types and quantities of solid and liquid waste generated during the mobilisation activities related to the establishment of the TCU Headquarter Office building ○ Assess compliance with waste disposal regulations and environmental standards, ensuring that proper waste handling procedures are followed to minimize adverse impacts on the surrounding environment and communities. 	Monthly	Observation	Environmental compliance	Consultant/TCU-PIU	2,000,000
Increase in business activities	Number of local people selling	<ul style="list-style-type: none"> ○ Ongoing surveys and evaluations to monitor the number of new businesses established, changes in employment 	Quarterly	Interview	N/A	Consultant/TCU-PIU	N/A

Potential Impacts	Monitoring Indicator	Monitoring Action	Monitoring Frequency	Means of verification	Target level/ Standards	Responsibility	Estimated cost (TZS) per annum
within the project area	goods at the project site	levels, and the types of businesses flourishing. <ul style="list-style-type: none"> ○ Assess the impact on local infrastructure, such as roads and utilities, to ensure they can accommodate increased business activities. ○ Periodic stakeholder consultations and engagement are crucial to gather feedback from the local community, allowing adjustments to be made to the project plan as needed. 					
Conflicts and grievances	Number of meetings held during the mobilisation Phase and throughout the project Phases -Number of complains and Incidences - Number and types of grievance reported and solved	<ul style="list-style-type: none"> ○ Regular monitoring of community feedback, conducting stakeholder consultations, and maintaining open communication channels to promptly address and resolve any disputes. ○ The monitoring team will document and analyze reported conflicts, implementing mitigation measures as necessary, and ensuring that grievance resolution is fair, transparent, and culturally sensitive 	Weekly	-Observation of records of complains -Analyse records of workers and community grievance	No complains	Consultant/ TCU-PIU	2,000,000
Impact on gender	Number of men and	<ul style="list-style-type: none"> ○ Ongoing data collection on the number of male and female workers employed, 	Monthly	Observation of records of complains	No Violations and harassments to	Consultant/ TCU-PIU	3,000,000

Potential Impacts	Monitoring Indicator	Monitoring Action	Monitoring Frequency	Means of verification	Target level/ Standards	Responsibility	Estimated cost (TZS) per annum
during employment	women employed	their job roles, and the wages they receive. <ul style="list-style-type: none"> ○ Assessing the working conditions to guarantee a safe and inclusive environment for all genders. ○ Periodic reviews should be conducted to identify any gender-specific challenges or issues that may arise during the construction activities 			vulnerable groups		
Air pollution from noxious gasses	Measurement of ambient gaseous (Noxious gasses (CO, CO ₂ , NO, NO _x , SO _x))	<ul style="list-style-type: none"> ○ The continuous measurement and analysis of emissions from construction activities that may release noxious gases into the atmosphere. ○ Monitoring stations will be strategically placed to capture data on air pollutants, and real-time monitoring devices will be employed to track levels of harmful gases. ○ Periodic site inspections and air quality assessments to ensure compliance with established environmental standards and regulations. ○ If elevated levels of noxious gases are detected, immediate corrective actions should be implemented to mitigate the impact, and adjustments to construction practices may be made to minimize air pollution. ○ Regular reporting and communication of monitoring results to relevant stakeholders will be integral to maintaining transparency and 	Quarterly	Measurement of ambient gaseous	<ul style="list-style-type: none"> ○ CO < 150 g/Nm³ for less than 15 mins. ○ NO_x < 150 g/Nm³ for 24 hours ○ Pb < 1.5 g/Nm³ for 24 hours ○ SO₂ < 0.5mg/Nm³ for 10 mins ○ Conforming to EC directive 89/336/EEC and ISO 12103-1) 	Consultant/TCU-PIU	4,000,000

Potential Impacts	Monitoring Indicator	Monitoring Action	Monitoring Frequency	Means of verification	Target level/ Standards	Responsibility	Estimated cost (TZS) per annum
		accountability throughout the construction phase					
Air pollution from dust imission	Measurement of particulate matter (PM ₁₀ & PM _{2.5})	<ul style="list-style-type: none"> ○ The implementation of air quality monitoring stations strategically placed to measure particulate matter and dust concentrations. ○ Frequent inspections of dust control measures, such as water spraying and dust suppression systems, to ensure their effectiveness. ○ Real-time monitoring tools and periodic site visits will be employed to promptly identify any exceedances of acceptable dust levels through visual inspection. Also, the data collected shall inform timely corrective measures and adjustments to mitigate the impact of dust emissions on air quality, safeguarding both the environment and the well-being of the local community. 	Quarterly	Measurement of particulate matter	Air emissions monitoring through a Continuous Emissions Monitoring (CEM) System	Consultant/ TCU-PIU	4,000,000
Noise generation	Day and night noise levels	<ul style="list-style-type: none"> ○ The use of sound measuring devices positioned strategically across the construction site and its immediate surroundings. ○ Track variations in noise levels to ensure compliance with established environmental regulations and standards. ○ Identification and implementation of mitigation measures if noise levels exceed permissible limits. 	Monthly	Inspection	<ul style="list-style-type: none"> ○ In compliance with WB and TBS standards: ○ Daytime noise levels < 60 Db ○ Night-time noise levels < 50 dB 	Consultant/ TCU-PIU	2,000,000
Solid and liquid waste generation	Solid and Liquid waste (Kg)	<ul style="list-style-type: none"> ○ The monitoring actions for solid and liquid waste generation during the construction phase of the proposed 	Weekly	Observation	Environmental compliance	Consultant/ TCU-PIU	3,000,000

Potential Impacts	Monitoring Indicator	Monitoring Action	Monitoring Frequency	Means of verification	Target level/ Standards	Responsibility	Estimated cost (TZS) per annum
	for Solid waste, Litres for Liquid waste)	<p>development involve regular and systematic checks to ensure compliance with environmental and social standards outlined in this ESIA report. This includes;</p> <ul style="list-style-type: none"> ○ Continuous observation and documentation of waste disposal practices, both solid and liquid, to assess their impact on the surrounding environment. ○ Routine inspections, data collection on waste quantities and types, and verification of adherence to waste management protocols. ○ Immediate corrective measures should be implemented if any deviations or non-compliance are identified, with ongoing reporting and communication to stakeholders to maintain transparency throughout the construction phase. 					
Health and Safety risks	- Number and type of safety equipment such as mask, helmet gloves and earplugs	<ul style="list-style-type: none"> ○ Ongoing surveillance of construction activities to identify and mitigate potential hazards to both workers and the surrounding community. ○ Regular site inspections, safety audits, and the enforcement of safety protocols to ensure compliance with health and safety standards. ○ Emergency response plans should be in place, and incidents should be documented and analyzed for continuous improvement. 	Quarterly	Inspection; Voluntary testing;	<ul style="list-style-type: none"> ○ Fire syste ○ Water reservoir tank ○ Assembly area with sign ○ Clear warning signs (Warning-No Smoking, No Naked Lights, Danger) 	Consultant/ TCU-PIU	8,000,000

Potential Impacts	Monitoring Indicator	Monitoring Action	Monitoring Frequency	Means of verification	Target level/ Standards	Responsibility	Estimated cost (TZS) per annum
		<ul style="list-style-type: none"> Community engagement should be implemented, with feedback mechanisms to address any health and safety concerns raised by local residents 					
Impact on natural resource (Energy and water)	Amount of water and energy consumed	<ul style="list-style-type: none"> Monitoring the usage patterns, identifying potential sources of inefficiency or waste, and implementing measures to optimize resource utilization. Track the project's adherence to sustainable practices, ensuring that energy is sourced efficiently, and water usage is minimized. 	Monthly	Measurement / records / Observation	Efficient use of water	Consultant/ TCU-PIU	2,000,000
Increase in accident incidences	<ul style="list-style-type: none"> -Number of humps on the local road; -Number of warning signs erected; -Number of people using PPEs; -Number of people trained Presence of a first aid kit 	<ul style="list-style-type: none"> The monitoring actions for this impact involve regular and systematic surveillance to identify, assess, and manage potential risks. This includes; Implementing safety protocols, conducting regular safety audits, and maintaining incident reporting mechanisms. Encompass on-site safety measures, adherence to construction standards, and the use of personal protective equipment. Tracking accident statistics, analyzing root causes, and promptly addressing any emerging safety concerns. Continuous communication and training programs for construction workers are essential to ensure awareness of safety practices 	Quarterly	Inspection	Measuring Incidences, Number of injured people,	Consultant/ TCU-PIU	4,000,000
DEMobilisation Phase							

Potential Impacts	Monitoring Indicator	Monitoring Action	Monitoring Frequency	Means of verification	Target level/ Standards	Responsibility	Estimated cost (TZS) per annum
Reduced noise levels	All equipment removed	<ul style="list-style-type: none"> ○ Monitoring noise levels during the dismantling and removal of construction equipment and structures. ○ The monitoring team will use sound measuring devices to quantify noise levels and compare them against predetermined standards and regulations. 	Once upon Decommissioning	Inspection	In compliance with WB and TBS standards: <ul style="list-style-type: none"> • Daytime noise levels < 60 dB • Night-time noise levels < 50 dB 	Consultant/TCU-PIU	2,000,000
Loss of employment	Severance benefits	<ul style="list-style-type: none"> ○ Continuous air quality monitoring to detect any increase in dust levels. ○ Monitoring mechanisms may include the use of air quality monitoring stations strategically placed around the construction site. ○ Routine inspections, data collection, and analysis should be conducted to identify sources of dust emissions and assess the effectiveness of dust control measures. ○ Corrective actions to be taken if dust levels exceed permissible limits, ensuring that appropriate measures are promptly implemented to mitigate the impact on air quality and prevent harm to the environment and local communities 	Once upon Decommissioning	Inspection	N/A	Consultant/TCU-PIU	N/A
Loss of business opportunities	Materials paid for	<ul style="list-style-type: none"> ○ Regular assessments to quantify the number of individuals affected, identify the reasons for demobilization, and assess the socio-economic consequences on the local community. ○ Implementation of mitigation measures to address any adverse effects, ensuring a proactive and responsive approach to 	Once upon Decommissioning	Records	N/A	Consultant/TCU-PIU	N/A

Potential Impacts	Monitoring Indicator	Monitoring Action	Monitoring Frequency	Means of verification	Target level/ Standards	Responsibility	Estimated cost (TZS) per annum
		minimize the impact of employment loss during the demobilization phase. <ul style="list-style-type: none"> Regular reporting and feedback mechanisms should be established to facilitate continuous improvement and adaptability in addressing emerging challenges related to employment dynamics 					
Poor waste management	Site clear of construction wastes and scrap metal	<ul style="list-style-type: none"> The monitoring actions for this impact involve regular and systematic checks on waste disposal practices. This includes; Assessing whether waste generated during the construction phase is appropriately collected, segregated, and disposed of in compliance with environmental regulations. Monitoring teams should track waste management procedures to ensure that potential environmental and social impacts are minimized. 	Once upon Decommissioning	Inspection	Environmental compliance	Consultant/ TCU-PIU	2,000,000
OPERATIONAL AND MAINTANANCE PHASE							
Creation of employment	-Number of local people employed -Number of women employed	<ul style="list-style-type: none"> Regularly assessing and documenting the number and types of jobs generated, ensuring compliance with agreed-upon employment targets, and evaluating the socio-economic impact on local communities. Monitoring should extend to the maintenance of a diverse and inclusive workforce, with attention to gender equality and the involvement of local residents. The monitoring process will 	Annually	Records	N/A	TCU-PIU	N/A

Potential Impacts	Monitoring Indicator	Monitoring Action	Monitoring Frequency	Means of verification	Target level/ Standards	Responsibility	Estimated cost (TZS) per annum
		also track any potential adverse effects on employment conditions and community well-being, allowing for timely adjustments and interventions to maximize positive impacts and address any emerging issues					
Community Health and Safety	-Inspection of the emergency and detection systems; - Verification of security system and access to the TCU Headquarter office building - Inspection of available health facility in the dispensary;	<ul style="list-style-type: none"> ○ The monitoring action for this impact, involve systematic and ongoing assessments to ensure the well-being of the local community. This includes ○ Regular inspections of infrastructure and facilities, health impact assessments, and continuous air and water quality monitoring. Emergency response drills and training sessions should be conducted to prepare for any unforeseen incidents. ○ Additionally, community feedback mechanisms and grievance redress processes should be established to address any health or safety concerns raised by the local population promptly. - 	Quarterly	Measuring Incidences, Number of injured people,	<ul style="list-style-type: none"> • Fire system • Water reservoir tank • Assembly area with sign • Clear warning signs (Warning-No Smoking, No Naked Lights, Danger) 	TCU-PIU	2,000,000
Air pollution from dust emission	Measurement of particulate matter	<ul style="list-style-type: none"> ○ Monitoring the quantity and types of solid and liquid waste produced, tracking disposal methods, and ensuring compliance with environmental regulations. ○ Identify any deviations from the 	Quarterly	Measurement of particulate matter	Air emissions monitoring through a Continuous Emissions Monitoring	TCU-PIU	2,000,000

Potential Impacts	Monitoring Indicator	Monitoring Action	Monitoring Frequency	Means of verification	Target level/ Standards	Responsibility	Estimated cost (TZS) per annum
		approved waste management strategies outlined in the ESIA report. <ul style="list-style-type: none"> ○ Continuous surveillance and periodic audits should be conducted to assess the effectiveness of waste management measures, mitigate potential environmental impacts, and promote sustainable practices throughout the project's lifecycle. 			(CEM) System		
Solid and liquid waste generation	Solid and Liquid waste	<ul style="list-style-type: none"> ○ Monitoring the quantity and types of solid and liquid waste produced, tracking disposal methods, and ensuring compliance with environmental regulations. ○ Identify any deviations from the approved waste management strategies outlined in the ESIA report. ○ Continuous surveillance and periodic audits should be conducted to assess the effectiveness of waste management measures, mitigate potential environmental impacts, and promote sustainable practices throughout the project's lifecycle. 	Weekly	Observation	Environmental compliance	TCU-PIU	2,000,000
Health and Safety risks	- Number and type of safety equipment such as mask, helmet gloves and earplugs	<ul style="list-style-type: none"> ○ Ongoing assessment of workplace conditions, machinery safety, emergency response procedures, and the overall well-being of workers, students, and the local community. ○ Identify and address any potential health and safety risks promptly, fostering a secure and healthy environment 	Quarterly	Inspection; Voluntary testing;	<ul style="list-style-type: none"> • Report • Survey • Physical observation • Medical reports • Surveys 	TCU-PIU	2,000,000

Potential Impacts	Monitoring Indicator	Monitoring Action	Monitoring Frequency	Means of verification	Target level/ Standards	Responsibility	Estimated cost (TZS) per annum
		throughout the project's operational lifecycle.					
Impact due to Fire hazard	-Records of authorized HSE; -Presence of fire alarm; -Presence of firefighting equipment and records of servicing; -Presence of fire hazard signs; - Presence of fire exit signs	<ul style="list-style-type: none"> ○ Regular inspections of electrical systems, fire suppression equipment, and potential ignition sources. ○ Continuous monitoring of fire risks and readiness to address emergencies is crucial. ○ Training staff, students, and nearby communities on fire safety protocols and conducting regular drills would contribute to effective preparedness. ○ Maintaining communication channels with local emergency services and periodically reviewing and updating the Fire Prevention and Emergency Response Plan to ensure its relevance and efficiency in mitigating fire hazards. ○ Regular reporting and documentation of fire-related incidents, near misses, and corrective actions taken should be part of the monitoring system to enhance accountability and continual improvement. 	Quarterly	Inspection	Fire and Rescue Force Regulations	TCU-PIU	1,000,000
Increase in Energy Demand	-Availability and condition of solar panels; - Presence of energy conserving electric lamps	<ul style="list-style-type: none"> ○ Regular monitoring of electricity and other energy sources used in the TCU Headquarter Office Building ○ Ensure that the increased energy demand aligns with the projected estimates and complies with environmental standards. ○ Assessing the efficiency of energy use, identifying areas for potential optimization, and implementing 	Quarterly	Inspection	Efficient use of Energy	TCU-PIU	3,000,000

Potential Impacts	Monitoring Indicator	Monitoring Action	Monitoring Frequency	Means of verification	Target level/ Standards	Responsibility	Estimated cost (TZS) per annum
		measures to enhance energy sustainability					
Increase in water demand	-Presence of water conserving taps; -Presence of gutters on roofs; -Presence of notices on water serving means;	<ul style="list-style-type: none"> ○ Monitoring the water usage within the TCU Headquarter Office Building to ensure compliance with established standards and sustainable practices. ○ Assessing water extraction rates, usage efficiency, and the potential impact on local water sources. Additionally, monitoring should extend to the surrounding areas to identify any unintended consequences on the water supply for nearby communities. 	Quarterly	Inspection and measurement	Efficient use of water	TCU-PIU	3,000,000
Prevalence of Communicable diseases	Number of people who have undergone HIV/AIDS test/ Number of people tested by gender and Condoms distributed to end users	<ul style="list-style-type: none"> ○ Ongoing surveillance of water quality, sanitation practices, and healthcare accessibility. ○ Regular health assessments of the local population, assessing the incidence of communicable diseases. ○ In case of any adverse trends, immediate corrective measures and interventions should be implemented, such as improving sanitation facilities, enhancing healthcare services, and conducting awareness campaigns. ○ Identify and address potential health risks, ensuring the well-being of the community and preventing the escalation of communicable diseases during the project's operational and maintenance phases 	Annually	Observation of medical records	All workers reached with testing services and condoms	TCU-PIU	2,000,000
Total							57,000,000

CHAPTER 9: COST BENEFIT ANALYSIS

9.1 Introduction

Cost Benefit Analysis (CBA) is the systematic process for calculating and comparing absolute costs and benefits of Business Resources. Costs and benefits are expressed in concrete monetary terms. The evaluation is often argumentative. However, CBA is a general method of project evaluation. This chapter describes the cost-benefit approach and estimation methods for the major costs and benefits of the proposed establishment. Cost benefit analysis estimates and compares the total benefits and costs of a project to the members of a specified community and project owner. CBA may be conducted at various geographical levels (international, national, state or regional). Critically, the principles and methods of CBA are the same at any spatial level. However, impacts that are transfers within one spatial level, such as the nation, may be benefits or costs at another spatial level, for example at regional level.

9.1.1 Relevance and challenges

Determining whether the proposed establishment is feasible in absolute terms benefits should outweigh the costs. The relevance and challenges of quantifying CBA lies within its relevance for business operations; help to compare and prioritize measures and identify the most suitable project if comparison has to be made. However, not all data/information necessary for the assessment is readily available to allow for an accurate and comprehensive assessment.

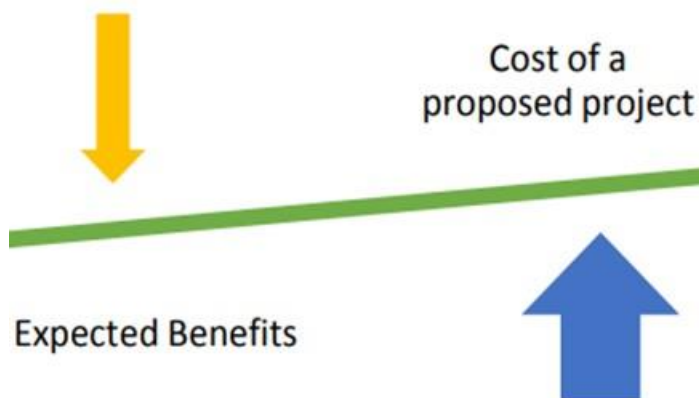


Figure 9.1: Cost and Benefit Analysis for CBA (Source: Author works through Google)

This section aggregates the costs and benefits as well as describes the following:

a. Costs:

- Project investment
- Environment
- Socio-economic

b. Benefits:

- Income
- Environment
- Socio-economic

9.2 Estimated Environmental and Social cost related to the project

According to Chapters 8 and 9, the expected annual expenses for adopting enhancement measures, impact management, and monitoring processes are around TZS 218,000,000. The environmental

costs could not be precisely calculated; hence they are not included in the anticipated expenditures for mitigation. The expenditures for these will also be short term because some of the affects won't be seen until the construction phase, especially if mitigation measures are fully adopted. Bills of Quantities contain comprehensive information on the construction expenses for each project.

9.2.1 Environmental cost

Analysis of environmental cost-benefit tradeoffs is evaluated in terms of both adverse and advantageous effects. The examination also takes into account whether the affects are reversible and whether the associated expenses are reasonable. The annual costs for monitoring and mitigating the indicated consequences are TZS. 57,000,000 and TZS. 161,000,000, respectively.

9.2.2 Community cost

The neighboring communities will bear the costs of the project's adverse environmental and social effects, such as noise pollution, deteriorated air quality, and safety and health hazards. But the use of mitigating strategies will lessen the expected effects. Other than the aforementioned, no other community events will be interfered with. TCU is dedicated to reducing the detrimental effects on society and the environment.

9.2.3 Government cost

Through the Ministry of Education, Science and Technology (MoEST), the Government of the United Republic of Tanzania has obtained funding from the World Bank to support higher education as a driving force in the country's emerging economy. The project aims to revive the crucial areas for innovation, economic growth, and relevance to the labor market. Additionally, as was already noted, taxes collected during both project phases will help the government both directly and indirectly. In addition to increasing tax revenue, the investment will boost corporate development, industrialisation, and economic growth.

9.3 Benefits related to the proposed establishment

The proposed establishment at the TCU Headquarter office building brings about direct and indirect benefits to the university, neighboring community, and the government. However, the primary benefits of the project can be further categorized as direct and indirect. While building construction projects may have some negative impacts, they are generally minimal compared to the positive benefits. Certain impacts resulting from the project cannot be precisely quantified and therefore cannot be included in benefit-cost analysis estimations. Overall, the benefits of the project are evident throughout all phases, including mobilisation, construction, operation, and decommissioning. These benefits include employment opportunities, public benefits, revenue generation, and multiplier effects that create linkages with the local and national economy.

a) Direct Benefits

The project's implementation will result in numerous employment prospects, enhance the visual appeal, provide a favorable working environment for TCU staff, generate entrepreneurial opportunities for the local community. Many of these intangible benefits directly benefit the stakeholders involved in the project.

b) Indirect Benefits

The proposed establishment brings about indirect advantages, primarily seen in the form of enhanced government revenue generated through various sectors such as TANESCO, DUWASA, NEMC, TRA, etc. It also promotes cultural exchanges, infrastructure development, and economic growth. However, due to the project's reliance on inputs from different sectors, and these sectors relying on inputs themselves, there will be successive rounds of interactions among them, leading to additional output from each sector of the economy.

9.3.1 Benefits to TCU

The establishment of a purpose-built office building will provide TCU with a centralized and efficient workspace, fostering improved collaboration and communication among its staff. Additionally, the new headquarters can enhance the organization's image and operational effectiveness, potentially attracting top talent and promoting the commission's objectives. The ESIA process ensures that the project is conducted in an environmentally and socially responsible manner, aligning with TCU commitment to sustainable development. Overall, the investment in the new headquarters is expected to yield long-term benefits for TCU in terms of improved functionality, visibility, and organizational performance.

9.3.2 Benefits to the Local Community

The construction and operation of the TCU headquarters are expected to generate employment opportunities for the local population, fostering economic growth. Additionally, the project may lead to improved infrastructure and services in the vicinity, enhancing the overall quality of life for residents. Socially, the presence of TCU in the area could contribute to community development initiatives and educational programs, further enriching the lives of Kisasa B residents. Overall, the project's cost-benefit analysis suggests a promising avenue for local empowerment and positive socio-economic impact. Additionally, the project is expected to bring about the following economic and social advantages:

- Increased economic activity in the local area.
- Enhanced infrastructure and services within the vicinity of the TCU Headquarter office building
- Potential growth in related industries, such as hospitality, transportation, and retail.
- Improved access to education and research opportunities for the local community.

9.3.3 Benefits to the Government

The establishment of the TCU Headquarters office building aligns with the government's commitment to enhancing the education sector and institutional infrastructure. The new headquarters will provide a centralized and modern facility for TCU operations, fostering efficiency and effectiveness in managing university affairs. Additionally, the project will contribute to economic development by generating employment opportunities during construction and subsequently supporting the local economy. From an environmental perspective, the assessment ensures that the construction and operation of the building adhere to sustainability standards, minimizing negative impacts on the surrounding environment. In summary, the project not only addresses the infrastructure needs of TCU but also promotes economic growth, job creation, and environmental responsibility, aligning with the government's broader goals for development and sustainability.

9.4 Conclusion on Cost Benefits Analysis

The project's environmental and social costs are relatively low in value when compared to the benefits it will bring. The option of not proceeding with the project is rejected as it is necessary and desirable to have institutions that help in delivering high-quality education, conducting impactful research, and providing valuable public services. The project will directly promote investment in different businesses and services, as well as improve Tanzania's reputation as a preferred investment destination. These factors will create more employment opportunities for Tanzanians and contribute to poverty eradication efforts. Therefore, the implementation of the project will bring overall benefits to the country.

CHAPTER 10: DECOMMISSIONING PLAN

10.1 Preliminary Decommissioning Plan

The project is anticipated to last for 100 years based on buildings standards and regulation, and this document outlines an initial decommissioning plan. The plan aims to establish practical decommissioning approaches that can be executed safely, without endangering the public's health and safety, decommissioning personnel, or causing harm to the environment. It adheres to the guidelines and regulations set by relevant regulatory agencies. The purpose of this preliminary decommissioning plan is to ensure that the decommissioning and final disposition of the project though it's not expected to happen are taken into account during the project's initial design phase.

This preliminary plan will remain a dynamic document and undergo revisions throughout the operational life of the project. Regular reviews and updates will be conducted to incorporate any changes in facility construction or operation that may impact the decommissioning process.

The Contractor will be required to prepare a detailed Demolition Plan and Construction Management Plan to the satisfaction of the proponent and relevant Authorities prior to the commencement of works on site.

10.2 Objectives of the Plan

The initial plan aims to prioritize the inclusion of decommissioning as a crucial factor right from the beginning of the project, throughout the design phase, and during the operation phase. The plan serves the following objectives:

- The primary objective of the preliminary plan is to ensure that designers of the building and infrastructure are fully aware of decommissioning requirements during the initial project design. This means that if there are design options available for materials, system components, and component locations that can enhance decommissioning, those choices should be made.
- Another goal of the preliminary plan is to identify the potential decommissioning options and the final status of the facility. These options will be evaluated and narrowed down to the preferred decommissioning method as the end of the project lifespan approaches.
- The final purpose of the preliminary plan is to demonstrate to regulatory agencies that important considerations regarding decommissioning are taken into account as early as possible during the initial project design.
- Additionally, the plan serves as a starting point to showcase various aspects related to decommissioning, such as methods, costs, schedules, and the operational impact on the infrastructure facilities.
- The plan acts as the initial reference to show that aspects like decommissioning techniques, expenses, timelines, and operational effects on decommissioning will undergo continuous evaluation and improvement throughout the operational lifespan.

The plan will outline feasible decommissioning methods for the project, providing a general description. This description should demonstrate the practicality of the considered methods and their ability to ensure the health and safety of the public and decommissioning personnel. Design personnel should thoroughly examine the proposed decommissioning methods and take measures to incorporate design features that will facilitate the decommissioning process. Key considerations include:

- a. Estimating the required manpower, materials, and costs to support the decommissioning activities.

- b. Describing the intended final disposition and status of the plant and site after decommissioning.
- c. Discussing the commitment to allocate adequate financing for the decommissioning process.
- d. Identifying the necessary records to be maintained throughout the construction and operation phases that will aid in decommissioning, such as a complete set of "as built" drawings.

10.3 Preliminary Plan

10.3.1 Project Removal Methodology and Schedule

The Proponent is responsible for financing and carrying out all aspects of project decommissioning, which includes engineering, environmental assessment, permitting, construction, and mitigation activities related to the removal of the building facilities, as outlined in this Plan. The Proponent must also address the environmental impacts during and after the project removal by promptly responding to defined events during the monitoring phase.

Furthermore, the university is obligated to safely remove the facilities and its accompanying structures in a manner that:

- Minimizes any adverse environmental effects.
- Meets the company's obligations under the Environmental Management Act (2004).
- Restores the site to a condition suitable for various uses.
- Pays all outstanding dues to workers, the government, suppliers, and other relevant parties.

The process of project removal will commence six months after closure and extend for a period of 2 years. During the initial six months following closure, the proponent will conduct an inventory of all components requiring removal or disposal. This inventory will encompass the identification of buildings and structures, to be demolished. Additionally, the method of disposal will be finalized. This information will be crucial for the development of the final decommissioning plan, which will then undergo approval by NEMC.

Upon approval of the decommissioning plan, the removal of metal parts will be prioritized within the first month to prevent any potential vandalism. Subsequently, in the second month of the decommissioning process, the focus will shift towards removing concrete structures and foundations. The resulting debris will be repurposed as fill material for rural roads.

10.3.2 Component to be demolished

The elements of the project that need to be demolished are typically built using load-bearing masonry walls along with roofs made of steel or timber frames, as well as metal roofs.

1. Buildings and other infrastructure

- All construction elements, such as buildings, pillars, platforms, or ramps supporting machinery or equipment, will be dismantled and secured to ensure safety. The areas previously occupied by these structures will be restored and replanted with vegetation as necessary.
- Equipment that is no longer functional will be sold through an auction process to scrap dealers.
- The future utilisation of the water supply infrastructure (pipeline) will be determined in collaboration with the National and City Closure Committees. The project aims to transfer the pipeline infrastructure to the district for its ongoing use.

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

10.3.3 Decommissioning Phase

Project decommissioning has five phases:

- Pre-removal monitoring;
- Permitting;
- Interim protective measures;
- Project removal and associated protective actions; and
- Post-removal activities, including monitoring of environment and socio-economic activities.

The initial three phases will occur before the Project is removed, specifically within the first six months. The fourth phase, which involves the removal of the project and necessary protective measures, will take place six months after project closure. The fifth phase will commence after complete removal of the project, and due to its medium scale and relatively moderate impacts, it will continue for at least two years.

The following description outlines the activities that will occur in each phase:

- a. **Pre-removal monitoring:** This phase involves assessing the environmental and socio-economic conditions of the project and its surroundings. The purpose is to identify any environmental or social liabilities that need to be addressed before obtaining closure permits. Additionally, this period will include inventorying all assets and facilities that require disposal and preparing a final decommissioning plan for approval by the National Environment Management Council (NEMC).
- b. **Permitting:** The proponent will acquire all necessary permits required for the project's removal. This includes permits from MoEST, NEMC, Local Government Authorities, and others as necessary.
- c. **Interim Protective Actions:** This phase focuses on implementing any interim measures necessary to safeguard human health and the environment during the removal process.
- d. **Project Removal:** As mentioned earlier, the project will be completely removed within a six-month timeframe.
- e. **Post-Removal Activities:** Following the project's removal, monitoring activities will continue for a period of two years to assess any lingering impacts.

Detailed information regarding the decommissioning of the project and its associated impacts, as well as proposed measures to restore the site to its former state, are provided in Table 10.1. The estimated cost for the decommissioning plan is TZS 90,000,000, which is subject to change based on currency value and other economic factors at that time.

Table 10.1: Decommissioning and Closure Plan

Activity	Closure Plan	Responsibility	Estimated Budget
Take apart all the equipment and dismantle the structures.	<ul style="list-style-type: none"> ○ Take apart electrical devices such as air conditioners, generators, and other machinery. ○ Consult with TANESCO (Tanzania Electric Supply Company) to disconnect the power supply for the building project. ○ All concrete and metal structures, including offices, washrooms, and pavements, will be demolished. ○ Warning signs will be displayed, and a fence will be erected around all commercial buildings. ○ Qualified engineers will supervise all disassembling and demolition activities. ○ The Closure Committee will oversee and monitor all closure activities to ensure proper execution. ○ Technical assistance during the closure phase will be sought by consulting relevant stakeholders. 	TCU and Closure Committee	40,000,000
Personal Protective Equipment (PPE)	<ul style="list-style-type: none"> ○ During the closure phase, it is mandatory for all workers to wear suitable personal protective equipment (PPE) such as a helmet, safety boots, dust mask, safety gloves, goggles, protective garments, and a safety vest. 	TCU and Closure Committee	10,000,000
Waste Management	<ul style="list-style-type: none"> ○ During the closure phase, proper waste sorting will be implemented for efficient management. ○ A review process will be established to regularly update the waste management plan to adapt to changes in building plans, schedules, community standards, and recognized best practices. ○ Instead of being dumped on land, debris can be utilized to fill feeder roads, providing an alternative use. ○ Metal materials will be collected and transported to steel factories for recycling and subsequent metal production. ○ All hazardous wastes discovered during the decommissioning of the building will be cleaned up and disposed of in accordance with regulations. ○ The closure committee will ensure that no waste is disposed of in water bodies. 	TCU and Closure Committee	10,000,000

Activity	Closure Plan	Responsibility	Estimated Budget
Rehabilitation of project site	<ul style="list-style-type: none"> ○ A suitable re-vegetation plan will be executed to restore the site to its original condition. ○ Measures will be implemented during the vegetation period to control surface water runoff and prevent erosion. ○ Regular monitoring and inspection of the area will be carried out to identify any signs of erosion, and necessary actions will be taken to rectify any occurrences. ○ Fencing and signage will be installed to limit access and minimize disturbances in newly vegetated areas. 	TCU and Closure Committee	30,000,000

CHAPTER 11: SUMMARY AND CONCLUSION

11.1 Summary

The ESIA for the proposed establishment of the TCU Headquarters Office Building on Plot No. 56/4 Block E, Kisasa B Area, Ilazo Mbuyuni Street, Ipogala Ward, Dodoma City Council in Dodoma City is a comprehensive evaluation of the potential environmental and social consequences associated with the construction and operation of the TCU headquarters. The assessment considers various aspects such as land use, air and water quality, biodiversity, noise, and socio-economic factors.

The study examines the potential impacts that the project may have on the surrounding environment and local communities, aiming to identify measures for mitigating adverse effects and enhancing positive outcomes. It includes an analysis of alternative sites, technologies, and designs to minimize environmental and social risks.

11.2 Conclusion

The EIA for the proposed TCU Headquarters Office Building in Dodoma City acknowledges the project's potential benefits for educational infrastructure and administrative efficiency but raises concerns about its environmental and social impact. These include disruptions of social and economic activities, increased traffic, and effects on community well-being. Hence, the report recommends implementing mitigation measures like sustainable building practices, waste management, traffic plans, and community engagement. Also, the EIA serves as a guide for decision-makers to balance developmental needs with environmental and social sustainability, emphasizing the importance of effective implementation and ongoing monitoring for the project's success.

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APPENDICES

Appendix 1: Approved Terms of Reference



THE UNITED REPUBLIC OF TANZANIA

VICE PRESIDENT'S OFFICE

NATIONAL ENVIRONMENT MANAGEMENT COUNCIL
(NEMC)



In reply please quote:

Ref: HD.88/145/161/02

27 November 2023

Tanzania Commission for Universities (TCU),
P. O. Box 11479,
DAR ES SALAAM

Re: **TERMS OF REFERENCES (ToRs) FOR THE ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) FOR THE PROPOSED ESTABLISHMENT OF TANZANIA COMMISSION FOR UNIVERSITIES (TCU) HEADQUARTERS OFFICE BUILDING ON PLOT NO. 56/4 BLOCK E, KISASA B AREA, ILAZO MBUYUNI MTA, IPAGALA WARD, DODOMA CITY IN DODOMA CITY**

Please, refer to the named subject.

2. The National Environment Management Council (NEMC) acknowledges receipt of your documents submitted on 15th November, 2023 allotted with the registration number EC/EIA/2023/7352. Having reviewed your Scoping Report, the Council decided that, the Environmental 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. While preparing the EIS, please, observe the following:

- i) Detailed stakeholders consultation including but not limited to Occupational Health and Safety Authority, Fire and Rescue Force, Relevant Basin Water Board, City Council of Dodoma, Dodoma Urban Water and Sanitation Authority, Geological Survey of Tanzania (GST), Relevant Ward/Mtaa office and neighbours;
- ii) The contents and organization of the report should comply with regulation 18(2)(a) i to xvi of the Environmental Impact Assessment and Audit Regulations, 2005 and its subsequent amendment regulations of 2018;
- 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(stumped and signed);
 - d) Other relevant licences and permits;

3. The budget for review and approval activities amounts to TZS 5,000,000/= 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 and from the project site. Therefore, you will be required to make arrangements for transport for the site verification team.

4. In case you need further clarification on this process please contact us through Tel. No. 0754815157.

5. Thank you for your continued cooperation.




Dr. C. A. Kahangwa
For: **DIRECTOR GENERAL**

C.C: Earth Environmental Experts Ltd,
P.O. Box 35413,
Dar es Salaam.

Appendix 2: Certificate Of Occupancy

THE UNITED REPUBLIC OF TANZANIA
MINISTRY OF LANDS, HOUSING AND HUMAN SETTLEMENTS DEVELOPMENT

Telephone: 026 2322185
Fax: 026 2320029
Email:
In reply please quote:
Ref. No. LR/DOM/T/



REGISTRAR OF TITLES
P. O. Box 1062,
DODOMA


27-9-2019

TO: TANZANIA COMMISSION OF UNIVERSITIES
BOX 6262
DAR ES SALAAM

TITLE No. 47769-DLR LO No. 1030673
PLOT No. 56/4 BLOCK No. E LOCATION KISASA B-CENTRE
DODOMA MUNICIPALITY

I have the honor to enclose herewith duplicate of the certificate of Title Numbered as above please.

cc LAND DIVISION


J. AWADH
ASST. REGISTRAR OF TITLES

CERTIFICATE OF OCCUPANCY
(Under Section 29)

Date of Issue:
Title Number: 47769-DLR
Land Office Number: 1030673
Land: FLOT NO 56/4 BLOCK 'B' KISASA B-CENTRE DODOMA MUNICIPALITY

Land Form No.22

THE UNITED REPUBLIC OF TANZANIA

THE LAND ACT, 1999
(NO. 4 OF 1999)

CERTIFICATE OF OCCUPANCY
(Under Section 29)

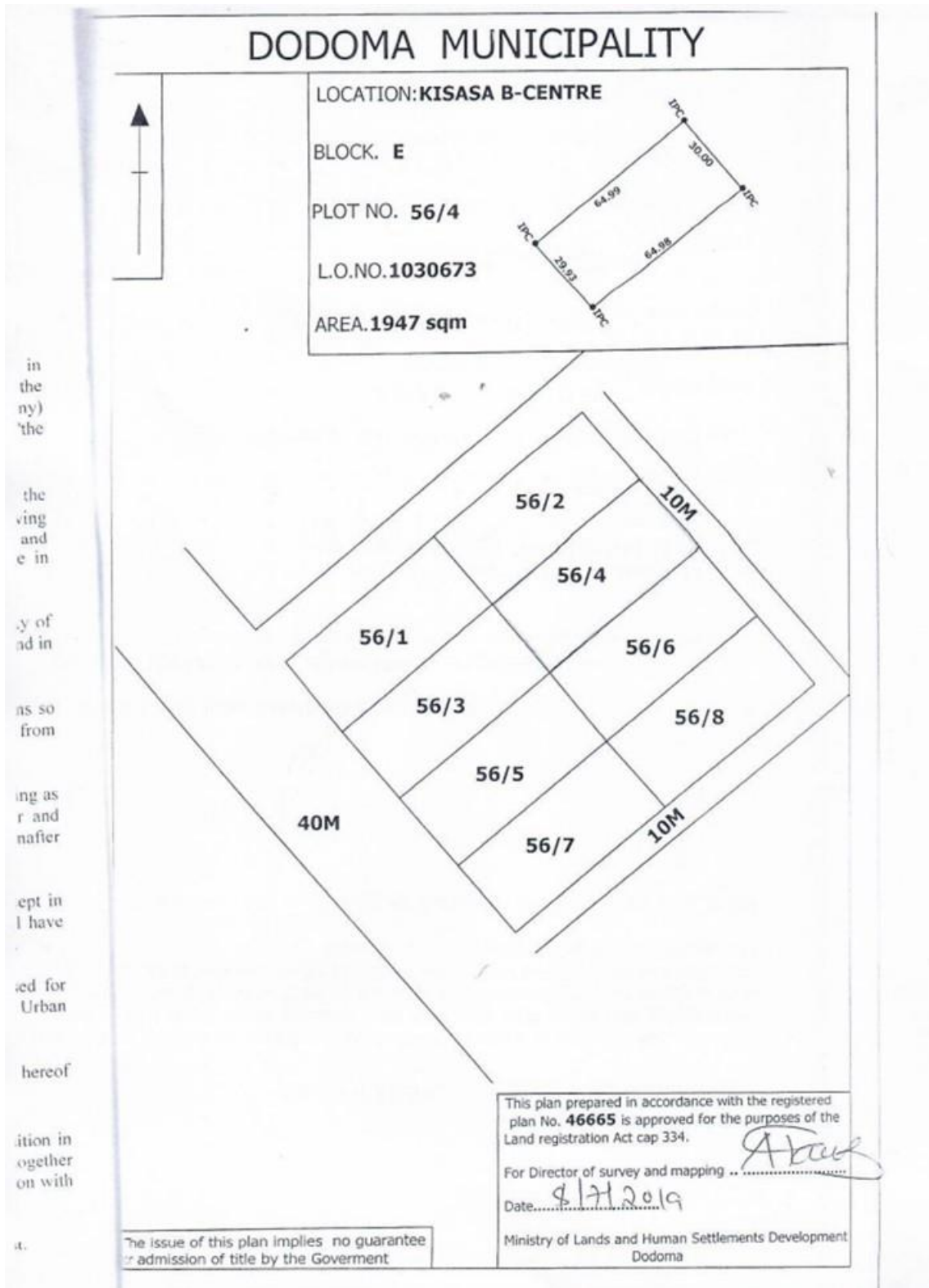
Title No. 47769-OLR
L.O. No. 1030673
DMC/LD. No. 56897

The 6th day of Sept, Two thousand and Nineteen.

THIS IS TO CERTIFY that TANZANIA COMMISSION FOR UNIVERSITIES Established under the university Act, 2005 of P.O. Box 6262, DAR ES SALAAM (hereinafter called "the Occupier") is entitled to the Right of Occupancy (hereinafter called "the Right") in and over the land described in the Schedule hereto (hereinafter called "the Land") for a term of ninety nine (99) years from the first day of July, two thousand and eleven according to the true intent and meaning of the Land Act and subject to the provisions thereof and to any regulations made there under and to any enactment in substitution thereof or amendment thereof and to the following special conditions:-

1. The Occupier having paid rent up to the thirtieth day of June, 2020; shall hereafter pay rent of **One hundred sixteen thousand Eight hundred twenty (116,820/=) shillings only** a year in advance on the first day of July in each of the term without deduction PROVIDED that the rent may be revised by the Commissioner for Lands.
2. The Occupier shall:-
 - (i) Be responsible for the protection of all beacons on the land throughout the term of the Right. Missing beacons will have to be re-established at any time at the Occupiers' expenses as assessed by the Director responsible for Surveys and Mapping.
 - (ii) Do everything necessary to preserve the environment and protect the soil and prevent soil erosion on the land and do all things which may be required by the authorities responsible for environment and to achieve such objective.

- (iii) Erect on the Land Buildings (hereinafter called 'the building') in permanent materials designed for use in accordance with the condition of the Right and which conform to the building line (if any) decided by **Dodoma Municipality Council** (hereinafter called 'the authority').
 - (iv) Within Six Months from commencement of the rights submit to the Authority such plans for buildings (including block plans showing the position of the buildings) such as drawings, elevations and specifications of them as will satisfy the Authority and as are in accordance with the building conditions.
 - (v) Within six months from the date of notification by the Authority of approval of the plans and specifications, begin building on the land in accordance with the building conditions.
 - (vi) Complete the buildings according to the plans and specifications so that they ready for use and occupation within thirty six months from the date of commencement of the rights.
 - (vii) At all times during the term of the Right have on the land building as approved by the Authority and maintain them in good order and repair to the satisfaction of the Commissioner for Lands. (Hereinafter called 'the Commissioner')
 - (viii) Not erect or commence to erect on the land any building except in accordance with building plans and specifications which shall have been first approved by the Authority as here in before provided.
3. **USER:** The land and the buildings to be erected thereon shall be used for **Office purposes only. Use Group 'G' Use classes (a) as defined in the Urban Planning (Use Groups and Use Classes) Regulations, 2018.**
 4. The Occupier shall not assign the Right within three years of the date hereof without the prior approval of the Commissioner.
 5. The Occupier shall deliver to the Commissioner notification of disposition in prescribed form before or at the time the disposition is carried out together with the payment of all premier, taxes and dues prescribed in connection with that disposition.
 6. The President may revoke the right for good cause and in public interest.



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SCHEDULE

ALL that Land known as Farm No.56/4 situated at **Kisasa B-Centre** in **Dodoma Municipality** containing **One thousand nine hundred forty seven (1947) Square metres** shown for identification only edged **red** on the plan attached to this Certificate and defined on the registered Survey Plan Numbered **46665** deposited at the Office of the Director for Surveys and Mapping at Dar es Salaam.

Given under my hand and my official seal the day and year first above written.



ASSISTANT COMMISSIONER FOR LANDS

We, the within-named **TANZANIA COMMISSION FOR UNIVERSITIES** hereby accept the terms and conditions contained in the foregoing Certificate of Occupancy.

SEALED with the **COMMON SEAL** of the said)
TANZANIA COMMISSION FOR UNIVERSITIES)
in the presence of us this...29th...day of...May... 2019)

Signature CKhanga)

Name: PROF. CHARLES DOMMINICK KHANGA)

Postal Address: P. O. Box 6562)
DAR-ES-SALAAM)

Qualification: EXECUTIVE SECRETARY)

Signature Rutta)

Name: ROSELINE JOSEPH RUTTA)

Postal Address: P. O. Box 6562)
DAR-ES-SALAAM)

Qualification: LEGAL OFFICER)
TANZANIA COMMISSION FOR)

Appendix 3: Ambient Gases Measured at the project area

Code & Coordinate	O ₂	O ₃	CO ₂	CO	NO	NO _x	SO ₂
	%	%	ppm	mg/m ³	mg/m ³	mg/m ³	mg/m ³
AQMS1 (-6.1480936, 35.8087608)	21	<0.00	100	<0.00	<0.00	<0.00	<0.00
AQMS2 (-6.1480935, 35.8087609)	20.9	<0.00	113	<0.00	<0.00	<0.00	<0.00
AQMS3 (-6.1480968, 35.8087609)	21	<0.00	102	<0.00	<0.00	<0.00	<0.00
AQMS 4 (-6.1480967, 35.8087605)	20.9	<0.00	119	<0.00	<0.00	<0.00	<0.00
TBS Limits	23.5	0.1	600	15	0.12	0.12	0.5
WHO/IFC Guidelines	19.5	0.12	500	30	0.2	0.2	0.5

Sampling date: October 2023

Source: Field Measurement

Appendix 4: Particulate Matter Measured at the project area

Code & Coordinate	PM ₁₀	PM _{2.5}
	µg/m ³	µg/m ³
AQMS1 (-6.1480936, 35.8087608)	6.0	6.3
AQMS2 (-6.1480935, 35.8087609)	6.1	6.2
AQMS3 (-6.1480968, 35.8087609)	6.1	6.0
AQMS 4 (-6.1480967, 35.8087605)	6.4	6.2
TBS Limits	150	75
WHO/IFC Guidelines	50	25

Sampling date: October 2023

Source: Field Measurement

Appendix 5: Noise levels (in dBA) recorded at the project area

Code & Coordinate	Average Noise during the Day	Average Noise during the Night
	dBA	dBA
AQMS1 (-6.1480936, 35.8087608)	66.5	45
AQMS2 (-6.1480935, 35.8087609)	68.9	50
AQMS3 (-6.1480968, 35.8087609)	67	49.9
AQMS 4 (-6.1480967, 35.8087605)	66.7	50
Environmental Management (Standards for Control of Noise and Vibration Pollution) Regulations, 2015	60	50
WHO/IFC Guidelines	85	85

Sampling date: October 2023

Source: Field Measurement

Appendix 5: vibration (in mm/s PPV) at the project area

Code & Coordinate	Vibration
	mm/s
AQMS1 (-6.1480936, 35.8087608)	<0.00
AQMS2 (-6.1480935, 35.8087609)	<0.00
AQMS3 (-6.1480968, 35.8087609)	<0.00
AQMS 4 (-6.1480967, 35.8087605)	<0.00
Environmental Management (Standards for Control of Noise and Vibration Pollution) Regulations, 2015	5
WHO/IFC Guidelines	5

Sampling date: October 2023

Source: Field Measurement

