

**ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR
THE PROPOSED CONSTRUCTION OF POSTGRADUATE BUILDING WITH SCIENCE RESEARCH
LABORATORY AND FACULTY OF HUMANITIES WITH LECTURE ROOMS AND ROOMS FOR
SPECIAL STUDENTS LOCATED AT PLOT NO. 324 & 325 BLOCK 'T', NATIONAL STADIUM
STREET,
MIBURANI WARD, TEMEKE MUNICIPAL IN DAR ES SALAAM**

PROPONENT:



**UNITED REPUBLIC OF TANZANIA
MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY
UNIVERSITY OF DAR ES SALAAM
DAR ES SALAAM UNIVERSITY COLLEGE
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EXECUTIVE SUMMARY

Introduction

DUCE, through the Government of the United Republic of Tanzania (URT) has received financing from the World Bank to implement Higher Education for Economic Transformation Project (HEET). DUCE intends to upgrade its infrastructures by constructing six storey building for postgraduate building with science research laboratories and six storey building for Faculty of Humanities and Social Sciences building within the compound on Plot Number 324 and 325 Block 'T' National Stadium Street, Miburani ward, Temeke Municipality.

The Environmental Management Act of 2004 of Tanzania requires project developers to carry out an Environmental and Social Impact Assessment (ESIA) prior to project implementation. In accordance with the categories identified in the Third Schedule to Environmental Management Act, Cap 191 and First Schedule to Environmental Impact Assessment and Audit (Amendment) Regulations, 2018, the nature of this project is subject to full EIA study.

Similarly, the World Bank provides Environmental and Social Framework (ESF), Environmental and Social Safeguarding Policies (ESSP) and relevant Environmental and Social Standards (ESSs), which aim to offset the anticipated social and environmental risks and impacts. The ESS1 for example, sets out the requirements for Borrowers relating to the identification and assessment of environmental and social risks and impacts and development of mitigation measures.

Therefore, Environmental Management Act, Cap 191, the Environmental Impact Assessment and Audit (Amendment) Regulations, 2018, World Bank Environment and Social Framework (ESF), Environmental and Social Standards as well as the HEET Project's Environmental and Social Management Framework (ESMF) were observed in the study.

Project Description

The College is located on Plot No. 324 and 325 Block 'T' Chang'ombe in Temeke Municipality, Dar es Salaam Region, adjacent to the new National Stadium and about 5KM from the City Centre via Kilwa Road. The College consists of 52.97 acres of land. This strategic location of the College provides opportunities in different areas of investment due to its proximity to City centre. The site for postgraduate building is located at the current football pitch with a foot print of 1,000sqm. The site is relatively flat covered with small grasses. Neither wildlife nor domestic animals were observed at the project site.

The site for building of Faculty of Humanities and Social Sciences is located at the center of DUCE campus. There are about 32 concrete benches (*Vimbwete*) which shall be relocated to another suitable area to pave way for the project. The footprint of the building is expected to be 1,500sqm. The vegetation of the area is characterized by

exotic trees including 13 neem trees and some flowers. Neither wildlife nor domestic animal was observed at the project site.

The main source of electricity at DUCE is from Tanzania Electric Supply Company (TANESCO) but there are two standby generators which are used when there is shortage of electrical supply, in the occurrence of power outage, the contractor will have to incorporate the use of a separate additional generator. The water source in DUCE is mainly from the boreholes and the same shall be during construction and operational period. Solid wastes shall be collected at the solid waste transfer stations on site and then transported to municipal dump site for disposal by the contacted companies which are GENESIS professional cleaning company and CHESS cleaning company. Liquid wastes shall be disposed to the septic systems present on site. Also there will be an additional septic tank for each new constructed building.

Policy and Legal Framework

Tanzania is committed to attaining sustainable development goal. A few policies and legislation that have a close bearing to education sector and construction industry are; National Environmental Policy (NEP) of 2021; Construction Industry Policy (2003); National Land Policy (1995); National Human Settlements Development Policy (2000); National Gender Policy (2002); Energy Policy (1992); The National Water Policy (2002); The National Health Policy (2003); Environmental Management Act No. 20 of (2004), Cap. 191; The Water Supply and Sanitation Act No. 12 of 2009; The Land Act, 1999; The Urban Planning Act (2007); Occupation Health and Safety (2003); Employment and Labour Relations Act No. 6 Of 2004; Engineers Registration Act and its Amendments 1997 and 2007; The Contractors Registration Act (1997); The Architects and Quantity Surveyors Act (1997); The Local Government Laws (Urban Authorities) Act (1999); Public Health Act 2009; The Tanzania Development Vision 2025; Fire and Rescue Act (2007); Environmental Impact Assessment and Auditing Regulations (2005); The Environmental Regulations (Standards for control of noise and Vibrations, 2014; The Environmental Management (Air Quality Standards) Regulations, 2007; Environmental Management (Solid waste Management) Regulation, 2009 GN. NO. 263.

Furthermore, this ESIA study has complied with the following tools:

- i. World Bank's Environmental and Social Framework (ESF);
- ii. The World Bank Environmental and Social Safeguarding Policy for Investment;
- iii. World Bank relevant Environmental and Social Standards (ESSs).

This ESIA has also applied 6 relevant standards out of 10 ESSs, which are:

- ESS1- Assessment and Management of Environmental and Social Risks and Impacts;
- ESS2 - Labour and Working Conditions;
- ESS3 - Resource Efficiency and Pollution Prevention and Management;
- ESS4 - Community Health and Safety;
- ESS8 – Cultural Heritage; and
- ESS10 - Stakeholder Engagement and Information Disclosure.

Stakeholder Consultation

Stakeholders' identification and engagement process was conducted based on EIA and Audit Regulations, 2005 and its amendment of 2018, World Bank Environmental and Social Standards (ESS10) and Stakeholders Engagement Plan (SEP). The project involved various stakeholders considering gender, vulnerable people as well as people with special needs. They were consulted to get their views throughout the project life. 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 Key stakeholders consulted during ESIA study include the following; Temeke Municipal Council, Occupational Safety and Health (OSHA), Tanzania Electric Supply Company Limited (TANESCO), Fire and Rescue Forces (Temeke), Legal and Human Rights Centre (LHRC), Tanzania Gender Network Programme (TGNP), Miburani Ward Office (WEO); and National Stadium Street Executive Officer (MEO). Also scoping reports was submitted to get inputs from the Ministry of Education, Science and Technology (MoEST), Ministry of Health, Community Development, Gender, Elderly and Children (MoHCDGEC) and Tanzania Electric Supply Company Limited (TANESCO), Fire and Rescue Forces (Temeke), Legal and Human Rights Centre (LHRC) and Tanzania Gender Network Programme (TGNP). The inputs received include the following:

- In terms of Waste Management there must be, proper solid waste and wastewater collection system during construction and operation phase;
- Developer and contractor must cooperate with local government authority during both phases of the project; and
- Contractor and developer must adhere to all provisions of Occupational Safety and Health Act 2003

Assessment of Environmental and Socio-Economic Impacts

(a) The assessed environmental risks and impacts were based on:

- i. World Bank Environmental Health and Safety Guidelines (EHSGs);
- ii. Effects related to climate change;
- iii. Effects of any material threat to the protection, conservation, maintenance and restoration of natural habitats and biodiversity;
- iv. Effects related to ecosystem services and the use of living natural resources; and those related to the design of the physical facilities.

(b) The assessed socio-economic risks and impacts were based on:

- i. Threats to human security through crime or violence; and
- ii. Risks that project impacts fall disproportionately on individuals and groups who because of their particular circumstances, may be disadvantaged or vulnerable

Identified Impacts

The development of teaching buildings and offices shall cause a wide range of environmental and social impacts on a number of receptors. The impacts are of both positive and negative nature. The identified significant environmental impacts during construction phase include; air and noise pollution; waste generation and

management; occupational safety and health risks; erosion of cleared areas; loss of vegetation, and construction vibration. Social impacts during construction are employment opportunities; GBV and sexual harassment; community health and safety risks, Transmission of Vector Borne and Communicable Diseases; Impacts associated with Transmission of Sexually Transmitted Infections; Impacts associated with Spreading of Covid 19 Pandemic; and Impacts on Labour and Working Conditions.

The identified significant environmental impacts during operation phase include; health and safety risks due to fire hazards and waste generation and management. The positive Social Impacts to communities are employment, reduction of gender gap in enrollment and completion rates, increase in economic activities, regional integration, increased revenue to the council and country as a whole, increased pressure on social services and utilities.

Consideration of Alternatives

Different alternatives were considered in this study including no project alternative, alternative sites, alternative designs, Energy Alternative and Wastewater treatment Alternatives. The no project alternative was disqualified because choosing that alternative shall mean to remain with the status quo (without project) and losing all the benefits of the project. Existing water sources (boreholes) was preferred than other water sources like rainwater harvesting. Electricity from National grid was preferred, however solar energy shall be explored and if feasible shall be used. For wastewater management, onsite sanitation system was preferred because there is no Municipal Central Sewer System (MCSS).

Environmental and Social Management Plan

The options to minimize or prevent the identified adverse social and environmental impacts as well as a monitoring plan have been suggested in this report and are contained in the project's ESMP in which the majority of them are based on good engineering practices. The Environmental and Social Management Plan (ESMP) presents the implementation schedule for the proposed mitigation measures to both environmental and social impacts as well as planning for long-term monitoring activities. The project's ESMP also includes the associated environmental costs needed to implement the recommended mitigation measures. The engineering designs shall include the mitigation measures recommended in this report.

Cost Benefit Analysis

This project is purely a service and therefore it is not possible to convert all the social benefits into monetary terms. Therefore, an indicative and elementary description of the environmental and social costs and benefits was presented and compared (qualitatively). The comparison of the positive and negative impacts of the project show that the project have more benefits than costs.

Project Decommissioning

As decommissioning will take place in the remote future (approximately 50 years), the specific conditions for mitigation are generally inherently uncertain. In view of this,

specific mitigation measures pertaining to environmental impacts of decommissioning works cannot be proposed at the moment with a reasonable degree of certainty.

A decommissioning plan that takes environmental issues into consideration shall be prepared by the developer prior to the decommissioning works. Should it be done, decommissioning may entail a change of use (functional changes) or demolition triggered by change of land use.

This ESIA have prepared brief outline of the works required to demolish the proposed project on the site incase it happen. This Plan will be used as a reference document that provides the framework to ensure that demolition activities on the site do not adversely affect the health, safety, traffic or the environment of the public and neighbouring properties. The identified significant environmental impacts during decommissioning phase include; air (dust) and noise pollution; waste generation and management; occupational safety and health risks; and vibration. Social impacts during construction are employment opportunities and community health and safety risks. The Contractor will be required to prepare a detailed demolition plan and construction management plan to the satisfaction of the developer and relevant authorities prior to the commencement of works on site.

Conclusion

The ESIA study results show that although there are some limited negative environmental implications of the project, the project will have high benefits to the DUCE and Tanzania as a whole. The associated negative impacts, to a large extent have been minimized through good engineering design and envisaged construction practices. Specific mitigation measures have been suggested in this report to offset some of the inherent adverse impacts. Implementing these mitigation measures would increase environmental soundness of the project.

It can therefore be concluded that, the proposed DUCE Postgraduate and Humanity and Social Sciences buildings project will entail no significant impacts provided that the recommended mitigation measures are adequately and timely implemented. The identified impacts will be managed through the proposed mitigation measures and implementation regime laid down in this ESIA. The developer is committed in implementing all the recommendations given in this ESIA and further carrying out the environmental auditing and monitoring schedules.

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ACRONYMS AND ABBREVIATIONS

	Application Reference Number
ARN	
BCR	Benefit Cost Ratio
BI	Building Inspector
BATNEEC	Best Available Technology Not Entailing Excess Cost
CBD	Central Business District
CDO	Community Development Officer
CISCO	Commercial & Industrial Security Corporation
CITES	Convention on International Trade in Endangered species of Wild Fauna and Flora
CRB	Contractors Registration Board
DoE	Division of Environment
DAWASA	Dar es salaam Water Supply and Sanitation Authority
DUCE	Dar es Salaam University College of Education
ESIA	Environmental and Social Impact Assessment
EIA	Environmental Impact Assessment
ESMF	Environmental and Social Management Framework
ESF	Environmental and Social Framework
EMA	Environmental Management Act
EMO	Environment Management Officer
EMP	Environmental management Plan
ERB	Engineers Registration Board
ESMP	Environmental and Social Management Plan
ESS	Environmental and Social Standards
EWURA	Energy and Water Utilities Regulatory Authority
GFA	Ground Floor Area
GBV	Gender Based Violence
GMU	Gender Management Unit
GOT	Government of Tanzania
GRM	Grievance Redress Mechanism
HEET	Higer Education for Economic Transformation Project
HIV	Human Immune Deficiency Virus
IAPS	Interested and Affected Parties
ICT	Information and Communication Technologies
IFC	International Finance Corporation
LHRC	Legal and Human Right Centre
LGA	Local Government Authorities
MARPOL	Marine Pollution from ships
MEO	Mtaa Executive Officer
MCSS	Municipal Central Sewer System
MoEST	Ministry of Education, Science and Technology
NCIP	Northern Corridor Initiative Project
NEMC	National Environment Management Council
NEP	National Environmental Policy
NGO	Non-Governmental Organisation

OSHA	Occupational Safety and Health Authority
PCU	Project Coordination Unit
PEA	Preliminary Environmental Assessment
PAD	Project Appraisal Document
POM	Project Operational Manual
PPA	Project Preparation Advance
PPE	Personal Protective Equipment
SEA	Strategic Environmental Assessment
SEP	Stakeholders Engagement Plan
TAC	Technical Advisory Committee
TACAIDS	Tanzania Commission for AIDS
TGNP	Tanzania Gender Network Program
TANESCO	Tanzania Electricity Supply Company Limited
TANROAD	Tanzania National Roads Agency
TARURA	Tanzania Rural and Urban Roads
TMA	Tanzania Meteorological Authority
TPO	Town Planning Officer
ToR	Terms of Reference
UDSM	University of Dar Es Salaam
URT	United Republic of Tanzania
VAT	Value Added Tax
VEO	Village Executive Officer
WB	World Bank
WEO	Ward Executive Officer

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

1.1.1 Developer

Dar es Salaam University College of Education (DUCE) is a Constituent College of the most esteemed University of Dar es Salaam. The genesis of DUCE can be traced back to 1965 when it was established on the 27th July, 1965 as the Dar es Salaam Teachers College (DTC). The DTC was transformed to a Constituent College of the University of Dar es Salaam (UDSM) through Government Notice No. 166 published on 23rd April, 2010 in accordance with the Universities Act, 2005 and the University of Dar es Salaam Charter, 2007. The College was provisionally registered on 29th November, 2005 as a Constituent College of the University of Dar es Salaam and was granted a Certificate of Provisional Registration (TCU CPR No.29). It was then granted a Charter in 2010 and come into operation from 31st December, 2006. The College obtained a full registration certificate from TCU on the 27th September, 2012.

The establishment of the College was a priority response by the Government of Tanzania to address the problem of acute shortage of graduate teachers and experts in the educational sector that had resulted from the rapid expansion of primary and secondary school enrolments. Currently, the college offers a vast of programs both undergraduate and postgraduate which provide competitive academic outputs not only in terms of quality technical training but also quality applied research and related expert services to the community.

1.1.2 The HEET Project

1.1.2.1 Project Background

The Government of the United Republic of Tanzania through the Ministry of Education, Science and Technology (MoEST) is preparing Higher Education for Economic Transformation (HEET) project. HEET is a five-year project through the World Bank support, to promote higher education as a catalytic force in the new Tanzanian economy. The project is designed to revitalize and expand the capacity of universities to contribute to key areas for innovation, economic development, and labour market relevance, by investing in requisite infrastructure for modern and effective teaching and research, and by training to the highest standard the teachers, researchers and administrators needed by universities to achieve to their full potential.

The Higher Education for Economic Transformation (HEET) Project is geared towards meeting the following strategic objectives (i) to increase enrolment in priority disciplines, (ii) to improve the relevance and quality of programs at universities to meet the conditions and standards of the current and future labour market, (iii) to strengthen system-level coordination, management, and regulations to ensure quantity, quality and relevance of higher education in Tanzania, and (iv) to increase the rate and extent of graduate employability through improving the relevance of curricula and create new and demand- driven programs.

This HEET project will be implemented in nine (9) regions; Eight (8) from Tanzania mainland and one (1) region in Zanzibar. Furthermore, 44% of the selected institutions are found in Dar es Salaam region. The development objective of the project is to strengthen the learning environment and labor market alignment of priority programs at beneficiary universities and improve the management of the higher education system.

1.1.3 The Project at DUCE Campus

1.1.3.1 Proposal

DUCE has received funding to support its strategic development plans through the Higher Education for Economic Transformation (HEET) Project (P166415). The HEET project is supported by the Government of the United Republic of Tanzania (GoT) through the World Bank financing with the Project Development Objective (PDO) aiming at strengthening the teaching and learning environment. The teaching and learning environments will be aligned to the labour market and priority programs that benefit higher education institutions while improving the management of the higher education system.

1.1.3.2 The Need for ESIA Study

The ESIA study is conducted in accordance with the Environmental Impact Assessment and Audit regulations (2005); and, formulated after the Environmental Management Act (EMA) No. 20 of 2004. The Regulations give mandate to NEMC to oversee the EIA process, which culminates with an award of the EIA Certificate by the Ministry responsible for Environment. The EIA Certificate is among the prerequisite approvals required before the project takes off. This project will need this approval before it is implemented. In addition, ESIA study will adhere to the World Bank Environmental and Social Framework (ESF), Environmental and Social Standards (ESSs) and Environmental and Social Safeguarding Policies.

To comply with the legal requirements governing construction industry and Environmental safeguards in Tanzania, DUCE has awarded the contract for the provision of consultancy services to undertake Environmental and Social Impact Assessment for the proposed construction of post graduate building with science research Laboratories and Faculty of Humanities and Social Sciences Building.

1.2 Objectives of HEET Project

The broad objective of the project as stipulated in the HEET's Project Appraisal (PAD) of 2021 is to strengthen the learning environment and labour market alignment of priority programs at beneficiary higher education institutions and improve the management of the higher education system at DUCE campus.

Specifically, the project has the following activities;

- Constructing a Postgraduate Building with Science Research Laboratory building which shall include: lecture rooms, conference rooms, research centers, postgraduate centers, multipurpose halls, high-tech science rooms, science workshops, staff offices, seminar rooms and examination rooms to both DUCE staff and students.

- Constructing Faculty of Humanities and Social Sciences Building with Lecture Rooms and Rooms for Staff and Students with Special Needs. The building will include Special Education Unit, Lecture Rooms, Language Laboratory, Seminar Rooms, Solar Room, GIS Lab, IT Room, Archive, Pantry on each floor, Lift elevator from ground floor to all floors for staff and students with special needs, Examination Rooms, Service Facilities, Offices and Conference Rooms.
- Reviewing and developing curricula to match with current and future labour market demand;
- Training 16 staff out of which 10 at PhD level and 6 at Master's Degree level;
- Strengthening ICT application in DUCE business process (teaching, administration and management); and
- Strengthening collaboration between DUCE and industry and R&Ds for fostering research, technology and innovation.

1.3 Project Justification and Rationale

Tanzania has made significant strides in increasing access to basic education since 2015, witnessing a 24.5% rise in primary enrolment from 2015 to 2018, surpassing 10 million pupils in 2019. Secondary enrolment also grew in 2013/14, but challenges arise in absorbing the growing number of basic education graduates into higher education. The higher education sector in Tanzania grapples with persistent issues like a skills gap between university graduates and industry demands, low enrolment and completion rates in STEM fields, insufficient infrastructure, weak academia-industry connections, and limited research capacity. The World Bank's Higher Education for Economic Transformation (HEET) project addresses these concerns by focusing on infrastructure investment, quality assurance, and gender disparities. The project aims to enhance higher education quality, relevance, and equity, supporting academic program development, research centers, and partnerships. It provides scholarships, grants, and loans, benefiting over 100,000 students and 3,000 faculty members by 2028.

The HEET project aligns higher education with economic priorities, developing workforce skills, expanding STEM and business education, improving teaching quality, and fostering university-industry collaborations. By addressing gaps in Tanzania's higher education, the project aims to boost economic growth and transformation, recognizing higher education's crucial role in innovation, economic development, and social inclusion. As basic education graduates increase, the HEET project invests in infrastructure and quality assurance, particularly in engineering, medical sciences, agriculture, energy, and natural resource management, supporting Tanzania's economic transformation. The Government of Tanzania uses the HEET project to enhance public universities' operational capacities, aligning them with economic goals for sustainable growth. However, the current College infrastructure status at DUCE cannot support modern technologies due to limited space, size and orientation. The existing science laboratories were designed to serve a small number of students but now due to increase in number of students enrolling per year, the facilities can no longer support more students' practicals. The laboratories are not only inadequate to support studies appropriately but also not fit for advancing research for postgraduate studies and community-related laboratory challenges. Therefore, the College needs

state-of-the-art science laboratories equipment and facilities to support advanced research to contribute to national development.

1.4 Nature of the project

The nature of the project initially comprises the identification and description of the works to be performed. Thus, projects differ according to nature, scales, severity of impacts and extent of coverage. Therefore, the nature of the project provides the basis of project categorization depending on different levels requirements such local and international.

1.4.1 National Requirements

As per the national regulatory framework, i.e., the third schedule of The Environmental Management Act, 2004 and first schedule of Environmental Impact Assessment and Audit Regulations amendments of 2018 the project (Multi-storey buildings) falls under “**Type A**” projects which a full ESIA study is mandatory. Therefore, a full ESIA study is being conducted to fulfil the provision of these regulations.

1.4.2 World Bank Environmental and Social Requirements

In order to reduce, minimize and mitigate adverse impacts and undue harm of its development projects to the environment, all World Bank-financed projects are guided by Environmental and Social Framework (ESF). Implementation of the Project is anticipated to have both positive and negative environmental and social impacts albeit on local scale and hence Environmental and Social Standard 1 (ESS1) is applicable. According to HEET ESMF, the WB classification under ESS1, the project has been given the risk assessment of “**Substantial**” due to the likelihood of environmental and social impacts generated by the project.

1.5 Objectives of this ESIA Study

The objective of ESIA is to assess the environmental and social impacts of the building construction and operations and recommend mitigation measures to address the negative and positive impacts. This is in line with the Environmental Management (EIA and Audit) (Amendment) Regulations of 2018 and World Bank Environmental and Social Standards (ESS1). Specifically, this ESIA study foresee all environmental, social and economic effects of the proposed project design before the project come into the actual implementation. This study therefore, addressed the social, economic, and environmental issues associated with the project and provided relevant mitigation plan to prevent or minimize adverse impacts and enhance the positive ones.

1.6 Rationale of the ESIA

To ensure that no segment of the population is adversely affected and the physical cultural resources are given the due attention. Therefore, this ESIA study was carried out to identify constraints, risks and mitigation measures on the project affected community by adhering to new Environmental and Social Framework (ESF) while applying the relevant World Bank Environmental and Social Standards (ESSs) which are ESS1, ESS2, ESS3, ESS4, ESS 8 and ESS10. The ESIA provides input to the design proposals of the DUCE teaching and office buildings project. The ESIA findings and recommendations contained in this report will be incorporated in the overall project

design, specifically assist in the development of mitigation and enhancement measures of the identified risks, opportunities and impacts.

1.7 Scope of Work

This study entailed the following: -

- To provide a description of the relevant parts of the project including project location, design, components and activities.
- To review of policies, legislation, standards and regulations governing Environment at International, Regional and Local levels.
- To assemble, evaluate, and present baseline data on the relevant environmental and social characteristics of the project area.
- To make consultation with government agencies, local communities and the private sector operating in near the project area.
- To assess and quantify the potential environmental impacts resulting from the construction of proposed office building, especially within the zone of influence of the project.
- Describe alternatives that were examined in the course of developing the proposed project and identify other alternatives, which would achieve the same objectives.
- To develop an Environmental and Social Management Plan (ESMP) detailing actions and responsibilities for impacts mitigation and monitoring. The ToR (See appendix I) formed the basis for the study, and for that matter, this report.

1.8 General Methodology

This section provides the methodology employed in the collection of data that were used in writing this report. Such methods include: interviews, checklist, field work, stakeholders' consultation, observation together with baseline data which all informed this report. In addition, it explains the study team and scoping exercise.

1.8.1 Study Team

The ESIA being a multidisciplinary field involved a team of experts in environment, engineering, sociology and gender/GBV as appended in (annex VIII).

1.8.2 Scoping Exercise

Scoping exercise identified key issues of concern at early stage of the ESIA process according to EMA of 2004 and its EIA and Audit Regulations of 2005 and the 2018 amendment as part of the ESIA processes. There are project benefits accrued from the process of scoping early such as appropriate site selection and identification of possible alternatives. Scoping also identifies and initiates involvement of all interested and affected parties (IAPS) such as the proponent and planning and members of the public. The results of scoping study determine the scope, depth and terms of reference (TOR) to be addressed within the Environmental Statement (EIS). Scoping exercise was conducted in August 2023 and TOR was approved by NEMC (Appendix II).

1.8.3 Desk Work Study

The desk work study noted important issues reflected in the ToR which deserved special attention to the existing information particularly in the following documents:

- Environmental and Social Management Framework (ESMF) for HEET Project
- Country and International Policies and legislation relevant to the project
- World Bank Environmental and Social Standards (ESS)
- World Bank Environmental, health and safety guidelines
- Project Design Drawings
- Site Master Plan 2018 – 2038 and
- Other documents available at DUCE

1.8.4 Field Survey

The field visits were essential to fully realize the scope of the project, the biophysical environment specific to the location and the socio-economic conditions in the project area. The team of experts made tree study visits during scoping stage and four visits during detailed ESIA stage. All visits were made between August and September 2023.

The team used the fieldwork to conduct interview with stakeholders and also to collect information on the state of the environment. Information collected includes site land use, water supply, wastewater collection, solid waste management, traffic issues, and other indicators related to environmental and socio-economic trends of DUCE and surroundings. In addition, other information was appraised through key informant interviews and experts' observations.

1.8.5 Onsite Measurements

The onsite measurements conducted for this study includes dust (particulate matter) measurements (ppm), ambient air measurements (respective units), noise levels measurements (dBA) and vibrations measurements (vibrations per Second) to establish baseline environment at the project area. Measurements were done by consultant for two days including weekend and weekdays from 1st and 2nd October 2023. Sunday was selected to represent weekend. Noise measurements were performed during the day and night. Results of the measurements are presented in chapter 4 of this report.

1.8.5.1 Selection and description of measured sampling stations

The monitoring stations were established based as per Environmental Management (Air Quality) regulations of 2007. The criteria followed included: predominant wind direction (leeward and windward) at the area during the study, workers'/operators' positions and nearest local communities as possible receptors, size of the area to be covered, the areas where pollution was expected, as well as areas that pollutants from the project activities are likely to disperse to. Other criteria include areas that are easily definable and with easy future access in case of need for comparison measurements or another monitoring study. Moreover, the selection criteria for sampling stations considered point source emissions and nearby receptors (i.e., workers or operators at their working locations) that is likely to be affected by the proposed project. Table 1.1 below shows the location of the selected sampling points for onsite measurements.

1.8.5.2 Dust (Particulate matter) concentrations in terms of PM₁₀

Dust levels in terms of PM₁₀ were measured using Casella Micro dust Pro 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. On taking measurements, the device was placed at breath height of about 1.5 meter from the ground to monitor dust concentrations at each identified station. This position is assumed to be a relatively the breathing zone of the people at their respective locality or working environment. The recorded average values were compared with prescribed available limit to check their compliance with both TBS standards, WHO standards.

1.8.5.3 Ambient Pollutant Gases Emission

Levels of ambient pollutant gases were measured using Portable Multi Gas Detector-71-0028RK, in accordance with manufacturer's procedure that meet ISO 9001:2008 protocol. The measuring device undergoes automatic calibration once it is switched ON by pumping in fresh air into the sensors to allow toxic sensors to be set to zero. Three measurements were recorded periodically at each station and used to calculate the average value of each pollutant in each station. The average values were then compared with TBS-NES limits and World Health Organization (WHO) guidelines to check their level of compliance.

1.8.5.3 Noise Levels

Noise measurements were carried out using sound level meter (model CEM DT-8852 data logger), with reference to the international standards namely IEC 61672:1999, IEC 61260:1995 and IEC 60651, as well as ISO 19961:2003 and ISO 3095:2001. During testing, the digital sound level meter was set to A-weighting scale to enable the meter to respond in the same manner as the human ear. The "A" scale is applicable for workplace compliance testing, environmental measurement, and workplace design. At each station, at least eight measurements were performed and used to calculate the average levels.

1.8.5.4 Ground Vibration

Ground vibrations were measured by using an XTECH SDL-800 vibration meter data logger was utilized to quantify the ground vibration at the study area. A meter has an accuracy of $\pm 5\%$, acceleration of 200 m/s^2 , a wide frequency range of 10 Hz to 1 kHz for capturing almost all possible vibrations for workplace assessments. The XTECH vibration meter data logger is designed to measure vibration at the workplace according to European standard EN 14253:2003. At each identified station, vibration readings were recorded after every 5 seconds three times and their mean value was used to represent the vibration level at that particular station.

1.8.6 Stakeholders consultations

The consultation programme maps out the stakeholder engagement process in each phase of the ESIA study as recommended in the World Bank ESS10. The programme is adaptive and subject to change based on stakeholder responses/requirements. A

combination of various types of consultation techniques used were face to face interviews and meetings. The overall consultation process was designed to comply with the requirements for public consultation as prescribed in Tanzania's EIA and Audit regulations and World Bank guidelines for stakeholder engagement. Issues raised by stakeholders are presented in chapter 5 of this report while the list of names, addresses and signatures of stakeholders consulted are found in appendix VI and VII.

1.8.7 Project Impact Assessment

Superimposing project elements onto the existing social and environmental natural conditions made it possible to identify the potential impacts of the proposed construction of Post graduate Building and Faculty of Humanities and Social Sciences building.

1.8.7.1 Identifying Environmental Impacts

A checklist method was used to identify impacts and mitigation measures. The ESMF for HEET project was also used as a framework in identification of impacts. A key guiding assumption in this study was that the project will be designed, constructed and operated with due care for safety and environmental matters using current and practical engineering practices and/or Best Available Technology Not Entailing Excess Cost (BATNEEC). The implementation schedule of the mitigation measures is summarized in the ESMP.

Several project alternatives including that of not implementing the project were considered. The fundamental environmental protection strategy and environmental considerations influencing engineering design were incorporated. However, reasonable regard to technological feasibility and economic capability were considered. The assessment entails the following:

1.8.7.2 Collection of Baseline Data

The collection of baseline data was conducted subsequent to defining the scope of the ESIA. These data allowed the study team to determine whether more detailed information on environmental conditions at the development site and its surroundings are needed and where such information can be obtained.

This means primary and secondary data were collected. Primary data were collected by direct measurement, observations and using semi-structured interviews to the targeted parties (as explained in the previous section). While secondary data were obtained from various relevant sources of information such as education and health reports, internet and many other documents related to the study.

BASELINE CONDITIONS

The proposed site has electric, water supply and telecommunication systems. In addition, many species of animals identified were domestic animals from the nearby community or surrounding residential areas. Also vegetation identified on site include wooded areas with alien species plants such as *Azadirachta indica* A Juss (Neem trees, Miarubaini), *Grevillea robusta* (silk oak) [mgrivelia], *Cassia siamea* (Blackwood cassia or yellow cassia) [mjohoro], *Mangifera indica* (mango) (miembe), *Saraca asoca*

(Ashok), *Adansonia digitata* (Boabab), and *Rhodognaphalon schumannianum* (Misufi) are among the other trees. Patches of grass can be seen in the areas that are not paved, notably near the academic zone. There were also planted flowers in the gardens and around the building walls. Apart from a few common house gecko lizards and birds including ravens and house sparrows, neither domestic animals nor wildlife were seen at the project area.

1.8.7.3 Review of Policies, Legal and Environmental and Social Management Framework for HEET Project

This allowed the study team to update and enhance their understanding of National policies, legislation and institutional arrangements for environmental management in Tanzania, World Bank Frameworks and standards and other international environmental and social laws, regulations and procedures to ascertain the optimal management of the impacts.

1.8.7.4 Prediction of the Environmental Impacts

This was done by using “best estimate” professional judgment of the experts and case studies as analogous or references. The environmental and social impacts were identified and their potential size and nature were predicted. The prediction of impacts specified the impact’s causes and effects of both secondary and tertiary consequences for the environment and the social aspects.

1.8.7.5 Identifying Mitigation and Management Options

The options for dealing with identified and predicted impacts were considered. This enabled the study team to analyse proposed mitigation measures. A wide range of measures have been proposed to prevent, reduce, remedy or compensate for each of the adverse impacts evaluated as being significant. The analysis of the implications of adopting different alternatives was also done to assist in the decision-making process.

1.8.7.6 Determining the Significance of Impacts

The key activity was to evaluate the significance of the impacts. Thus, the major criteria used include the following:

- The level of public concern and
- Scientific and Professional Evidence concerning
 1. Resource loss and Ecological damage
 2. Negative Social Impacts and
 3. Resource use options.

1.9 Report Structure

Generally, the report structure conforms with the World bank guidelines and specified EIA and Audit Regulations of 2005 which were amended in 2018. The chapters are arranged as follows:

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

1. Introduction
 2. Project description
 3. Policy, administrative and legal framework
 4. Baseline/ Existing conditions
 5. Stakeholders Analysis
 6. Assessment of Impacts and Identification of Alternatives
 7. Environmental and Social Mitigation Measures
 8. Environmental and Social Management Plan
 9. Environmental and Social Monitoring Plan
 10. Resource Evaluation / Cost Benefit Analysis
 11. Decommissioning and Closure
 12. Summary and Conclusions
- References
- Appendices

CHAPTER TWO

2.0 PROJECT DESCRIPTION

2.1 Location and Accessibility

Dar es Salaam is located in the eastern part of the Tanzanian mainland at 6°51'S latitude and 39°18'E longitude. With an area of 1,350 square kilometres (km²), it occupies 0.19 percent of the Tanzanian mainland, stretching about 100 km between the Mpiji River to the north and beyond the Mzinga River in the south. The Indian Ocean borders it to the East.

Temeke Municipal is one of the five Municipalities of the City of Dar es Salaam. It was established on 10th November, 1999 under the Local Government (Urban Authorities) Act, 1982 No. 8 Sections 8 and 9. The Municipal is located at Longitude 39° 12' - 39° 33' East and Latitude 6° 48' - 7° 33' South, and located at the Southern part of the City of Dar es Salaam . It is bordered by the Indian Ocean in the East and the coast of Mkuranga in the south. In the West it is adjacent to Ilala Municipal and in the North East Kigamboni Municipality. Administratively, the Council is divided into 2 divisions and 23 wards (Investment Profile of Temeke Municipal Council, 2019).

DUCE is located on plot number 324 and 325 Block 'T' National Stadium Street, Miburani Ward, Temeke Municipality at Latitude 6.0510954 South and Longitude 39.0162624 East. It is bordered with the Taifa Road to the West and North, Chang'ombe Road and Mgulani JKT to the East, National Stadium and Isamhyo Hall to the South. DUCE can be accessed through Taifa and Chang'ombe Roads. The site for Postgraduate building is located at the current football pitch in the South West corner of the campus. The site is boarded by the Benjamini Mkapa Stadium separated by a fence wall to the south. The footprint of the building is expected to be 1,500sqm.

The site for Faculty of Humanities and social sciences building is located at the center of DUCE campus. It is boarded by lecture theatre 1 and cafeteria to the North, existing Faculty of Humanities and Social Sciences building to the East, Faculty of Science to the South. The project area is currently used as an open study area with concrete benches (*Vimbwete*) which shall be relocated to another area. The distance from the two sites is about 150m and the footprint of the building is expected to be 1,500sqm.

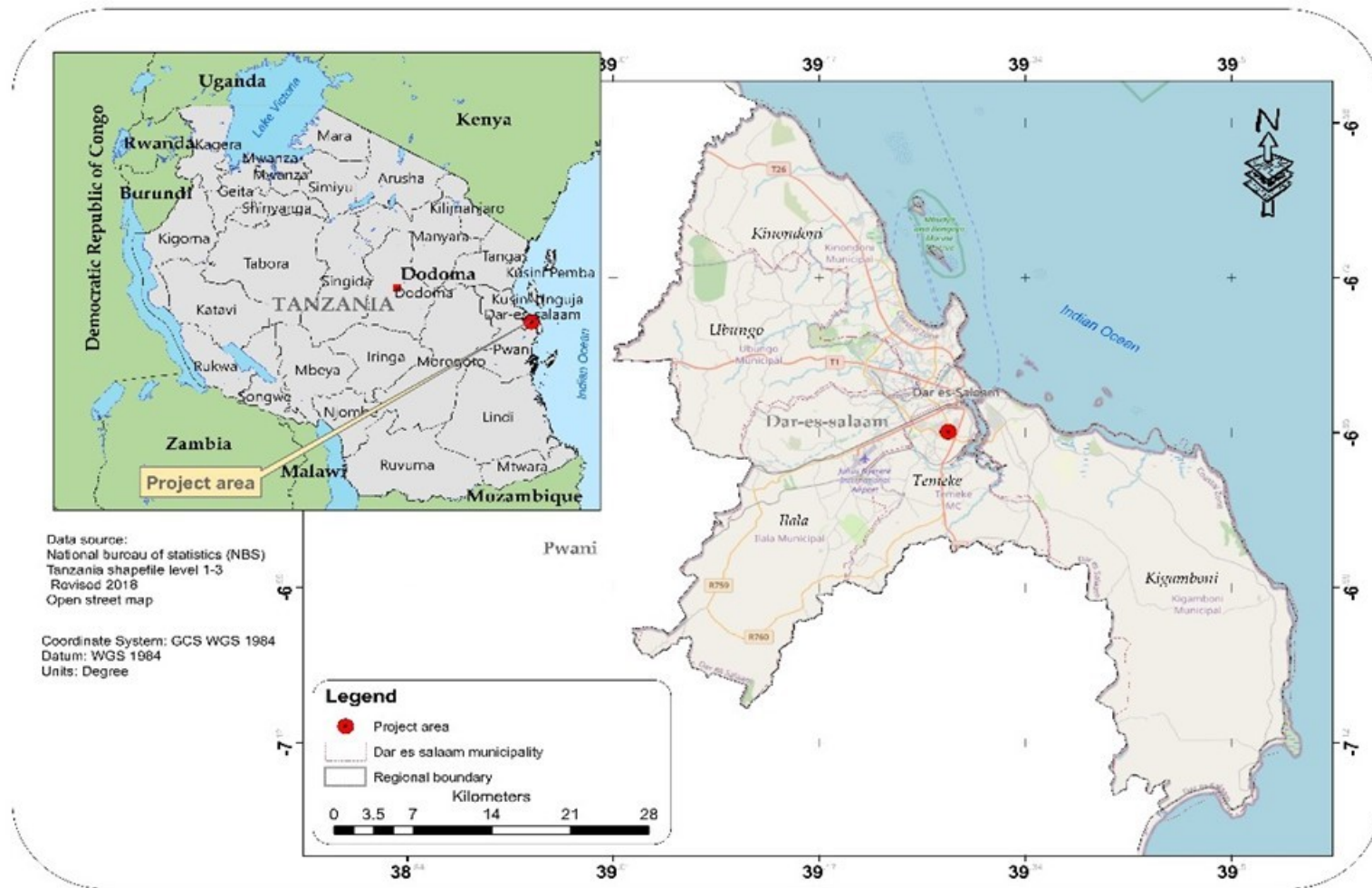


Figure 2.1: Map of Tanzania and Dares Salaam showing project area

Source: NBS, 2018

2.2 Proof of Land Ownership and Land Use

The project is an infill project within the DUCE in Chang'ombe owned by Dar es Salaam University College of Education (DUCE) for the term of sixty-six years (See certificate of occupancy in Appendix III). The whole campus has a total area of 52.97 acres (equivalent to 214,361.98sqm) while this project shall utilise only 9,900 square meters, the remaining space is occupied by existing buildings, studying areas, play grounds etc. The certificate of occupancy with Plot No. 324 and 325 Blok T Temeke Dar es Salaam, show that the area should be used for Training Institutions-University purposes only, use group "k" use classes (a) and (b) as defined in the Town and Country Planning Regulations, 1960 amended in 1993.

2.3 Project Components and design

2.3.1 Project Components

The project shall involve construction of Six storey Post graduate building and, Six (6) storey Faculty of Humanities and Social Sciences building together with rehabilitation of campus building and infrastructure. Table 2.1 below provides the description of the proposed buildings and their capacity (See appendix IX).

Table 2.1: Postgraduate Building Components and its Capacity

Functional Requirement (Components)	Quantity	Capacity (People)
Ground Floor (Chemistry Laboratory)		
Teaching Laboratory with Preparation Room and Store	1	100
Research Laboratory (Organic and Inorganic)	2	50
Instrumentation Room		
Central Science Workshop		
First Floor (Biology Laboratory)		
Teaching Laboratory with Preparation Room and Store	1	100
Research Laboratory (Botany and Zoology)	2	50
Herbarium		
Aquarium		
Second Floor (Physics Laboratory)		
Teaching Laboratory with Preparation Room and Store	1	100
Research Laboratory (Material Science and Energy)	2	50
Dark Room		
Nuclear Room		
Third Floor		
Lecture Rooms	2	320
Language Laboratory	1	80
Seminar Room	1	80
Fourth Floor		
Seminar Room with capacity of 48 students	6	288
Seminar Room with capacity of 80 students	1	80

Functional Requirement (Components)	Quantity	Capacity (People)
Offices	10	20
Fifth Floor		
Offices	10	20
Conference Room	1	80
Total Number of Offices and Staff Accommodated	42	97
Total Number of Laboratories and their Capacity	11	570
Total Number of Lecture Rooms and their Capacity	2	320
Total Number of Seminar Rooms and their Capacity	8	448

Source: Client requirements and Project drawings, 2023

Table 2.2: Faculty of Humanities and Social Sciences building Components and its Capacity

PROPOSED FACULTY OF HUMANITIES AND SOCIAL SCIENCES BUILDING		
Functional Requirement (Components)	Quantity	Capacity (People)
Ground Floor		
Conference Rooms with capacity of accommodating 150 people	4	600
Offices	4	8
Store	1	
Ablution Rooms (Toilets)	2	
First and Second Floor		
Research Centre (Partition walls to be according to the need)	2	
Third and Fourth Floor		
Postgraduate Centre (Partition walls to be according to the need)	2	
Fifth Floor		
Multipurpose Halls (Flexible / Adjustable) with capacity of accommodating 150 people	4	600

Source: Client requirements and Project drawings, 2023

2.3.2 Project Design

The project is being designed now; however, the building rules and regulations will be in accordance with Urban Planning (Planning and Space Standards) Regulations of 2018. The following are the key design criteria that shall be followed during the design of the buildings;

- Functional space and relationship (Performance and adequacy).
- Coordination of Services network to ease installations and management.
- Effective security and Safety provisions in terms of escape, control and supervisions.
- Sufficient power and water supply with back-up facilities.

- Balanced indoor and outdoor spaces relationship to create conducive health environment.
- Design for future changes with adequate flexibility to allow for technological development.
- Flexible and adaptable infrastructure to meet unpredicted needs.
- Environmental responsiveness with considerations of renewable energy systems, solid waste management, waste water treatment and rainwater harvesting.

2.3.2.1 Climate Change risks mitigation and adaptation in the Project Design

To address the risks associated with climate change, including heat, drought, floods, and water scarcity, the proposed project design incorporates infrastructure elements focused on promoting low energy consumption, rainwater harvesting, effective stormwater management, natural ventilation, and adequate lighting. The key features of the design include:

- **Open Spaces:** The central area of the site emphasizes open spaces with the use of native plants to facilitate stormwater treatment and infiltration. These open spaces prioritize maximizing tree canopy cover, offering shade, and enhancing ecosystem services.
- **Greenery Walkways:** The design prioritizes pedestrian movement over motorized transport to minimize air emissions (greenhouse gases) and enhance carbon sequestration. Walkways are strategically placed to control unrestricted movement that can lead to vegetation destruction, with trees planned along access roads and footpaths to improve the landscape and mitigate the effects of sun radiation.
- **Green Areas:** Every zone/block incorporates green areas to facilitate cross ventilation into buildings. Additionally, green belts and conservation zones are designated to preserve the ecosystem, prevent land degradation, and enhance the mountainous scenery. The use of native and artificial trees and grasses is proposed to reduce soil erosion in vulnerable areas.
- **Energy-Efficient Buildings:** The project emphasizes constructing buildings with low energy consumption, featuring provisions for cross ventilation through adequate openings, motion sensors in public areas for automatic light control, presence sensors in offices and classrooms, proper orientation to minimize indoor discomfort and harness natural air, and measures to reduce the impact of sunlight, such as fan installation and solar lights along pathways. The design also maximizes the use of renewable energy sources like solar and wind, and utilizes biogas from wastewater treatment for cooking.
- **Low-Footprint Buildings:** The project aims to minimize the environmental footprint by increasing green spaces, incorporating rainwater harvesting, stormwater management, and waste management systems, and adopting water-efficient processes.

2.3.2.2. Disaster risk management

The planned project will include measures for fire prevention and firefighting facilities. The building itself will be equipped with systems for managing solid and liquid waste, aimed at preventing the spread of diseases. Furthermore, the campus will utilize two access roads (Taifa and Chang'ombe roads) to facilitate convenient pedestrian and vehicular movement to

and from the site, with the intention of preventing traffic congestion and minimizing the risk of accidents. These roads will be securely linked to a sufficiently spacious parking area capable of accommodating cars. The project site will implement an emergency management plan, clearly delineating responsibilities for various emergency tasks, specifying who is responsible for what, when, and how.

2.4 Project Activities

The proposed project will be the construction of Postgraduate and Research Centre and Faculty of Humanities and Social Sciences buildings. The undertaking involves various phases from the planning phase all the way to the construction and operation phase. Each specific phase has its own activities which are well elaborated in following sections;

2.4.1 Pre -Construction Phase

The following are the main activities which to be executed on the site as pre- construction activities

- **Architectural, Engineering and Services Designs-** Preparation of Architectural drawings, engineering drawings, services drawings, BoQ is in progress by the procured Consultants as per client’s (DUCE) requirements.
- **Topographical Survey-** Done by Surveyors to establish the boundaries and the ground levels
- **Geotechnical investigations-**In progress by geotechnical engineers to determine the physical properties of rock and soil around the site.
- **Environmental Impact Assessment-**This is underway
- **Acquisition of various permits/ certificates** (i.e Building Permit)- This shall be obtained once EIA certificate is submitted to Temeke Municipal Office.

The duration of this phase will be three (3) months

2.4.2 Construction Phase

2.4.2.1 Activities

The following are the main activities to be executed on the site during construction phase:

Table 2.3: Description of Project Activities and Environmental Issues during Construction Phase

SN	Activity	Description	Environmental/ Social Issue
1	Site Clearance and relocation of concrete study benches	This involves clearance of vegetation and relocation of the concrete study benches to another location near play grounds area. The contractor shall ensure that clearance is confined within the areas requiring permanent construction.	<ul style="list-style-type: none"> ● Loss of vegetation ● Noise ● Dust ● Vibrations ● Emissions to air ● Solid waste generation ● Occupational safety and health ● DUCE Community Health, Safety and security risk

SN	Activity	Description	Environmental/ Social Issue
2	Foundation excavation	This involves cutting of the land to a required depth that foundation shall lie. The excavation activities shall be limited to the required areas and the excavated soil shall be used for landscaping activities to match the surrounding environment. Excavators shall be used.	<ul style="list-style-type: none"> ● Noise ● Dust ● Vibrations ● Emissions to air waste generation (spoil soil) ● Solid waste generation ● Occupational safety and health ● DUCE Community Health, Safety and security risk
3	Material transportation	Materials (fine and course aggregates) from quarries will be transported by trucks to the construction site. Water shall be supplied by the borehole at site and DAWASA articulation system, other materials like cement, timber and reinforcement bars will be transported by trucks to the construction site.	<ul style="list-style-type: none"> ● Noise ● Dust ● Vibrations ● Emissions to air ● Occupational safety and health ● DUCE Community Health, Safety and security risk
4	Material Storage-	Materials like aggregates and sand will be stockpiled at the site ready for use. Cement and reinforcement bars will be stored in special storage rooms. Timber will directly be used at the required areas and consequently there will be no stockpiling of timber at the sites.	<ul style="list-style-type: none"> ● Loss of amenity
5	Actual construction works	This involves masonry, concrete works and related activities. Generally masonry and related activities will include stone shaping, concrete mixing, plastering, slab construction, construction of foundations, and erection of building walls and curing of fresh concrete surfaces. These activities are known to be labour intensive and will be supplemented by machinery such as concrete mixers.	<ul style="list-style-type: none"> ● Noise ● Dust ● Vibrations ● Solid waste generation ● Liquid waste (sewage) ● Occupational safety and health ● DUCE Community Health, Safety and security risk

SN	Activity	Description	Environmental/ Social Issue
6	Steel Structure works	The buildings will be reinforced with structural steel for stability. Structural steel works will involve steel cutting, welding and erection.	<ul style="list-style-type: none"> Noise Solid waste generation (metal cuts) Occupational safety and health DUCE Community Health, Safety and security risk
7	Installation of power, communications lines, water, foul water systems	This involves electrical work and plumbing activities. Electrical work during construction of the premises will include installation of electrical gadgets and appliances including electrical cables, lighting apparatus, sockets etc. In addition, there will be other activities involving the use of electricity such as welding and metal cutting.	<ul style="list-style-type: none"> Solid waste generation (garbage) Occupational safety and health DUCE Community Health, Safety and security risk
8	Landscaping	Landscaping shall be done to match with the surrounding environment to improve the aesthetic value or visual quality of the site once construction ceases, the proponent will carry out landscaping.	<ul style="list-style-type: none"> Noise Dust Solid waste generation (rubbles) Occupational safety and health DUCE Community Health, Safety and security risk

Source: Consultant, August, 2023

2.4.2.2 Duration

The duration of this phase will be Eighteen (18) Months.

2.4.2.3 Types and Sources of Project Requirements

Types and sources of project requirements during the construction phase are shown in Table 2.4.

Table 2.4: Types and Sources of Project Requirements during the Construction Phase

Requirements	Type	Source	Quantity (Approx)
Raw Materials	Aggregates	Dar es Salaam (licenced suppliers shall be used)	100,000-110,000 tons
	Blocks	Dar es Salaam (licenced suppliers shall be used)	12,000 -14,000 tons
	Sand	Dar es Salaam (licenced suppliers shall be used)	45,000-50,000 tons
	Cement	Cement Industries in Dar es Salaam	20,000-25,000Tons
	Water	DAWASA/ Borehole at site	3-4M Litres

Requirements	Type	Source	Quantity (Approx)
	Reinforcement bars	Dar es Salaam(licenced suppliers shall be used)	800-950Tons
	Timber	Dar es Salaam (licenced suppliers shall be used)	20-30 Tons
Manpower	Skilled	Contractor	20
	Unskilled	Local People	80
Equipment	Excavator	Contractor	1
	Dozer	Contractor	2
	Motor grader	Contractor	2
	Plate compactor	Contractor	4
	Water Boozer (Emergency)	Contractor	2
	Tippers/ Dampers	Contractor	10
	Concrete mixers	Contractor	4
	Generator	Contractor	2

Source: Consultant, August, 2023

2.4.2.4 Transportation of Construction Materials

Materials (fine and coarse aggregates) from quarries will be transported by trucks to the construction site by authorised suppliers. Water from boreholes and DAWASA system will be available from the site. Other materials like cement, timber and reinforcement bars will be transported by trucks to the construction site. Trucks carrying construction materials shall use Kilwa and then Taifa Roads before entering DUCE via the front gate. These two roads do not have restrictions to trucks as tonnage is within the allowable range. Contractor shall prepare Traffic Management Plan (TMP) which shall be approved by DUCE and the WB before the commencement of the construction activities.

2.4.2.5 Storage of Construction Materials

Materials like aggregates and sand will be stored within the project site while cement and reinforcement bars will be stored in special storage rooms. The materials for storage shall be manageable not to cause nuisance to DUCE Community. Timber will directly be used at the required areas and consequently there will be no stockpiling of timber at the construction site.

2.4.2.6 Waste Generated and Management

Types, amounts and treatment/disposal of wastes during the construction phase are shown in Table 2.5 below:

Table 2.5: Types, Amounts and Treatment/Disposal of Wastes during Construction Phase

Waste	Types	Amount	Treatment/ Disposal
Solid Waste (Degradable)	General garbage (food remains,	25kg/day (based on generation rate of	To be collected in a large skip bucket at each site and disposed at the authorized dumpsite at Pugu Kinyamwezi thrice a week

Waste	Types	Amount	Treatment/ Disposal
	cardboards and papers etc)	0.25kg/day/person and 100 people)	
	Remnants of timber	4-10kg/day	Shall be given to recyclers
Solid Waste (Non-Degradable)	Scrap Metals (drums, iron sheets etc)	100-200kg	Given/Sold to companies authorised to collect hazardous wastes.
	Plastics	5-7kg/ day	Given to plastic recyclers
	Tins, glasses	3-5kg/day	To be collected at waste collection point at site and disposed at the authorized dumpsite at Pugu Kinyamwezi twice a week
Liquid waste	Sewage	2.4m ³ /day (Based on 100 people, water consumption rate of 40L/capita/day and wastewater discharge factor of 80%)	Waste Water is channelled to septic tanks cum soak away pits at site

Source: Consultant, August, 2023

2.4.3 Operation phase

2.4.3.1 Activities

The activities that are expected to be executed during operational phase are presented in table 2.6.

Table 2.6: Description of Project Activities and Environmental Issues during Operational Phase

SN	Activity	Description	Environmental/ Social Issue
1	Education /training activities	The new buildings shall be used to impart knowledge to the students and researchers. Classrooms, seminar rooms, laboratories, libraries, auditoriums, lecture theatres etc shall be used for teaching and research purposes. The two buildings shall provide space for training of about 1,900 students.	<ul style="list-style-type: none"> • Solid waste mainly papers, cardboards, electronic wastes, etc • Liquid waste -Domestic sewage • Hazardous waste management (Laboratory waste, electronic wastes etc)

SN	Activity	Description	Environmental/ Issue	Social
3	Office works	Several office activities shall be carried out within the school of science and post graduate buildings. This project shall develop staff offices that can accommodate about 100 staff.	<ul style="list-style-type: none"> • Solid waste mainly papers, cardboards, food waste, electronic wastes etc • Liquid waste -Domestic sewage 	
4	Good housekeeping of the area	DUCE will hire a private cleaning firm which will be responsible for the cleanliness of the two buildings and the outside premises. Cleaning operations will involve the use of substantial amounts of water, disinfectants and detergents. Enough waste bins shall be provided in each building, cleaning firm shall be responsible for collection and disposal to the collection point before being transported to the Authorised dumpsite. Electronic wastes shall be collected and stored in a special bund room before given to authorised recycler.	<ul style="list-style-type: none"> • Solid waste -mainly yard waste, leaves, papers, cardboards, food waste, electronic wastes etc • Liquid waste -from cleaning of surfaces 	
5	Maintenance	The two buildings and associated facilities will be repaired and maintained regularly during the operational phase of the project. Such activities will include repair of building walls, roofs and floors. Maintenance of machines, electrical gadgets and equipment, repairs of leaking water pipes, painting and replacement of worn out materials among others. This shall be the responsibility of the developer.	<ul style="list-style-type: none"> • Solid waste – mainly rubles, pieces of wood, metals, plastics, tins, electronic wastes etc • Liquid waste -from cleaning of surfaces, paints 	

Source: Kaskim and Eco Services, August, 2023

2.4.3.2 Duration

The duration of this operation phase will be more than fifty (50) years.

2.4.3.3 Types, Amounts and Sources of Project Requirements

Types and sources of project requirements during the operational phase are shown in Table 2.7

Table 2.7: Types and Sources of Project Requirements during the Operation

Requirements	Source	Quantity
Water	3 Boreholes at DUCE	Both buildings, worst case scenario; <ul style="list-style-type: none"> • 2000 students and staff at a time

Requirements	Source	Quantity
		<ul style="list-style-type: none"> Water consumption 10L/capita/day <p>Total Water demand per day under worst case scenario – (2,000x10) =20,000L/day (20m³/day)</p> <p>-DUCE has 3 Boreholes; Two with capacity of approx.72, 000 litres per day each and one 54, 000 litres per day.</p>
Electricity	<ul style="list-style-type: none"> TANESCO (National Grid) Standby generator at each building 	<ul style="list-style-type: none"> 30-50 MwHr/ month Generator specification to be provided after design

Source: Consultant, August, 2023

2.4.3.4 Waste Generation and Management

Types, amounts and treatment/disposal of wastes during the operation phase are shown in Table 2.19.

Table 2.9: Types, Amounts and Treatment/disposal of Wastes during the Operation Phase

Waste	Types	Amount	Treatment/ Disposal
Solid Waste (General garbage)	Papers, food wastes, cardboards, tins, glasses and all general garbage	Approximately 0.6tonnes/day (based on generation rate of 0.3kg/day/ person and 2,000people)	To be collected in garbage collection area at site ready to be disposed at the authorized dumpsite at Pugu Kinyamwezi
Solid wastes (Hazardous)	Electronic wastes	100-200kg/year	Shall be stored in special bund room before given to companies authorised to collect hazardous wastes.
	Laboratory wastes	30-50kg/year	
Liquid waste	Sewage	48m ³ /day (Based on 60m ³ /day water demand and wastewater discharge factor of 80%).	Water is channelled to septic tanks

Source: Consultant, August, 2023

2.4 Declaration that the Project is not within or near Sensitive Environment

According to the EIA and Audit regulations amendments of 2018 requires the proponent to declare if the project is within or near any environmental sensitive areas, these includes water bodies (lakes, river etc, protected forests, National parks, wetlands etc). DUCE and EIA Consultant, hereby declare that the project area is neither within nor near environmental sensitive areas.

2.5 Project Budget

Since the design and bills of quantities are not available at the moment, a budget of about Tshs 7,800,000,000 (7.8 billions) have been allocated for the project.

CHAPTER THREE

3.0 POLICY, ADMINISTRATIVE AND LEGAL FRAMEWORK

3.1 Environmental Management Regulation in Tanzania

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

3.2 National Policies

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

3.2.1 National Environmental Policy (NEP) of 2021

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

The National Environmental Policy, 2021 stresses that for a framework law to be effective, environmental standards and procedures have to be in place. For example, Chapter 4 of the policy (Instruments for Environmental; Policy), Section 61, states that "As part of the (National Environmental Policy) strategy in the implementation of the National Environmental Guidelines, specific criteria for EIA conduct will be formulated". This policy is relevant to the proposed project as it restates the need to protect the environment regardless of the importance of the proposed development. This policy provide framework for the EMA 2004 and EA and Audit regulations of 2005 and its amendment of 2018 which guided this EIA Study.

3.2.2 Education and Training Policy of 2014

Education and Training policy (2014) is the result of restoration and finally cancelled by the Education and Training Policy (1995), Vocational Education and Training Policy (1996), National Higher Education Policy (1999) and Information and Communication Technology for Basic Education Policy (2007). The Education and Training policy 2014 is designed to provide direction for education and training in considering changes in economic, social, scientific and

technological challenges of education and training nationally, regionally and internationally, to increase opportunity, efficiency and quality of education and in training and human resources to meet the standards of a country with middle economy by 2025. The specific objectives of the policy are listed below :

- i. Framework, flexible structures and procedures to enable Tanzanians to develop in different ways in the currents of academic and professional;
- ii. Education and training with highly recognized quality standards nationally, regionally and internationally;
- iii. Access to a variety of opportunities in education and training
- iv. Increased human resources according to national priorities;
- v. Management and effective operation of education and training in the country;
- vi. Sustainable system of financing education and training in the country; and
- vii. Education and training system centred cross-cutting issues.

Regarding Environment, policy statement no. 3.7.1 states that *“The government will put in place a mechanism that will ensure that the content of the care for the environment is integrated into the curriculum of education and training at all levels.”* The policy statement no 3.7.3 states that *“The government will strengthen the partnership between the public and private sectors to facilitate availability of modern infrastructure and services at all levels of education and training.”* This project is part of Government efforts to achieve the objectives of this policy.

3.2.3 Construction Industry Policy (2003)

The Construction Industry Policy intends to support sustainable construction sector by promoting application of costs effective and innovative technologies and practice to support socio-economic development activities such as road-works, water supply, sanitation, shelter delivery and income generating activities. It also ensures application of practices, technologies and products which are not harmful to both environment and human health. There is no room for this project contractors not to adhere to construction standards as required by the National Bureau of Standards (Item 8.2 of the Policy). The policy also requires contractors to promote sustainable building environmental practices as required by national laws (Item 8.2.2 of the policy). The proposed project shall comply with the sustainable building practices.

3.2.4 National Land Policy (1995)

The policy recognizes the need for protecting the environment. It stresses protecting the environment and natural ecosystem from pollution; degradation and physical destruction. Important sections of the policy relevant to the proposed project are section 2.4 (on use of land to promote socio-economic development; section 2.8 (on the protection of land resources), section 3 (iii) and section 4 (on land tenure). This policy is relevant and guides the proponent in terms of occupancy, land use and land-use change at the project site. DUCE is a legal owner of the project area, having certificate of occupancy showing that the land use of the area is for educational purposes.

3.2.5 The National Water Policy (URT, 2002)

The overall objective of this policy is to develop a comprehensive framework for the sustainable management of the water resources in the country. This framework promotes the optimal, sustainable and equitable development and use of water resources for the benefit of all Tanzanians, based on a clear set of guiding principles. The policy provides for beneficiaries' participation in water supply schemes and addresses cross-sectoral interests in water, watershed management and integrated and participatory approaches for water resources planning, development and management. The policy provides a shift of Government roles from service provider to that of coordination, policy and guidelines formulation, and regulation. This policy is relevant to this project because it provides framework for sustainable management of water resources during project implementation. Ground water extracted through borehole at the project area is water resources according to this policy and therefore its use for the project must be sustainable.

3.2.6 The National Employment Policy (NEP) 2008

The NEP intends to promote employment and efficient utilization of human resources in achieving national development goals in Tanzania. It acknowledges the problem of unemployment in Tanzania but strives to create good environment for employment (Items 2.4 & 2.5 of the NEP). The construction sector is acknowledged as one of the rapidly growing sectors in employment creation due to public construction projects in both urban and rural areas (Item 1.2.2 of the NEP). The relevant issues to note include the following:-

- Creating enabling environment for promoting and encouraging the private sector and other stakeholders to allocate investment in labour and protect marginalized groups (Item 3.2 of the NEP).
- Rationalising of employment of foreigners in Tanzania (Item 3.13 of the NEP). This will include skills transfer, work permits and control of foreign workers without required skills.
- Reducing the impact of HIV/AIDS in work place (Item 3.14 of the NEP).
- Improving access to employment opportunities and productive resources for people with disability (Item 3.15 of the NEP).
- Mainstreaming environmental issues in employment creation as required under the National Environmental Policy and Laws (Item 3.16 of the NEP).
- Eliminating Child labour in work place (Item 3.22 of the NEP).
- Mainstreaming gender in employment (Item 3.24 of the NEP).
- Provision of rights to Workers' Organisations at place of work (Item 4.3 of the NEP).
-

Regarding gender, the policy also calls for affirmative actions aimed to facilitate access to productive employment opportunities among women both in wage and self-employment in public and private sectors. DUCE shall implement this policy by providing equal opportunities for both gender while prohibiting child labour and providing conducive environment for workers during construction and operation of the project.

3.2.7 The National Health Policy, 2017

This Policy is a revised edition of the 2003 Health Policy, which emphasized on the need for increasing community involvement in health development and improved access and equity in health and health services. One of the main objectives of this policy is to ensure that health

services are available and accessible to all people wherever they are in the country, whether in urban and rural areas. The policy encourages safe basic hygienic practices in workplaces, promote sound use of water, promotes construction of latrines and their use, encourage maintenance of clean environment and working environment which are conducive to satisfactory work performance. The developer shall comply to the provisions of this policy.

3.2.8 The Community Development Policy (CDP), 1996

The Policy envisages that community development is achieved when people are enabled to develop their capacity to identify their problems and plan ways of solving them. Therefore, members of the community are to be involved in planning, decision making and implementation of development initiatives. One of the emphasized areas in this policy is to expand and develop infrastructure and using local labour in works such as roads, water, schools, dispensaries and godowns. An increase in social services is considered an indicator of community development i.e. good housing, health, education, nutrition, clean environment and safe water (Items 10 & 11 of the CDP). Improvement of Education sector through this project is part of Government efforts to achieve the objectives of this policy.

3.2.9 The Women, Gender and Development Policy (2000)

The key objective of the women and gender and development policy is to provide guidelines to ensure that gender sensitive plans and strategies are developed in all sectors and institutions. Moreover, the policy emphasizes on gender quality and equal opportunity of both men and women for them to participate equitably in development projects as it requires proper and effective project management to ensure that gender issues get the attention and priority they deserve. Therefore, this project shall insure women's participation is incorporated in all levels of project planning and implementation.

3.2.10 The National Strategy for Gender and Development (2005)

The strategy outlines the step for laying out the foundation for promoting gender equality and equity in the country's institutions. As the Beijing Platform for Action is vital in enforcing the rights of women, the Tanzania government has committed itself to supporting initiatives that focusing on alleviating gender inequality in economic, education, training and employment at all levels. One of the aim of this project is to alleviate students gender inequality at DUCE.

3.2.11 National Policy on HIV/AIDS (2001)

The overall goal of the National HIV/AIDS policy is to provide a framework for leadership and coordination of the National multi-sectorial response to the HIV/AIDS epidemic. This includes formulation, by all sectors, of appropriate interventions which will be effective in preventing transmission of HIV/AIDS and other sexually transmitted infections, protecting and supporting vulnerable groups, mitigating the social and economic impact of HIV/AIDS. Emphasis is placed on women who work as food vendors and other small businesses who are at risk and vulnerable of contracting HIV/AIDS infection due to integration of seasonal contractual workers and vice versa. Therefore, this policy is relevant in this respect since it provides the larger framework for intervention and production of HIV/AIDS for all people (Item 3 of the NPH).

3.2.12 Energy Policy (2015)

The policy guides sustainable development and utilization of energy resources to ensure optimal benefits to Tanzanians, contributing to economic transformation. The Policy document covers the following areas or subsectors: (i) Electricity generation, transmission, distribution, interconnection, power trading and rural electrification; (ii) Petroleum and gas upstream, midstream and downstream activities; (iii) Renewable energy, energy conservation and energy efficiency including Feed-in-tariff; and (iv) Cross-cutting issues including subsidies, institutional, legal, regulatory as well as monitoring and evaluation frameworks. The proposed project proposes to use grid electricity from Tanzania Electric Supply Company Limited (TANESCO). The project also intends to install a standby generator in case of a power outage. The setup of the generator will consider environmentally friendly options to minimize pollution.

3.3 Legal Framework

3.3.1 Environmental Management Act No. 20 of (2004), Cap. 191

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

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

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

Part VI of the EMA deals with Environmental Impact Assessments (EIA) and other Assessments and directs that an EIA is mandatory for all development projects. Section 81(2) states that *“An Environmental Impact Assessment study shall be carried out prior to the commencement or financing of a project or undertaking”*, while Section 81(3) states *“a permit or licence for the carrying out of any project or undertaking in accordance with any written law shall not entitle the Developer or developer to undertake or to cause to be undertaken a project or activity without an environmental impact assessment certificate issued under this Act”*. This EIA is conducted to respond to provisions of this act.

The Act is relevant to the project because the project is in the list of those projects requiring EIA. The proponent strives to comply with this Act that is why the study is conducted to not only get the environmental certificate as required by EMA (2004) but also to show commitments on protecting the environment regarding the proposed project. In this case the project is required to abide by the legislation and existing national guidelines.

3.3.2 The Water Supply and Sanitation Act, 2019

This legislation provides sustainable management and adequate operation and transparent regulation of water supply and sanitation services. It also provides for establishment of water supply and sanitation authorities as well as community owned water supply organizations, Also it provides for appointment for service providers. The main aim of this law is to ensure the right of every Tanzanian to have access to efficient, effective and sustainable water supply and sanitation services for all purposes by considering among others protection and conservation of water resources and development and promotion of public health and sanitation; and protection of the interest of customers. Under this law, the Minister responsible for water affairs shall establish water authority and cluster water authorities in order to achieve commercial viabilities. DUCE shall comply to all provisions of this act because the proposed project shall use water supplied by DAWASA which is recognized by this law.

3.3.3 The Land Act, CAP 113 R.E 2019

This law declares that all land in Tanzania “Public land” to be held by the state for public purposes. The Acts empower the President of the United Republic of Tanzania, to revoke the “*Right of Occupancy*” of any landholder for the “public/national interest” should the need arise. The laws also declare the value attached to land. The law as amended in 2004 recognizes the role of land in economic and urban development. The law provides for technical procedures for preparing land use plans, detailed schemes and urban development conditions in conformity with land use plan and schemes. The LGA has the power to impose conditions on the development of any area according to the land-use planning approved by the Minister. This project has been designed according to the requirements of this law.

3.3.4 The Urban Planning Act (2007)

The law provides for the orderly and sustainable development of land in urban areas, to preserve and improve amenities; to provide for the grant of consent to develop land and powers of control over the use of land and to provide for other related matters. Section 29-(1) of the law states that “*Notwithstanding the provisions of any other written law to the contrary, no person shall develop any land within a planning area without planning consent granted by the planning authority or otherwise than in accordance with planning consent and any conditions specified therein*”. Building permit will be issued before construction and therefore the project complies to the provisions of this Act.

3.3.5 Occupational Health and Safety (2003)

The law provides for safety, health and welfare of persons at work places; to provide for protection of persons other than persons at work against hazards to health and safety arising out of or connection with activities of persons at work; and to provide for connected matters. Section 62 of the law states that “*where in a workplace, workers are employed in any process involving exposure to any offensive substance or environment, effective protective equipment shall be provided and maintained by employer for the use of the persons employed*”. In this

project the contractor (during construction) shall provide PPEs as per provision of this act including, overall dress, boots, helmets, ear plugs etc depending on the exposure.

Section 58 present the issue of first aid box and it states that “ *There shall be provided and maintained a first aid box or cupboard to the prescribed standard and the first aid box or cupboard shall be distinctively marked “FIRST AID” having only appliances or stocks of first aid equipment*”. A well-stocked first aid kit shall be provided at the construction site.

Section 24 (1) states that “*a thorough pre-placement and periodic occupational medical examination for fitness for employment and for employees shall be carried out by a qualified occupational health physician or where necessary a qualified medical practitioner as may be authorized by the chief inspector*”. Developer shall conduct medical examination to all those who require employment before employing them.

The project proponent shall be required to abide by the relevant provisions given in the Act. This includes seeking approvals and license from the relevant authorities as specified in the Act. The proponent shall also be required to safeguard public health and safety of the workers.

3.3.6 Employment and Labour Relations Act Cap 366 R.E 2020 GNNO 140

The Act makes provisions for core labour rights and procedures, establishes basic employment standards, provides a framework for collective bargaining and provides for the settlement of disputes. The proposed project must meet the minimum standards of labour laws in Tanzania provided under Sections 5 – 25 of the Act including prohibition on child and forced labour, discrimination and harassment, and so forth. DUCE shall comply to the provisions of this act.

3.3.7 Engineers Registration Act and its Amendments 1997 and 2007

The Acts regulate the engineering practice in Tanzania by registering engineers and monitoring their conduct. It establishes the Engineering Registration Board (ERB) (Section 25 of the Act). Laws require any local and foreigner engineers to register with ERB before practicing in the country (Section 10 of the Act). This means that the Engineers contracted for construction and operation of the DUCE project must be registered with ERB.

3.3.8 The Contractors Registration Act (1997)

The Contractors Registration Act requires contractors to be registered by the Contractors Board (CRB) before engaging in practise and entitled class in respect to the costs of the project (Section 7 of the Act). It also requires foreign contractors to be registered by the Board before gaining contracts in Tanzania. This Act requires contractors in any site to abide to labour laws and Occupational Health and Safety regulations in construction industries. Furthermore, in execution of the works, the contractors are obliged to supply materials for the work and exercise control over type, quality and materials used during construction. The developer shall comply with the law requirement during the recruitment of contractors for project implementation.

3.3.9 The Local Government Laws (Urban Authorities) Act (1999)

This act established the local governments and urban authorities with mandates to spearhead developments in districts and urban centres (for cities and municipalities) respectively. By this law, the authorities have mandates to formulate bylaws to enhance environmental management within their district/urban authorities. The proposed construction of a Post graduate Building and Faculty of humanities and social science building project will be located within National Stadium Street, Miburani ward, Temeke Municipality and therefore its development and operation shall abide to all bylaws formulated by the mentioned local governments.

3.3.10 Public Health Act 2009

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

Section 54 of this law states that *"A person shall not cause or suffer from nuisance, likely to be injurious or dangerous to health, existing on land, premises, air or water"*. Therefore, Developer (DUCE) shall develop this project so that nobody suffers from nuisance or cause danger to people's life.

3.3.11 Fire and Rescue Act (2007)

According to the Act, among others, the functions of the force are to

- a) *'Extinguish fire;*
- b) *Grade cities, municipalities, townships and villages into various fire and rescues services levels;*
- c) *Conduct fire inspection and investigations for purposes of obtaining information relating to the causes of fire and loss inflicted by fire;*
- d) *Conduct studies on investigation of arson and accidental fire;*
- e) *Conduct training for fire department personnel, other officers and voluntary fire fighters;*
- f) *Prepare fire statistics and fire service information; and*
- g) *Conduct fire tests on protection facilities, equipment and materials.*

In section 3(1) (g) it covers premises of facility used as a place for storage flammable liquids, gas or chemicals. 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. Developer shall comply of all the provisions of this Act during construction and operation of the project.

3.3.12 The workman's Compensation Act, 2015

The law provides for compensation to employees for disablement or death caused by or resulting from injuries or diseases sustained or contracted in the course of employment (Section 19 of the Act); to establish the Fund for administration and regulation of workers' compensation and to provide for related matter. This act is very relevant to this project as workers will be exposed to various hazards during construction and operation of the four colleges. This law is relevant to the project as workers will be exposed to various hazards during construction of the facilities. The proposed project will adhere to the provisions of the Act when dealing with issues pertaining to injuries of workers in the cause of performing their duties. The contractor of the proposed project must be register with Workers Compensation Fund and make monthly contribution.

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

The Act requires every institution registered and operating in Tanzania to do the following (Sections 19 – 32 of the Act):-

- Promote public awareness on causes, transmission, consequences, prevention and control of HIV/AIDS;
- Reduce the spread and adverse effects of HIV/AIDS;
- Protect the rights of orphans;
- Discourage negative traditions and practices which enhance the spread of HIV/AIDS;
- Increase access, care and support to persons living with HIV/AIDS.

The Act also requires every employer in consultation with the Ministry of Health to establish and coordinate a workplace programme on HIV/AIDS for employees. The contractors and DUCE in the proposed project will have to comply with the provisions of this Act.

3.3.14 The Child Act, 2009

Part II of the Act defines a child in Tanzania as a person below the age of 18 years. Part II, Section 78 of the Act, provides for prohibition of exploitive labour to children. Every child shall be protected from labour exploitation and any work that is likely to (a) deprive the child of his health or development; (b) exceeds six hours a day; (c) is inappropriate to his age, and (d) the child receives inadequate remuneration. The developer shall adhere to this act

3.3.15 Sexual Offences (Special Provisions) Act (1998)

Also known as SOSPA amended several times written laws to incorporate special provisions on sexual violence and other offences to enhance personal integrity, dignity, liberty and security of women and children. More significantly, SOSPA introduced severe punishments for sexual offences such as imprisonment of rape perpetrators for a minimum sentence of 30 years and compensation to a survivor of sexual violence. DUCE shall comply to provisions of this act during construction and operation phase of the project.

3.3.16 The Prevention and Combating of Corruption Act (2007)

This law has established the Prevention and Control of Corruption Bureau (PCCB), which is one of the government organs mandated with handling all types of corruption incidents including those related to gender and sexual violence such as demand or offer of sexual favours in exchange for official services. For instance, Section 125 of the PCCB states that "*any person being of position or authority, who in the exercise of his authority, demands or imposes*

sexual favours or any other favour on any person as a condition for giving employment, a promotion, a right, a privilege or any preferential treatment, commits an offence and shall be liable on conviction to a fine not exceeding five million shillings or to imprisonment for a term not exceeding three years or both". DUCE shall comply to this act.

3.4 Relevant Regulations and Guidelines

3.4.1 Environmental Impact Assessment and Auditing Regulations, 2005 (as amended in 2018)

These regulations set procedures for conducting EIA and environmental audit in the country. They are made from Section 82 and 230 of EMA 2004 and prescribe that the Minister responsible for environment shall formulate regulations and guidelines on how EIA shall be conducted. EIA and Audit are applicable to all projects contained in Third Schedule of the EMA 2004 and First Schedule of the EIA and Audit Regulations. A project of this nature is also covered in both schedules. It is thus a legal binding requirement to undertake the EIA of this project (Regulations 4 – 15).

These regulations also prescribe the stages and/or the EIA process, which are in principal managed by NEMC. The procedure is as follows: -

- Project registration and Screening before approval is made;
- Conducting of EIA under the approved Scope and Terms of Reference;
- Review of process of Environmental Impact Statement;
- Decision of the Minister & Issue of EIA Certificate;
- Project Implementation;
- Environmental Audit; and Monitoring.

This EIA is conducted in accordance to the provisions of these regulations.

3.4.2 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 dispose solid waste and license to own or operate solid waste disposal site. DUCE shall abide to the regulations by ensuring that solid waste generated on site does not lead to pollution within the project area or around the neighbouring area.

3.4.3 The Environmental Management (Air Quality Standards) Regulations, 2007

These Regulations regulate the air pollution from human activities including construction. It requires any person or company to comply with minimum standards of air quality issued by the National Environmental Standards Committee (Regulations 4 & 7). It also prohibits emission of hazardous substances, chemicals and gas that create air pollution. The proposed project will have to comply with the limits of emissions (Regulation 9).

The objectives of these regulations are to set baseline parameters on air quality and emissions and enforce minimum air quality standards. These Regulations stipulate the role and powers of the National Environmental Standards Committee. According to the regulations, the approval of a permit for emission of air pollutants shall be guided by ambient, receptor,

emission and specification standards approved by the Minister. Offences and penalties for contraveners are also provided for in the regulations.

Emission limits of sulphur and nitrogen dioxides, carbon monoxide, lead, ozone, black smoke and suspended particulate matter together with their test methods are specified. Tolerance limits and test methods for dust, sulphur dioxide and nitrogen oxides from cement factories into the air as well as from motor vehicles are also given. Even though the project operations shall not generate air emissions but during construction air pollution is expected. Developer shall monitor the air quality from the construction site with guidance from these regulations.

3.4.4 The Environmental Management (Standards for Control of Noise and Vibration Pollution) Regulations, 2015

These Regulations provides for control and standards of noise pollution and vibrations in any environment resulting from human activities (Regulation 5). They give permissible noise levels and tolerance limits for environmental vibrations as provided by the National Environmental Standards Committee (Regulations 9 & 10).

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

It is evident that construction of the project shall produce noise and vibrations owing to the use of heavy machinery therefore these regulations shall be used to monitor noise and vibrations.

3.4.5 The Environmental Management (Soil Quality Standards) Regulations, 2007

These regulations set limits for soil contaminants in agriculture and habitat, enforce minimum soil quality standards, prescribe measures designated to maintain, restore and enhance the sustainable productivity of the soil and prescribe minimum soil quality standards for sustaining ecological integrity and productivity of the soil. According to the regulations, among others, the National Environmental Standards Committee has the powers to set pollutant limits and specify procedures for determination of the quality of soil for protection of the soil from degradation as a result of anthropogenic activities such as agricultural and mining activities and waste disposal.

Owners and operators of a main polluting activity are required to voluntarily register with NEMC and obtain a soil pollutants discharge permit. Obligations of polluters are also given. According to the regulations, the NEMC plays a crucial role in soil quality compliance and enforcement. Recording and reporting requirements, Offences and penalties for non-compliance as well as how appeals against aggrieved decisions should be handled are stipulated. Contaminant limits for selected soil pollutants mainly halogenated hydrocarbons (example, trichloroethylene, dichloromethane, tetrachloroethylene, carbon tetrachloride, etc.), fuel hydrocarbons (benzene, ethylbenzene, total xylenes, toluene, etc.), organic and inorganic pesticides (lindane, Atrazine, DDT, sulphur, Hexachlorobenzene, Aldrin, etc.) and their respective test methods are specified. The Regulations also cover contaminant limits for some heavy metals (e.g. arsenic, cadmium, nickel, copper, zinc, etc.) together with their test methods.

Most of the pollutants covered in these regulations will not be produced from the project activities. However, there is a potential for soil pollution from petroleum hydrocarbons due to the use of fossil fuels for running machineries, plants and vehicles during the construction phase. Nonetheless, the developer is committed to abide to the provisions of these regulations should any of the project activity produce anyone of the pollutants covered in the regulations.

3.4.6 Environmental Management (Water Quality Standards) Regulations, 2019

The regulations provide for water pollution and water quality standards, in respect to compliance by polluters and enforce minimum water quality standards prescribed by the National Environmental Standards Committee. The established committee may prescribe classifications, criteria and procedure for measuring standards for water quality and enforcement of legal water resources management requirements and monitoring. In fulfilling the requirements of the regulations the project proponent will have to undertake monitoring of both domestic water and wastewater and ensure compliance with the acceptable discharge standards. These Regulations provide procedures for the following:-

- Protection of human health and conservation of the environment through protection of water sources and ground water (Regulation 5)
- Enforcement of minimum water quality standards prescribed by the National Environmental Standards Committee (Regulation 8)
- Establishing water usages for purposes of establishing environmental quality standards and values for each usage (Regulation 7)
- Prohibition of illegal discharges and pollutions in view of avoiding contamination which is detrimental to water usages (Regulations 9 – 17).

Monitoring of water quality within DUCE shall be done in accordance with these regulations.

3.4.7 Environmental Management (Hazardous Waste Control and Management) Regulations, 2021

These Regulations apply to all categories of hazardous waste and to the generation, collection, storage, transportation, treatment, recycling, reuse, recovery and disposal of hazardous waste and their movements in, into and out of Mainland Tanzania. The Act (EMA 2004) defines hazardous wastes as any solid, liquid, gaseous or sludge waste which by reason of its chemical reactivity, environmental or human hazardousness, its infectiousness, toxicity, explosiveness and corrosiveness is harmful to human health, life or environment. Section 16.-(1) of the regulation's states that "*A person who intends to collect, store or transport hazardous waste shall apply for a permit to the Minister by filling Form No. 1 prescribed in the Fifth Schedule and submit it to the Council for consideration*". For this project, hazardous wastes are expected during construction phase only (i.e scrap metals, used oils), therefore, handling measures of hazardous wastes shall be done according to the provisions of this Regulation, specifically by commissioning a person/firm that have a permit recognized by this regulation.

3.4.8 Urban Planning (Planning and Space Standards) Regulations, 2018

These regulations revokes the urban planning and space standards regulations of 1997 and that of 2011. "Urban Planning and Space Standards" includes standards for residential areas, building lines and setbacks, plot coverage and plot ratio, health and educational facilities, golf

courses, passive and active recreation, public facilities by planning levels, public facilities by population size, parking agriculture show grounds, standards for electricity supply and its way leave, way leave for water supply, road width, communication pylons, sewerage treatment plants, ponds, transportation terminals, stream/river valley buffer zone, beaches and industrial plots and recommended colours for land uses. DUCE have complied to these regulations since the total area of the campus is 21.43Ha (requirement is 5-10ha) and the maximum number of storeys at DUCE is 10 as per regulations.

3.4.9 The Environmental Management (Fees and Charges) Regulations, 2021

These regulations revoke The Environmental Management (Fees and Charges) Regulations, 2008. The Regulations apply in relation to an act or service in respect of which fees and charges are payable under the Act and Regulations made thereunder. Section 4-(1) of these regulations itemize all undertakings which fees and charges apply, it states that “A person shall not, upon payment of fees and charges prescribed in the Schedule to these Regulations, carry on any of the following:

- a. *Environmental Impact Assessment;*
- b. *Environmental Compliance Monitoring and Audit;*
- c. *registration of Environmental Experts;* d) *Environmental Quality Standards;*
- d. *ozone Depleting Substances;*
- e. *management of waste;*
- f. *biosafety;*
- g. *noise and Vibrations;* or
- h. *other activities related to the environment.”*

For this project, the fees for Environmental Impact Assessment includes registration fees and EIA review fees have been paid dully to NEMC. Therefore, DUCE have fully complied to these regulations.

3.4.10 The Environmental Management (Registration and Practice of Experts) Regulations, 2021 G.N 267

These Regulations apply to registration, categorization, practicing and conduct of environmental experts and firms of environmental experts registered and certified under these Regulations to conduct-

- a) environmental impact assessment;
- b) environmental audit; or
- c) any other environmental study that may be required to be undertaken under the Act or its Regulations.

The objectives of these Regulations are to-

- a) *establish a system of registration, categorization and practicing of environmental experts;*
- b) *provide for qualifications for persons who may conduct environmental studies;*
- c) *provide for a system of nurturing competence, knowledge and consistence of environmental experts in the carrying out of environmental impact assessment and environmental audits; and*
- d) *provide for a code of conduct, discipline and control of environmental experts.*

The consultants who has conducted this EIA (Kaskim Company Limited and Eco services (T) Limited) have been registered by these Regulations. Also, developer shall use consultant registered by these regulations when conducting annual audits for the project.

3.5 World Bank Environmental and Social Framework (ESF)

The World Bank's Environmental and Social Framework sets out the Bank's commitment to sustainable development, through a Bank Policy and a set of Environmental and Social standards that are designed to support Borrowers' projects, with the aim of ending extreme poverty and promoting shared prosperity. The E&S Framework comprises of: (1) Vision for Sustainable Development, which sets out the Bank's aspirations regarding environmental and social sustainability; (2) The World Bank Environmental and Social Policy for Investment Project Financing, which sets out the mandatory requirements that apply to the Bank; and (3) The Environmental and Social Standards, together with their Annexes, which set out the mandatory requirements that apply to the Borrower and projects.

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.

3.5.1 World Bank Environmental and Social Standards (ESS)

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. The E&S standards are expected to: (a) support Borrowers in achieving good international practice relating to environmental and social sustainability, (b) assist Borrowers in fulfilling their national and international environmental and social obligations; (c) enhance non-discrimination, transparency, participation, accountability and governance; and (d) enhance the sustainable development outcomes of projects through ongoing stakeholder engagement.

The ten ESSs as per the WB ESF are: ESS 1: Assessment and Management of Environmental and Social Risks and Impacts; ESS 2: Labor and Working Conditions; ESS 3: Resource Efficiency and Pollution Prevention and Management; ESS 4: Community Health and Safety; ESS 5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement; ESS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources; ESS 7: Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities; ESS 8: Cultural Heritage; ESS 9: Financial Intermediaries; and ESS 10: Stakeholder Engagement and Information Disclosure. Given the nature of activities of this project, six out of ten ESSs will be relevant.

Environmental and Social Standard ESS1 applies to all projects for which Bank Investment Project financing is sought. ESS1 establishes the importance of: (a) the Borrower's existing environmental and social framework in addressing the risks and impacts of the project; (b) an integrated environmental and social assessment to identify the risks and impacts of a project; (c) effective community engagement through disclosure of project-related information, consultation and effective feedback; and (d) management of environmental and social risks and impacts by the Borrower throughout the project life cycle. The Bank requires that all environmental and social risks and impacts of the project be addressed as part of the

environmental and social assessment conducted in accordance with ESS1. ESS2–10 set out the obligations of the Borrower in identifying and addressing environmental and social risks and impacts that may require particular attention based on the proposed project activities.

The World Bank Access to Information Policy, which reflects the Bank’s commitment to transparency, accountability and good governance, applies to the entire Framework and includes the disclosure obligations that relate to the Bank’s Investment Project Financing. Borrowers and projects are also required to apply the relevant requirements of the World Bank Group Environmental, Health and Safety Guidelines (EHSGs). These are technical reference documents, with general and industry specific examples of Good International Industry Practice (GIIP). A detailed outline of all the ESSs in relation to the activities of this project are presented in next section.

3.5.2 World Bank Environmental and Social Standards Applicable to the project

The following Table 3.3 below summarises The World Bank Environmental and Social Standards applicable to the project:

Table 3.3: The World Bank Environmental and Social Standards (ESSs) Applicable to the Project

No	The Applicable Environmental and Social Standard (ESS)		Reason for its Application in the Project
1	ESS1: Assessment and Management of Environmental and Social Risks and Impacts	YES	The project will generate environmental and social risks and hence they will be screened, identified and prevention and mitigation measures implemented to prevent, reduce, mitigate and address these impacts. Site-specific ESMP will be prepared to recommend E&S measures to be incorporated into designs of the specific subprojects.
2	ESS2: Labour and Working Conditions	YES	The project will engage community and contracted workers. The standard will promote the health and safety of these workers and ensure fair working conditions. Further a project GRM that is attentive to GBV/SEA will be in place to manage project related grievances from project affected people and other stakeholders in order to address them appropriately. In line with ESS2, the project will establish and operate a worker grievance mechanism to enable project workers to raise workplace concerns, including work-related sexual harassment.
3	ESS3: Resource Efficiency and Pollution Prevention and Management	YES	Construction materials such as wood, sand, gravel and water are expected to be supplied by authorized vendors. Mitigation measures are put in place to ensure that methods of extraction of the materials and transportation do not lead to soil erosion, pollution of water bodies, air. Site specific environmental and social assessment will determine the significance of the likely impacts and risks and mitigation measures will be included in the ESMP. It is anticipated that e-waste will be collected separately and later on taken to the designated registered vendor by the National Environmental Management Council (NEMC) for recycling and proper disposal.

No	The Applicable Environmental and Social Standard (ESS)		Reason for its Application in the Project
4	ESS4: Community Health and Safety	YES	<p>Construction activities (excavation, vehicle operations, work at height, use of chemicals, use of crane or other heavy equipment etc.) may have irreversible effects of disability or fatality to community. Localized negative impacts (like dust emissions, accidents, etc.) to sensitive receptors such as schools, religious buildings and community centers will need to be managed. The Project will require Contractors to prepare appropriate plans for emergency preparedness and response, management and safety of hazardous materials, traffic and road safety, security personnel, etc. as per the requirement of ESS4.</p> <p>Implementation of the Project is likely to trigger influx of workers or job seekers and their followers into sub-project areas. If a significant labor influx does occur, the project will develop and implement a Labor Influx Management Plan in line with ESS2, and ESS4. The project workforce could facilitate an increase in the transmission of HIV and other communicable diseases to members of the local/host communities. Implementation of the sub-projects.</p> <p>As the situation permits and depending on the public health circumstances, the project will ensure compliance with national law, policies and protocol requirements as well as World Health Organization and World Bank guidance regarding the COVID-19 situation in relation to stakeholders' consultations, project worksites and related areas.</p>
5	ESS 5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	NO	This ESS is not relevant to the proposed project as the site is legally owned by DUCE

No	The Applicable Environmental and Social Standard (ESS)		Reason for its Application in the Project
6	ESS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	NO	The project is situated at a distance from protected areas and delicate habitats. Should the project involve the procurement of natural resource commodities like timber, it becomes crucial to identify the origin and implement a mechanism to guarantee that Primary Suppliers do not cause substantial impact on sensitive ecosystems or degrade natural habitats."
7	ESS 7: Indigenous People/ Sub-Saharan African Historically Underserved Traditional Local Communities	NO	This standard is deemed irrelevant, given that the project will primarily be executed in regions where communities meeting the criteria of ESS7 are generally not present in the area.
8	ESS 8: Cultural Heritage	Yes	This ESS is relevant since there will be excavation therefore there is a chance that cultural heritage will be found. Chance find Procedure will be developed and implemented by contractor
9	ESS 9: Financial Intermediaries	NO	This ESS is not relevant to the project, since its not reflected in the HEET ESMF of 2021.
10	ESS10: Stakeholder Engagement and Information Disclosure	YES	A Stakeholders Engagement Plan (SEP) has been prepared to guide implementing agencies on how to 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. In ensuring that the project complies to the ESS10, the ESIA has been prepared by consulting stakeholders that include local communities, etc.

Source: Project HEET ESMF, 2021

3.5.3 Project Classification According to the World Bank ESF

According to the WB ESF, the Bank will classify all projects (including projects involving Financial Intermediaries (FIs)) into one of four classifications: **High Risk, Substantial Risk, Moderate Risk or Low Risk**. In determining the appropriate risk classification, the Bank takes into account relevant issues, such as the type, location, sensitivity, and scale of the project; the nature and magnitude of the potential environmental and social risks and impacts; and the capacity and commitment of the Borrower (including any other entity responsible for the implementation of the project) to manage the environmental and social risks and impacts in a manner consistent with the ESSs. Other areas of risk may also be relevant to the delivery of environmental and social mitigation measures and outcomes, depending on the specific project and the context in which it is being developed. These could include legal and institutional considerations; the nature of the mitigation and technology being proposed; governance structures and legislation; and considerations relating to stability, conflict or security.

The Bank will disclose the project's classification and the basis for that classification on the Bank's website and in project documents. The Bank will review the risk classification assigned to the project on a regular basis, including during implementation, and will change the classification where necessary, to ensure that continues to be appropriate. Any change to the classification will be disclosed on the Bank's website. According to the WB ESF the HEET project is given the risk assessment of Substantial due to the likelihood of environmental and social impacts generated by the project.

3.5.4 World Bank Group ESHS 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. Specific guidelines which will be used is Environmental, Health, and Safety (EHS) Guidelines: Environmental Waste Management. As stipulated earlier the guidelines will be used together with the Environmental, Health, and Safety General Guidelines. 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 will 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 will be based on the professional opinion of qualified and experienced persons.

3.5.5 Overall Management Responsibility at Project Level

To ensure the sound development and effective implementation of the proposed project, it will be necessary to identify and define the responsibilities and authority of the various key project implementors. The following entities will be involved:

- i. Funding Institution
- ii. DUCE PIU
- iii. Contractor; and
- iv. Consultant

3.5.5.1 Funding Institutions (GoT and World Bank)

The HEET project funders will have an overarching responsibility to ensure that the project is carried out to the highest environmental standards strictly in accordance with the ESF, ESSs and EIS.

3.5.5.2 PIU-DUCE

The proponent responsibility is to ensure that the implementation process of the ESMP and Mitigation measures are in line with the relevant national policies and legislations and World Bank Environmental and Social Standard (ESS1). DUCE has the Project implementation Unit (PIU) responsible for supervision and monitoring the implementation of the project construction activities. The management of all project activities during operation is under the PIU, in collaboration with other departments and units depending on the nature of the activity. In general, the PIU falls under the management of DUCE executing day-to-day activities in the project. The PIU is guided by management meetings that are chaired by the Deputy Vice Chancellor. The management meetings provide support, guidance and oversight of the progress of the PIU. Further, the PIU has designated the Environmental and Social Safeguard Specialists responsible for supervision and monitoring the implementation of the project.

3.5.5.3 The Contractor

The project will be implemented by a Contractor who will be responsible for the implementation of the proposed project in accordance with the Technical Specifications required. The Contractor shall implement the project entirely in accordance with the ESIA mitigation measures detailed in the ESMP. It is required that before commencement of actual construction, the Contractor should submit a work site plan that complies with the national environmental guidelines and an ESMP for the different phases of the work. The environmental plan shall specify the location of sources of materials and disposal area of construction debris as well as other related matters. The plan shall take into consideration the mitigation measures proposed in this ESIA project report.

The Contractor shall have a Project Environmental, Health and Safety Site Officer (EHSSO), and Project Social Site Officer (SSO) who will be the Contractor's focal point for all environmental and social matters. The EHSSO and SSO will be routinely on-site for the duration of the construction works. Both officers will have minimum of Bachelor Degree in their respective specialization. The officers among others will be responsible for the following tasks:

- i. Drafting environmental and social aspects during project implementation;
- ii. Managing environmental, social, health and safety aspects at the worksites;
- iii. Participating in the definition of the no working-areas;

- iv. Recommending solutions for specific environmental and social problems;
- v. Facilitating the creation of a liaison group with the stakeholders at the project site and shall monitor the compliance of ESMP;
- vi. Organizing consultations at critical stages of the project with the stakeholders and interested parties;
- vii. He/She will be required to liaise with DUCE Safeguard specialists on the level of compliance with the ESMP achieved by the contractor regular for the duration of the contract;
- viii. Controlling and supervising the implementation of the ESMP;
- ix. Preparing environmental and social progress or "audits" reports on the implementation status of measures and management of site works.

3.5.5.4 The Consultant

The project Consultant will be responsible for design review and supervision of the construction phase of the proposed project. The Consultant shall ensure compliance of EIS and C-ESMP. The Consultant shall have a Project Environmental, Health and Safety Site Officer (EHSSO) and Project Social Site Officer (SSO) who will be the focal point for all environmental, health and safety and social matters. The EHSSO and SSO will be routinely supervised on-site for the duration of the construction works. Both officers will have minimum of Bachelor degree in their respective specialization.

3.6 Other International Co-operation in Environment and Social

Tanzania cooperates with other nations in managing global environment and in compliance of international agreements on the environment. In that regard, the United Republic of Tanzania is a part of various international treaties aimed at the protection of the environment. The treaties are divided between those having a universal application and those limited to the Africa Region. Some of the treaties and conventions on environmental issues that Tanzania is a party are shown in Table 3.4 below.

Table 3.4: International Conventions Relevant to the project

Treaty/ Convention/ Protocol	Relevance	Compliance
The convention relative to the Preservation of Fauna and Flora in their Natural state, London, 1993	On the project area there are Fauna	All trees which do not interfere with the project shall be left intact
The Biodiversity Convention (CBD) adopted on 22 May 1992 and came into operation on 29 December 1993	The project site has some plants and small animal species in the project site	All plant species to be removed for the project implementation shall be replaced at DUCE premises
The African convention on the Conservation on Nature and Natural Resources, Algiers.	The project shall use Raw materials such as Water, Aggregates,	The raw materials shall be used in a sustainable manner.

Treaty/ Convention/ Protocol	Relevance	Compliance
	Sand etc which are natural resources.	
The Montreal Protocol on substances that deplete the Ozone layer, Montreal, 1987.	The use of equipment's (Air conditioners) with gases which deplete ozone	All substances which deplete ozone shall be prohibited
The Basel convention on the control of Transboundary Movements of Hazardous Wastes and their Disposal, 1989.	Hazardous materials (electronic wastes) shall be generated by project	No hazardous waste shall be transported outside of the country.
Bamako convention on the Ban of the Import into Africa and the control of Transboundary Movements of Hazardous Wastes within Africa, 1990.	The project shall import materials and equipment during construction and operation phase	DUCE shall see to it that all imported goods/equipment for the project are not hazardous materials
The United Nations Framework Convention on climate change, 1992.	Emissions from construction equipment have potential for climate change	DUCE shall mitigate emissions to be limited to acceptable range
The Kyoto Protocol on climate change, 1997	Emissions from construction equipment have potential for climate change	DUCE shall mitigate emissions to be limited to acceptable range
Universal Declaration of Human Right (1948), which form the basic principles for human right in the world.	People shall be employed during construction and operation phase, hence human rights must be observed.	DUCE shall recognise equality, security, liberty, integrity and dignity of all the people, including women.
The Convention on the Elimination of Violence against Women (CEVAW), as adopted by the UN General Assembly.	Women shall be employed to the project but also DUCE have female students and staff.	DUCE shall conduct due diligence in a bid to prevent, investigate and, in accordance with national legislation, punish acts of violence against women
The Beijing Declaration and Platform for Action (BPfA), adopted at the Fourth World Conference on Women (1995).	Women shall be employed to the project but also DUCE	DUCE shall comply to all acts and enforce the penal, civil, labour and

Treaty/ Convention/ Protocol	Relevance	Compliance
	have female students and staff.	administrative sanctions to punish and redress the wrongs done to victims.
The Southern African Development Community's Declaration on Gender and Development (1997) and its 1998 Addendum on the Eradication of All Forms of Violence against Women and Children (1998). the declaration emphasises on making sure that violence against women and children in any social-economic activities is eradicated.	Women shall be employed to the project but also DUCE have female students and staff.	DUCE shall make sure that violence against women and children in any social-economic activities is eradicated (if any).
The Protocol to the African Charter on Human and Peoples' Rights, on the Rights of Women in Africa known as the Maputo Protocol, which went into effect in 2005.	Women shall be employed to the project but also DUCE have female students and staff.	DUCE shall prohibit gender-based violence as part of women's rights to life, integrity and security of the person, and dignity.

CHAPTER FOUR

4.0 BASELINE ENVIRONMENTAL AND SOCIAL CONDITIONS

4.0 Introduction

This part postulates the baseline environmental details of an area prior to the project development. It describes the physical, chemical, biological and social environment that could be affected by the project development.

4.1 DUCE General baseline Environment

4.1.1 Climate

The climatic condition of the project site is similar to that of Dar es Salaam which is coastal tropical climate characterized by high temperature, low wind speed, high humidity, and the absence of cold season. The wet or heavy rain season lasts from March to May and the dry season from June to October. Also, there is a short rainy season from November to December followed by a short dry hot season from January to February. The climate is influenced by the south-to-south –east monsoon from April to October, and north-east monsoon between November and March. The presence of the ocean also has a vital impact on the climatic condition of an area mainly due to sea breeze (TMA, 2023).

4.1.1.1 Rainfall

The annual rainfall average of National stadium street where the project is located is 1100mm in its bimodal pattern. The short rainy season during November and December giving a maximum average rainfall of 800 mm per month and the long rainy season between March and May which give a monthly rainfall average of up to 1300mm.

4.1.1.2 Temperature

The average annual low and high temperature in the National Stadium Street is 24°C and 31 °C respectively and the average yearly temperature is 26°C with a mean seasonal change of ± 4°C. There are not noticeable differences in temperature, October to March is the hottest period of the year when temperature can rise up to 35°C the weather is quite cool from May to August with temperature hovering around 25°C (TMA, 2013).

4.1.1.3 Humidity

Humidity of the air varies with the rainfall pattern and is maximum during lengthy rain. Maximum humidity occurs around dawn, averaging 96% and the minimum humidity occurs in the afternoons with an average of 67%.

4.1.1.4 Wind characteristics

National Stadium street wind system is characteristic of the Western Indian Ocean, which is characterized by a full clockwise wind system over the northern Indian Ocean. It departs throughout the northern summer months of April to September. During this time, the winds are mostly South-Easterly (SE monsoons) whereas the southern summer is characterized by NE winds (monsoons). Winds in the area are normally light, ranging from F3 to F4 on the Beaufort scale. The peak winds occur in the months of February (NE monsoon period), April and July during SE monsoon. This wind system is linked to a nearly full clockwise current system that changes character as the wind change.

4.1.2 DUCE Community

DUCE community includes both academic staff, non-academic staff and students. Table 4.1 below shows a demography of the DUCE community;

Table 4.1: DUCE Community Demography

Category	Male	Female	Total
Academic Staff	183	97	280
	65.4%	34.6%	100%
Non-Academic Staff	145	148	293
	49.5%	50.5%	100%
Students	8628	8540	17,164
	50.3%	49.7%	100%

Source: DUCE, 2023

4.1.3 Topography and Soil

The topography of DUCE is relatively flat with a gently slope towards the east, the slope varies from 0.9% to 2.6%. Physical observation and the soil finger test confirmed that the type of the soil is sand soil.

4.1.4 Land Use

Land use zones at DUCE as that was observed during the site survey which have also been documented in the DUCE masterplan of 2018 as described in Table 4.2 below.

Table 4.2: DUCE Land Use Zones

SN	Land Use Zone	Description
1	Academic Zone	Academic zone is located at the central and southern side of the campus. The zone is incorporated with the library, lecture halls, Teachers' Profession Centre, Director of Student Services and Faculty of Education, Science and Humanities and Social Sciences.
2	Administration Zone	This zone is located at the southern part of the campus. It takes 0.87% of the total area, this zone is comprised of administration building.
3	Students' Hostel Zone	This zone takes up 6.81% of the whole area located at eastern side of the campus bordered by Chang'ombe road. The zone is consisted of undergraduate students' hostel buildings.
4	Staff Housing Zone	The staff housing zone occupies 6.38% of the entire campus area, it is located at the eastern part of the university. This zone consists of one opulent house for the principal, paired houses for senior staff and flat blocks for other staffs.
5	Demonstration Schools Zone	Demonstration Schools Zone is located at western part of DUCE main campus occupying 21.17% of the total area, it is comprised of the Chang'ombe Demonstration Pre School, Chang'ombe Demonstration Primary School and Chang'ombe Demonstration Secondary School.

6	Welfare Zone	This zone takes up 3.5% of the whole area located at the central and south eastern parts of the college. It is comprised of the Dispensary, Cafeteria, Staff Canteen, SACOS, and Auxiliary Police Unit.
7	Recreation Zone	Recreation zone is located at the south west and the central part of the campus occupying 20.13% of the campus area. It comprises of Football Pitch, Basketball and Netball Courts. The football pitch shall be rehabilitated to replace the main pitch that the land use has changed.
8	Commercial Zone	This zone is located at the north, east and western parts of the campus consisting of the Financial Institutions, Shops and Restaurants along Taifa Road and Chang'ombe Road. It takes 1.87% of the total area.
9	Estate Zone	Estate Zone occupies 1.96% of the total college area. It is located at the eastern part of the college with the backdoor entrance to the Chang'ombe road. It is consisting of the Estate Department and the Procurement Management Unit.
10	Open space	An open space occupies 11.09% of the total area, comprising of gardens and outdoor leaning hubs known as "Vimbwete". This zone is located at the north, east and southern parts of the campus. It is expected that the benches from the proposed site shall be relocated here.
11	Road network	Road network occupies 6.93% of the total area of the college which includes three entrances which are the main gate facing Taifa Road and two rear gates facing Chang'ombe road. This zone serves the accessibility to the campus and connect all zones of the campus.

Source: DUCE Master Plan, 2018 and Site Survey, 2023

4.1.5 Utilities

4.1.5.1 Electricity

Tanzania Electric Supply Company (TANESCO) provides electricity. The electricity lines run beside the main and entry lane. There are two transformers situated in the campus where by the first transformer has 200KVA capacity placed next to the Estate building and the second transformer has the capacity of 500KVA. These two transformers step up the power received from Kurasini Substation so that to ensure the electrical supply meets the demand of the DUCE campus. Currently, the electricity consumption per month is about 66,110KWH. Also, there is a standby generator which is used as the alternative source of power during blackout of which its capacity data are unavailable.

4.1.5.2 Water Supply

There are two main sources of water at DUCE main campus which are boreholes and DAWASA. There are four boreholes in the campus where by three are owned by the university and one is owned by DAWASA. The borehole owned by DAWASA has a capacity of 23m³/hour but only 2m³/hour of water is supplied by DAWASA in the campus. The other three DUCE owned boreholes are located near the residential houses, close to the lecture theatres and next to the teacher's professional centres with the capacities of 9.7m³/hour, 2m³/hour and 1.5m³/hour respectively. The total existing water consumption per day is 364.3m³. The existing sources will be able to service the new buildings.

4.1.6 Biological features

4.1.6.1 Flora

DUCE is extensively wooded with alien species plants. *Azadirachta indica* A. Juss (Neem trees, Miarubaini), *Grevillea robusta* (silk oak) [mgrivelia], *Cassia siamea* (Blackwood cassia or yellow cassia) [mjohoro], *Mangifera indica* (mango) (miembe), *Saraca asoca* (Ashok), *Adansonia digitata* (Boabab), and *Rhodognaphalon schumannianum* (Misufi) are among the other trees. Patches of grass can be seen in the areas that are not paved, notably near the academic zone. There were also planted flowers in the gardens and around the building walls.

4.1.6.1 Fauna

Aside from a few common house gecko lizards and birds including ravens and house sparrows, neither domestic animals nor wildlife were seen at the project area.

4.1.7 Access Roads and Parking Lots

DUCE campus can be accessed via three gates connected to Taifa and Chang'ombe roads, the main entrance is directly connected to Taifa Road and the other two gates (rear and alternative) are connected to Chang'ombe Road, these two roads link the college to the Nelson Mandela and Kilwa Roads. There are parking lots near various buildings. However, some are not paved. The main parking lot is located in front of the administration block and has a capacity of accommodating 135 automobiles in three rows where by each can accommodate 45 cars at once.

Also, DUCE is equipped with a network of pathways which connect different components of the college with the access roads having a total distance of about 1.5km which is 62% of tarmac road while 38% is gravel road and 655m of paved walkways.

4.1.8 Solid Waste Management

DUCE common solid wastes consists primarily of papers, plastic bottles, cardboards, yard wastes, food wastes and infectious wastes from the clinic. Solid wastes are predicted to rise throughout the project's development and operation. Consequently, solid waste management must be upgraded to handle the increasing wastes. There are three solid waste transfer stations within the college, two of them are located at the demonstration schools and one is located closer to College Library and Director of Students premises. Solid wastes from these collection points are transported and disposed at the municipal dump site by the private contractors which are also responsible for cleaning. There are two cleaning companies GENESIS professional cleaning company for interior and CHESS cleaning company for exterior. Solid wastes from dispensary are burnt in the incinerator and the food wastes from the canteens are managed by the operators of the canteen (caterers).

4.1.9 Liquid Waste Management

The Campus employs an onsite sanitation system comprised of septic systems of 22 septic tanks and soak away pits. However, the capacity of the septic tanks and soak away pits is insufficient to meet the existing number of students enrolled and staff. The proposed project is expected to rise the quantity of waste water generation during construction and operation phase. Therefore, the project should have its own treatment and disposal system,

consideration of a small scale UASB should be made. There is no sewer system near the project area.

4.1.10 Hazardous Waste Management

The source, types and existing disposal methods of hazardous wastes at DUCE are shown in Table 4.3. There are no data on the quantities of hazardous wastes generation and collection.

Table 4.3: Sources, Types and Disposal Methods of Hazardous Wastes at DUCE

SN	Type	Source	Existing disposal method
1.	Electronic wastes	Computers, Photocopiers, Printers etc	-Some are disposed as general waste - Some are sold through public auction
2	Infectious waste	Dispensary	-Collected in daily basis by special vehicle from Temeke municipal
3	Obsolete chemicals	Chemical Laboratories	Handled and disposed by TBS or TDFRA

Source: DUCE Estate Manager, 2023

As per Environmental Management Act of 2002 hazardous wastes are to be handled by NEMC approved hazardous waste collector from the source to the disposal area. This project is expected to increase the amount of hazardous wastes generation for example electronic trash especially during operation time. DUCE should contract a hazardous waste dealer so as to comply with this requirement.

4.1.11 Health, Safety and Security

Staff, students, and visitors' health and safety are of the highest significance. Table 4.4 shows the existing situation of the health safety and security at DUCE. The Health and Security plan maps out all necessary guidelines and procedure in each phase of the ESIA study as recommended in the World Bank ESS4.

Table 4.4: Health Safety and Security Issues at DUCE

SN	Health, Safety and Security Item	Description
1	OSHA Premises Registration	DUCE have registered the premises with OSHA
2	Annual OSHA Compliance	Present
3	Annual OSHA training	There is no evidence to show that staff attend OSHA training annually.
4	Fire Preparedness	<ul style="list-style-type: none"> - About 160 Portable fire extinguishers are located at all strategic areas and are serviced after 6 months. - Regular fire drills are conducted - There are fire hydrants - No fire outbreak in the past five years - No Annual Inspection by Fire and Rescue Forces

SN	Health, Safety and Security Item	Description
5	Health issues	<ul style="list-style-type: none"> - Presence of dispensary with qualified personnel and required equipment and drugs - Almost outside of all buildings have been installed with facility to provide running water and soap - Some buildings are provided with sanitizer dispensers
6	Accidents	<ul style="list-style-type: none"> - No death has been reported to be caused by activities at DUCE - No accidents in Classrooms, Workshops, Laboratory reported - No car accident has been reported
7	Security	<ul style="list-style-type: none"> - DUCE Main campus is fenced all around - There are seven auxiliary police - Security company called Insight security Company limited provide security of the campus 24 hours.

Source: Various Departments Units at DUCE

The proposed project is expected to increase the population of an area and traffic which threaten the health, safety and security within DUCE premises so additional measures and precautions should be taken to reduce the impacts.

4.1.12 Neighboring Area

DUCE neighbourhood is characterised by mixed land uses. This is depicted by the presence of National stadium on the southern side, JKT Mgulani on the Eastern side, Chang'ombe Mchichani, a mixed commercial and residential community flanked by the Muslim College and Mgulani is on the northern side.

4.1.13 Ambient Dust (particulate matter) in terms of PM10

The sampling methodology is provided in section 1.8.5. The measured particulate matter (PM₁₀) concentrations associated with project site were within the detectable levels in the ambient air. The average PM₁₀ concentrations recorded at five (5) sampling locations ranged from 0.01 to 0.03 mg/m³, with the maximum values been measured in the northern side which is mostly caused by wind movements and other human activities . PM₁₀ values measured some stations were BELOW corresponding limits prescribed by TBS and IFC/WHO for ambient air quality. Similarly, all stations were having PM₁₀ values satisfying the US OSHA standard limit of 15 mg/m³ recommended purposely for inert or nuisance dust.

Some dust abatement strategies and/or technology should be enforced as special attention to mitigate effects associated with particulate matter production and ensuring that prescribed levels are met. These include:

- Improved process design, operation and maintenance, cleanness and other management practices to reduce dust generation;
- Employing dust suppression technique, such as applying water or non-toxic chemicals to minimize dust from vehicle movements during dry and/or windy weather. Dusty areas such as internal access roads and bare area with loose soils should be suppressed down and compacted to reduce dust generation;

- Stock piled materials should be covered or stored properly;
- Planting of trees around the project area as trees absorb these toxic chemicals through their stomata or pores, effectively filtering these chemicals from the air. Trees also mitigate the greenhouse gas effect by trapping heat, reduce ground level ozone levels and release life giving oxygen
- Provision of PPE to workers and their use should be made mandatory to dust prone areas;
- Implementing Environmental Monitoring Program for the sites by monitoring the dust levels of dust (in term of PM₁₀) under quarterly basis (after every three months).

4.1.14 Ambient Pollutant Gases

The sampling methodology is provided in section 1.8.5. Scanty levels of Pollutant gases were detected at some monitoring stations with CO₂ (Carbon dioxide), CO (Carbon monoxide), NO₂ (Nitrogen dioxide), SO₂ (Sulfur dioxide), CH₄ (Methane gas) and H₂S (Hydrogen sulfide). Methane (CH₄) and Hydrogen sulfide (H₂S) levels were measured across the sampling stations, despite being not regulated by either local or international standards; the recorded levels for unlegislated CH₄ have no significant affects to the environment and human health. Levels of legislated ambient pollutant gases i.e CO (Carbon monoxide), NO₂ (Nitrogen dioxide), SO₂ (Sulfur dioxide) and CO₂ (Carbon dioxide) were found to be within their corresponding limits prescribed by TBS and WB/IFC for ambient air quality.

Based on the results, the following mitigation measures should be employed in order to reduce the emitted pollutant gases to an unacceptable level:

- The use of good quality fuels for trucks and machinery according to the Draft Tanzania Standards for fuel specifications (TBS/CDC 15 (1990) DTZS:2023 ICS: 75.160.20)
- Maintaining stable operating conditions i.e., minimize emission by maintaining proper air and fuel ratio.
- Ensure appropriate uses of machineries as per manufactures guidelines.

4.1.15 Noise Levels

The sampling methodology is provided in section 1.8.5. The average noise levels were ranging from 43dB (A) to 58dB (A) for day time and 30db(A) to 31 dB(A) during night time, with the maximum values been noted close to the road near DUCE dispensary. The main contributors of recoded noise levels were primarily from movement of vehicles.

Based on the measured noise levels, the following abatement and control strategies are recommended as mitigation measures for laborers and nearby locals in noisy zones to avoid sound lever induced hearing damages:

- Check the performance of the major equipment periodically, in order to troubleshooting and fix the problem by lubricating, repairing and etc. These include regular servicing and proper lubrication and maintenance of noisy machines to reduce noise levels; maintenance should consider of the following:
 - *replacement or adjustment of worn or loose parts;*
 - *balancing of unbalanced equipment;*
 - *lubrication of moving parts;*

- *use of properly shaped and sharpened cutting tools.*
- Use of machinery or equipment of superior technology as a noise minimization strategy;
- Reduce the noise exposure level of the laborers by employing part time operators or altering their activity zones between safe and unsafe acoustical zones;
- Installation of barriers between noise sources and receivers can be attenuating the noise levels
- Encourage the use of noise protectors i.e. earplugs where necessary however this should be done with carefully because workers if not done properly as workers would not be able to communicate; in noise; that they will not be able to hear warning signals; and they would not hear conversation; 'when wearing protector devices, hence appropriate trainings should be done including the use of signals before applying such methodology.

4.1.16 Ground Vibrations

The sampling methodology is provided in section 1.8.5. As detailed in table below, all five assessed locations had the ground vibrations levels below the TBS limit (TZS 1471:2011) of 5mm/s. The mean ground vibration level recorded in both areas was below the limits. There were no significance difference in vibration levels, hence it is obvious that, vibration in the assessed areas were mainly contributed by other natural and anthropogenic activities. The detected ground vibration was assumed to be originating from vehicle and human movements that were moving near by the measuring points.

4.2 Socio-Economic Environment

4.2.1 Site for Postgraduate Building

The footprint of the proposed building is expected to be 1,000sqm. The site is relatively flat covered by small grasses. Neither wildlife nor domestic animal was observed at the project site.

4.2.2 Site for Faculty of Humanities and Social Science Building

The site for Faculty of Humanities and Social Sciences building is located at the center of DUCE campus. There are about 32 concrete benches (*Vimbwete*) which shall be relocated to another suitable area to pave way for the project. The footprint of the building is expected to be 1,500sqm. The vegetation of the area is characterized by exotic trees including 13 neem trees and some flowers. Neither wildlife nor domestic animal was observed at the project site.

4.2.3 Land use and administration

Land use of Miburani Ward is dominated by commercial/ residential uses, institutional uses and the National Stadium. Miburani ward has a total of 7 streets, including National Stadium street where the project site is found.

4.2.4 Population

According to census conducted in 2022, Miburani Ward has population of 93,457 of which male are 44,684 and female are 48,773. The average household size is 5.7. With the total area of 52.60km², the population density of Miburani ward is 1,777/km².

4.2.5 Education Services

Miburani Ward has several education services of which some are privately and others are publicly owned as shown in Table 4.5. The proponent shall have social cooperate responsibility on education and other social services through various contributions (e.g., construction of schools etc).

Table 4.5: Education Services in Miburani Ward

Type of Education Services	Public	Private	Total
Primary School	4	0	4
Secondary School	3	3	
Higher Learning Institutions	2	0	2

Source: Ward Executive Officer, 2023

4.2.6 Health Services

All streets have dispensaries. There are no health centres while there is one hospitals in Miburani ward. Table 4.6 shows different health services in the area. The mode of health services delivery in Temeke District is like other districts in Tanzania, based on preventive, promotive and curative care. The line of operation starts from the dispensary, health centre to the District Hospital.

Table 4.6: Health Services in Miburani Ward

Type of Health service	Public	Private	Total
Hospitals	1	0	1
Health Centers	0	0	0
Dispensaries	11	4	15
Laboratory	0	6	6
Pharmacy	0	25	25

Source: Ward Executive Officer, 2023

4.2.7 Safe and Clean Water Services

The main source of water for Miburani residents is DAWASA articulation system. All streets are served by the system. However, individuals have other sources of water including boreholes, shallow wells and rain water harvesting systems to argument the water supplied by DAWASA. This project shall use water supplied by DAWASA as well.

4.2.8 Energy

Miburani Ward depends on different sources of energy, such as electricity, solar, compressed petroleum gas etc. The main source of power at Miburani Ward is electricity, which is generated, transmitted and supplied by a sole utility agent, Tanzania Electric Supply Company Limited (TANESCO). The whole ward has TANESCO network. Residents commonly use liquified petroleum gas for cooking.

4.3 Gender issues

DUCE is deeply devoted to gender equality and inclusion. The college provides equal chances in employment of staffs, provision of expertise skills to both staff and students, students' enrolment, assessment and leadership and promotions for staff. DUCE developed a gender policy in 2016, through this the college is committed in promoting gender equality and fairness. This gender strategy is the result of the Tanzanian government's commitment in numerous programmes such as the National Development Vision (2025) and the United Republic of Tanzania's constitution. Furthermore, the Tanzanian government is devoted to the concept of properly incorporating all people in the country's development. In addition, it has signed all international treaties aiming at eradicating gender bias against women. Moreover, there is Gender Desk which is guided by the guidelines from the Ministry of Community Development, Gender, Women and Special Groups. Currently the desk has not received any case on gender-based violence between staff and staff and staff and students. However, there are cases among students.

4.3.1 Gender Equality Issues for Staff and Students

According to DUCE Gender Focal Person, female students' enrolment has been increasing for the past years relative to that of male students. This entails a gradual increase in the number of female students in recent years. For instance, in 2021-2022 the enrolment of students was 49% and 51% female and male, respectively, while the enrolment for 2022-2023 is 51% and 49% female and male, respectively, in both diploma and degree programmes.

It was established that, the gradual increase in the number of females in the enrolment from 2021 to 2023 was due to deliberate efforts the College had taken by creating incentives and publishing female students who had distinguished themselves in class and in the labour market upon employment. The other effort is through improving different learning infrastructures which has attracted more female students to pursue different courses.

The gender imbalances among staff and students was a major concern, but Dar es salaam University College of Education has reached many milestones to ensure that the challenges are well-addressed in the future by establishing the College's gender policy. The policy provides a framework for staff and students in planning and implementing a gender-responsive education, training, research and consultancy services. The policy highlights key issues and intervention strategies in aspects including disparities in student enrolments, and staff recruitment to improve the overall performance of the institution. It incorporates a holistic approach as well as the adaptation and best gender equity and equality practices to ensure an enabling environment that promotes and facilitates gender equality.

More specifically, the policy states the key objectives of the College is to facilitate the creation of an enabling environment to the full development of intellectual potentials of both men and women; Providing guidelines that will facilitate equality and equity of opportunities for women and men in terms of accessing knowledge, employment opportunities, services and resources as well as equality and equity of treatment by employees and all service providers at the college; Establish guidelines for the college including affirmative actions to redress the historical gender imbalances; proposing institutional transformation of values, norms and practises, which hinder promotion of gender equality; providing guidelines which will support women empowerment as students and members of staff so that they can demand gender

accountability from office bearers; providing guidelines that will enable the College measures which will eradicate discriminative practises, procedures and rules and; providing guidelines that will enable the college mainstream gender in the curricula programs and projects to ensure that they are gender sensitive. It is worthwhile to note that, this gender policy which was formulated in 2016 has currently been reviewed and is in its final stage process of approval for implementation.

4.3.2 Gender-Based Violence Status at DUCE

4.3.2.1 Gender- Based Violence between Students and Staff

The findings from the consultation done with different department staff and students at the Dar es salaam University College of Education did not reveal any notorious gender-based violence acts between staff and students at the college. According to the gender focal person, the College has the institutional guideline and gender policy which every staff and student ought to abide by while at the College, the guidelines stipulate the key responsibilities and demarcation between student and staff which in one way or another limits the chances for gender-based violence as well as sexual harassment among staff and students.

The college formulated a Gender Desk in the year 2022, which consists of 11 members who work hand in hand to solve issues concerning Gender Based Violence (GBV). Furthermore, the college offers seminars and trainings on GBV to staff, students, and service providers around the campus to make them aware on the policy, the laws guiding the policy and best practises on how to live with one another. The college has a Counselling Unit which works hand in hand with the Gender Desk committee to best help students and staff deal with different matters in the campus. The college also formulated an Anti-sexual Harassment Policy in 2019 as an initiative to create an Environment that fights sexual harassment while aligning with the goals of DUCE Gender Policy.

Students representative explained that the College is committed to policies and guidelines on gender equality and ending GBV by explaining that as part of ensuring students problems, especially female students' problems are well addressed, every student at the College is assigned to academic advisor who act as the guardian and advisor on academic matters. Furthermore, in case of any social-economic challenges which may affect student performance the advisor directs the student to the respective authorities (Gender Desk, Counselling Unit or Director of Student Services).

According to the Medical Officer In-charge at DUCE medical centre, the health centre at the College had not received issues from staff and students in relation to gender-based violence or sexual harassment. Moreover, the level of awareness on GBV issues at the College is generally high and people are taking GBV issues as the serious component in daily operational activities.

4.3.2.2 Gender- Based Violence between Students and Students

On the other hand, the consultation with staff and the College's management revealed that there are few cases of GBV among students. According to the Director of Students Services and Gender Focal Person, the popular cases of GBV that the College encountered included conflicts resulting from the relationship and love affairs, which leads to misunderstandings, physical fights and emotional torture among students: In response to these cases of violence

and sexual harassment, the College handles them through responsible units dealing with various issues including those of violence.

4.3.3 Gender-Based Violence issues from past Construction Project

It was reported that, DUCE has not experienced any case of gender-based violence in the past construction activities at the campus. However, some of the major issues raised by DUCE staff and students regarding what kinds of gender-based violence that can be exacerbated by the construction project were economic violence, abusive language to women and other services providers as construction workers sometime neglect to pay for service and provides demeaning comments to service providers and abusing of labourers (men and women) in terms of extremely low wage which may results into conflicts as well as risky to sexual behaviour.

4.3.4 Awareness of Gender Based Violence among DUCE Communities

Many participants during interviews and FGDs in their respective areas indicated to know the meaning and consequences of gender-based violence. According to them, gender-based violence includes forced sex, humiliation, physical torture, sexual corruption, sextortion, insults and other demeaning comments. Few cases of gender-based violence were reported to be found within the campus and are among students themselves. These cases include physical fight and emotional torture among students caused by misunderstandings in relationships and love affairs. Other respondents such as local government authorities did not expose any kind of gender-based violence as popular in the community. The respondents believed that the DUCE community was well-informed about GBV causes and consequences. As such, much violence was addressed through institutional policies and guidelines but also the available laws and policies of the country.

4.3.5 Viewpoint on Gender Based Violence Issues associated to Project Implementation

Though participants during interview and focus group discussions did not show to have experiences of gender-based violence being caused by construction projects, they pointed out some of the issues they think can be exacerbated by project during the implementation:

- Women who seek employment may face demands for sexual favours or sex corruption;
- Women in the community may risk being subjected to verbal harassment in the form of insults and demeaning comments and unwanted gestures and touches by construction workers;
- Construction workers can easily be involved in risky sexual behaviour with the surrounded communities including students which can cause conflicts and misunderstanding among the community;
- The construction site may lack good infrastructure to accommodate workers such as enough toilets and venerated rooms for both men and women;
- Mistreating of labourers (men and women) in terms of extremely low wage which may results into conflicts; and
- Construction activities on the sites may cause noise pollution to the nearby hospital, churches whereby children and patients can be disturbed.

4.3.6 Plans for Gender Mainstreaming at DUCE

Gender mainstreaming at DUCE is stated in the Gender Policy: The DUCE Gender policy objectives include:

- Facilitate the creation of an enabling environment to enable full development of intellectual potentials of both men and women;
- Providing guidelines that will facilitate equality and equity of opportunities for women and men in terms of accessing knowledge, employment opportunities, services and resources as well as equality and equity of treatment by employees and all service providers at college; Establish guidelines for the college including affirmative actions to redress the historical gender imbalances;
- proposing institutional transformation of values, norms and practises, which hinder promotion of gender equality;
- providing guidelines that will support women empowerment as students and members of staff so that they can demand gender accountability from office bearers;
- providing guidelines that will enable the college to institute measures that will ban discriminative practises, procedures and rules and;
- providing guidelines that will enable the college mainstream gender in the curricula programs and projects to ensure that they are gender sensitive.

4.3.4 Gender Balance Main Streaming Strategies

Some of the strategies, as stated in the DUCE Gender Policy in relation to gender mainstreaming, include:

- Explicitly promote gender equality and gender equity in all key policies
- Establish procedures for ensuring the implementation of gender mainstreaming across newly established policies, programmes, plans and functions
- Institute mechanisms that would provide gender budgeting approach at DUCE, support and finance gender research and consultations
- Review all the DUCE curricula for gender responsiveness
- Strengthen counselling services for students
- Build sustainability and accountability plans for moving DUCE towards 50/50 enrolment percentage ratio between female and male

4.3.5 Reporting and Handling Mechanism of GBV Issues

Different mechanisms were established within DUCE and nearby community as major ways of handling gender-based violence issues in case their occurrences;

- At Dar es salaam university college of Education, the Director of Students Services is responsible for handling any misunderstanding among students while issues of GBV between staff and students are handled by the Gender Desk Office.
- Any complaint from internal staff and external workers including those running projects at DUCE campus are received and handled by the Gender Desk Office which is responsible for handling and addressing all complaints related to GBV and sexual harassment.
- There exists the office of Diversity Unit with a Gender Focal Person, who is in charge of all the matters relating to gender equality, GBV and also an advisor of gender mainstreaming at the College.

- There is a health centre responsible for providing health care services for all victims of violence as another way of helping GBV victims. However, the health centre is challenged by lack of Post Exposure Prophylactics services which is helpful for rape victims. With progress in efforts for improvement of health facilities in Tanzania and awareness on GBV, these challenges are expected to be dealt with from the national level narrowing to the local community level.
- Other helping mechanisms in handling GBV matters include the Auxiliary Police within the campus and a nearby Police Gender Desk at Chang'ombe Police Station.
- The existence of the Local Government Authorities (LGAs) to resolve Gender-Based Violence Issue. The LGAs help to deal with GBV thusly when a GBV case is reported it is handled by the Community Development Officer (CDO) who is in the Ward Office. Then, he/she should advise on what to do. If it is a serious case, for instance, a rape case, then CDO will direct the victim to be taken to the the Police who provide PF3 for Hospital medical treatment and file a case to court of law for legal proceedings. The CDO and the Ward Office at large will be responsible for making follow up of the proceedings and the decision of the court.
- DUCE community can also get assistance from Tanzania Gender Network Programme (TGNP), which is a gender-based network with over 16 centres in Dar es Salaam responsible for sharing information and providing knowledge on GBV. In addition, these centres provide counselling services to the victims of GBV as well as connecting the victims to lawyers and gender desks available in different police stations.

4.3 Institutional Capacity in implementing ESIA

As indicated in the POM, DUCE structure comprises of Coordinator, Assistant Coordinator, Portfolio Leaders, Consultants, Contractors and the DUCE Community (See Figure 4.2). Coordinator will be responsible in coordinating and managing functions of the project at the institution level such as organising financial procurement, E&S and monitoring and evaluation (M&E). Similarly, will be providing support geared towards building capacity of the staff in the implementation of the project in order to observe issues of E&S as recommended by the MoEST and the World Bank as stipulated in the POM, PAD and ESMF.

Environmental and Social Safeguards Specialist at DUCE will ensure that different activities of the project meet the country legal and World Bank requirements in regard to Environment and Social Standards. The environmental and Social Safeguard Team will work closely with the consultants Contractors and the DUCE community to implement E&S activities. The team will also work closely with consultants and contractors to ensure the implementation observes project E&S standards as indicated by ESS1, ESS2, ESS3, ESS4, ESS8 and ESS10. In addition, consultants and contractors will provide technical assistant to the institution on how to implement the project by observing the standards given by the government and the World Bank as shown in PAD, POM and ESMF. In the implementation of the project the team will ensure that DUCE community and the nearby surroundings understand the project, cooperate and own it. The process of addressing issues of E&S standards in the project implementation will also involve other stake holders such as Temeke Municipal Council, OSHA, Police Force, TANESCO, NEMC, TGNP and DAWASA.

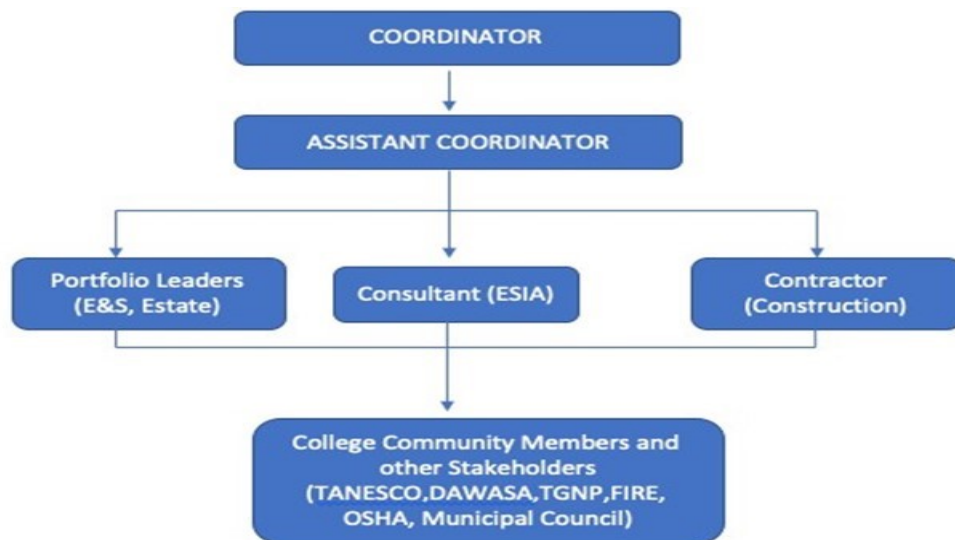


Figure 4.2: Institutional Project Implementing Team (PIT)
CHAPTER FIVE

5.0 STAKEHOLDER CONSULTATIONS AND PUBLIC INVOLVEMENT

5.1 Introduction

Public consultation as recommended by the World Bank Environmental and Social Standard (ESS10-“Stakeholders Engagement and Information Disclosure”) recognizes the importance of open and transparent engagement between the borrower and project stakeholders as an essential element of good international practices which is an essential requirement of the ESIA process. This aim to ensure public participation and acceptance of the project as well as limiting adverse impacts that would be produced when the project is being implemented. Similarly, it helps to uncover issues that the preparation team may not have been identified nor addressed in the EIA. If the community participates in the early stages of project preparation, then it should it be possible to develop a close relationship between the community and the project team thereby allowing the community to put forward valuable proposals before project implementation. A Stakeholders Engagement Plan (SEP) has been prepared to guide implementing agencies on how to provide stakeholders with timely, relevant, understandable and accessible information The Objectives of public consultation are to:

- share information about project components and proposed project activities with the community in the project areas, and also with relevant stakeholders.
- gather different viewpoints and opinions, and to understand the concerns and sensitivities of local authorities and communities on environmental problems in the project areas, especially problems which were not identified by the EIA team. Using this information, public concerns can be addressed in time, during project design and when selection between alternative solutions are made
- perform a thorough and comprehensive evaluation of all environmental impacts and propose the most effective mitigation measures that exactly address the expected adverse environmental impacts of the project.

The Methodology for Stakeholders consultation has been presented in a Methodology section (See section 1.8).

5.2 Stakeholders Consulted

In line with ESS10, ESS1 and the ESF, stakeholder engagement will focus on broad inclusion and ensuring meaningful engagement with and participation of members affected directly by the project. The project stakeholders are individuals or groups who are affected or likely to be affected by the project affected parties (PAP) and who may have an interest in the project and/or the ability to influence its outcome, either positively or negatively (other interested parties OIPs). The identification of stakeholders under the HEET project will be based on (a) their roles and responsibilities; (b) possible influence/interest on the project; and (c) their particular circumstances they may be disadvantaged or vulnerable in different ways from each other. Stakeholders consultation will also be done in the phases of construction and operation of the project.

A summary of the consultation programme which contains stakeholders identified for this project is presented in Table 5.1 below. The consultation programme maps out the stakeholder engagement process in each phase of the ESIA study. The programme is adaptive and subject to change based on stakeholder responses/requirements. A combination of various types of consultation techniques was used like face-to-face meetings, interviews and serving of scoping report and request for issues. The overall consultation process was designed to comply with the requirements for public consultation as prescribed in Tanzania's EIA and Audit regulations for stakeholder engagement, and World bank guidelines for stakeholder's engagement.

Table 5.1: Stakeholders Identified and Consultation Programme

ESIA Phase	Stakeholders Identified and Consultation Plan	Method of Consultation
Project Inception State (July 2023)	<ul style="list-style-type: none"> • DUCE (Project Coordinator, Estate manager, Procurement officer, Warden, Dean of students, Human Resources officer) 	Face to face consultation
Scoping Phase (August 2023)	Consultation with Stakeholders including; <ul style="list-style-type: none"> • Temeke Municipal Council (Town Planner and Environmental management Officer) • Occupational Safety and Health Authority (OSHA) • Miburani Ward Executive Officer (WEO) • National Stadium Street Executive Officer (MEO) 	Face to face consultation
Detailed ESIA Study (Aug-Oct 2023)	<ul style="list-style-type: none"> • Legal and Human Right Centre (LHRC) • Tanzania Gender Network Programme (TGNP) • DUCE Officers (Gender Unit Officer, Medical Office In charge, Dean of Students (DUCE), Director of Postgraduate and undergraduate) 	Face to face consultation

ESIA Phase	Stakeholders Identified and Consultation Plan	Method of Consultation
	<ul style="list-style-type: none"> • DUCE Students Government Leaders 	Meeting
	<ul style="list-style-type: none"> • Ministry of Education, Science and Technology (MoEST) • Tanzania Electric Company limited (TANESCO) • Dar es Salaam Water Supply and Sanitation Authority (DAWASA) • Fire and Rescue Forces (Temeke) 	Scoping reports submitted to stakeholders and requested to send comments to NEMC as per EIA regulations amendments of 2018

Source: Consultant, September 2023

Issues raised by the stakeholders are summarized in Table 5.2. below .

Table 5.2: Comment Response Table

Authority / institution	Position/Designation	Issues raised	Response
Temeke Municipal Council	Town Planner Officer (TPO)	<ul style="list-style-type: none"> • The land use for the project area is institutional and therefore compatible with the proposal. • DUCE should observe and consider its boundaries during construction. • The proponent should add use classes from “a” and “b” to “c” and “d” for the proper use group “k”. 	<ul style="list-style-type: none"> • N/A • DUCE shall comply with the given provisions
	Environmental Management officer (EMO)	<ul style="list-style-type: none"> • Observe setback of the proposed buildings, such that every building should be easily accessible. • Observe all rules, regulations, laws and permits required before starting the project. • Drainage systems, fire systems, ventilation and soil texture of the area are things of concern to be observed before and when planning for construction. • Building materials must be from licenced sources. 	<ul style="list-style-type: none"> • Boundaries shall be well observed • All rules and regulations will be adhered to • The proponent will do as advised • Materials shall be sourced from licenced dealer
Miburani Ward	WEO	<ul style="list-style-type: none"> • The project is accepted and may continue to further stages. • Construction should be done while observing all rules and regulations. • Job opportunities (unskilled labour) should be prioritized to the people of Miburani Ward 	<ul style="list-style-type: none"> • N/A • All rules and regulations will be observed • The proponent will do as advised

Authority / institution	Position/Designation	Issues raised	Response
National Stadium Street	MEO	<ul style="list-style-type: none"> • It's a good project because it will increase educational services to the community by enrolling more students. • It was advised that the proponent should cooperate with Mtaa office in providing social cooperate responsibility. • Job opportunities (unskilled labour) should be priotized to the people of National Stadium Street. 	<ul style="list-style-type: none"> • N/A • The proponent will show cooperation with Mtaa offices • The proponent shall do the needful
Occupational Safety and Health Authority (OSHA)	OHS Inspector	<ul style="list-style-type: none"> • The premises must be registered by OSHA as per section 16 and 17 of OSHA act 2003. • During operation phase, DUCE must apply and acquire OSHA Compliance certificate. • Persona Protective Equipment (PPE) must be provided to all employees during construction and operation phase as per section 62 of OSHA act 2003. • Conduct medical examination to all employees at least once a year as per OSHA Act 2003 section 24. • Provide training for first aiders and safety health and Environment representatives. • Washrooms should consider both genders and should be labelled. • Warning signs should be placed when required. • Prepare OHS policy and risk assessment report. • Formulate OSH committee and minutes should be recorded. 	<ul style="list-style-type: none"> • Premises is registered already • Compliance certificate shall be acquired • PPE shall be provided and enforced • Medical examination shall be conducted once a year • The proponent will do the needful • Washrooms will be labelled • The policy shall be in place • OSH committee will be formulated

Authority / institution	Position/Designation	Issues raised	Response
		<ul style="list-style-type: none"> • Allocate a first aid kit at the premises. • Identify fire assembly point and prepare emergency response plan. 	<ul style="list-style-type: none"> • A first aid kit will be in place • Fire assembly point will be identified
Legal Human Rights Centre (LHRC)-Tanzania	Gender Focal Person	<ul style="list-style-type: none"> • Sex distribution consideration and the roles that they play (the works that women do). • Consideration of enabling environments that allow gender inclusivity (e.g., areas for pregnant women) as well as disabled people. • Consideration of sexual harassment gender policy and equality. • Recruitment transparency should also be adhered to. • Observe an inclusion of protective measures for preventing nuisance to women. • Considerations of CSRs to the surrounding community • Disabled people should be accommodated, if possible, to allow input. • Review of the Sexual Harassment Policy of the University (DUCE); Including a retaliation-free grievance reporting system. • Introduce affirmative actions for women and female staff. 	<ul style="list-style-type: none"> • The proponent will do so as advised • All special needs aspects shall be taken into consideration in the project design and implementation

Authority / institution	Position/Designation	Issues raised	Response
		<ul style="list-style-type: none"> • Learning areas should accommodate people with visual impairment. • Include adequate hostels and priority should be given to female students. • Include private rooms for nursing breaks for students and staff with infants. • Construction should not interfere with individual/community health comfort, • Legal recruitment and working policies should be considered and do not all child labour in all project phases. • Consider all PPEs as a requirement in employment standards for all local and international requirements • Consider overtime and work leaves for staff and casual workers as human rights and employment standards. 	
DUCE	Head of Diversity Unit	<ul style="list-style-type: none"> • There is presence of a gender desk with eleven members who are responsible for handling GBV issues in association with the counselling office. • There is presence of Gender policy which has been reviewed currently and is in the final process of being updated. • The project should include awareness programs and trainings/seminars to students, staff and services providers on issues of Gender and how to 	<ul style="list-style-type: none"> • N/A • Noted • The proponent will do the needful • Noted for implementation

Authority / institution	Position/Designation	Issues raised	Response
		cohabitate in the same Environment in an effective manner <ul style="list-style-type: none"> • During Construction, the contractor should be fair to both genders, there should no discrimination of any kind and that workers are paid on time. 	
	Dean of Students	<ul style="list-style-type: none"> • The project should include sports and games for disabled people, and allocate changing rooms for both genders. • The contractor should provide seminars and education to their workers and staff on moral conduct. 	<ul style="list-style-type: none"> • The proponent will do the needful • Noted for implementation
	Director of Undergraduate Studies	<ul style="list-style-type: none"> • Construction of these buildings will increase enrolment thus offering a large number of students to acquire quality education. • The contractor should observe and put preventive and mitigation measures for noise and dust. • The contractor should provide seminars to his workers on moral conduct. • The construction of post graduate building will provide more room for new degree programmes and the first PHD programmes. • The project should construct modern multi-purpose playing grounds. 	<ul style="list-style-type: none"> • N/A • The proponent will put measures as discussed in chapter 8 • Noted for implementation • N/A • Noted for implementation
	Director of Postgraduate Studies	<ul style="list-style-type: none"> • Since the Postgraduate building will be built near Taifa stadium, the contractor should include insulating materials as one of the building designs to avoid noise cause by matches at Taifa stadium. 	<ul style="list-style-type: none"> • The proponent will do the needful • Noted

Authority / institution	Position/Designation	Issues raised	Response
		<ul style="list-style-type: none"> We expect the buildings should be designed and built at a very advanced way. 	
	Headmaster (Chang'ombe secondary school)	<ul style="list-style-type: none"> The contractor should provide seminars to his workers on moral conduct and how to behave around children especially not to use abusive language. During construction, contractor should use modernized machines to reduce noise and emissions. There should be proper housekeeping during mobilization and construction phase. 	<ul style="list-style-type: none"> Noted for implementation Noted The proponent will do the needful
	Headmaster (Chang'ombe primary school)	<ul style="list-style-type: none"> The management and board are aware of the project and excited for the benefits that come with it. Security should be maintained at all times during construction phase. Construction and rehabilitation of playgrounds should be prioritized and put to phase one, so that students and other people do not stay long without sports and games. The contractor should provide seminars to his workers on moral conduct and how to behave around children especially not to use abusive language. 	<ul style="list-style-type: none"> N/A Noted for compliance The proponent has noted for implementation The proponent will do the needful
	University President and	<ul style="list-style-type: none"> The project is beneficial to the university as it will increase enrolment, and improve studying schedule due to lack of enough venues. 	<ul style="list-style-type: none"> N/A

Authority / institution	Position/Designation	Issues raised	Response
	Minister of Education	<ul style="list-style-type: none"> • The design of the buildings should include infrastructure for disabled people example, Library and Laboratories. • The design team should design the playgrounds at a high level such that they may be used as a source of income by other people who wish to use them. • The new constructed concrete benches should include sockets and lighting tubes. Furthermore, repair of concrete benches should be done to them all around campus. 	<ul style="list-style-type: none"> • Noted for implementation • The proponent will do the needful • The proponent will adhere to this
	Head of Auxiliary Police	<ul style="list-style-type: none"> • There has not be any reports in the year 2022/2023 for Gender based violence in the compound. • The counselling unit and Gender desk works hand in hand with Auxiliary police in providing awareness and seminars on matters relating to Gender. • The only cases reported were those of Loan payments between students where they were solved. 	<ul style="list-style-type: none"> • Noted • N/A • Noted

CHAPTER SIX

6.0 ASSESSMENT OF IMPACTS AND IDENTIFICATION OF ALTERNATIVES

This section outlines the identification and assessment of the impacts in each stage of the proposed project. Two zones of impact namely core impact zone and influence impact zone are considered as follows;

- i. The core Impact zone- The core impact zone includes the area immediately bordering the project (100m radial distance from the project boundary). In the case of this project, local impacts will be the site of the construction and the immediate surrounding areas including existing DUCE buildings and infrastructure as well as DUCE Pre- and Primary demonstration schools.
- ii. The influence impact zone- includes the area beyond 100m from the proposed site. Most of the positive impacts are expected to go beyond National Stadium street boundaries, Tememe Municipal, Dar es Salaam region and all Regions within Tanzania. On another note, due to the fact that from new facilities DUCE will be in position to host postgraduate and research students both local and international students from within East African Regions and beyond.

6.1 Impact Identification

According to the WB ESF the HEET project is given the risk assessment of Substantial due to the likelihood of environmental and social impacts generated by the project. The assessment of environmental and social risks has been analyzed based on the type of the proposed project nature of civil works is limited to the construction of a postgraduate building with classrooms, research rooms, laboratories, as well as buildings for Faculty of Humanities and Social Sciences.

The proposed project can cause a wide range of environmental and social impacts on a number of receptors. The EIA identifies these impacts for the purposes of mitigating the adverse ones or enhancing the benefits. Impact *identification* is a process designed to ensure that all potentially significant impacts are identified and taken into account in the EIA process. A number of 'tools' are available to assist in impact identification. The simplest, and most frequently used, *checklists* of impacts method was used for this project. The following subsections present the impacts identified to associate with the project.

6.2 Potential Environmental Impacts during Construction Phase

Negative Impacts

6.2.1 Increased Noise Levels

Construction activities normally generate a lot of noise. Noises from vehicles during construction phase may rather be significant. Noises will also arise from various construction machinery at site and transportation of materials. The existence of high noise levels has a significant impact to DUCE staff and students. During construction

noise levels are expected to reach 80dBA if not controlled (TBS Standard is 45dBA during day and 35dBA during night). This impact is moderate significant because taking into consideration that the project areas are very close to the offices and students lecture halls as well as the existing DUCE pre, primary and secondary schools which require tranquility. Most of the deterrent noises shall be confined during the construction period only because operation phase is not associated with noise, which is rather a shorter period compared with the lifetime of the proposed buildings. *This impact is local, short term and moderate.*

6.2.2 Impacts to Air Quality

Air pollution by dust emissions from various sources is an issue for consideration during design stage particularly in the choice of technologies and practices to be used under the project. The main impact of dust is impairment of local air quality, the extent will depend on quantities emitted, duration and prevailing atmospheric conditions. Dust will mainly be generated from earth movements (excavation, levelling, dumping), wheels of trucks and machinery moving /travelling along unpaved surfaces, handling and transport of soil and wind erosion from exposed surfaces.

At the construction site, the possible impacts are expected across (at a radial distance of ± 0.5 km. The dispersion area of exhaust and dust (up to standard levels of air quality) will depend on the concentration of machinery and equipment at the site and the capacity of their engines.

Along the proposed project areas, the adjacent areas including the National stadium and a main road are relatively open without impediment to air movement hence enhance dilution of air pollutants. Also, the leafy vegetation should be able to filter out a considerable content of low-level air borne pollutants. Thus, ventilation is anticipated to lessen the air pollution problem. Moreover, sprinkling of the open areas with water during construction work will further lessen generation of dust, and consequently alleviate the air pollution problem. This impact is moderate significant because the project areas are very close to existing DUCE campus buildings.

Reduction in air quality depends on equipment type, quantities, duration, distance from sensitive environments and prevailing atmospheric conditions, particularly wind and moisture of the air. The main source of emission of atmospheric pollutants emanates from the exhaust from engines (in construction equipment trucks/tipper, excavators etc.). Various internal combustion engines will release Greenhouse-Gases (GHGs), notably carbon-dioxide (CO₂), small quantities of noxious gases such as nitrogen oxides (NO_x), sulphur oxides (Sox) and hydrocarbons. There will be truck journeys by vehicles mobilizing construction materials, land clearance to the project sites followed by several truck journeys. *This impact is local, short term and moderate.*

6.2.3 Increased Waste during Construction

Site clearance, construction activities and domestic activities create wastes (solid and liquid) that need to be disposed. The wastes created include excavated materials from the earth works, timber from used formwork, paints, lubricants and oil wastes, Other wastes include containers, cement bags and other packaging materials, metal, glass,

plastic containers and other unwanted materials, food remains and wastewater (Sewage).

These wastes may have a direct impact on the neighbouring premises. Disposal of the same solid wastes off-site could also bring social inconvenience if done in wrong places. The offsite effects could be un-aesthetics view, pest breeding, unhygienic conditions, chocking of nearby drains and stream and pollution of physical environment.

If wastewater is not well managed it has the potential to cause soil and ground water pollution, cause diseases to DUCE community and surrounding areas, become nuisance due to smell and bad look. Proper waste management will however be taken into consideration and proper dumping done according to the requirements and directions of the Temeke Municipal Council. Estimation of waste quantities is provided in Section 2.3 of this report. *This impact is local, long term and substantial.*

6.2.4 Occupational Safety and Health Risks

Construction sites always present elements of danger. Construction workers are likely to encounter accidental injuries as a result of the intensive engineering and construction activities including erection and fastening of materials, metal grinding and cutting, concrete work, steel erection and welding among others. Such injuries can result from accidental falls from high elevations, injuries from hand tools and construction equipment cuts from sharp edges of metal sheets and collapse of building sections among others. Deaths have also been experienced as a result of poor construction activities leading to occupational health and safety concerns. Workers are also likely to be exposed to diseases from building materials during the construction phase of the Project. Occupational health and safety of the workforce will have to be monitored by the respective contractor's supervisors and foremen. As long as proper procedures are followed and Personal Protective Equipment (PPE) provided and their use enforced, risks of accidents and incidents can be substantially reduced. *This impact is local, short term and moderate.*

6.2.5 Erosion of Cleared Areas

Earthworks during construction will have an impact on soil erosion. There will be mass soil material movement from the site and from one area to another. The removal of the vegetation cover will accelerate soil movement by erosion by agents notably water, wind and machinery. The sites have very loose sand soils, which are very prone to erosion. Incorporating appropriate soil conservation measures and proper drainage facilities during construction would mitigate the impacts. *This impact is local, short term and moderate.*

6.2.6 Construction Vibration

Construction activity can result in varying degrees of ground vibration, depending on equipment and method employed. Vibration will be produced by construction vehicles, plant and machinery during delivery of materials, processing of materials, and actual construction work. For this project, construction activity that is expected to generate the most severe vibrations is excavation of basement. Due to an increase

in activities and number of operational vehicles, the impacts vibration will cause disturbance to neighbours and physical damage to properties near the construction site. *This impact is local, short term and moderate.*

6.2.7 Loss of Vegetation

Construction activities might involve clearance of about 30 mature trees (for both sites) causing the following impacts from the environmental point of view: Loss of natural vegetation causing ecological imbalance; Loss of natural habitat for small animals, insects and birds; and loss of a natural source of Oxygen.

6.3 Significant Social Impacts during Construction Phase

Positive Impacts

6.3.1 Employment Benefits

The proposed project development will benefit nearby communities in terms of employment and creating linkages with local economy by the supply of goods and services during construction. The local people either shall be employed directly by the contractor or indirectly by other businesses linked to it (i.e selling of food to workers). The project is expected to employ about 100 people during this phase. The contractor will lease with DUCE to ensure employment opportunities for unskilled labour are from the neighbouring surrounding and hence benefit directly from the project. The contractor is obliged to visit the local government office to get recommendations of people in the surrounding neighbours as explained in the meeting minutes in appendix VII and Stakeholders consultation in appendix VI

Benefit to local producers and suppliers of goods and services

The project will procure most construction materials from local sources. The use of locally available materials and labour for the proposed development will contribute towards growth of the economy by contributing to the income and hence poverty reduction as well as contributing to gross domestic product. The consumption of these materials, fuel oil and others will attract taxes including VAT which will be payable to the government hence increasing government revenue. Some of the project services have been already contracted to Tanzanian suppliers and contract.

Negative Impacts

6.3.2 DUCE Community Health, Safety and Security Risks

Due to technological developments and investments in labour saving equipment it is expected that a good number of workforces is needed for the project. The estimated number of workers is 100. Out of which skilled labours are approximated to be around 25. The skilled construction workers will be imported to the area of construction. A smaller number of local low-skilled jobs may be envisaged. These will include protection and guarding of the construction companies' properties while low skilled workers will be hired within 20km radius of project area and wider if necessary.

It is expected that the increased number of workers and higher concentration of residents near construction sites will have impact on DUCE staff and students.

Uncontrolled movement of workers will affect DUCE Community. Due to this, a limited regime of movement of workers in the area around the construction sites and mode of movement must be well organized and defined by agreement between the Employer (DUCE) and the Contractor(s).

Impacts on the health and safety of the community may arise during construction as a result of noise, vibration, dust and other emissions from earth moving activities. Other impacts such as GBV and sexual harassment and transmission of STDs and communicable diseases which have been already been addressed in different chapters of the ESIA may occur. Moreover, other risks may involve;

(i) Accidents and Incidents due to Traffic

The traffic related to construction will contribute to reduced road safety on especially on local roads where some contractor's facilities are located. The traffic to construction site will depart from the public roads. Staff and students using these haulage roads will be exposed to increased possibilities for accidents and injuries. Traffic consisting of heavy vehicles and machinery is especially risky. Proper traffic control and construction scheduling at times with low traffic will help reduce this risk.

(ii) Security Risks

A potential increase in crime may be experienced during the construction period if mitigation measures are not introduced. In addition, an increase in construction activities and the possibility of job seekers arriving, it may be more difficult to identify strangers in the area. In addition, the increase in disease associated with the entry of a temporary labour force into an area could also occur. There may also be negative issues that need to be managed such as increases in local prices, crime, prostitution, drug abuse and alcohol consumption.

(iii) Social Conflicts

Entry of a temporary labour force into an area could cause different negative impacts to the community. The situation when temporary workers come from different parts of Dar es Salaam Region and they are from different social and cultural backgrounds could easily create conflicts with the local social environment. Due to this, workers must receive training and sign a labour Code of Conduct, in order to avoid conflicts with the local communities.

Influx of temporary workers and their inadequate behaviour could cause issues. Contractors will be aware of avoiding where possible these kinds of situations and any effects of such issues must be subject to fair compensation. Despite strengthened measures for impacts reduction, sometimes it is not easy to control workers. Awareness of employees about the measures proposed, as well as negative effects that could occur is essential for the safe implementation of the project. *This impact is local, short term and moderate.*

6.3.3 Gender Based Violence (GBV), Rape and Sexual Harassment

The report on GBV for this project shows that there is no record of GBV within the campus even if there are major projects implemented within the campus. However,

due to labour influx to the campus on daily bases (there shall be no construction camp at the site) for this project. This will help to avoid acts of GBV, sexual harassment, and other sexual offenses such as rape which might happen. It is expected there will be about 100 workers working for the project contractor during the construction phase. DUCE has more than 6000 students who attend classes on a daily basis and a few reside in the hostels at the campus. College data indicate that about 49.7% of students are female student. In addition, the majority of DUCE staff commutes to and from on a daily bases as there are only a few staff houses. The following are the potential impacts and risks that might happen during the construction phase if proper mitigation measures will not be implemented;

- Construction workers may engage in sexual fraternization with DUCE students and staff. In addition, to this being a driver of HIV infection, it will lead to domestic conflicts, GBV, and domestic violence.
- Women who seek employment may also face demands for sexual favours before being employed which amounts to sexual harassment. Furthermore, even when employed, women may face continuous and unwanted demands for sex and risk of losing their jobs if they do not give in.
- The college and its demonstration schools (Pre, Primary and Secondary School female staff and students may also face risks of being subjected to verbal harassments in the form of insults and demeaning comments, unwanted gestures and touches by construction workers.
- Sexual harassments of women (workers) might also happen as a result of interaction between women and men at worksites.
- Outright rape is also a risk to not only DUCE female students and staff but also to female workers at construction sites as result domestic violence and gender-based violence might happen.

This is a negative impact characterized as local, long term and moderate probable.

6.3.4 Gender Inequity in Employment

During the construction phase at DUCE, the potential risk that may result into gender inequality may include unequal distribution of work, discrimination against women, and unequal pay for women among others. It should be noted that despite various efforts in regard to gender equality, such as legislation, policies and other initiatives in Tanzania, the construction sector remains one of the most male dominated sectors while women are the mostly under-represented in all construction occupations and professions. As such circumstance, project implementers such as engineers, director, and managers in the DUCE project are likely to be men. Thus, women are likely to face challenges associated with cultural and structural barriers such as harassment and discrimination, limited networking opportunities and long working hours which may result in poor career prospects and high levels of stress. Moreover, women may experience difference in wages or salaries. The difference in wages maybe associated with the gap in education between men and women, different types of posts held in the construction site, differences in amount of work experiences as well as difference in the working days and capability to negotiate salary. *This impact is local, short term and moderate.*

6.3.5 Impacts associated with Transmission of Vector Borne and Communicable Diseases

Communicable diseases are caused by viral, bacterial, parasitic and fungal pathogens that are airborne or that are transmitted through an infected person, animal or environmental source. Communicable diseases include malaria, tuberculosis (TB), measles and bacterial infections such as colds, gastric infections (eg diarrhoea) and the like. According to DUCE Medical Doctor, communicable diseases experienced at the campus include Malaria, tuberculosis, gastroenteritis, pneumonia, acute respiratory infection, diarrhoea, etc. HIV/AIDS and other sexually transmitted diseases. Some of these diseases are water borne and caused by poor sanitary conditions and poor-quality drinking water.

The presence of an external workforce working in construction sites at DUCE where interaction with DUCE community is possible could lead to the increased transmission of communicable diseases within the College. It is expected that there shall be no construction camps within the DUCE campus. Thus, workers shall come in the morning and leave in the evening. The profile of any disease transmission will be influenced by the existing disease profile of Dar es Salaam region and the diseases profile of the other parts of Tanzania workers are sourced from. In addition, if opportunistic workers (those hoping to find employment on the Project or from related activities) migrate to DUCE which could also bring impacts on the transmission of communicable diseases.

Finally, overcrowding, poor hygiene and sanitation at construction site and poor waste management can also facilitate the spread of communicable diseases. There is also a potential for increased transmission between contractor's workers living at the site at DUCE and the DUCE workers and the students through interactions. Students will be at particular risk of diarrhoea diseases due to their poor sanitary behaviours while the staff will be at risk of more severe health outcomes as a result of their frailty.

During construction, modifications to the environment and in-migration into the area are likely to increase the risk of transmission of malaria. Modifications to the environment can create small water pools (e.g. wheel ruts and footprints) offering new mosquito breeding grounds and leading to increased vector densities and human-vector interaction. Any influx of people into the area may play an indirect role in increasing the malaria burden. This may result from an increase in pressure on medical facilities and inadequate waste management. The highly endemic nature of malaria means that the proposed buildings are unlikely to significantly add to the already high disease burden of the community during the wet season. However, modifications to the environment may change the breeding patterns of mosquitoes extending the high-risk malaria season for transmission from its peak.

As above, poor hygiene, sanitation and waste management can all result in increased risk of transmission of water borne communicable diseases such as Hepatitis A and E and Typhoid through increased risk of contamination of water and food with faecal matter. In addition, these factors can also result in increased number of pests, such as rats, which can contribute to disease transmission.

Communicable diseases have the potential to impact Project workforce and DUCE staff and students. It is anticipated that during the construction period the workforce will comprise up to 100 employees, both skilled and unskilled. Local labour will (as far as possible) be sourced from Dar es Salaam region. *This impact is local, long term and moderate.*

6.3.6 Impacts associated with Transmission of Sexually Transmitted Infections

The annual incidence of HIV in Tanzania among adults, ages 15 to 64 years, is 0.29 percent (0.40 percent among females and 0.17 percent among males). This corresponds to approximately 81,000 new cases of HIV annually among adults, ages 15 to 64 years, in the country. In addition, prevalence of HIV among adults, ages 15 to 64 years, in Tanzania is 5.0 percent (6.5 percent among females and 3.5 percent among males). This corresponds to approximately 1.4 million people living with HIV (PLHIV), ages 15 to 64 years in Tanzania. The HIV/AIDs prevalence rate in Dar es Salaam is 4.7.

It is anticipated that during the construction period, the necessary workforce will comprise up to 100 people, who shall enter the DUCE campus and leave daily (there shall be no camp within the campus). The Project could result in increased transmission of STDs including HIV/AIDs

during construction due to:

- Presence of a mainly male workforce, with higher incomes, who may engage in high-risk sexual activities with young DUCE male and female students.
- Workers establishing casual relationships with DUCE young boys and girls. This may result in transactional sex or circumstances where the women assume they are in a more serious relationship, which will end in marriage.
- Engagement in casual high-risk sexual activity by transport drivers at their end destination (DUCE Campus). Transport drivers typically have higher rates of STDs and HIV/AIDs than the general population.
- Increased numbers of CSWs, who may have higher infection rates of STDs and HIV, near construction sites.
- In-migration, resulting in the mixing of people with higher HIV/AIDs or STD prevalence rates than the host community, which may promote the transmission of the disease.

While there is access to treatment for STIs including HIV/AIDs in the communities, it is limited in terms of quality. Furthermore, there are significant taboos around STDs, which may influence people's willingness to access treatment. Any lack of access to treatment could affect the long-term health of those who contract STDs other than HIV, including fertility, damage to internal organs and long-term disability or even death. Increased transmission of STDs including HIV/AIDs has the potential to affect DUCE community. However, impacts could spread regionally due to vehicle movements and especially if there shall be the presence of CSWs nearby. The increase in risk of STDs including HIV/AIDs will be long-term, as it can take time for prevalence/incident rates to return to baseline levels. Furthermore, those infected with HIV/AIDs will have health effects, which last beyond the duration of the construction activities.

the impact from increases in HIV/AIDS and other sexual related diseases will be a *This impact is local, long term and moderate.*

6.3.7 Impacts associated with Spreading of Covid 19 Pandemic Disease

The World Health Organization (WHO) declared COVID-19 a global pandemic after assessing both its alarming levels of spread and severity, and the alarming levels of inaction. Consequentially, WHO issued various guidance and measures to prevent the spread of the virus. The measures have been adopted worldwide. Similarly, the Tanzania government has since then issued several guidance and directives. At DUCE there are no baseline data on the impact of the Covid 19 to its community.

During project execution (civil works), large numbers of workers will be required to assemble together in meetings, toolbox talks and even at work sites. In addition, varied number of workforces including suppliers of material and services are also expected to come in from various places in the country which may be COVID-19 hot spots. The interaction of workers with the project host community will happen as workers find accommodation close to work sites and/or return to their homes after works. The potential for the spread of any infectious disease like COVID-19 by projects may be high.

There is also the risk that the project may experience large numbers of its workforce becoming ill and will need to consider how they will receive treatment and whether this will impact on local healthcare services including the project host community. The presence of international workers, especially if they come from countries with high infection rates, may also cause social tension between the foreign workers and the local populations.

Recognizing the potent risk this may present, it is difficult to clearly outline exhaustive mitigation measures under the mitigation impacts. As such, there is need for the DUCE and the contractor to develop and adopt COVID-19 Standard Operating Procedure (SOPs) in line with the WB guideline for covid-19 considerations in construction/civil works projects, Ministry of Health Directives and site-specific project conditions. These SOPs need to be communicated to all workers and enforced to the latter without fail. *This impact is local, long term and moderate.*

6.3.8 Impacts on Labour and Working Conditions

According to the European Foundation for the Improvement of Living and Working Conditions (2012), whilst labour laws have influence in the United Republic of Tanzania with regard to minimum standards, the actual working conditions are often not in line with the legal provisions. The substance of labour law is often undermined and employees are subjected to conditions well below the specified minimum working conditions. Informal sector employed most people in Dar es Salaam which is the source of labour force for the project. Formal employment is limited. Lack of employment is an issue in the communities, especially the youth. As such, many people will lack knowledge and experience of formal employment and associated requirements.

Workers' rights including occupational health and safety need to be considered to avoid accidents and injuries, loss of man-hours, labour abuses and to ensure fair treatment, remuneration and working and living conditions. These issues should be considered not only for those who are directly employed by the Project, but also their sub-contractors and those within the supply chain.

Worker Health and Safety

According to the nature of the activities being undertaken during construction; worker health and safety is a key risk area with the potential for accidents that may result in injuries and potential fatalities as well as lost man- hours. Currently, many national companies may not meet international safety requirements and standards. Employees working informally and those with limited or without awareness of their rights (for example, migrant workers, or those newly entering the labour market) are likely to be most at risk.

Worker Rights

The labour laws in Tanzania are generally in line with international labour laws and Tanzania has ratified the eight core International Labour Organisation (ILO) conventions:

- Freedom of Association and Protection of the Right to Organise Convention, 1948 (No. 87);
- Right to Organise and Collective Bargaining Convention, 1949 (No. 98);
- Forced Labour Convention, 1930 (No. 29);
- Abolition of Forced Labour Convention, 1957 (No. 105);
- Minimum Age Convention, 1973 (No. 138);
- Worst Forms of Child Labour Convention, 1999 (No. 182);
- Equal Remuneration Convention, 1951 (No. 100); and
- Discrimination (Employment and Occupation) Convention, 1958 (No. 111).

However, the implementation of workers' rights is unlikely to be fully aligned with these requirements. The enforcement of laws is also often limited. There is therefore, a risk that some subcontractors/suppliers on the proposed project may not be fully compliant with Tanzanian legal requirements related to labour conditions. Forced labour and child labour are unlikely to occur in sub-contractor organisations but may occur in the supply chain, particularly in relation to the provision of food supplies. Discrimination is likely to occur as women are generally not employed in construction activities and may not be selected by contractors. Sensitive receptors for this impact will be Project employees especially the unskilled employees who have a poor understanding of the requirements of Occupational Health and Safety (OHS) standards and their labour rights as enshrined in the law. *This impact is local, short term and moderate.*

6.4 Significant Environmental Impacts during Demobilization Phase

Negative Impacts

6.4.1 Increased Noise

Demobilization activities normally generate a lot of noise. Noises can arise from vehicles during the demolition of temporary structures and transportation of rubbles. During demobilization noise levels are expected to reach 80dBA if not controlled. Most of the deterrent noises shall be confined during the demobilization period only, which is rather a shorter period compared with the lifetime of the proposed project. *This impact is local, short term and moderate.*

6.4.2 Impact to Air Quality

Demobilization activities such as demolition of temporary structures, transportation of rubbles, and landscaping always involve production of dust. During construction dust levels are expected to be around 0.2 ppm if not well controlled. If not properly controlled, the dust can cause bronchitis to the workers at the site and people living/working near the project site. *This impact is local, short term and moderate.*

6.4.3 Waste Generation and Management

Demobilization activities will generate a lot of rubble and spoil soils. The waste generated need adequate haulage facilities and at the right time. Inadequate management of the waste shall create unsightly condition on site. The types and quantities of waste have been presented in section 2 of this report. *This impact is local, short long and moderate.*

6.5 Significant Social Impacts during Demobilization Phase

Positive Impacts

6.5.1 Employment Opportunities

During demobilization phase, the project will benefit nearby communities in terms of employment and creating linkages with local economy by the supply of goods and services. The local people either shall be employed directly by the contractor or indirectly by other businesses linked to it (ie selling of food to workers). Many people are expected to be employed during this phase.

6.6 Significant Environmental Impacts during Operational Phase

Positive Impacts

6.6.1 Strengthening the culture of environmental and social risk mitigation

The environmental and social risk mitigation measures put in place under the project will contribute to strengthening the culture of environmental and social risk mitigation in the colleges, especially for future projects.

Negative Impacts

6.6.2 Health and Safety Risks due to Fire Hazards

Buildings are prone to fire hazards because of different types of combustible materials and machines which, are used and installed, respectively. Electrical fault is by large the main culprit in fire accidents in buildings in Tanzania. The components of a fire are fuel

(combustible substance), heat and oxygen. Unless all three are present fire will not occur. Fire can cause the following effects: Loss of lives; serious Injuries; and loss of properties etc. *This impact is local, long term and moderate.*

6.6.3 Increased Wastes during Operations

During the operation phase it is expected that a lot of solid and liquid wastes will be generated from the activities that will be taking place in the building. Solid waste will mainly be comprised of paper, food waste, cardboards, electronic wastes etc. The offsite effects could be un-aesthetics view, pest breeding, unhygienic conditions, chocking of nearby drains and stream and pollution of physical environment.

Liquid waste will mainly consist of wastewater from bathrooms, pantry and lavatories (wastewater discharge values are given in Chapter 2). If wastewater is not well managed it has the potential to cause soil and ground water pollution, cause diseases to DUCE community and surrounding areas, become nuisance due to smell and bad look. If these wastes are not properly managed, they have the potential to change the aesthetic scenery of the DUCE premises and the surrounding areas as well as cause public health problems. *This impact is local, long term and substantial.*

6.6.4 Increased Surface Water Run-off

The project shall involve roofing of the buildings and paving the project area thus reducing water infiltration into the ground. This implies that surface runoff from the site will increase. The project will occupy an area of about 9,900m² out of 214361m² (DUCE whole area). The amount of runoff will increase slightly due to lowered infiltration of rainwater into the soil. Uncontrolled storm water have the potential to cause floods or water logging either within DUCE campus or surrounding areas. Floods can cause damage to properties, injuries to people or even loss of life, depending on the magnitude. Water logging can be breeding sites for diseases vectors especially mosquitos, but also cause visual pollution apart from blocking access (if happen on access road). *This impact is local, long term and moderate.*

6.7 Significant Social Impacts during Operational Phase

Positive Impacts

6.7.1 Improved Enrolment

Poor and inadequate infrastructure has been identified as one of the primary causes of low enrolment in educational institutions. The project is expected to increase students' enrolment levels at DUCE for both male and females well as in non-female traditional courses.

6.7.2 Creation of Employment Opportunities

This project will increase employment opportunities and student's enrolment when facilities are improved in their respective faculties, directorates, departments and units. In addition, increased enrolment means more teachers are needed to be employed. Furthermore, increased population at DUCE will also translate to more opportunities for the local economy as demand for goods and services trickle down to the local businesses. The project will translate to overall measurable economic and

employment growth for the country. DUCE will ensure Employment opportunities are advertised publicly and the selection of all the positions will consider gender.

6.7.3 Reduction of Gender Gap in Enrolment

Gender breakdown in enrolment will be monitored throughout the project including providing for an enabling environment for safety of women from sexual harassment and provision of gender friendly facilities to enhance retention and completion for women and girls.

6.7.4 Increased Capacity for Gender Friendly and Responsive Learning Environments

The project will develop infrastructure with increased capacity to enrol women and facilities that will attract them to enrol.

6.7.5 Increase in Skilled Workforce

The project will help increase the likelihood of students' employment after graduation by providing good quality and relevant training programs to staff, students, researches, and exchange opportunities for trainers and supporting staff in academic, industry, and social and humanitarian skills areas.

Negative Impacts

During operational phase most of social impacts such as the risk of GBV, Sexual harassment and transmission of communicable and vector borne diseases are likely to return to baseline levels (apart from the increased pressure on social services). This is because the project buildings are being constructed within existing campus, which already have mechanisms for GBV, sexual harassment and provides a transit route for disease transmission.

6.7.8 Increased Pressure on Social Services and Utilities

The proposed project is expected to add a good number of staff and students. . The increase in the number of people at the project area has the potential to increase pressure on social services and utilities such as water, electricity, sewerage systems, etc. It was estimated in Chapter 2 that, the project shall demand 20 cubic meters of water per day, 30MWh-50MWh of electricity per month and it shall produce 48 cubic meters of wastewater. The demand may strain the existing service delivery system in one way or the other. However, DUCE has enough water to save the project without affecting the community and Onsite sanitation system shall be used by septic tank handling of wastewater. In addition, DUCE have its own transformer which supply electricity to the Institution, therefore the project won't affect electricity usage to the community. Furthermore, due to increase of people in that area there may cause, under-capacity of local social services, food scarcity and price increases to the neighbouring areas. *This impact is local, long term and moderate.*

6.8 Impacts Evaluation

Taking a step further, the ranking in all phases (mobilization, construction and demobilization and operation) signifies the magnitude of each and combined phases. Various methods are available for impacts evaluation including *matrices, network diagrams* and *map overlays*. In this EIA *a matrix* were used.

The matrix consists of a horizontal list of development activities against a vertical list of environmental factors. Thus it identifies impacts by methodically checking each development activity against each environmental consideration to ascertain whether an impact is likely to occur. As a result the more the score illustrated the severity the impact the road project or section has. Table 6.1 presents factors that were used to ascertain the significance of the impacts;

Table 6.1: Factors for Determining Significance of Impacts

General	Ecological	Social
<ul style="list-style-type: none"> • Magnitude • Extent • Non-conformity with environmental standards. • Level of public concern • Social impacts resulting from environmental change. • Scientific and professional evidence concerning: • resource loss/ecological damage. • negative social impacts. • foreclosure of land and resource use options. • Environmental loss and deterioration. • Probability and acceptability of risk. • Environmental sensitivity. 	<ul style="list-style-type: none"> • Reduction in species diversity • Habitat loss, degradation or fragmentation. • Affecting threatened, rare and endangered species • Impairment of ecological functions 	<ul style="list-style-type: none"> • Displacement of people • Human health and safety.. • Decline in important local resource • Loss/gain of valued area. • Disruption of community livelihoods. • Demands on services and infrastructure. • Public concern. • Political concern.

Source: Consultant Evaluation, 2023

The above factors were used to create six criteria which were used to determine the significance of the impacts in the Matrix these include;

- i. **Spatial Scale-** The spatial dimension encompasses the geographical spread of the impacts regardless of whether they are short term or long term. Table 6.2 describes the ratings used in the Simple Matrix as far as spatial scale is concerned.

Table 6.2: Spatial Rating

International (I)	Trans-boundary
National (N)	Within country
Regional (R)	Within Region
Local (L)	On and adjacent to site

Source: UNEP 2005

- ii. **Temporal Scale-** Temporal boundaries refer to the lifespan of impacts. Table 6.3 describes the ratings used in the Simple Matrix.

Table 6.3: Temporal Rating

Short-Term (ST)	During construction
Medium-Term (MT)	Life of project
Long –Term (LT)	Residual impacts beyond life of project
Local (L)	On and adjacent to site

Source: UNEP 2005

- iii. **Reversibility of the impact-** Every impact was checked if its effect can be reversed or not. Letter R was used to denote reversible impacts while IR was used to denote Irreversible impacts
- iv. **Cumulative Impacts-** These are Impacts that cause changes to the environment that are caused by an action in combination with other past, present and future human actions. Assessing cumulative socioeconomic impacts requires the definition of a cumulative impacted area within which the activities and impacts of the College project would overlap with those of other active and planned projects in the same area. Table 6.4 show types of cummulative impacts;

Table 6.4: Types and Characteristics of Cumulative Impacts

Type	Characteristic	Example
Time crowding	Frequent and repetitive effects	Forest harvesting exceeds rate of re-growth

Type	Characteristic	Example
Time lags	Delayed effects	Bioaccumulation of mercury
Space crowding	High spatial density of effects	Numerous small mining enterprises on river
Cross-boundary	Effects occur away from the source	Atmospheric pollution and acid rain
Fragmentation	Change in landscape pattern	Fragmentation of habitat by agriculture
Compounding effects	Effects arising from a multiple sources or pathways	Synergistic effect of POPS in humans and rivers
Indirect effects	Secondary effects	Forest areas opened up as a result of new highway
Triggers and thresholds	Fundamental changes in system functioning	Climate change

Source: UNEP 2005

- v. **Residual Impacts-** These are long term impacts which go beyond the lifetime of the project in other words Residual impacts refer to those environmental effects predicted to remain after the application of mitigation suggested by the PEA i.e. they are non-mitigable.
- vi. **Timing-** During which phase of the construction is the impact likely to occur. The phases included Mobilization, Construction, Demobilization and Operation.

6.8.1 Types of Impacts

Direct Impacts:

These are immediate and tangible effects directly associated with the construction of the two buildings in the existing college. Examples include noise, dust, vibrations, and changes in traffic patterns. Construction activities may disrupt the daily lives of the neighboring community, affecting their peace, air quality, and overall well-being.

Indirect Impacts:

These are secondary effects resulting from the construction activities that may not be immediately noticeable. For instance, increased traffic congestion caused by construction vehicles can indirectly affect local businesses if potential customers are deterred due to difficulty accessing the area. Indirect impacts can also include changes in property values or perceptions of safety.

Induced Impacts:

These are the consequences that arise due to changes in the local economy and social dynamics resulting from the construction. The influx of construction workers and

increased economic activity in the area may lead to higher demand for goods and services, potentially benefiting local businesses. Conversely, it could also strain local resources and infrastructure.

Cumulative Impacts:

Cumulative impacts refer to the combined effects of the construction of the two buildings with other existing and potential future developments in the area. The cumulative impacts take into account the synergistic or additive effects over time, considering not only the direct and indirect impacts of the current project but also the compounding effects of other developments in the vicinity. This long-term perspective is crucial for comprehensive impact assessments and urban planning.

Table 6.5: Impact Evaluation Matrix for the Proposed Construction Project at DUCE

S/N	Environmental and Social Impacts	Impact Rating Criteria					Impact Significance Rating		
		Direct/Indirect	Spatial Scale	Temporal Scale	Reversibility	Cummulative	Construction Phase	Demobilization Phase	Operation Phase
	Environmental Impacts								
1.	Increased Noise Levels	D	L	ST	R		-2	-2	0
2.	Impacts to Air Quality	D	L	ST	R	√	-2	-2	0
3.	Waste Generation and Management	D	L	LT	R		-3	-2	-3
4.	Occupational Safety and Health	D	L	ST	R		-2	-1	-1
5.	Erosion of cleared areas	ID	L	ST	R	√	-2	-1	0
6.	Construction Vibrations	D	L	ST	R		-2	-1	0
7.	Loss of Vegetation	D	L	LT	R	√	-2	0	0
8.	Strengthening the culture of environmental and social risk mitigation	D	N, I	LT				0	+2
9.	Health and safety risks due to fire hazards	D	L	LT	R		-1	-1	-2
10.	Increased surface water run-off	D	L	MT	R	√	0	0	-2
	Social Impacts								
1.	Improved enrolment	D	I	LT			0	0	+3
2.	Reduction of gender gap in enrolment	D	N	LT		√	0	0	+2
3.	Increased capacity for gender friendly and responsive learning environments	ID/D	N	LT			0	0	+2
4.	Benefits to communities resulting from employment	D/ID	N	LT			+3	+2	+2
5.	Increase in skilled workforce	D	N	LT			+1	0	+3
6.	DUCE Community Health, Safety and Security Risk	D	L	ST	R		-2	-1	-2
7.	Gender based violence (GBV), equity, rape and sexual harassment	D	L	LT	R		-2	-1	0
8.	Gender inequity in employment	D/ID	L	ST	R		-2	0	0
9.	Impacts associated with Transmission of Communicable Diseases	D/ID	L	ST	R		-2	-1	0
10.	Impacts associated with Transmission of Sexually Transmitted Infections	D/ID	R	LT	IR		-2	-1	0

11.	Impacts associated with Spreading of Covid 19 Pandemic	D/ID	R	ST	R		-2	-1	0
12.	Impacts on Labour and Working Conditions	D	L	ST	R		-2	-1	0
13.	Increased pressure on social services and utilities	D/ID	L	LT	R		-1	-1	-2

Key: **Spatial Scale:** Local (L), Regional (R), National (N), International (I) **Temporal Scale:** Short Term (ST), Medium Term (MT), Long Term (LT)

Reversibility: Reversible (R), Irreversible (IR)

Significance: Highly Adverse (-3); Adverse (-2); Mild Adverse (-1); No impact (0); Mild Beneficial (+1); Beneficial (+2); highly Beneficial

(+3)

Source: consultant's analysis, 2023

6.9 Project Alternatives

Consideration of project alternatives is crucial in ensuring that the developer and decision-makers have a wider base from which they can choose the most appropriate option. The following alternatives are considered and will be examined in detail during the EIA process:

6.9.1 No Project Alternative

The no project alternative entails retaining the current status quo (No construction of the proposed buildings). Adopting this option would mean acknowledging the technical and cost convenience in proper DUCE organization in a single campus as well as avoiding most of the negative effects associated with the presence of the building and missing all the positive benefits such as;

- Increased Enrolment
- Creation of employment opportunities
- Reduction of gender gap in enrolment
- Increased capacity for gender-friendly and responsive learning environments
- Increase in skilled workforce
- Strengthening the culture of environmental and social risk mitigation

6.9.2 Alternative Site

The option of using another site apart from that of the proposed one was also considered. However, the proposed site was observed to have the following advantages over others;

- The site is owned by DUCE so no need to buy another piece of land for this purpose.
- It is an infill project and the space is available so no need to find another piece of land.
- The planned land use of the project site is for institutional use purposes so it fits with the intended use
- The project site is in adherence to DUCE's Master plan.
- The site has all infrastructures in the vicinity including roads, water supply, waste water management plan, electricity, etc.
- The site is in a good location due to the road network and easy access to public transportation.

6.9.3 Energy Alternative

The use of other alternative energy sources apart from power from the National grid and diesel generators were considered. 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. On the other hand, diesel generators, which are mainly used during power interruptions, emit a lot of greenhouse gases especially when they are run for a long time. Solar energy was considered and the design team shall explore the feasibility of using this alternative at the proposed site. However National grid shall be the key energy source.

6.9.4 Technology and Building Materials Alternatives

Construction technology involves the choice of building materials and the technique and means used to erect buildings. As with the building design process, cautious consideration of contextual conditions is crucial to developing appropriate construction technologies. In addition, any selected technology must be constantly reviewed and, if necessary, upgraded during the construction process. A number of

construction technologies were considered. The following criteria were used to select the most suitable technology options for this project;

- The use of locally available, low-energy-consumption building materials, especially those produced with renewable energy sources;
- The use of materials from sustainable production chains (e.g., avoid use of timber from savage deforestation);
- The use of non-toxic materials; and
- The use of materials easily dismantled (and recyclable as building materials or energy sources).

6.9.5 Collection, Treatment, and disposal of Sewage

Two alternatives were considered for wastewater collection and disposal which includes the use of offsite sanitation or onsite sanitation. Onsite sanitation includes treatment and disposal of liquid wastes on site (i.e Multiple Septic tanks etc) while offsite sanitation means collection of wastewaters from the site for treatment and disposal outside of the site (i.e Sewerage system). Onsite sanitation is preferred for this project due to the following reasons;

- i. The project site is not supplied by any pre-existing Sewer System indicating an additional cost and technical inconvenience for requiring offsite sanitation; onsite sanitation is therefore more feasibly used.
- ii. There is a pre-existing onsite sanitation system that will only require enhancement in quality and quantity to accommodate additional discharge from the project construction and operational activities; thus, economic and technical convenience.

6.9.6 Design Alternative

The proposed project will involve the construction of two six-storey buildings. This is the appropriate design given the nature of the use and the available space. Also, the National Human Settlement Policy encourages multi-storey buildings against horizontal expansion as strategy for space minimization. Prime land is becoming a scarce commodity and therefore optimal use is encouraged. Similarly, the proposed construction is compatible with the college master plan. Thus, the position of the two buildings fits well at their located area in the master plan .

CHAPTER SEVEN

7.0 IMPACTS MITIGATION MEASURES

7.1 Introduction

This chapter is devoted to describe measures or interventions that shall be implemented so as to mitigate the negative impacts and enhancement measures of the positive ones identified in the preceding chapter. Many of the mitigation measures put forward are nothing more than good engineering practice that shall be adhered to during all the project phases.

7.2 Mitigation Measures for Environmental Impacts during Construction Phase

7.2.1 Increased Noise Levels

- Wherever possible all construction equipment will comply with the requirements of Tanzania Bureau of Standards (TBS) on noise emission in the environment by equipment for use outdoors. All the equipment shall bear the TBS marking and the indication of the guaranteed sound power level and shall be accompanied by an TBS declaration of conformity;
- Construction works will not be permitted during the night; the operations on site shall be restricted to the period 07.00 -22.00 h;
- All vehicles and machinery used at the construction sites will be subject to regular maintenance. The vehicles and machines that are excessively noisy due to poor engine adjustment or damage noise control devices shall not be operated until corrective measures have been taken;
- The **Construction Traffic Management Plan** (TMP) will establish speed limits for construction vehicles and machinery at the construction site and the haulage roads used, and organize traffic so as to avoid as much as possible populated areas;
- DUCE Staff and students will to the best of the project's efforts be kept informed on due time of the planned works and the noise levels and periods during which they will occur;
- The location of noisy equipment will be chosen as far as possible from sensitive receptors (hostels, offices). When near sensitive receptors, construction works will be scheduled and provided with the necessary resources so that the time of exposure is as short as possible;
- Good management practice will be used to distribute heavy noise equipment at the site so as to avoid the cumulative effects of noise;
- Workers shall be told to maintain tranquillity at site

7.2.2 Impacts to Air Quality

- Accesses and construction sites will be kept moist to reduce dust formation. Water sprays should be implemented all the time.
- In the dry season, hygroscopic additives will be used in water to increase its presence in the ground;
- Dust-generating activities will be slowed down in days of strong wind;
- Ground will be moistened during loading and unloading of aggregates in trucks;
- Truck dumpers carrying spoil or other dusty materials will be covered with tarps;
- Loaded trucks should be washed down prior to exit from the working site to ensure that loose material is not tracked onto the roads;
- Hoardings will be constructed around the construction sites to minimize the spread of dust;

- Vehicles and construction machinery will be required to be properly maintained and to comply with relevant emission standards;
- No unnecessary idling of construction vehicles at the construction sites will be allowed;
- Construction truck traffic will be optimized so as to get a minimum number of trucks carrying the maximum volume of materials. This will be addressed in the Construction Traffic Management Plan;
- The truck routes will be planned to avoid peak traffic hours or routes with heavy traffic.

7.2.3 Waste Management Problems during Construction

The main mitigation measures during the construction phase to minimize wastes and to manage wastes would be contained in the **Waste Management Plan** which shall Contain among other things;

- All demolition waste/materials which can be reused at site as follows;
 - o Salvaging easy-to-remove items like doors, hardware, appliances, iron sheets, and fixtures for reuse.
 - o Wood cut-offs can be used for cripples, lintels, and blocking to eliminate the need to cut full length lumber. Scrap wood can be chipped on site and used as mulch or groundcover.
 - o Brick, concrete and masonry can be recycled on site as fill, subbase material or driveway bedding.
- The demolition materials which cannot be reused/ recycled shall be collected as garbage at the transfer station and disposed off at Pugu Kinyamwezi dump site.
- Brick, concrete and masonry can be recycled on site as fill, subbase material or driveway bedding.
- Identification and classification of the different waste types that could be generated at the construction site (due to the materials used and waste generated in different sections) according to the Environmental Management Regulations (Hazardous Waste Control), 2009;
- Completely separate hazardous from non-hazardous waste streams at the construction site should be done;
- Immediate removal of waste material (concrete, iron, rocks, etc.) waste from site.
- Collection and disposal of municipal solid alike waste generated in the construction site and camps (food, beverages, packaging waste such as paper, bottles, glass, etc., glass bottles) according to national legislation (separation of recycling waste materials from the waste stream that will be disposed at pugu dumpsite). Recyclable waste shall be given to an authorized recycling company;
- Signing a contract with the company for waste collection (registered by NEMC) and transportation for the collection and transport of the hazardous waste generated at the construction site to the authorised dumpsite;
- Ensuring that the contracts signed with the companies dealing with waste recycling and recovery will take delivery and acceptance of the waste streams is performed on a frequent basis so that the construction sites remain clean at any time;
- Reusing excavated soil and construction waste as much as possible;
- The separate collection of possible hazardous waste (motor oils, vehicle fuels) and sub-contracting an authorized collector and transporter to transport, recovery or finally dispose the hazardous waste;
- Establishing the Temporary Hazardous Waste Storage Points according the national legislation on handling, labelling, storage and management with hazardous waste;
- Establishing and following the hazardous waste management procedure;

- o Ensuring that the hazardous waste is packaged and labelled showing the R and S phrases (risk and safety statements of the hazardous waste) and it is temporary stored on safety storage facility equipped with adequate ventilation, fire resistant conditions especially if there are VOC emissions, mercury containing lamps, asbestos materials from demolition works (if any);
- o Ensuring that the access to these temporary hazardous waste storage points be only allowed for trained and equipped staff, and entrance prohibited for untrained workers and public;
- Promptly cleaning up All waste spills;
- Making available for inspections full records of the type of waste stream generated, quantity composition, origin, disposal destination and method of transport for all different waste streams;
- Contractor shall cooperate with Miburani Ward and National Stadium Street Offices for smooth collection of solid wastes from the project area;
- Undertaking the selective removal and storage of top soil;
- The removal of topsoil from the soil surface so as to serve for reuse in the restoration of disturbed areas not occupied by the proposed project;
- The reuse of topsoil to restore cuttings;
- Burning and burying of wastes shall be strictly prohibited.
- All liquid wastes are to be disposed either to the sewer along the main roads or treated and disposed onsite

7.2.4 Occupational Safety and health risks

- The Proponent through the Contractor is committed to adherence to the occupational health and safety rules and regulations stipulated in Occupational Safety and Health Act, 2003.
- Appropriate working gear (such as nose, ear mask and clothing) and good construction site management shall be provided.
- During farm setup and construction phase the contractor shall ensure that the construction site is hygienically kept with adequate provision of facilities including waste disposal receptacles, sewage, firefighting and clean and safe water supply.
- A well-stocked First Aid kit (administered by first aider) shall be maintained at each farm area and construction site. The first aider shall also be responsible for primary treatment of ailments and other minor medical cases as well as providing some health education to the workforce.
- **Health and Safety Management Plan** shall be prepared by contractor and adhered during construction taking stock of HSMP in;
- Qualified contractor preferably class 1 shall be used

7.2.5 Erosion of Cleared Areas

- There shall be no construction activities on the ground during rainy season.
- The contractor shall deliberately re-cover exposed soils with pavements for smooth operations and unpaved area shall be covered with grass to overcome erosion by moving water in the area.
- The project site shall be fenced to prevent the effect of wind.
- Proper drainage channels shall be provided to direct water to designated area.
- Proper grading to promote sheet flow and minimize flow concentration on unconsolidated soil.

7.2.6 Construction Vibration

- The Earth moving equipment shall be operated as far away from vibration sensitive areas as possible
- Earth moving and ground impacting operations shall be phased so as not to occur in the same time period because vibrations are additive.
- Night time activities shall be avoided as people feel more vibrations during night time hours.
- Dynamic compaction. A smaller falling weight will produce smaller vibrations;
- Select demolition methods not involving impact, where possible;
- Avoid vibratory rollers and packers near sensitive receptors.
- Monitoring of vibrations during the performance of critical work processes will be undertaken in buildings which are within a distance of 20-30 meters from the area where these works take place.

7.2.7 Loss of Vegetation

- Wherever possible mature trees (especially baobab) shall be retained. If the tree is not in the direct construction area it shall be left there as long as it does not interfere with the construction activities.
- Close supervision of earthworks shall be observed in order to confine land clearance within the project area boundaries.
- Appropriate vegetation shall be planted as part of land scaping of the project

7.3 Mitigation Measures for Social Impacts during Construction Phase

7.3.1 DUCE Community Health, Safety and Security Risks

- Construction work shall commence on site only when the **Health & Safety (H&S) Plan** has been adequately developed by the Contractor and accepted by DUCE;
- Emergency Preparedness and Response Plan will be developed prior to construction works starting;
- Traffic Management Plan will be developed for safe access to construction sites with minimum negative impact on the existing roads and in parallel to ensure community safety.
- DUCE and the Contractor/s will openly and transparently inform DUCE community of the affected places for planned activities that follow quarterly;
- The traffic flow through the site and within the public areas will be coordinated with the responsible traffic engineers;
- An Emergency Plan will be developed, including to cover for the management of cases of incidents during the transportation of raw materials/hazardous substances;
- Workers will receive training and guidance in how to avoid conflicts with the local community members and sign a labour code of conduct, in order to avoid creating conflicts with the local environment;
- Avoidance of unauthorized entry into contractor's facilities will be considered in their design and siting. The design, layout and site location of facilities should facilitate natural surveillance by police and the safeguards engaged by Contractor/s;
- Workers shall be provided with identification cards and shall put on uniforms all the time while at the campus
- Adequate selection of qualified security guards with appropriate training;

- All necessary permits will be obtained prior to the start of construction phase from responsible institutions responsible for urban planning, communal works, water protection, electricity and telecommunication.
- The Contractor/s will take into consideration all proposed preventive, mitigation and compensation measures included within the ESIA;
- During construction, all building materials must be accommodated within the proposed site and not along the road to reduce inconvenience to road users.

7.3.2 Gender Based Violence (GBV), Equity, Rape and Sexual Harassment

- Contractor and implementing agency to prepare and implement a **GBV Action Plan** to include at minimum, in conformance with local laws and customs, equal opportunity for employment.
- Contractor to prepare and enforce a No Sexual Harassment Policy in accordance with national law where applicable.
- All workers and DUCE Community and stakeholders will be educated on preventing and responding to sexual harassment and GBV ahead of any project related works.
- Workers shall be provided with identification cards and shall put on uniforms all the time while at the campus
- The community within the vicinity of the college where construction will take place will also be educated on gender-based violence and sexual offences such as sexual harassment, rape and defilement in the context of labour influx and the prevention and response measures.
- Strategies such as male involvement will be employed in preventing and responding to GBV and sexual harassment.
- Partnerships will be established with relevant government agencies and NGOs to ensure survivors of GBV and sexual offences access survivor centred services such as medical care, psychosocial support, legal redress, safety, etc as and when necessary.
- Impose zero tolerance on sexual harassment, all forms of gender-based violence and discrimination at all phases of the project.

7.3.3 Gender Inequity in Employment

- DUCE and contractor shall ensure that women get adequate employment opportunities during recruitment and job postings.
- The contractor shall carry out regular sensitisation and awareness campaigns for workers to promote gender equity in employment during the construction works and during operation.
- During programme inception, contractor shall disclose standard operating procedures, guidelines and management systems established to ensure the promotion of gender equality and social inclusion.
- Programme staff and trainers need to include male and female representatives from diverse ethnic groups. They will need to receive training on gender equality and social inclusion within the context of the programme.
- The contractor shall provide gender disaggregated data, separate bathing, changing, sanitation facilities for men and women.

7.3.4 Impacts associated with Transmission of Vector Borne and Communicable Diseases

- In order to minimise negative impacts from communicable diseases, a ***Worker Health and Safety Management Plan*** will be developed and will include the following mitigation measures:

- Develop and implement pre-employment screening measures for workers, which will cover applicable diseases. Individuals found to be suffering from communicable diseases will need to seek treatment prior to mobilization to site. However, no one should be denied employment because of their health status as long as they are able to undertake the required duties (following treatment if relevant).
- Workers should receive training as part of their induction and then at least every 6 months on potential high risk communicable and vector borne diseases, symptoms, preventative measures and transmission routes as well as treatment options. This will be particularly important for diseases with which non-local workers are unfamiliar and in case of any emerging disease outbreaks.
- A Worker Code of Conduct should be developed providing a site code of behaviour including worker-worker interactions, worker-community interactions and development of personal relationships with members of the DUCE community. This would apply to all Project workers and visitors to the construction sites within DUCE.
- In the event of a new disease, increased transmission or outbreak compared to the baseline, the Project should interact with local health care facilities and workers to ensure there is an appropriate response in place. This involves community education and awareness, training of health care workers etc
- For all contractors and sub-contractors, at worker sites the following will be implemented at a minimum in order to minimize disease transmission:
 - Providing workers with appropriate sanitary facilities which are appropriately designed to prevent contamination.
 - Developing a robust waste handling system to avoid the creation of new vector breeding grounds or attracting rodents to the area.
 - Implementing measures to reduce the presence of standing water onsite through environmental controls and source reduction to avoid the creation of new breeding grounds.
 - Ensuring the construction site is kept clean and free from any accumulation of wastes as well as supplied with clean potable water.
 - Ensuring appropriate food preparation and monitoring measures are in place.
 - Monitoring to ensure that all standards are being met by the relevant departments.
 - The workforce will be provided with access to treatment at health facilities near the site. Access to health care should include direct employees, sub-contractors and employees of the supply chain working on based on site.
- The Project should prepare and implement a **Vector Borne Disease Management Plan** focusing on malaria, which includes vector control, avoidance, diagnosis, treatment and training.
- The Project should implement TB prevention measures including testing and referral for treatment for all personnel working on the Project. This approach should be explained clearly to the workforce along with making it clear that there are no consequences for their employment.
- The Project should monitor the emergence of major pandemics through World Health Organization (WHO) alerts and in the event of a pandemic review mobilization and demobilization of ex-patriate Project personnel and/ or implement appropriate control measures and Emergency Response Plans.

7.3.5 Impacts associated with Transmission of Sexually Transmitted Infections

The following mitigation measures are recommended:

- Development of a Code of Conduct / rules for worker-DUCE community interaction and on-site behaviour.
- The Project should develop an **STD Management Plan** designed to minimize the spread of HIV infection and other STDs. The plan should be prepared with the assistance of a specialist in sexually transmitted diseases. A typical plan would include, among other things, the following measures:
 - o An HIV/AIDS training course and on-going education on transmission of HIV/AIDS and STDs, to employees, through workshops, posters and informal information sessions;
 - o Encouragement of employees to determine their HIV status;
 - o Supply of condoms/ femidoms at the construction site(s) and Development of a comprehensive Construction Site Management Plan, including rules for on-site behaviour, entrance and exit policies and prohibition of sex workers on site.
 - o As part of STD Management Plan, information should be provided to workers on STD prevalence rates in Tanzania as well as the expectations of local communities if a woman is made pregnant by a worker (e.g., marriage, financial implications etc.).
 - o Workers should have access to confidential health care for the treatment of STDs through medical facilities/ health care at Project site.
 - o The Project should partner with other NGOs and CBOs to support the provision of information, education and communication campaigns around safe sexual practices and transmission of STDs.
- **A Grievance Mechanism** should be developed, whereby affected people can raise issues and concerns associated with social vices, prostitution and the behaviour of workers and drivers.

7.3.6 Impacts associated with Spreading of Covid 19 Pandemic Disease

- The Contractors will develop SOPs for managing the spread of Covid-19 during project execution and submit them for the approval of the Supervision Engineer and the Client before mobilizing to site. The SOPs shall be in line with the World Bank guidance on COVID-19, Ministry of Health Directives and site-specific project conditions;
- Mandatory provision and use of appropriate Personal Protective Equipment (PPE) shall be required for all project personnel including workers and visitors;
- Avoid concentration of more than 15 workers at one location. Where there are two or more people gathered, maintain social distancing of at least 2 meters;
- All workers and visitors accessing worksites every day or attending meetings shall be subjected to rapid Covid-19 screening which may include temperature check and other vital signs;
- Install hand washing facilities with adequate running water and soap, or sanitizing facilities at entrance to work sites including meeting venues and ensure they are used;
- Ensure routine sanitization of shared social facilities and other communal places routinely including wiping of workstations, door knobs, hand rails etc;

7.3.7 Impacts on Labour and Working Conditions

In order to minimise negative impacts from labour and working conditions, the following mitigation measures should be applied:

Employment and Procurement

The Project shall develop a **Human Resources Policy, Labour and Employment Plan (LMP)** as well as specific recruitment policies and procedures, specifically:

- The Project should prioritize the recruitment of workers and procurement of goods and services from within the Dar es Salaam then to national companies. This will not apply to the provision of highly technical equipment. The Project should develop a fair and transparent employment and procurement policy and processes to avoid any potential for nepotism or favouritism. The policy should be shared with the Ward and Street Leaders.
- A **Local Recruitment Procedure** shall be developed by Contractor which will outline the percentage of skilled, semi-skilled and unskilled employment that should be sourced from the different locations in Dar es Salaam. For unskilled workers this target should be set as high as possible i.e at least 90%. The procedure will also include requirements for recruitment of vulnerable groups (women and disabled workers) to ensure equal opportunities, involvement of ward and street leaders in ensuring local employment is achieved, no hiring of workers at the gate etc. The requirements of this procedure will form part of the conditions of contract with subcontractors.
- Contractor will notify Temeke Municipal Council, Ward and Street leaders of the specific jobs and the skills required for the Project, prior to the commencement of construction phase. This will give the local population time to prepare and apply for the available job opportunities on time. This is mainly applicable to unskilled and semi-skilled workers who will be locally sourced.
- Employment and procurement opportunities will be publicly advertised in appropriate newspapers, Municipal, Ward and Street offices and in all relevant languages in a timely manner to allow fair competition.
- There will be no requirement for applicants to make payments for applying for, or securing, employment on the proposed Project.
- The Project will ensure that recruitment procedures are transparent and monitored to ensure that those recruited present their actual experience, geographical location, health status, and age and that requirements for local employment are being met.
- The Project will develop and implement a program of up-skilling, training and development for workers to assist them in accessing opportunities associated with the Project and in finding work following completion of their contracts.
- The Project will provide training on health and safety and quality standards required by the Project for provision of goods and services to the Project to ensure that local businesses have the opportunity to benefit.
- The Project will ensure that contracts are unbundled to allow a number of small businesses to provide goods and services rather than the supply being monopolized by one larger sub-contractor.
- The Project will develop a Workers Grievance Mechanism (WGM).

Management System

The Project should develop a **Human Resources Policy, Labour and Employment Plans:** These requirements should also be passed on to any subcontractors. Key issues with the Human Resource (HR) management will include, but not be limited to the following:

- Provision of clear and understandable information regarding rights under national labour and employment law, and any applicable collective agreements, including those related to hours of work, wages, overtime, compensation, etc.
- Provision of reasonable working conditions and terms of employment.

- Provision of employment, compensation/remuneration and working conditions, including working hours, based on equal opportunity and fair treatment, avoiding discrimination on any aspects.
- Provision of adequate welfare facilities on site.
- Implementation of a grievance mechanism for the Project workers.
- Adoption and implementation of a sexual harassment policy.
- Adoption of open attitude towards freedom of association.

The Project will develop a H&S programme which will include risk assessments (such as working at heights, confined space machine guarding), work permit systems and a H&S management system, in line with industry best practice, including worker performance safety tracking (safety observations) to assure worker safety. All workers will receive induction and continuous training regarding this system.

Sub-Contractor and Supplier Management

- Subcontractor and Supplier Contracts should make explicit reference to the need to abide by Tanzanian law, international standards (in particular World Bank Occupational Health and Safety Guidelines) and the ratified ILO conventions and the Project Proponent's policies relating to health and safety, labour and welfare standards.
- As part of the subcontractor and supplier selection process, Contractor should take into consideration performance with regard to worker management, worker rights, health and safety as outlined in Tanzanian law, international standards and the Proponent's policies.
- Contractor should provide support to sub-contractors and suppliers to ensure that labour and working conditions are in line with Tanzanian legislation and World Bank Occupational Health and Safety Guidelines through gap analysis, awareness raising and information provision, as necessary.
- Regular checks / audits by Contractor should be undertaken to ensure the relevant labour laws are adhered to at all times.

Workers' Rights

- Contractor should ensure no employee or job applicant is discriminated against on the basis of his or her gender, marital status, nationality, ethnicity, age, religion or sexual orientation.
- All workers (including those of subcontractors) should, as part of their induction, receive training on worker rights in line with Tanzanian legislation to ensure that positive benefits around understanding labour rights are enhanced. This process should be formalized within the Code of Conduct that would be provided by Contractor.
- All workers (including those of subcontractors and suppliers) should have contracts, which clearly state the terms and conditions of their employment and their legal rights. These contracts should be aligned with Tanzanian labour law, the ILO core conventions and the requirements of World Bank Occupational Health and Safety Guidelines. Contracts should be verbally explained to all workers where this is necessary to ensure that workers understand their rights.
- The Project should put in place a WGM that should be accessible to all workers, whether permanent or temporary, directly or indirectly employed. The worker grievance mechanism should be open to Contractor and the subcontractor workforce in the event that their grievance is not adequately resolved by their direct employer. Contractor would then have the authority to act to resolve these grievances.
- All workers (including those of Contractor and the subcontractor) should have access to training on communicable diseases and STDs and community interactions in general.

- Contractor should undertake surveillance and assurance that no children or forced labour is employed directly, and to the extent possible by third parties related to the Project and primary suppliers where such risk may exist.

7.4 Mitigation Measures for Environmental Impacts during Demobilization Phase

7.4.1 Increased Noise Levels

- Vehicles carrying materials/equipment/wastes shall be restricted to work during day time only.
- The impacts of noise will further be minimized by proper choice of plant and machinery (i.e. fitted with noise silencers or reducers).
- Machine operators in various sections with significant noise levels shall be provided with ear plugs.
- The workforce shall be educated on the issue of maintaining tranquillity at site.

7.4.2 Impact to Air Quality (Dust)

- Water sprinkling shall be applied to open earth areas to reduce dust emission.
- Trucks transporting debris materials/wastes shall be covered if the load is dry and prone to dust emissions.
- The site shall be fenced; this will prevent the dust at the ground to be picked up by the wind.

7.4.3 Waste Generation and Management

- The contractor shall have adequate facilities for handling the construction waste. A large Skip Bucket shall be provided at the site.
- The skip bucket shall be collected by a contracted waste collector/municipal truck once a week to pugu Kinyamwezi dumpsite.
- Onsite dumping, burying and burning of solid waste shall not be permitted.
- Liquid waste from toilet and bathrooms shall be directed to the septic tank at site.

7.5 Mitigation Measures for Environmental Impacts during Operation Phase

7.5.1 Health and safety risks due to fire hazards

- Adequate number of portable fire extinguishers shall be placed at strategic locations.
- Smoking shall be prohibited except for designated areas.
- The design of the buildings shall strictly adhere to the Fire Safety Standards (eg provision of exit stairs for building with more than 1 floor).
- Post graduate building and faculty of humanities and social science building shall be equipped with fire detectors and alarms.
- Firefighting training shall be provided to DUCE Community.
- Fire drill exercise shall be practised at least once a year.
- Drawings (including electrical) shall be submitted to TANESCO and fire department for review and approval before operation phase.

7.5.2 Increased Wastes during Operations

- DUCE shall hire a private cleanliness company to clean the buildings and premises on daily basis.

- All hazardous wastes including electronic wastes shall be collected and disposed/ recycled off by NEMC authorized hazardous waste collector,
- Wherever possible, solid waste shall be recycled or reused.
- Domestic garbage such as papers, food wastes, yard waste shall be collected at a new transfer station at site before disposal to authorised dump site at least twice a week.
- Wastewater from buildings shall be treated and disposed onsite, the type of treatment system shall be proposed by design team.

7.5.3 Increased Surface Water Run-off

- Roofs of both buildings shall be installed with gutters and downward pipes to direct rain water to the designated storm water drains within the site.
- Designs shall explore option for rain water harvesting and if found feasible it shall be implemented.

7.6 Mitigation Measures for Social Impacts during Operation Phase

7.6.1 Increased Pressure on Social Services and Utilities

- Alternative measures like use of solar power, water recycling shall be explored and implemented if found feasible.
- The borehole at site shall be used to augment water supply be used for project.
- Use of energy savers bulbs shall be given high priority.
- Use of air conditioning shall be kept to a minimum and maintenance of the cool indoor environment using natural ventilation system shall be strongly explored during the design process.
- The project shall have its own facilities for solid waste collection.
- The project shall have septic tanks onsite sanitation system to avoid putting pressure on sewer network.

7.7 SOCIAL Enhancement Measures

7.7.1 Creation of Employment Opportunities

It is expected that during construction phase of the project, a good number of people will be employed. Offering local people, the opportunity for employment during the construction or of providing services such as supplying construction materials etc, will provide an additional income-generating opportunity to locals of the area. Where skilled labour is concerned, this will almost certainly be the case when there will be limited or no local skilled labour. This impact could be enhanced if the contractor constructing the building is both encouraged to and committed to hiring local labour, particularly when only semi-skilled or unskilled labour is required. This could be made clear during the tendering process for construction of the building. One way of promoting this would be for the Contractor to train local people to acquire the skills needed by these contractors to carry out the work.

7.7.2 Benefit to local producers and suppliers of goods and services

The project will procure most construction materials from local sources. The use of locally available materials and labour for the proposed development will contribute towards growth of the economy by contributing to the income and hence poverty reduction as well as contributing to gross domestic product. The consumption of these materials, fuel oil and others will attract taxes including VAT which will be payable to the government hence increasing government revenue. Some of the project services have been already contracted to Tanzanian suppliers and contract.

CHAPTER EIGHT

8.0 ENVIRONMENTAL AND SOCIAL IMPACT MANAGEMENT PLAN

8.1 Impact Management Plan

Plans for the implementation of mitigation measures for the proposed project are provided below. The Plans indicate institutional responsibilities, time to take the action and estimated costs. The proposed costs are only indicative, should the proposed development proceed with the suggested changes, the developer will work out on actual costs and include them in the overall cost of the project. The Environmental and Social Management is to be undertaken within the framework of an Environmental Management System compliant to the Tanzania Environmental and Audit Regulation of 2005 and its amendment of 2018 as well as the World Bank Environmental and Social Framework (ESF) and its associated environmental and social standards (ESSs).

The measures are given in Table 8.1. The developer is committed to implement the mitigation measures suggested by the Environmental and Social Impact Management Plan (ESMP).

8.2 Implementation of the Management Plan

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. The contractor shall implement the ESMP during the construction period under close supervision of supervising firm representing the Management team. During the Operation Phase, Building Management and the real estate firm that will manage the block will implement the ESMP.

The responsibility for mitigation and monitoring during the operation phase will lie with the DUCE Estate Department, i.e. a team of experts formulated with the tasks of following up the monitoring process. They may include Engineers, Health and safety specialist, Gender based violence expert, sociologist and an environmental Focus person. DUCE shall be responsible to produce reports on environmental and social compliance during operation, as part of their annual progress reports and annual EHS monitoring/Audit reports. Depending on the implementation status and sensitivity of any emerging issues, OSHA and /or NEMC will perform annual EHS reviews in which environmental concerns raised will be reviewed alongside project implementation.

8.3 Environmental and Social Costs

The principal environmental and social costs include the cost for implementing the mitigation measures proposed. These costs are indicated in Table 8.1. The developer shall cover all the costs proposed in the ESMP.

Table 8.1: Environmental and Social Impact Management Plan for the Proposed Project at DUCE

Identified Impact	Mitigation Measures	Responsible Institution	Relative Annual cost (TZS)
Management of Environmental Impacts During Construction Phase (18 Months)			
Increased Noise Levels	<ul style="list-style-type: none"> o Wherever possible all construction equipment will comply with the requirements of Tanzania Bureau of Standards (TBS) on noise emission in the environment by equipment for use outdoors. All the equipment shall bear the TBS marking and the indication of the guaranteed sound power level and shall be accompanied by an TBS declaration of conformity; o Construction works will not be permitted during the night; the operations on site shall be restricted to the period 07.00 -18.00 h; o All vehicles and machinery used at the construction sites will be subject to regular maintenance. The vehicles and machines that are excessively noisy due to poor engine adjustment or damage noise control devices shall not be operated until corrective measures have been taken; o The construction traffic plan will establish speed limits for construction vehicles and machinery at the construction site and the haulage roads used, and organize traffic so as to avoid as much as possible populated areas; o DUCE Staff and students will to the best of the project’s efforts be kept informed on due time of the planned works and the noise levels and periods during which they will occur; o The location of noisy equipment will be chosen as far as possible from sensitive receptors (hostels, offices). When near sensitive receptors, construction works will be scheduled and provided with the necessary resources so that the time of exposure is as short as possible; o Good management practice will be used to distribute heavy noise equipment at the site so as to avoid the cumulative effects of noise; o Workers shall be told to maintain tranquillity at site 	-Contractor Environmental and Social personnel from DUCE	6,000,000
Impacts to Air Quality	<ul style="list-style-type: none"> o Accesses and construction sites will be kept moist to reduce dust formation. Water sprays should be implemented all the time; o Dust-generating activities will be slowed down in days of strong wind; 	Contractor Environmental and	6,000,000

Identified Impact	Mitigation Measures	Responsible Institution	Relative Annual cost (TZS)
	<ul style="list-style-type: none"> o Ground will be moistened during loading and unloading of aggregates in trucks; o Truck dumpers carrying spoil or other dusty materials will be covered with tarps; o Loaded trucks should be washed down prior to exit from the working site to ensure that loose material is not tracked onto the roads; o Hoardings will be constructed around the construction sites to minimize the spread of dust; o Vehicles and construction machinery will be required to be properly maintained and to comply with relevant emission standards; o No unnecessary idling of construction vehicles at the construction sites will be allowed; o Construction truck traffic will be optimized so as to get a minimum number of trucks carrying the maximum volume of materials. This will be addressed in the Construction Traffic Management Plan; o The truck routes will be planned to avoid peak traffic hours or routes with heavy traffic; 	Social personnel from DUCE	
Increased Waste	<ul style="list-style-type: none"> o The main mitigation measures during the construction phase to minimize wastes and to manage wastes would be contained in the Waste Management Plan which shall Contain among other things; o Identification and classification of the different waste types that could be generated at the construction site (due to the materials used and waste generated in different sections) according to the Environmental Management Regulations (Hazardous Waste Control), 2009; o Completely separate hazardous from non-hazardous waste streams at the construction site should be done; o Immediate removal of waste material (concrete, iron, rocks, etc.) waste from site; o Collection and disposal of solid alike waste generated in the construction site and camps (food, beverages, packaging waste such as paper, bottles, glass, etc., glass bottles) according to national legislation (separation of recycling waste materials 	Contractor Environmental and Social personnel from DUCE Temeke municipal Council	24,000,000

Identified Impact	Mitigation Measures	Responsible Institution	Relative Annual cost (TZS)
	<p>from the waste stream that will be disposed of in the solid waste city dumpsite). Recyclable waste shall be given to an authorized recycling company;</p> <ul style="list-style-type: none"> o Signing a contract with the company for waste collection (registered by NEMC) and transportation for the collection and transport of the hazardous waste generated at the construction site to the authorised dumpsite; o Ensuring that the contracts signed with the companies dealing with waste recycling and recovery will take delivery and acceptance of the waste streams is performed on a frequent basis so that the construction sites remain clean at any time; o Reusing excavated soil and construction waste as much as possible; o The separate collection of possible hazardous waste (motor oils, vehicle fuels) and sub-contracting an authorized collector and transporter to transport, recovery or finally dispose the hazardous waste; o Establishing the Temporary Hazardous Waste Storage Points according the national legislation on handling, labelling, storage and management with hazardous waste; o Establishing and following the hazardous waste management procedure; o Ensuring that the hazardous waste is packaged and labelled showing the R and S phrases (risk and safety statements of the hazardous waste) and it is temporary stored on safety storage facility equipped with adequate ventilation, fire resistant conditions especially if there are VOC emissions, mercury containing lamps, asbestos materials form demolition works (if any); o Ensuring that the access to these temporary hazardous waste storage points be only allowed for trained and equipped staff, and entrance prohibited for untrained workers and public; o Contractor shall cooperate with Miburani Ward and National Stadium Street Offices for smooth collection of solid wastes from the project area o Promptly cleaning up All waste spills; o Making available for inspections full records of the type of waste stream 		

Identified Impact	Mitigation Measures	Responsible Institution	Relative Annual cost (TZS)
	<p>generated, quantity composition, origin, disposal destination and method of transport for all different waste streams;</p> <ul style="list-style-type: none"> o Undertaking the selective removal and storage of top soil; o The removal of topsoil from the soil surface so as to serve for reuse in the restoration of disturbed areas not occupied by the proposed project; o The reuse of topsoil to restore cuttings; o Burning and burying of wastes shall be strictly prohibited; o All liquid wastes are to be disposed either to the sewer along the main roads or treated and disposed onsite. 		
Occupational Safety and Health risks	<ul style="list-style-type: none"> o The Proponent through the Contractor is committed to adherence to the occupational health and safety rules and regulations stipulated in Occupational Safety and Health Act, 2003; o Appropriate working gear (such as nose, ear mask and clothing) and good construction site management shall be provided; o During construction phase the contractor shall ensure that the construction site is hygienically kept with adequate provision of facilities including waste disposal receptacles, sewage, firefighting and clean and safe water supply; o A well-stocked First Aid kit (administered by first aider) shall be maintained at each farm area and construction site. The first aider shall also be responsible for primary treatment of ailments and other minor medical cases as well as providing some health education to the workforce; o Health and Safety Management Plan shall be prepared by contractor and adhered during construction taking stock of HSMP in appendix X; o Qualified contractor preferably class 1 shall be used. 	Contractor Environmental and Social personnel from DUCE OSHA	15,000,000
Erosion of Cleared Areas	<ul style="list-style-type: none"> o There shall be no construction activities on the ground during rainy season; o The contractor shall deliberately re-cover exposed soils with pavements for smooth operations and unpaved area shall be covered with grass to overcome erosion by moving water in the area; o The project site shall be fenced to prevent the effect of wind; 	Contractor Environmental and Social personnel	2,000,000

Identified Impact	Mitigation Measures	Responsible Institution	Relative Annual cost (TZS)
	<ul style="list-style-type: none"> o Proper drainage channels shall be provided to direct water to designated area; o Proper grading to promote sheet flow and minimize flow concentration on unconsolidated soil. 	from DUCE	
Construction Vibration	<ul style="list-style-type: none"> o The Earth moving equipment shall be operated as far away from vibration sensitive areas as possible; o Earth moving and ground impacting operations shall be phased so as not to occur in the same time period because vibrations are additive; o Night time activities shall be avoided as people feel more vibrations during night time hours. o Dynamic compaction. A smaller falling weight will produce smaller vibrations; o Select demolition methods not involving impact, where possible; o Avoid vibratory rollers and packers near sensitive receptors. o Monitoring of vibrations during the performance of critical work processes will be undertaken in buildings which are within a distance of 20-30 meters from the area where these works take place. 	Contractor Environmental and Social personnel from DUCE	2,000,000
Loss of Vegetation	<ul style="list-style-type: none"> o Wherever possible mature trees (especially baobab) shall be retained. If the tree is not in the direct construction area it shall be left there as long as it does not interfere with the construction activities. o Close supervision of earthworks shall be observed in order to confine land clearance within the project area boundaries. o Appropriate vegetation shall be planted as part of land scaping of the project 	Contractor Environmental and Social personnel from DUCE	8,000,000
Management of Social Impacts During Construction Phase (1 Year)			
DUCE Community Health, Safety and Security Risk	<ul style="list-style-type: none"> o Construction work shall commence on site only when the Health & Safety (H&S) Plan has been adequately developed by the Contractor which adheres to the guidelines of World Bank ESS4; o Emergency Preparedness and Response Plan will be developed prior to construction works starting; o Traffic Management Plan will be developed for safe access to construction sites 	Contractor Environmental and Social personnel from DUCE	20,000,000

Identified Impact	Mitigation Measures	Responsible Institution	Relative Annual cost (TZS)
	<p>with minimum negative impact on the existing roads and in parallel to ensure community safety.</p> <ul style="list-style-type: none"> o DUCE and the Contractor/s will openly and transparently inform DUCE community of the affected places for planned activities that follow quarterly; o The traffic flow through the site and within the public areas will be coordinated with the responsible traffic engineers; o An Emergency Plan will be developed, including to cover for the management of cases of incidents during the transportation of raw materials/hazardous substances; o Workers will receive training and guidance in how to avoid conflicts with the local community members and sign a labour code of conduct, in order to avoid creating conflicts with the local environment; o Avoidance of unauthorized entry into contractor’s facilities will be considered in their design and siting. The design, layout and site location of facilities should facilitate natural surveillance by police and the safeguards engaged by Contractor/s; o Adequate selection of qualified security guards with appropriate training; o All necessary permits will be obtained prior to the start of construction phase from responsible institutions responsible for urban planning, communal works, water protection, electricity and telecommunication; o Workers shall be provided with identification cards and shall put on uniforms all the time while at the campus; o The Contractor/s will take into consideration all proposed preventive, mitigation and compensation measures included within the ESIA; o During construction, all building materials must be accommodated within the proposed site and not along the road to reduce inconvenience to road users; 		
Gender based violence (GBV), equity, and sexual	<ul style="list-style-type: none"> o Contractor and implementing agency to prepare and implement a GBV Action plan to include at minimum, in conformance with local laws and customs, The GBV Action Plan will be survival centred and identify the actors and steps to be 	Contractor Environmental, Social	20,000,000

Identified Impact	Mitigation Measures	Responsible Institution	Relative Annual cost (TZS)
harassment	<p>followed in case of GBV;</p> <ul style="list-style-type: none"> o Contractor to prepare and enforce a No Sexual Harassment Policy in accordance with national law where applicable; o All workers and DUCE Community and stakeholders will be educated on preventing and responding to sexual harassment and GBV ahead of any project related works; o The community within the vicinity of the college where construction will take place will also be educated on gender-based violence and sexual offenses such as sexual harassment, rape and defilement in the context of labour influx and the prevention and response measures; o Strategies such as male involvement will be employed in preventing and responding to GBV and sexual harassment; o Partnerships will be established with relevant government agencies and NGOs to ensure survivors of GBV and sexual offenses access survivor centred services such as medical care, psychosocial support, legal redress, safety, etc as and when necessary; o Impose zero tolerance on sexual harassment, all forms of gender-based violence and discrimination at all phases of the project. 	and GBV personnel from DUCE	
Gender inequity in employment	<ul style="list-style-type: none"> o DUCE and contractor shall ensure that women get adequate employment opportunities during recruitment and job postings; o The contractor shall carry out regular sensitization and awareness campaigns for workers to promote gender equity in employment during the construction works and during operation o During programme inception, contractor shall disclose standard operating procedures, guidelines and management systems established to ensure the promotion of gender equality and social inclusion; o Programme staff and trainers need to include male and female representatives from diverse ethnic groups. They will need to receive training on gender equality and social inclusion within the context of the programme; 	Environmental, Social and GBV personnel from DUCE	5,000,000

Identified Impact	Mitigation Measures	Responsible Institution	Relative Annual cost (TZS)
	<ul style="list-style-type: none"> o The contractor shall provide gender dis-aggregated data, separate bathing, changing, sanitation facilities for men and women; 		
Impacts associated with Transmission of Vector Borne and Communicable Diseases	<p>In order to minimize negative impacts from communicable diseases, a Worker Health and Safety Management Plan will be developed and will include the following mitigation measures:</p> <ul style="list-style-type: none"> o Develop and implement pre-employment screening measures for workers, which will cover applicable diseases. Individuals found to be suffering from communicable diseases will need to seek treatment prior to mobilization to site. However, no one should be denied employment because of their health status as long as they are able to undertake the required duties (following treatment if relevant); o Workers should receive training as part of their induction and then at least every 6 months on potential high risk communicable and vector borne diseases, symptoms, preventative measures and transmission routes as well as treatment options. This will be particularly important for diseases with which non-local workers are unfamiliar and in case of any emerging disease outbreaks; o A Worker Code of Conduct should be developed providing a site code of behaviour including worker-worker interactions, worker-community interactions and development of personal relationships with members of the DUCE community. This would apply to all Project workers and visitors to the construction sites within DUCE; o In the event of a new disease, increased transmission or outbreak compared to the baseline, the Project should interact with local health care facilities and workers to ensure there is an appropriate response in place. This involves community education and awareness, training of health care workers etc; o For all contractors and sub-contractors, at worker sites the following will be implemented at a minimum in order to minimize disease transmission: <ul style="list-style-type: none"> • Providing workers with appropriate sanitary facilities which are appropriately designed to prevent contamination; 	Contractor Environmental and Social personnel from DUCE	10,000,000

Identified Impact	Mitigation Measures	Responsible Institution	Relative Annual cost (TZS)
	<ul style="list-style-type: none"> • Developing a robust waste handling system to avoid the creation of new vector breeding grounds or attracting rodents to the area; • Implementing measures to reduce the presence of standing water onsite through environmental controls and source reduction to avoid the creation of new breeding grounds; • Ensuring the construction site is kept clean and free from any accumulation of wastes as well as supplied with clean potable water; • Ensuring appropriate food preparation and monitoring measures are in place; • Monitoring to ensure that all standards are being met by the relevant departments. • The workforce will be provided with access to treatment at health facilities near the site. Access to health care should include direct employees, sub-contractors and employees of the supply chain working on based on site; <ul style="list-style-type: none"> o The Project should prepare and implement a Vector Borne Disease Management Plan focusing on malaria, which includes vector control, avoidance, diagnosis, treatment and training; o The Project should implement TB prevention measures including testing and referral for treatment for all personnel working on the Project. This approach should be explained clearly to the workforce along with making it clear that there are no consequences for their employment; o The Project should monitor the emergence of major pandemics through World Health Organization (WHO) alerts and in the event of a pandemic review mobilization and demobilization of ex-patriate Project personnel and/ or implement appropriate control measures and Emergency Response Plans. 		
Impacts associated with Transmission of Sexually Transmitted	<p>The following mitigation measures are recommended:</p> <ul style="list-style-type: none"> o Development of a Code of Conduct / rules for worker-DUCE community interaction and on-site behaviour; o The Project should develop an STD Management Plan designed to minimize the 	Contractor Environmental and Social	30,000,000

Identified Impact	Mitigation Measures	Responsible Institution	Relative Annual cost (TZS)
Infections	<p>spread of HIV infection and other STDs. The plan should be prepared with the assistance of a specialist in sexually transmitted diseases. A typical plan would include, among other things, the following measures:</p> <ul style="list-style-type: none"> • An HIV/AIDS training course and on-going education on transmission of HIV/AIDS and STDs, to employees, through workshops, posters and informal information sessions; • Encouragement of employees to determine their HIV status; • Supply of condoms/ femidoms at the construction site(s) and Development of a comprehensive Construction Site Management Plan, including rules for on-site behaviour, entrance and exit policies and prohibition of sex workers on site. • As part of STD Management Plan, information should be provided to workers on STD prevalence rates in Tanzania as well as the expectations of local communities if a women is made pregnant by a worker (e.g., marriage, financial implications etc.). • Workers should have access to confidential health care for the treatment of STDs through medical facilities/ health care at Project site. • The Project should partner with other NGOs and CBOs to support the provision of information, education and communication campaigns around safe sexual practices and transmission of STDs. <p>o A Grievance Mechanism should be developed, whereby affected people can raise issues and concerns associated with social vices, prostitution and the behaviour of workers and drivers.</p>	personnel from DUCE	
Impacts associated with Spreading of Covid 19 Pandemic	<p>o The Contractors will develop Standard Operation Procedures (SOPs) for managing the spread of Covid-19 during project execution and submit them for the approval of the Supervision Engineer and the Client before mobilizing to site. The SOPs shall be in line with the World Bank guidance on COVID-19, Ministry of Health Directives and site-specific project conditions;</p> <p>o Mandatory provision and use of appropriate Personal Protective Equipment</p>	Contractor Environmental and Social personnel from DUCE	12,000,000

Identified Impact	Mitigation Measures	Responsible Institution	Relative Annual cost (TZS)
	<p>(PPE) shall be required for all project personnel including workers and visitors;</p> <ul style="list-style-type: none"> o Avoid concentration of more than 15 workers at one location. Where there are two or more people gathered, maintain social distancing of at least 2 meters; o All workers and visitors accessing worksites every day or attending meetings shall be subjected to rapid Covid-19 screening which may include temperature check and other vital signs; o Install handwashing facilities with adequate running water and soap, or sanitizing facilities at entrance to work sites including meeting venues and ensure they are used; o Ensure routine sanitization of shared social facilities and other communal places routinely including wiping of workstations, door knobs, hand rails etc; 		
Impacts on Labour and Working Conditions	<p>In order to minimize negative impacts from labour and working conditions, as guided from World Bank ESS2, the following mitigation measures should be applied:</p> <p><i>Employment and Procurement</i></p> <p>The Project shall develop a Human Resources Policy, Labour and Employment Plan (LMP) as well as specific recruitment policies and procedures, specifically:</p> <ul style="list-style-type: none"> o The Project should priorities the recruitment of workers and procurement of goods and services from within the Dar es Salaam then to national companies. This will not apply to the provision of highly technical equipment. The Project should develop a fair and transparent employment and procurement policy and processes to avoid any potential for nepotism or favouritism. The policy should be shared with the Ward and Street Leaders; o A Local Recruitment Procedure shall be developed by Contractor which outlines the percentage of skilled, semi-skilled and unskilled employment that should be sourced from the Different locations in Dar es Salaam. For unskilled workers this target should be set as high as possible ie at least 90%. The procedure will also include requirements for recruitment of vulnerable groups (women and disabled 	Contractor Environmental and Social personnel from DUCE	20,000,000

Identified Impact	Mitigation Measures	Responsible Institution	Relative Annual cost (TZS)
	<p>workers) to ensure equal opportunities, involvement of ward and street leaders in ensuring local employment is achieved, no hiring of workers at the gate etc. The requirements of this procedure will form part of the Conditions of Contract with subcontractors;</p> <ul style="list-style-type: none"> o Contractor will notify City Council, Ward and Street leaders of the specific jobs and the skills required for the Project, prior to the commencement of construction phase. This will give the local population time to prepare and apply for the available job opportunities on time. This is mainly applicable to unskilled and semi-skilled workers who will be locally sourced; o Employment and procurement opportunities will be publicly advertised in appropriate newspapers, City Offices and Ward and Street offices and in all relevant languages in a timely manner, to allow fair competition; o There will be no requirement for applicants to make payments for applying for, or securing, employment on the proposed Project; o The Project will ensure that recruitment procedures are transparent and monitored to ensure that those recruited present their actual experience, geographical location, health status, and age and that requirements for local employment are being met; o The Project will develop and implement a program of up-skilling, training and development for workers to assist them in accessing opportunities associated with the Project and in finding work following completion of their contracts; o The Project will provide training on health and safety and quality standards required by the Project for provision of goods and services to the Project to ensure that local businesses have the opportunity to benefit; o The Project will ensure that contracts are unbundled to allow a number of small businesses to provide goods and services rather than the supply being monopolized by one larger sub-contractor. o The Project will develop a Workers Grievance Mechanism. 		

Identified Impact	Mitigation Measures	Responsible Institution	Relative Annual cost (TZS)
	<p>Management System</p> <p>The Project should develop a Human Resources Policy, Labour and Employment Plan (LMP) These requirements should also be passed on to any subcontractors. Key issues with the Human Resource (HR) management will include, but not be limited to the following:</p> <ul style="list-style-type: none"> o Provision of clear and understandable information regarding rights under national labour and employment law, and any applicable collective agreements, including those related to hours of work, wages, overtime, compensation, etc; o Provision of reasonable working conditions and terms of employment; o Provision of employment, compensation/remuneration and working conditions, including working hours, based on equal opportunity and fair treatment, avoiding discrimination on any aspects; o Provision of adequate welfare facilities on site; o Implementation of a grievance mechanism for the Project workers; o Adoption and implementation of a sexual harassment policy; and o Adoption of open attitude towards freedom of association. <p>The Project will develop a H&S programme which will include risk assessments (such as working at heights, confined space machine guarding), work permit systems and a H&S management system, in line with industry best practice, including worker performance safety tracking (safety observations) to assure worker safety. All workers will receive induction and continuous training regarding this system</p> <p>Sub-Contractor and Supplier Management</p> <ul style="list-style-type: none"> o Subcontractor and Supplier Contracts should make explicit reference to the need to abide by Tanzanian law, international standards (in particular World Bank Occupational Health and Safety Guidelines) and the ratified ILO conventions and 		

Identified Impact	Mitigation Measures	Responsible Institution	Relative Annual cost (TZS)
	<p>the Project Proponent’s policies relating to health and safety, labour and welfare standards;</p> <ul style="list-style-type: none"> o As part of the subcontractor and supplier selection process, Contractor should take into consideration performance with regard to worker management, worker rights, health and safety as outlined in Tanzanian law, international standards and the Proponent’s policies; o Contractor should provide support to sub-contractors and suppliers to ensure that labour and working conditions are in line with Tanzanian legislation and World Bank Occupational Health and Safety Guidelines through gap analysis, awareness raising and information provision, as necessary; o Regular checks / audits by Contractor should be undertaken to ensure the relevant labour laws are adhered to at all times. <p>Workers’ Rights</p> <ul style="list-style-type: none"> o Contractor should ensure no employee or job applicant is discriminated against on the basis of his or her gender, marital status, nationality, ethnicity, age, religion or sexual orientation; o All workers (including those of subcontractors) should, as part of their induction, receive training on worker rights in line with Tanzanian legislation to ensure that positive benefits around understanding labour rights are enhanced. This process should be formalized within the Code of Conduct that would be provided by Contractor; o All workers (including those of subcontractors and suppliers) should have contracts, which clearly state the terms and conditions of their employment and their legal rights. These contracts should be aligned with Tanzanian labour law, the ILO core conventions and the requirements of World Bank Occupational Health and Safety Guidelines. Contracts should be verbally explained to all workers where this is necessary to ensure that workers understand their rights; 		

Identified Impact	Mitigation Measures	Responsible Institution	Relative Annual cost (TZS)
	<ul style="list-style-type: none"> o The Project should put in place a worker grievance mechanism that should be accessible to all workers, whether permanent or temporary, directly or indirectly employed. The worker grievance mechanism should be open to Contractor and the subcontractor workforce in the event that their grievance is not adequately resolved by their direct employer. Contractor would then have the authority to act to resolve this grievance; o All workers (including those of Contractor and the subcontractor) should have access to training on communicable diseases and STDs and community interactions in general; o Contractor should undertake surveillance and assurance that no children or forced labour is employed directly, and to the extent possible by third parties related to the Project and primary suppliers where such risk may exist. 		
Management of Environmental Impacts During Operation Phase (50 Years)			
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; • Smoking shall be prohibited except for designated areas; • The design of the buildings shall strictly adhere to the Fire Safety Standards (eg provision of exit stairs for building with more than 1 floor); • Teaching building shall be equipped with fire detectors and alarms; • Firefighting trainings shall be provided to DUCE Community; • Fire drill exercise shall be practiced at least once a year; • Drawings (including electrical) shall be submitted to TANESCO and fire department for review and approval before operation phase. 	Proponent	15,000,000
Increased wastes during operations	<ul style="list-style-type: none"> • DUCE shall hire a private cleanliness company to clean the buildings and premises on daily basis; • All hazardous wastes including electronic wastes shall be collected and disposed/ recycled off by NEMC authorised hazardous waste collector • Wherever possible, solid waste shall be recycled or reused; 	Proponent/ Temeke municipal Council	12,000,000

Identified Impact	Mitigation Measures	Responsible Institution	Relative Annual cost (TZS)
	<ul style="list-style-type: none"> • Domestic garbage such as papers, food wastes, yard waste shall be collected at a new transfer station at site before disposal to authorised dump site at least twice a week; • Wastewater from postgraduate building and Faculty of humanities and social science will be directed to the respective septic tanks; • Wastewater from the buildings shall be treated and disposed onsite, the type of treatment system shall be proposed by design team. 		
Increased surface water run-off	<ul style="list-style-type: none"> • Roofs of both buildings shall be installed with gutters and downward pipes to direct rain water to the designated storm water drains within the site; • Designs shall explore option for rain water harvesting and if found feasible it shall be implemented. 	Proponent	3,000,000
Food Insecurity and inflation of prices on other social services	<ul style="list-style-type: none"> • Encourage traders to supply food and other products to the project area. • Sensitization of the surrounding communities in order to make them aware of the employment and hence income generating opportunities with the proposed project. • Provide more avenues for service providers e.g. cafeteria and restaurants 	Proponent	3,000,000
Management of Social Impacts During Operation Phase (50 Years)			
Increased pressure on social services and utilities	<ul style="list-style-type: none"> • Alternative measures like use of solar power, water recycling shall be explored and implemented if found feasible; • The existing borehole at site may be used for the project; • Use of energy savers bulbs shall be given high priority; • Use of air conditioning shall be kept to a minimum and maintenance of the cool indoor environment using natural ventilation system shall be strongly explored during the design process; • The project shall have its own facilities for solid waste collection. 	Proponent	6,000,000
		Total	223,000,000

Source: Consultant, 2023

CHAPTER NINE

9.0 ENVIRONMENTAL AND SOCIAL MONITORING PLAN

Monitoring refers to the systematic collection of data through a series of repetitive measurements over a long period of time to provide information on characteristics and functioning of environmental and social variables in specific areas over time. There are four types of monitoring that are also relevant to this ESIA.

- **Baseline Monitoring** – the measurement of environmental parameters during a pre-project period and operation period to determine the nature and ranges of natural variations and where possible establish the process of change.
- **Impact/effect Monitoring:** involves the measurement of parameters (performance indicators) during establishment, operation and decommissioning phase in order to detect and quantify environmental and social change, which may have occurred as a result of the project. This monitoring provides experience for future projects and lessons that can be used to improve methods and techniques.
- **Compliance Monitoring:** takes the form of periodic sampling and continuous measurement of levels of compliance with standards and thresholds – e.g. for waste discharge and air pollution.
- **Mitigation Monitoring** aims to determine the suitability and effectiveness of mitigation programs, designed to diminish or compensate for adverse effects of the project.

In order to ensure that mitigation measures are properly done, monitoring is essential. Table 9.1 provides details of the attributes to be monitored, frequency, and institutional responsibility and estimated costs. These costs are only approximations and therefore indicative. Costs that are to be covered by the developer should be included in the project cost.

Table 9.1: Social and Environmental Monitoring Plan for the Proposed Project at DUCE

Environmental Aspect	Parameters	Monitoring frequency	Sampling Area	Measurement Units	Method	Target level/ Standard	Responsibility for monitoring	Annual costs estimate (Tsh)
Pre-construction Phase								
Air Quality	Dust (PM ₁₀)	Once before construction start	Project sites	g/Nm ³	<i>Micro-dust Pro (TZS 837 Part 3)</i>	<0.25 WHO/TBS	DUCE	1,000,000
Noise Baseline	Noise level	Once before construction start	Project sites	dBA	<i>Noise Level Meter</i>	<45 (Day Time) <35(Night Time) WHO/TBS	DUCE	1,000,000
Mobilization and Construction Phase								
Air Quality	Dust (PM ₁₀)	Once in three months	Project sites	g/Nm ³	<i>Micro-dust Pro (TZS 837 Part 3)</i>	<0.25 WHO/TBS	DUCE	2,400,000
Noise pollution	Noise level	Once in three months	Project sites	dBA	<i>Noise Level Meter</i>	<55 (Day Time) <45(Night Time) WHO/TBS		1,600,000
Employment opportunity	Percentage of local construction labourers	Twice a year	Project sites	Number of local people employed in the project	Records, inquiries and observation	>140	DUCE	3,000,000

Environmental Aspect	Parameters	Monitoring frequency	Sampling Area	Measurement Units	Method	Target level/ Standard	Responsibility for monitoring	Annual costs estimate (Tsh)
Safety and health risks	Number and type of safety equipment such as mask, helmet gloves and ear plugs. Health and sanitation facilities in site.	Daily	Project sites	Number of safety measures provided	Records, inquires and inspection	-	DUCE/ OSHA	5,000,000
Waste Management	Solid and Liquid waste collection facilities	Once a week	Project sites	Presence of Skip bucket and Proper working septic tanks	Observations	At Least 1 Skip bucket and connection to timely discharge at septic tanks.	DUCE	2,000,000
Soil erosion and ground water quality	Soil erosion and ground water quality	Once per Month during dry season and weekly	Project Sites	Area eroded	Observations and measurements	No erosion at all	DUCE	2,000,000

Environmental Aspect	Parameters	Monitoring frequency	Sampling Area	Measurement Units	Method	Target level/ Standard	Responsibility for monitoring	Annual costs estimate (Tsh)
		during rainy season						
Vibrations	Vibrations	Once per year	Project sites	mm/s	Observations and Measurements	TBS Standards	DUCE	2,000,000
Gender based violence (GBV), equity, rape and sexual harassment	GBV	Monthly	Project site and the whole of DUCE Community	Number of GBV	Records and Inquiries	Zero cases of GBV	DUCE	12,000,000
Gender inequity in employment	Female workers	Monthly	Project site	Number of female workers	Records and Inquiries	Adequate number of female workers	DUCE	4,000,000
Transmission of Vector Borne and Communicable Diseases	DUCE Community and Contractor's Workers	Monthly	Project site and the whole of DUCE Community	Number of workers got ill from communicable diseases	Records	Zero (0)	DUCE	2,000,000

Environmental Aspect	Parameters	Monitoring frequency	Sampling Area	Measurement Units	Method	Target level/ Standard	Responsibility for monitoring	Annual costs estimate (Tsh)
Impacts associated with Transmission of Sexually Transmitted Infections	DUCE Community and Contractor's Workers	Monthly	Project site and the whole of DUCE Community	Number of workers got ill from STDs	Records	Zero (0)	DUCE	2,000,000
Impacts associated with Spreading of Covid 19 Pandemic	Contractor's workers	Daily	Project Site	Number of workers got ill from Covid 19	Records	Zero (0)	DUCE	4,000,000
Impacts on Labour and Working Conditions	Contractor Workers	Daily	Project Site	Preparation and implementation of Human Resources Policy, Labor and Employment Plan	Records, Observations, Inquiries	Presence of the Plan and Enforcement	DUCE	2,000,000
Operation phase								

Environmental Aspect	Parameters	Monitoring frequency	Sampling Area	Measurement Units	Method	Target level/ Standard	Responsibility for monitoring	Annual costs estimate (Tsh)
Safety risk due to fire	Awareness and Signage number of fire extinguishers	Once a year	Project sites	Number of safety measures provided	Records, injuries and inspection		DUCE/ OSHA / Fire and rescue forces	5,000,000
Waste Management	Solid and Liquid waste	Twice per week	Project sites	Presence of Waste Collection facilities Proper working of septic tanks	Quantification of waste	At least 1garbage collection point Timely discharge of septic tanks	DUCE/ Temeke Municipal council/ DAWASA	2,000,000
Increased pressure to Social Services and Utilities	Water Supply, Electricity, Sewer system, Solid waste collection facilities	Monthly	National Stadium Street	Respective Units	Records, Inquiries, Observations	No decrease of service provision	DUCE	7,000,000
Total monitoring costs								60,000,000

Source: Kaskim and Eco services, September, 2023

CHAPTER TEN

10.0 COST BENEFIT ANALYSIS OF THE PROJECT

10.1 Introduction

This section is supposed to address financial, economic and an extended cost-benefit analyses for the proposed project. However, this project is purely a service and therefore it is not possible to convert all the social benefits into monetary terms. Therefore, what is presented in this section is rather an indicative and elementary description of the environmental costs and benefits. It is based on the indicative costs for implementation of mitigation measures as well as the cost of monitoring.

10.2 Benefits Related to the Project

Several benefits are associated with the proposed construction of these teaching and hostel building both at local and national level in terms of improved education the multiplier effects associated with linkages with local and national economy. Likewise, there are costs that must be incurred in order to gain the expected benefits. Table 10.1 below gives the list of benefits and costs of the project from the environmental, social and economic point of view.

Table 10.1: Benefits and Costs of the Project

Environmental and Social Benefits	Environmental and Social Costs
<ul style="list-style-type: none"> • Benefits to communities resulting from employment • Improved enrolment • Creation of employment opportunities • Reduction of gender gap in enrolment • Increased capacity for gender friendly and responsive learning environments • Institutional Fiscal Efficiency and Transparency • Increase in skilled workforce • Strengthening the culture of environmental and social risk mitigation 	<ul style="list-style-type: none"> • DUCE Community Health, Safety and Security Risk • Erosion of cleared areas • Increased Noise Levels • Waste management problems during construction • Erosion of Cleared Areas • Impacts to Air Quality • Construction Vibration • Waste Generation and Management • Increased Traffic congestion • Erosion of Cleared Areas • Gender based violence (GBV), equity, rape and sexual harassment • Gender inequity in employment • Increased pressure on social services and utilities • Health and safety risks due to fire hazards • Increased wastes during operations Transmission of Vector Borne and Communicable Diseases • Impacts associated with Transmission of Sexually Transmitted Infections

Environmental and Social Benefits	Environmental and Social Costs
	<ul style="list-style-type: none"> • Impacts associated with Spreading of Covid 19 Pandemic • Impacts on Labour and Working Conditions

Source: Consultant, September 2023

Since some of the impacts will only be realized during construction phase, the costs for these will also be short term especially if mitigation measures are fully implemented. From the table it can be observed that all the Environmental and Social Costs can be mitigated properly, and the benefits of having colleges outweigh by far the costs that shall be incurred for implementing this project.

CHAPTER ELEVEN

11.0 DECOMMISSIONING

11.1 Introduction

Decommissioning will occur in the far future, hence the precise circumstances for mitigation are typically unpredictable. As a result, precise mitigation strategies for the environmental effects of decommissioning activity cannot be recommended at this time with a high degree of assurance.

The developer must create a thorough decommissioning strategy that takes environmental concerns into account before beginning the decommissioning procedures. If decommissioning is carried out, it may involve demolition brought about by a change in the land's use or a change in usage (functional changes). Therefore, what is described here is only a conceptual decommissioning plan that outlines what has to be done when decommissioning become necessary.

11.2 Preliminary Decommissioning Plan

This part gives a concise description of the tasks necessary to demolish the planned project on the area, should that scenario arise. The framework for ensuring that demolition activities on the site don't negatively impact the environment, traffic, or the health of the general public and nearby properties is provided by this Plan, which will be used as a reference document.

Before starting demolishing activities on site, the Contractor will be expected to create a thorough demolition plan and construction management plan to meet the requirements of the developer as well as required authorities.

11.2.1 Type of Buildings to be Demolished

The blocks that will be demolished are typically made of load-bearing masonry structures, steel or timber roof frames, and roofing made of metal. The blocks are built on top of a slab of concrete supported by strip and pad footings.

11.2.2 Demolition Methods

Before undertaking demolition operations on site, it is expected that the contractor will create a complete demolition plan. In the meanwhile, the following demolition process will serve as a guide:

- Bobcats, 3-5t excavators, and dingo-style loaders will be used along with hand labor to strip out and remove non-structural components.
- With the aid of small to medium-sized vehicles, the materials will be removed from the location.
- The buildings will be dismantled using heavier machinery, such as hydraulic excavators weighing 15 to 40 tons. These tools will be outfitted with rock breakers, pulverizers, and similar devices that will be utilized in succession.
- The expert in question will be hired to offer additional engineering guidance about back propping, or temporary support, of the building during deconstruction.

- Erosion prevention measures will be installed during demolition. The management of dust and subsequent discharge into storm water drainage channels will be among them.

11.2.3 Materials Handling

Excavators, bobcats, and other mechanical equipment will be used for material handling, and these materials will be loaded onto trucks (bogie tippers and semi-trailers) to a designated trash facility or recycling location, the waste will be transported off-site.

The contractor shall submit a Demolition Waste Management Plan to Temeke Municipal Council which outlines the objectives of:

- Maximization, reuse and recycling of demolition material.
- Minimization of waste disposal.
- Evidence of implementation for specified arrangements of waste management.

Reusable items will be stored at the facility. Collection vehicles will also be able to park here with recycling and disposal bins. The hazardous wastes will be handled differently. A certified specialist will inspect the hazardous items and prepare a report. The removal of hazardous items shall follow EMA 2004. The hygienist will offer a final clearance report which will contain tip dockets from waste facilities.

11.2.4 Proposed Sequence

The Contractor will be required to prepare the following documentation prior to the commencement of demolition and/or excavation works:

- Dilapidation Survey.
- Construction Waste Management Plan.
- Demolition Management Plan.

The demolition process is often carried out in the opposite order from building. Interior decorations will basically be removed. After that, services like air conditioning, conduit, and piping will be taken out. If necessary, exteriors will be taken off before the building is destroyed with the use of heavier machinery. The site's demolition and clean up are anticipated to take three months.

11.2.5 Protective Measures

Before the start of the demolition process, an A Class hoarding will be placed around the perimeter of the construction site. Additionally, overhead protection in the shape of a B Class hoarding will be supplied everywhere there is a risk of debris falling into public spaces. To facades where items may fall more than 4 meters, scaffolding will be installed. To contain trash and dust on the site, the scaffolding will be covered with chain wire and shade cloth. To minimize dust dispersal from the demolition site, dust control techniques will be implemented. To guarantee adherence to the safety regulations and established work techniques, the contractor will have a senior representative on the job site at all times.

11.2.6 Traffic Management

An extensive traffic management strategy must be provided in order to control construction traffic throughout the decommissioning phase. The Contractor will create this plan for the

various demolition phases. All traffic will be restricted to the perimeter of the property during demolition. The location will continue to be secured and off-limits to pedestrians.

11.2.7 Occupational Health and Safety

A detailed Occupational, Health and Safety (OH&S) Policy will be provided by the Contractor prior to work initiation. A detailed Site Safety Plan will be prepared for the specific project.

11.2.8 Environmental Management Plan

A detailed Environmental Management Plan will be provided by the Contractor prior to the commencement of the work.

11.2.9 Potential Impacts and Mitigation Measures

Dust and Noise Pollution

Since the demolition work is anticipated to be completed utilizing the traditional manner using mechanical breakers and jackhammers, the demolition operations for the remaining portion (foundation structure) will be accompanied by the emission of a lot of dusts. However, other demolition strategies, such as explosive methods can be used.

Mitigation Measures

- Water sprinkling shall be applied to open earth to reduce dust emission.
- Trucks transporting construction materials shall be covered if the load is dry and prone to dust emissions.
- The demolition area shall be fenced by iron sheets; this will prevent the dust at the ground to be picked up by the wind.
- Community notification shall be undertaken where appropriate where work is likely to cause dust impact on the public and nearby residents.
- Sound construction equipment, with noise sinks, shall be used
- Machine operators in various sections with significant noise levels shall be provided with noise protective gear.
- Construction equipment shall be selected, operated and maintained to minimize noise.

Increased Waste

A lot of demolition waste is expected as a result of the demolition of these blocks. These shall include walls concrete, reinforcements, pipes etc. Most of the materials shall be salvaged and recycled.

Mitigation Measures

- All materials which can be reused shall be reused
- Materials that cannot be reused shall be sent to the authorized dumpsite

11.2.10 Costs for Undertaking the Mitigation Measures

The cost for undertaking Mitigation measures during decommissioning is estimated to be Tsh 200,000,000.

CHAPTER TWELVE

12.0 SUMMARY AND CONCLUSION

12.1 Summary

DUCE, through the Government of the United Republic of Tanzania (URT) has received financing from the World Bank to implement HEET Project. DUCE is among the High Learning Institutions selected to establish the Humanities and Social Science and Postgraduate and research centers under the HEET project. DUCE intends to upgrade the DUCE by constructing Six storey building for Postgraduate and Research center and Six storey Faculty of Humanities and Social Sciences building within the compounds on plots number 324 and 325 National Stadium Street, Miburani /Ward, Temeke Municipality. The study was conducted to comply with the Environmental Management Act (2004) and was done in accordance with the EIA and Audit (amendment) Regulations, 2018 as well as World Bank Environment and Social Framework (ESF) and the project's Environmental and Social Management Framework (ESMF) respectively

The College is located on Plot 324 and 325 Block 'T' Chang'ombe in Temeke Municipality, Dar es Salaam Region, adjacent to the new National Stadium and about 5 km from the City Centre via Kilwa Road. The College consists of 52.97 acres of land. This strategic location of the College provides opportunities in different areas of investment due to its proximity to City centre. The site for postgraduate building is located at the current football pitch, The footprint of the building is expected to be 1,500sqm. The site is relatively flat covered by small grasses. Neither wildlife nor domestic animal was observed at the project site.

The site for Faculty of Humanities and Social Sciences is located at the center of DUCE main campus. There are about 32 concrete benches (vimbwete) which shall be relocated to another suitable area to pave way for the project. The footprint of the building is expected to be 1,500sqm. The vegetation of the area is characterized by exotic trees including 13 neem trees and some flowers. Neither wildlife nor domestic animal was observed at the project site.

The main source of electricity at DUCE is from Tanzania Electric Supply Company (TANESCO) but there are two standby generators which are used when there is shortage of electrical supply. The water source in DUCE is mainly from the boreholes and the same shall be during construction and operational period; construction activities are not expected to affect the water supply at DUCE as it is confirmed by DAWASA for the existing water sources to suffice an increase in water demand (See Table 5.1). Solid wastes shall be collected at the solid waste transfer stations on site and then transported to municipal dump site for disposal by the contacted companies which are GENESIS professional cleaning company and CHES cleaning company. Liquid wastes shall be disposed to the septic systems present on site.

Key stakeholders were consulted during ESIA study, include the following; Temeke Municipal Council, Occupational Safety and Health (OSHA), Tanzania Electric Supply Company Limited (TANESCO), Fire and Rescue Forces (Temeke), Legal and Human Rights Centre (LHRC), Tanzania Gender Network Programme (TGNP), Miburani Ward Office (WEO); and National Stadium Street Executive Officer (MEO). Also scoping reports was submitted to the Ministry of Education, Science and Technology (MoEST), Ministry of Health, Community Development, Gender, Elderly and Children (MoHCDGEC) and Tanzania Electric Supply Company Limited

(TANESCO), Fire and Rescue Forces (Temeke), Legal and Human Rights Centre (LHRC), Tanzania Gender Network Programme (TGNP) to seek for comments/issues. The main issues and concerns identified include the following:

- Waste Management-There must be proper solid waste and wastewater collection system during construction and operation phase;
- Developer and contractor must cooperate with local government authority during both phases of the project; and
- Contractor and developer must adhere to all provisions of Occupational Safety and Health Act 2003.

The construction of Postgraduate and Faculty of Humanities and social sciences building at DUCE shall cause a wide range of environmental and social impacts on a number of receptors. The impacts are of both positive and negative nature. The identified significant environmental and social impacts during construction phase include; Employment opportunities; air and noise pollution; waste generation and management; occupational safety and health risks; erosion of cleared areas; construction vibration and community health and safety risks. The identified significant environmental and social impacts during operation phase include; benefits to communities resulting from employment, reduction of gender gap in enrollment and completion rates increase in economic activities, regional Integration, increased revenue to the council and country as a whole, increased pressure on social services and utilities, health and safety risks due to fire hazards, waste generation and management.

in this study different alternatives were considered including no project alternative, alternative sites, alternative designs, Energy Alternative, Wastewater Treatment Alternatives. The no project alternative was disqualified because choosing that alternative shall mean to remain with the status quo (without project) and losing all the benefits of the project. Existing water sources (boreholes) was preferred than other water sources like rainwater harvesting. Electricity from National grid was preferred, however solar energy shall be explored and if feasible shall be used. For wastewater management, onsite sanitation system was preferred because there is no sewer system.

The options to minimize or prevent the identified adverse social and environmental impacts as well as a monitoring plan have been suggested in this report and are contained in the ESMP. Many of them are based on good engineering practices. The Environmental and Social Management Plan (ESMP) presents the implementation schedule for the proposed mitigation measures to both environmental and social impacts as well as planning for long-term monitoring activities. The ESMP also includes the associated environmental costs needed to implement the recommended mitigation measures. The engineering designs shall include the mitigation measures recommended in this report.

The EIA study results show that although there are some limited negative environmental implications of the project, the project will have high benefits to the DUCE and Tanzania as a whole. The associated negative impacts, to a large extent have been minimized through good engineering design and envisaged construction practices. Specific mitigation measures have been suggested in this report to offset some of the inherent adverse impacts whereby implementing these mitigation measures would increase environmental soundness of the project.

12.2 Conclusions

It can therefore be concluded that, the proposed DUCE Postgraduate and Faculty of Humanity and Social Sciences buildings project will entail no significant impacts provided that the recommended mitigation measures are adequately and timely implemented. The identified impacts will be managed through the proposed mitigation measures and implementation regime laid down in this ESIA. The developer is committed in implementing all the recommendations given in this ESIA and further carrying out the environmental auditing and monitoring schedules.

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APPENDICES

Appendix I: Certificate of Occupancy

TITLE NO. 123865
 REGISTERED 25/04/2013
 AT 11:02AM

[Signature]
 Registrar of Land Titles

LAND REGISTRY
 TANZANIA

Land Form No. 22
 TANZANIA STAMP DUTY ACT
 Stamp Duty No. 10015 Paid
 Receipt No. 42900937
 of 14.04.2013
[Signature]
 Stamp Duty Officer

TANZANIA STAMP DUTY ACT
 Stamp Duty No. 3054561 Paid
 on receipt No. 42900937
 of 14.04.2013
[Signature]
 Stamp Duty Officer

THE UNITED REPUBLIC OF TANZANIA
 THE LAND ACT, 1999
 (NO. 4 OF 1999)

CERTIFICATE OF OCCUPANCY
 (Under Section 29)

Title No. 123865
 L.O. NO. 391456
 LD/TM/CH/14710

The 19th day of April, Two thousand and Eleven Thirteen AC1

THIS IS TO CERTIFY that DAR ES SALAAM UNIVERSITY COLLEGE OF EDUCATION (DUCE) of P.O. BOX 2329, DAR ES SALAAM (hereinafter called "the Occupiers") are entitled to a 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 Sixty six years from the first day of October, Two thousand and seven 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 there-for or amendment thereof and to the following special conditions:-

1. The Occupier having paid rent up to the thirtieth day of June 2008, shall thereafter pay rent of shilings two hundred thousand six hundred and fifty thousand (Tshs. 265,000/=) only a year in advance on the first day of July in every year of the term without deduction PROVIDED that the rent may be revised by the Commissioner for Lands.
2. The Occupiers 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 Occupier's expenses as assessed by the Director responsible for Surveys and Mapping.

AC2

- (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) Maintain on the land buildings (hereinafter called "the buildings") in permanent materials designed for use in accordance with the conditions of the Right and which conform to the building line (if any) decided by the Temeke Municipal Council (hereinafter called "the Authority").
 - (iv) all times during the terms of the Right have on the land buildings 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")
 - (v) 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.
3. USER: The land and the existing buildings erected thereon shall be maintained and the same shall be used for Training Institution – University purposes only. Use Group 'K' Use Classes (a) and (b) as defined in the Town and Country Planning (Use Classes) Regulations, 1960 as amended in 1993.
 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 premia, taxes and dues prescribed in connection with that disposition.
 6. The President may revoke the Right for good cause or in Public interest.

SCHEDULE

ALL that land known as Plot No. 324 & 325 Block 'T' situated at Chang'ombe Area in Temeke Municipality containing fifty two decimal point ninety seven (52.97) ACRES shown for identification only edged red on the plan attached to this Certificate and defined on the registered Survey Plan Numbered 13254 deposited at the Office of the Director for Surveys and Mapping at Dar es Salaam.

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

[Signature]
Asst. COMMISSIONER FOR LANDS

We The within named DAR ES SALAAM UNIVERSITY COLLEGE OF EDUCATION (DUCE) hereby accept the terms and conditions contained in the foregoing Certificate of Occupancy:

SEALED with the COMMON SEAL of the said)
DAR ES SALAAM UNIVERSITY COLLEGE)
OF EDUCATION (DUCE) and DELIVERED)
in the presence of us this 17th)
day of 2012.)

Signature: *[Signature]*)

Postal address: P. O. BOX 2329)

DAR ES SALAAM)

Qualification: Ag. PRINCIPAL)

Signature: *[Signature]*)

Postal address: P. O. BOX 2329)

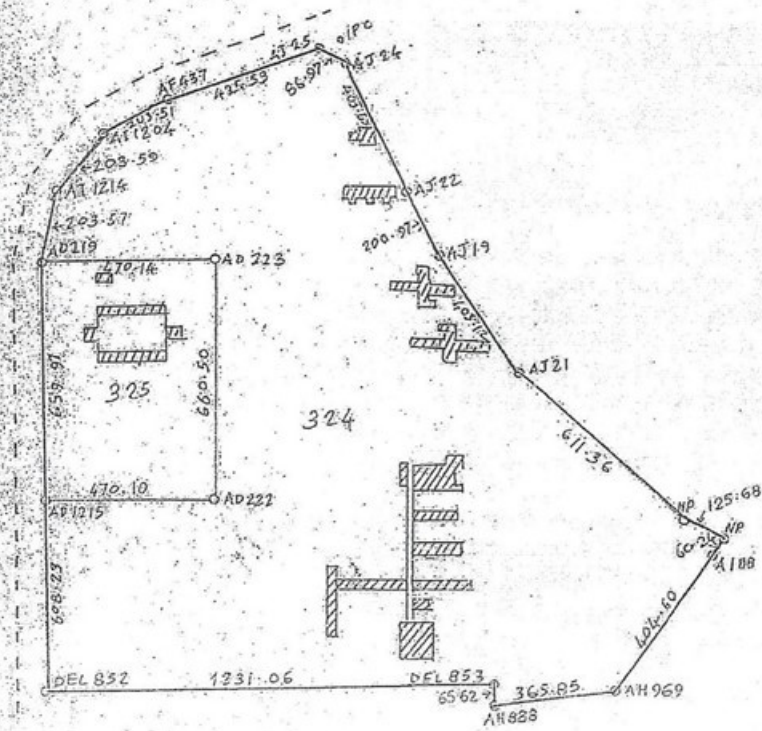
DAR ES SALAAM)

Qualification: PRINCIPAL LEGAL OFFICER)

TEMEKE MUNICIPALITY



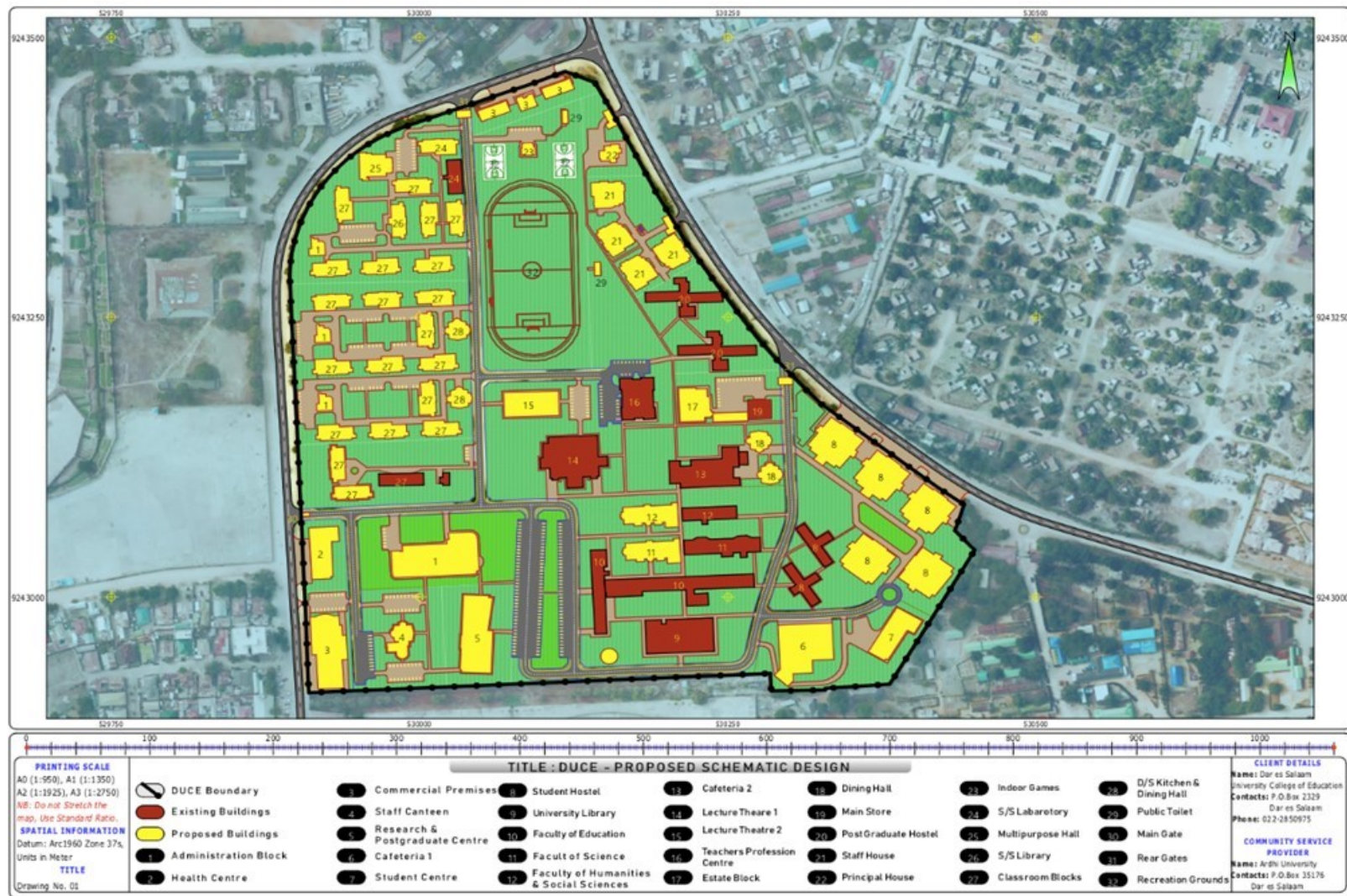
LOCATION CHANG'OMBE
 BLOCK T
 PLOT No. 324 & 325
 L.O. No. 391456
 AREA 52.97 ACRES



The issue of this plan implies no guarantee or admission of title by the Government.

This plan was prepared in accordance with the provisions of the Land Survey Act No. 1325/1963 and the Land Survey Regulations No. 1325/1963. It was prepared by the Municipal Land Surveyor, Tembeke Municipality, on the 14/7/2011.

Appendix IV: DUCE site Layout Plan



Appendix IX: Architectural Drawings
1.POST GRADUATE BUILDING

