THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF FINANCE

INSTITUTE OF RURAL DEVELOPMENT PLANNING

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) FOR THE PROPOSED CONSTRUCTION OF FOUR STOREY (G+3) ACADEMIC BLOCK TO BE LOCATED ON PLOT NO.2, BLOCK 'B', WITHIN DODOMA MAIN CAMPUS, MIYUJI PROPER MTAA, MIYUJI WARD, DODOMA CITY IN DODOMA REGION

PROPONENT

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EXECUTIVE SUMMARY

INTRODUCTION

The Institute of Rural Development Planning (IRDP), its main campus located at Mbwanga Area in Dodoma City, is a corporate body established by the Parliamentary Act No. 8 of 1980s. This Act provides a legal framework for the Institute to be established as an important national centre for provision of training, research and consultancy services in the field of rural development planning and management. The institute was established with a main objective of alleviating qualitative and quantitative shortage of skilled manpower within the framework of sustainable capacity building directed towards reducing poverty and attaining sustainable development.

Currently, IRDP has a total population of 14,000 students and 425 staffs. The institute operates two campuses namely Dodoma Campus and Lake Zone Center- Mwanza Campus. IRDP Dodoma Campus has been divided in various areas including Mbwanga area, Miyuji area, Furaha area and Nala area which is expected to be constructed in the near future. IRDP provides a number of course including Regional Development Planning, Environmental Planning and Management, Population and Development Planning, Development Finance and Investment Planning, Economics, Urban Development and Environmental Management, Human Resource management, Community Development, Business Administration, Project Planning and Management, Urban and Regional Planning, Information and Communication Technology and Geomatics. All these courses are provided in different levels of Certificate Programmes, Ordinary Diploma Programmes, Bachelor Degree Programmes and Master Degree Programmes.

The headquarters of the IRDP is located in Mbwanga area while the proposed project will be constructed at Miyuji area.

Description of the HEET Project

The Government of the United Republic of Tanzania through the Ministry of Education Science and Technology (MoEST) is implementing 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 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 teachers, researchers and administrators needed by universities to achieve their full potential. According to the HEET's Project Appraisal Document (PAD, 2021), the main objective of the HEET project is to strengthen the learning environment and labor market alignment of priority programs at beneficiary University and improve the management of the higher education system.

IRDP is one of the higher learning institutions that benefit from the HEET project funding. The total amount of fund allocated for IRDP is 6 billion. IRDP is planning to use part of the funds under HEET project to construct eco-friendly academic block in Dodoma Campus – Miyuji. The cost of the proposed project implementation is Tanzania Shilling 3,650,000,000. This construction will increase enrolment capacity in degree programmes in priority disciplines and to promote applied research and innovation capacity.

Further, the HEET project at IRDP intends to promote accessibility for those with special needs and address gender considerations as well as safety concerns. In addition, the fund will be used for adoption of Digitization Enhanced Learning Technology (DELTA) as well as enhance of capacity of staffs and management.

The proposed eco-friendly academic block at IRDP Campus Miyuji will comprise of the following:

i. Ground Floor: Two (2) Classrooms with a capacity of 200 students each, ICT Office, Toilets (11), Ramp, stairs and Lift
ii. First Floor: Studio (2) each with 200 persons capacity, Toilets (22).
iii. Second Floor: Studio (1) with 200 persons capacity, Toilets (22), Computer room (200 persons capacity).
iv. Third Floor: 38 Staff Offices (76 persons capacity), semina room (1) with 100 persons capacity, Toilets (11), and Tea room.

The design will pay attention the people with special needs namely physically challenged individuals/groups. For example ramp, and disabled toilets. Also, the design considered the provision of special room for lactating women workers and students as well as special room in the ladies toilets for menstrual hygiene.
Infrastructure development through construction of eco-friendly four storey eco-friendly academic block requires the proponent (IRDP) to undertake environmental and social impact assessment (ESIA) for the proposed project site in accordance with Environmental and Social Framework with Environmental and Social Standards (ESSs) as prescribed by World Bank.

The construction of the proposed academic block must abide to the Tanzanian Environmental Management Act of 2004 and its Environmental Impact Assessment and Audit (Amendment) regulations of 2018 which requires the project developers to carry out Environmental and Social Impact Assessment prior to project implementation. Likewise, the World Bank's Environmental and Social Standards (ESS1) requires the borrower to identify, assess and manage potential environmental and social impacts and risks associated with the project. In view of the above, IRDP through Consultant carried out this environmental and social impact assessment (ESIA) for the proposed a four storey academic block in the project area. Therefore, the Environmental Management Act, 2004, the Environmental Impact Assessment and Audit (Amendment) Regulations, 2018, and the World Bank Environment and Social Framework (ESF) as well as the HEET project's Environmental and Social Management Framework (ESMF) were observed in the study.

Methodology for ESIA of a Proposed Construction Project
The following were the methods used in the ESIA study including: Screening, Scoping, Baseline Data Collection, Impact Prediction, Impact Assessment Mitigation and Impact Management, EIA Report Preparation, Public Consultation, Decision- making, post- Decision Monitoring and Auditing and Review and Improvement. The methods used to collect data include the following: Field Survey and Observations, Remote Sensing and GIS, Sampling and Laboratory Analysis, Ecological and Biodiversity Studies, Hydrological and Hydro-geological Studies, Social and Economic Surveys, Noise and Vibration Studies, Climatic and Meteorological Data, Stakeholder Engagement and Use of Models.

Project Location and Accessibility
The Institute of Rural Development Planning (IRDP) site is located on Plot No 2 Block "B", Miyuji Proper area at Miyuji Proper *Mtaa*, Miyuji Ward, Dodoma City, Dodoma Region. The IRDP Miyuji area is accessible from City centre by the Babati-Dodoma road about 8.5 km to Kibaoni Njia Panda and then turning right and stretch about 1km and turn left stretch about 500m through the earth road to IRDP Miyuji Area. About 9km of the road from the city center is tarmac road while 500meter access road to the project site is earth road that is well paved and is passable throughout the year. The IRDP Miyuji area is its bordered by residential plots and some business outlet to the Eastern, Northern and Western sides while to the Southern side is bordered by religious institution including St. Gemma Hospital. IRDP is surrounded by earth roads in all sides that acts as the buffer zone with other neighbours.

Land Ownership
The IRDP Miyuji Area site is on land area owned by The Institute of Rural Development Planning (IRDP) who has legal documents for ownership (See Appendix 5). The land has been surveyed and planned for Educational Purposes of use Group "K" and use classes (b) as defined in the Town and Country Planning (Development and Zoning) (Capital Development Areas) Regulations, 1979. The whole land covers total area of 15.056hectares (150,560m^2).

Description of the IRDP Miyuji Area
IRDP Miyuji area is among three areas of the IRDP Dodoma Campus. It has been established since academic year 2022/2023 as the new training area/site. Currently, three programmes are offered at IRDP Miyuji area namely Environmental Planning and Management (Bachelor), Urban and Regioanl Planning (Bachelor) and Community Development (Non degree programme). IRDP Miyuji area covers a total area of 40acres and it's wholly fenced.

Within IRDP Miyuji area there are many infrastructures currently used and others are still under construction. The existing building including two hostel building, one lecture theater, football pitch, DUWASA water supply system with some above ground plastic storage tanks.

The ongoing construction involves one hostel building, canteen building, one Lecture Theater. Other ongoing construction activity is the concrete wall surrounding the whole boundaries of the Miyuji area of IRDP Dodoma Campus to strengthen the security issues and privacy.

Adjacent Development

The IRDP Miyuji Area is bordered by residential plots and business outlets to the Eastern, Western and Northern sides while to the southern is adjacent to Religious institution including St. GEMMA Hospital. The area is also surrounded by earth road in all sides that act like a buffer zone with its neighbors.

Description of the Proposed Project Site & Infrastructures

The Institute of Rural Development Planning (IRDP) through HEET project supported by World Bank intends to construct Academic block of G+3 floor to be located on Plot No 2 Block "B" at Miyuji Proper *Mtaa*, Miyuji Ward, Dodoma City in Dodoma Region. The site for proposed academic block to be implemented is currently undeveloped area, characterized by sandy soil and grasses. The proposed site is bound by undeveloped area to the Northern, Southern sides while to the Eastern is bordered by pond and IRDP concrete wall which is under construction. To the western side (about 20meters), the project site is bordered by Academic complex building. There is no tree observed within the proposed project site, however to the southern side, there are some trees including *azardica indica* (Neem tree), *Mangifera indica* (Mango tree) and Syzygium cumini (Java Plum).

The proposed infrastructure to be funded by the Wordl Bank HEET is specifically construction of one eco-friendly G+3 academic block at IRDP Miyuji area. Each floor of the building will occupy 2,028 sqm.

Policy, Administrative and Legal Framework

Carrying out the Environmental and Social Impact Assessment (ESIA) for the proposed development, various Policies relevant to this assignment were reviewed, namely;

i. The National Environmental Policy (2021),
ii. The National Human Settlement Development Policy, 2000,
iii. The National Water Policy, 2002,
iv. The National Sustainable Industrial Development Policy (1996),
v. The National Land Policy (1997),
vi. The National Energy Policy (2015),
vii. The National Investment Promotion Policy (1996),
viii. The National Employment Policy, 2008,
ix. The National Policy on HIV/AIDS, 2001,
x. The Construction Industry Policy, 2003,
xi. The National Health Policy, 2008,
xii. The National Gender Policy, 2000,
xiii. The National Health Policy 2017,
xiv. The Education and Training Policy, 2014 and
xv. The National Transport Policy, 2003.

Similarly, various Acts and Regulations relevant to this assignment were reviewed, namely;

i. The Environmental Management Act, No.20 of 2004,
ii. The Land Act, 1999, The Occupational Health and Safety Authority Act, 2003,
iii. The Standards Act No. 2, 2009,
iv. The Water Resources Management Act No. 11, 2009,
v. The Environment Impact Assessment and Audit Regulations, GN No.349 of 2005 and its amendments of 2018,
vi. Water Resource Management Act, 2009, The Land Use Planning Act No. 6, 2007, Roads Act, 2007,
vii. The HIV and AIDS (Prevention and Control) Act, 2008,
viii. The Public Health Act, 2009,
ix. The Employment and Labour Relations Act, 2004,
x. The Local Government Urban Authorities Act Cap. 288 R.E 2002,
xi. The Engineers Registration Amendments Act No. 24, 2007 and among others.

Furthermore, various World Bank Environmental and Social Standards (ESSs) for addressing environmental and social issues within the World Bank supported development projects. The proposed project at IRDP Campus was assessed and found to have potential adverse environmental and social impacts. However, those impacts are site-specific, reversible and for which mitigation measures can be implemented easily. As per ESMF, to offset the anticipated social and environmental impacts for this project will use the new Environmental and Social Framework (ESF) by applying 6 relevant standards out of 10 Environmental and Social Standards (ESSs). The Environmental and Social Standards (ESS's) that apply to this ESIA report include:

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

Stakeholder Engagement

Stakeholders' identification and engagement process was conducted based on EIA and Audit Regulations, 2005 and its amendment of 2018 and World Bank Environmental and Social Standards (ESS10) and Stakeholders Engagement Plan (SEP).

Public consultation entailed sharing information and knowledge about the project, seeking to understand key stakeholders' concerns and building relationships with the community. Stakeholders' identification considered all aspects of stakeholders that may be affected or have interest to project activities whether positively or negatively and/or based on their roles in implementation of the project.

The SEP covers both national and sub-national engagement; however, a greater focus was placed on sub-national stakeholders. The SEP provides details on the engagement needed associated with project activities.

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).

Stakeholder comprising of individuals, groups or organizations that might be affected or might affect the project (positively or negatively) at different levels (national, city and local) were consulted during the preparation of scoping report. Explicitly, the stakeholders consulted include; Dodoma City Office, Miyuji Ward Office, Miyuji Proper *Mtaa* Office, IRDP Dodoma Campus, Neighbours, NGOs, Occupation Safety and Health Authority (OSHA), Dodoma Urban Water Supply and Sanitation Authority (DUWASA). Others were Ministry of Education Science and Technology (MoEST) and Fire and Rescue Force Dodoma Region. Some major concerns raised by stakeholders were;

i. Loss of lives and property due to fire break out
ii. Dust emission during construction phase
iii. Occupational health hazard and safety risks to workers
iv. Proper Waste Management
v. Enhanced income, employment opportunities and local business

Assessment of Environmental and Socio-Economic Impacts

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
v. Environmental risks and impacts related to the design of the physical facilities.

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.

The proposed project will generate a wide range of environmental and social impacts from site preparation stages, construction phase to operation phase to decommission phase. The impacts are of both positive and negative in nature. Most adverse impacts will be of a temporary nature during the construction phase and can be managed to acceptable levels with implementation of the recommended mitigation measures for the project. Ways of enhancing positive impacts have been also suggested. Significant impacts are as follows:-

A: Impacts on the Physical Environment

i. Vegetation clearance to accommodate project development
ii. Dust emission during site clearing
iii. Occupational Health hazards to mobilization workers
iv. Nuisance from noise and vibration impacts during construction
v. Disturbance to contractor due to effect of storm water flowing during rainy season
vi. Occupational Health and Safety Hazards/Risk
vii. Air pollution due to dust and gaseous emission during construction
viii. Spread of communicable disease due to mismanagement of domestic wastewater
ix. Health hazards due to mismanagement of hazardous waste
x. Spreading of HIV and other STDs in the project area and surrounding environs
xi. Fire outbreak
xii. Dust and noise Pollution from demolition activities

B: Impacts on Socio-Economic

i. Employment Opportunities to local people
ii. Knowledge and skill increase to local labour
iii. Benefit to local producers and suppliers of construction materials
iv. Increase skills for all students graduate
v. Revenue generation to local governments and agencies
vi. Increase income to offsite services providers
vii. Reduction of gender gap
viii. Gender inequity in employment opportunities
ix. Spreading of HIV and other STIs in the project area and surrounding environs
x. Disrupted traffic flow and public safety/accidents
xi. Gender based violence, sexual exploitation and harassment

Mitigation Measures for Potential Impacts

The design of the mitigation measures for the identified Environmental and Social impacts applied the mitigation hierarchy suggested in the ESS1 which are:

a) Anticipate and avoid risks and impacts;
b) Where avoidance is not possible, minimize or reduce risks and impacts to acceptable levels;
c) Once risks and impacts have been minimized or reduced, mitigate; and
d) Where significant residual impacts remain, compensate for or offset them, where technically and financially feasible.

Most of the mitigation measures put forward are essential for good environmental, social and safety practices that shall be adhered to during all the project phases.

The ESIA identifies potential adverse environmental impacts and proposed mitigation measures to minimize or prevent any adverse impacts. The following potential impacts are identified with their mitigation measures as;

Positive Impacts

Proposed enhancement measures include:

i. Use of locally registered and certified contractors and sub-contractors;
ii. Provisions of on-job training for the workers (unskilled and semi-skilled) in various areas of construction. This could be achieved by deliberately placing unskilled workers with semi-skilled personnel and semi-skilled with skilled workers;
iii. Offering capacity-development opportunities (e.g. internships, training seminars) for women and minority employees, and women and minorities pursuing education within the civil engineering sector;
iv. Contractors and sub-contractors will be encouraged to deliver skills and training to local staffs (both skilled and unskilled);
v. The construction staff will be encouraged to further develop acquired knowledge and skills through Vocational Training Centres (VTCs); and
vi. Transfer of the skills into other livelihood activities, seek opportunities in other similar projects in the region and beyond.

Negative impacts

i. Regular maintenance of all used machines
ii. Site mobilization works will be on day time only not otherwise
iii. The site will be fenced by iron sheet before levelling
iv. Noise protective gears will be provided to workers
v. To mitigate the impact during mobilization, the vegetation clearance shall be for those hinder project implementations and after construction trees planting program shall be initiated
vi. Application of water spray for all area where dust emission is high
vii. Fence the area using iron sheets to minimize wind effects
viii. All cleared materials will be covered while at project site waiting for disposal
ix. Apply water spray to all area where dust emission is high;
x. All used trucks will be serviced regularly;
xi. Cover all stockpile found at site;
xii. Any trucks used for transporting waste from site will be covered;
xiii. Provide safety gears to site clearance crews like safety boots, uniform etc;
xiv. Emergency assembly point shall be designed; and
xv. Induction training shall be given to mobilization crews
xvi. In order to mitigate impacts; generated cut pieces of iron sheets, steel bars, e-waste and a like shall be collected into a designated area for temporary hazardous waste storage while waiting to be collected by authorized dealers for disposal.
xvii. Ensuring proper design of systems for collection, transportation and disposal of solid wastes;
xviii. Ensuring availability of sufficient waste bins at appropriate locations;
xix. Design and construct solid waste collection chambers for collecting waste before transported to dump site;

xx. Sorting of solid waste shall be done at source;
xxi. Constructed temporary solid waste collection chamber at project site ; and shall be paved and roofed to ensure no contamination due to rainy water effect
xxii. In order to address and alleviate spreading of HIV/AIDS among construction crew, sensitization campaigns against the danger of HIV/AIDS shall be organized including voluntary Counselling and Testing programs in collaboration with agencies dealing with control of HIV/AIDS.
xxiii. The major impact that will result from the project decommissioning will be loss of jobs. In order to minimize the impacts that may result from this eventuality, the following measures will be taken:
xxiv. Prepare workers for forced retirement by providing skills for self-employment, and wise investment of the retirement benefits,
xxv. Ensure that all employees are members of the Social Security schemes,
xxvi. Consider redeploying employees in other projects of the proponent.

Environmental and Social Management Plan (ESMP)
Several mitigation and enhancement measures have been proposed to address both major and minor negative and positive impacts identified during the study. These measures have been used to develop an ESMP for the proposed project. The ESMP is presented as a detailed plan and schedule of measures designed to mitigate, eliminate, offset, or reduce environmental and social impacts of the project. These measures/actions outlined in the ESMP will be conducted collaboratively and mainly coordinated by IRDP Campus. IRDP will be responsible for monitoring the implementation of the ESMP and preparing monthly, quarterly, semi-annual, and annual environmental monitoring reports throughout all project phases. The total budget for implementing ESMP is estimated at Tsh 112,500,000/=, the cost will be covered by contractor as a part of project during tendering and other cost will be covered by developer direct

Environmental and Social Monitoring Plan (ESMoP)
Environmental and Social monitoring will be carried out to ensure that all operations comply and adhere to environmental provisions and standard specifications. The activities and indicators recommended for monitoring are presented in an Environmental and Social Monitoring Plan (ESMoP) in Chapter 9 of this report. The ESMoP consists of mitigation measures, parameters to be monitored, monitoring frequency, sampling area and desired target/standards level to be undertaken during monitoring and at different phases of the proposed project. IRDP Campus (Proponent) will be responsible for overall monitoring the implementation of the ESMoP during the mobilization, construction, operation, and decommissioning phases of the project. The monitoring programme also establishes effective feedback mechanisms to evaluate the performance and effectiveness of the various elements of the ESMoP. It is recommended that internal and external environmental monitoring will be done to determine the long-term effects of adopted mitigation and enhancement measures. The total budget for implementing ESMP is estimated at TZS 165,000,000/=, the cost will be covered by the developer.

Alternative Considered

In ESIA process, consideration of project alternatives is critical for ensuring that the developer and decision-makers have a wider base from which they can choose the most appropriate option. In this ESIA study, the following alternatives were considered and examined. In terms of alternative site, the ESIA found that no need of altenative site because the target site is economic feasible for proposed project implementation since not require fund for purchasing extra land. Also, the use of solar panels is found to be the best option to TANESCO power supply due to environmentally friendly of no gaseous emission and economically feasible for low running cost compared to diesel generator. Construction of the proposed buildings at IRDP Campus in Miyuji, means even rainy water generation surface will be increased and this will be easy to consider borehole drilling as the best option for alternative water source to replace piped water from DUWASA. This alternative will be economically feasible, due to low operation cost.

The construction materials opted in this project include sand, timber, iron sheets, aggregates, steel bar of 1" x 3mm for window and steel plates of 2mm thickness (4ft x 8ft) for door gate. All construction materials will be locally obtained from authorized suppliers.

Various construction technologies were considered such as use of concrete framework, use of steel framed, use of structural insulated panels and use of cob technology. Structural Insulated Panels (SIPs) is considered a best method as it provides a cost effective, environmentally friendly and labour-saving alternative to traditional timber framing and masonry construction methods. A method reduces energy consumption and CO_2 emissions.

The no-project alternative is considered not feasible from the following facts:

a) The revenue envisaged from the project and other incomes for local people will not be realized;
b) Availability of academic complex buildings will not be realized, hence enhancing the quality of students graduating and accommodation rooms for students within IRDP Campus will be thwarted.
c) It is against the Tanzania Development Vision 2025 to encourage developments of projects especially if there are no negative irreversible impacts associated with such project.

Environmental Cost Benefit Analysis (ECBA)

The ECBA compared the magnitude of both negative and positive impacts of the proposed project to the environment. However, it was difficult to calculate and give monetary value to the negative impacts. Conversely, the new project is anticipated to provide better education, to generate employment, revenues and other financial and social benefits. The monetary value from the operations is far exceeding its operating expenses, taxes, maintenance, among others. In short, the project is expected to be beneficial to the community and will afford to operate in an environmentally friendly manner.

Decommissioning
Decommissioning is not anticipated in the foreseeable future. In the event that the proposed project will be decommissioned, the primary activity is expected to be the removal of the infrastructure associated with the project and rehabilitation of the site. The main negative impacts during the decommissioning phase are the loss of the infrastructure associated with the proposed project hence change in aesthetic of the area, loss of employment to workers employed due to proposed project, loss of income for offsite service providers, noise and dust emission due to demolition activities, injuries to demolition workers and contamination of environmental due to improper management of demolition wastes. About 60,000,000/= Tanzania Shillings is proposed to be used during project decommissioning, this will vary depending on money value on the time where decommissioning start.

CONCLUSION
Given the study findings, it can be concluded that the proposed project activities from design, construction to operations stage will have manageable/ reversible negative impacts on the biophysical and social-economic environments, provided that if the proposed mitigation measures are appropriately implemented. In this way, the project will have minimal environmental, socio-economic, and cultural concerns that would inhibit its implementation and development. It is anticipated that the project will potentially result in more positive than negative impacts in the long term.

This ESIA report recommends that the proposed project be allowed to proceed on condition that the IRDP will implement the proposed ESMP and ESMoP incorporated in this report as appropriate and any other conditions imposed by NEMC, WB and other relevant authorities.

Further, it is recommended that IRDP to develop, implement and periodically review an operative Environmental and Social Management System (ESMS) for the project life cycle and other operations at the project site.

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ACKNOWLEDGEMENT

Institute of Rural Development Planning (IRDP) (the Project Proponent) would like to express sincere gratitude the World Bank and Tanzanian Government through the Ministry of Education Science and Technology (MoEST) for the funding to implement the proposed consustruction of four storey academic building at Miyuji Area, Dodoma Main Campus in Dodoma Region of the academic block. We acknowledge with thanks all individuals, agencies, and institutions who contributed to the completion of this ESIA study for the proposed project. Special thanks to City Council of City Council of Dodoma, Miyuji Ward Office and Miyuji Proper community for their valuable support and collaboration throughout the study.

Further, IRDP Management would like to thank various government agencies for their contributions related to specific areas and issues in the project: Occupational Health and Safety Authority (OSHA), Tanzania Building Agency (TBA), Fire and Rescue Force and Dodoma Urban Water Supply and Sanitation Authority (DUWASA).

IRDP Management would also like to thank COLBA Consulting Ltd, especially all Key and Non-Key Experts for undertaking this study successfully. Several other persons were involved in one way or another in the execution of this study, to all those, IRDP extends many thanks.

LIST OF ABBREVIATIONS AND ACRONYMS

AIDS	Acquired Immune Deficiency Syndrome
AQS	Air Quality Standards
BoQ	Bill of Quantities
CAPP	Child Abuse and Protection Plan
CBA	Cost Benefit Analysis
CEF	Community Engagement Framework
CRB	Contractor Registration Board
CSMP	Construction Safety Management Plan
CSR	Community Social Responsibility
DoS	Dean of Student
DTC	District Training Centre
EA	Environmental Audit
EHS	Environmental Health and Safety
EHSG	Environmental Health and Safety Guidelines
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EMA	Environmental Management Act
EMO	Environmental Management Officer
ESMoP	Environmental and Social Monitoring Plan
ERB	Engineer Registration Board
ESCP	Environmental and Social Commitment Plan
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESSs	Environmental and Social Standards
EWURA	Energy and Water Utilities Regulatory Authority
FGD	Focus Group Discussion
GBV	Gender Based Violence
GRM	Grievance Redress Mechanism
GN	Government Notice
GPS	Geographical Positioning System
HEET	Higher Education for Economic Transformation
HIV	Human Immunodeficiency Virus
HPD	Hearing Protection Devices
HSMP	Health and Safety Management Plan
IAP	Interested and Affected Part
iCHF	Improved Community Health Fund
ICT	Information Communication Technology
ILO	International Labour Organization
ISO	International Standards Organization
KIIs	Key Informant Interviews
MoEST	Ministry of Education Science and Technology
NEMC	National Environment Management Council
NEP	National Environmental Policy
NGO	Non-Government Organization
NHIF	National Health Insurance Fund
NSSF	National Social Security Fund

OSHA	Occupational Safety and Health Agency
OUT	Open University of Tanzania
PAD	Project Appraisal Document
PAPs	Project Affected Persons
PGDO	Police Gender Desk Officer
PM	Particulate Matter
PPE	Personal Protective Equipment
ppm	parts per million
PTW	Permit to Work
RPF	Resettlement Policy Framework
SEP	Stakeholder Engagement Plan
STD	Sexual Transmitted Disease
TAC	Technical Advisory Committee
TANESCO	Tanzania Electric Supply Company
TBS	Tanzania Bureau of Standards
TCU	Tanzania Commission for Universities
TDV	Tanzania Development Vision
TGNP	Tanzania Gender Networking Programme
TMP	Traffic Management Plan
ToR	Terms of Reference
TTCL	Tanzania Telecommunication Limited
TZS	Tanzania Standards
URT	United Republic of Tanzania
WBG	World Bank Group
WEO	Ward Executive Officer
WHO	World Health Organization
WSP	Waste Stabilization Pond

CHAPTER ONE: INTRODUCTION

1.1 BACKGROUND INFORMATION

The Institute of Rural Development Planning (IRDP) is a corporate body established by the Parliamentary Act No. 8 of 1980s. This Act provides a legal framework for the Institute to be established as an important national centre for provision of training, research and consultancy services in the field of rural development planning and management with main objective of alleviating qualitative and quantitative shortage of skilled manpower within the framework of sustainable capacity building directed towards reducing poverty and attaining sustainable development.

Currently, IRDP has a total population of 14,000 students and 425 staffs. IRDP provides a number of course including Regional Development Planning, Environmental Planning and Management, Population and Development Planning, Development Finance and Investment Planning, Economics, Urban Development and Environmental Management, Human Resource management, Community Development, Business Administration, Project Planning and Management, Urban and Regional Planning, Information and Communication Technology and Geomatics. All these courses are provided in different levels of Certificate Programmes, Ordinary Diploma Programmes, Bachelor Degree Programmes and Master Degree Programmes.

The headquarters of the IRDP is located in Mbwanga area while the proposed project will be constructed at Miyuji area.

IRDP strives to enhance and strengthen capacity for rural development practitioners by providing post-secondary education and training, research and consultancy services. IRDP is thus a multi-disciplinary and multi-sectorial institute empowered to oversee and coordinate the provision of expertise to in-service and pre-service personnel involved in rural development planning in the country. Since its establishment, IRDP has been shaping destinies in planning and research methodologies focusing on the future prosperity of its students. As a result, graduates with IRDP qualifications have made valuable contributions in their fields. They are a proof of our unique approach of learning and training methodologies. IRDP provides a conducive environment for teaching, learning and working to both students and staff. This includes library, academic blocks and the multipurpose hall.

The functions of IRDP as stipulated in the establishment Act No 8 of 1980 are:

i. To promote social and economic development by providing opportunities for the study of and training in the principles, techniques and their practical applications in all aspects of rural development planning.
ii. To provide facilities, places and centres of learning, education, training and research in rural development planning and other related subjects and disciplines as the council may from time to time decide.
iii. To conduct training programmes in all disciplines related to rural development planning including the preparation, application and evaluation of development programmes.
iv. To undertake, either alone or in association with any other person or body of persons within or outside the United Republic of Tanzania, research in methodology and techniques of improving regional and rural development planning.
v. To monitor and co-ordinate research and training programmes related to rural development.
vi. To collect, publish or otherwise disseminate data and other information related to rural development including the publication of results of any research carried out by the Institute.
vii. To sponsor, arrange or provide facilities for conferences, seminars or symposia on subjects related to rural development planning.
viii. To provide advisory, consultancy and other services to the government, organizations, villages and individuals in matters related to rural development planning.
ix. To prepare students for examinations as may be conducted by the Institute and to grant such awards as may be prescribed under or in accordance with the Act.
x. To establish and maintain a system of consultation and co-operation with any person or body of persons within or outside the United Republic of Tanzania engaged in activities related to the functions of the Institute.
xi. To perform any other function conferred upon the Institute by or under the Act.

Currently, IRDP has two campuses named Dodoma Campus and Lake Zone Center- Mwanza Campus. IRDP Dodoma Campus has been divided in various areas including Mbwanga area, Miyuji area, Furaha area and Nala area which is expected to be constructed in the near future. The headquarters of the IRDP is located in Mbwanga area while the proposed project will be constructed at Miyuji area.

The Institute of Rural Development Planning (IRDP), a Public Higher Learning Institution in Tanzania has received financial support from the World Bank (WB) and the Government of Tanzania (GoT) through the Ministry of Education, Science and Technology (MoEST). The support is availed through the Higher Education and Economic Transformation (HEET) project (P166415). The funding is earmarked to support implementation of its strategic Investment Plans. The Project Development Objective (PDO) is

strengthening the learning environment, labor market alignment of priority programs at beneficiary higher education institutions, and improve the management of the higher education system. This is conducted under seven (7) strategic focus areas namely:

i. Increasing enrolment capacity in degree programmes in priority disciplines
ii. Upgrading Learning Resources and Equipment
iii. Promoting applied Research and innovation capacity
iv. Building functional linkages with private sector/industry
v. Strengthening use of digital technology
vi. Promote self-generated income
vii. Building capacity of academic staff and university leadership

In strengthening the learning environments and labor market orientation of programmes in priority, disciplines the Institute plans to focus on seven strategic focus areas under HEET project. The priority disciplines for IRDP are four, namely Climate change, Urban and Environmental Planning, Agribusiness and Humanities. The Institute plans to focus on four out of seven strategic focus areas under HEET project, namely;

i. Construction of infrastructure (Academic Building)
ii. Reviewing curriculum and introducing innovative pedagogical methodologies;
iii. Establishing and/or upgrade state-of-the-art ICT infrastructure, equipment and services; and
iv. Building capacity of academic staff

In order to increase enrolment capacity in degree programmes in priority disciplines and to promote applied research and innovation capacity, IRDP is planning to use part of the funds to construct eco-friendly academic block in Dodoma Campus - Miyuji that promote accessibility for those with special needs and address gender considerations as well as safety concerns. In addition, the fund will be used for adoption of Digitization Enhanced Learning Technology (DELTA) as well as enhance of capacity of staffs and management.

Infrastructure development through construction is among the activities that will be implemented under the HEET project. In order to implement the infrastructure works in the project, IRDP is required to engage a consultant to undertake environmental and social impact assessment (ESIA) for the construction site proposed for Bank support in accordance with Environmental and Social Framework with Environmental and Social Standards. The proposed eco-friendly academic block at IRDP Campus Miyuji will comprise of the following:

i. Ground Floor: Two (2) Classrooms with a capacity of 200 students each, ICT Office, Toilets (11), Ramp, stairs and Lift
ii. First Floor: Studio (2) each with 200 persons capacity, Toilets (22).
iii. Second Floor: Studio (1) with 200 persons capacity, Toilets (22), Computer room (200 persons capacity).
iv. Third Floor: 38Staff Offices (76 persons capacity), semina room (1) with 100 persons capacity, Toilets (11), and Tea room.

IRDP, hereafter referred to as the Project Proponent, has commissioned **COLBA Consulting Ltd** (the Consultant) of P.O Box 60132, Dar es Salaam to undertake a full Environmental and Social Impact Assessment (ESIA) for the proposed project according to National Legislative requirements and World Bank Environmental and Social Standards (ESSs).

The construction of the proposed academic block must abide to the Environmental Management Act of 2004 of Tanzania which requires the project developers to carry out Environmental and Social Impact Assessment prior to project implementation. Likewise, the World Bank's Environmental and Social Standards (ESS1) requires the borrower to identify, assess and manage potential environmental and social impacts and risks associated with the project. In view of the above, IRDP carried out this environmental and social impact assessment (ESIA) for the proposed a four storey academic block in the project area. Therefore, the Environmental Management Act, 2004, the Environmental Impact Assessment and Audit (Amendment) Regulations, 2018, and the World Bank Environment and Social Framework (ESF) as well as the HEET project's Environmental and Social Management Framework (ESMF) were observed in the study.

1.2 PROJECT DEVELOPMENT OBJECTIVE (PDO)

According to the HEET's Project Appraisal Document (PAD) of 2021, the main 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

i. Students and faculty participating in internships/fellowships/forms of placement in industry, companies or research institutions (sub-indicators for gender, individuals with disabilities, and students/faculty ratios) (number)
ii. Degree programs within priority disciplines that are aligned to labor market needs (number)
iii. Students benefiting from direct interventions to enhance learning (corporate indicator) (number)
iv. Active use of a Tertiary Education Management Information System (TEMIS) (yes/no) and
v. Higher education institutions supported by the project that achieve a minimum threshold of the annual targets set in the Performance Agreements (number).

1.3 PROJECT RATIONALE

The proposed project demonstrates Tanzania's Development Vision 2025 that embraces the development of high-quality education at all levels. The emphasis goes hand in hand with the education system's transformation by enhancing scientific and technological programmes to increase productivity. More specifically, the focus will be to increase the number of student's enrolment, produce graduates who meet the need of the employers, improve teaching environment with upgraded facilities and learning equipment, strengthen access to a network of specialized trainers, develop a framework of core curricular competencies, quality assurance standards, and state-of-the-art facilities for up-to-date training of the workforce in the region's priority sectors.

Therefore, it is clearly stated in various documents of the Governments' development agenda that, all development initiative that aims to promote good quality of life, employment and other sustainable economic investments are highly needed and encouraged. The proposed project development is therefore, in line with the national development agenda and its operation will potentially enhance economic and employment gains as it will add the chance for business opportunities, tax and revenue availability.

1.4 NATURE OF THE PROJECT

The Third Schedule of the Environmental Management Act 2004 and First Schedule to the Environmental Impact Assessment and Audit Regulations 2005 and EIA and Audit Regulations (Amendment) 2018 are the Environmental and Social Impact Assessment (ESIA) mandatory list. The First Schedule of the Environmental Management (EIA and Audit) (Amendment) Regulations, 2018, made under Regulation 5 (1), categorizes this project as a Type B1 - Project requiring a mandatory ESIA. That is, the project is likely to have medium adverse environmental impacts. Thus, in-depth study is required to determine the scale, extent and significance of the impacts and to identify appropriate mitigation measures.

According to the "List of Type B1 Projects in the First Schedule, Item 13 "Building and Civil Engineering Industry" sub-items (a), (b) and (c) particularly (a*)* are the most relevant to this undertaking. Further, under World Bank's Environmental and Social Standard (ESS)1 – Assessment and Management of Environmental and Social Risks and Impacts, the proposed project may be categorized as a 'Moderate' risk project requiring detailed environmental study.

The proposed project was registered to National Environment Management Council (NEMC) via the Project Management System for screening followed with scoping study and preparation of Terms of References (ToR). The Scoping Study was undertaken by the consultant and the Terms of Reference (ToR) presented in *Appendix 2* were approved by NEMC.

1.5 OBJECTIVES OF THE ESIA STUDY

1.5.1 General Objective

The general objective of this study was to identify, predict and evaluate potential impacts of the proposed construction of an eco-friendly academic building on Plot No 8, Block 'B' at Miyuji Proper *Mtaa*, Miyuji Ward, Dodoma City in Dodoma Region. Thus, this ESIA study integrates mitigations and enhancement measures in all phases of the proposed project, i.e. planning, mobilization, construction, operation to the decommissioning phase, aimed at having a sustainable project with minimal negative impacts on biophysical, socio-economic and ecological environment.

1.5.2 Specific Objectives

The following were the specific Objectives of this ESIA study: -

- To ensure that environmental considerations are explicitly addressed and incorporated into the development decision making process;
- To anticipate and avoid, minimize or offset the adverse significant effects of on biophysical, social and ecological environment;
- To provide mitigation measures for all potential negative impacts and enhancement of positive impacts;
- To promote development that is sustainable and optimizes resources use and management opportunities;
- To analyze environmental cost and benefits of the proposed project; and
- To enable information exchange, notification and consultations between stakeholders.

1.6 APPROACH AND METHODOLOGY OF THE STUDY

Recommended standard methods for conducting EIA studies (in compliance with EIA and Audit Regulations (2005); EIA and Audit (Amendment) Regulations 2018 and World Bank ESSs were used in this study. Both qualitative and quantitative methodologies were employed in collecting and analysing data for this ESIA. The following are the methods used in the study including Screening, Scoping, Baseline Data Collection, Impact Prediction, Impact Assessment Mitigation and Impact Management, EIA Report Preparation, Public Consultation, Decision- making, post- Decision Monitoring and Auditing and Review and Improvement.

1.6.1 Kick-off Meeting and Scoping Exercise

The initial stage of the ESIA was to undertake the Scoping exercise and project registration. The Scoping commenced with a kick-off meeting with the Proponent and key team members on August and September 2023. The meeting served as an introductory session, revisiting the objective, scope and logistical coordination and proposed work plan was presented and discussed. This activity followed by site reconnaissance survey to collect pertinent site-based data (information is the processed data) for developing the Scoping report. The Scoping exercise results reinforce the drafting of the Terms of

Reference (ToR) before their finalization. The scoping exercise identified key stakeholders for the project and main issues of concern.

1.6.2 Site Visits and Inspections

The Consultant undertook detailed visits at the proposed project area on 29th August 2023 to observe, record and analyse the pertinent socio-economic and biophysical characteristics within and adjacent to IRDP Dodoma Campus in Miyuji. The field visits were essential to fully realize the project's scope and understanding the existing biophysical and socio-economic conditions within the project area of influence. In compliance with the World Bank ESS1 (Assessment and Management of Environmental and Social Risks and Impacts), site visits at IRDP Dodoma Campus in Miyuji and adjacent areas were carried out by the Consultant's team. The ESS1 recommends fieldwork to be conducted to ensure that ecological variations and/or season-specific issues are fully captured and taken into consideration.

Site observation, inspection, recording and photographing focused on systematic investigations of conditions on the ground, recording findings for later comparative analysis, prediction and recommendations for mitigating the negative impacts of the project and risks. These details were supplemented by secondary data collected through other techniques.

Overall, the fieldwork involved physical observation and recording of the pertinent biodiversity (i.e., flora, habitats, fauna, and avifauna), landscape, physical features, infrastructures, utilities, accessibility, land use and cover patterns, livelihood activities, heritage and other specialized baseline assessments. Field visits were extended beyond project operations premises (inside IRDP Dodoma Campus in Miyuji) to the surrounding areas (Miyuji area). The ESIA team used the fieldwork to conduct stakeholder consultations, specialized baseline studies, and secondary information data collection and review other documents/reports available from different institutions.

1.6.3 Stakeholder Consultations

Different stakeholders from different levels were identified and consulted to solicit the concerns, views, opinions and suggestions of the Interested and Affected Parties (IAPs). Consultations were done to various Government agencies, IRDP Miyuji Campus community (students, staff), City Council of Dodoma, Ward and *Mtaa* leaders and communities around.

Consultative meetings, Focus Group Discussions (FGDs), Key-Informant Interviews (KIIs) and in-depth discussions were held with various groups, key informants, relevant personnel, and representatives. Both from public and private sectors as mandated by the EIA and Audit Regulations 2005 and its amendment of 2018, World Bank ESS1 and ESS10 (Stakeholder Engagement and Information Disclosure). The Consultant adopted recommendations from the IFC Performance Standard 1 (Social and Environmental Assessment and Management Systems) paragraph 30 and World Bank ESS1 to ensure an inclusive and transparent consultation process and public involvement. A

guiding question and/or issues were prepared before holding meetings with stakeholders. During consultations, the key issues were reviewed and analyzed for their significance before being incorporated in this report. Stakeholders' engagement and key issues of concern are presented in Chapter 5.

The consultations were held to ensure that various groups were informed about the proposed project for construction of a four-storey academic building, where their views were incorporated accordingly. The discussions allowed the stakeholders to present their views concerning the proposed project. Their views and preferences were useful in the identification of impacts and drawing effective mitigation measures that are presented in this report.

The Consultant used both snowball and purposive sampling techniques in identifying the relevant stakeholders. The methods for consultation, information sharing, and gathering were highly participatory in nature. The stakeholders were involved significantly in the ESIA study. Their involvement in decision-making process through dialogue and discussions on various issues and concerns related to the proposed project formulation, design, construction and operation were important.

1.6.4 Desk Study

A desk study was done by collecting documents and other relevant information about the project. Documents, reports, and records were reviewed to obtain existing secondary data and information relevant at IRDP Dodoma Campus in Miyuji where the project will be implemented. The information gathered during the study included IRDP Dodoma Campus background reports, socio-economic and investment profiles, ESMF, development plans and project's preliminary reports. The secondary data included various national policies and legislation, national strategies and plans, which apply to the World Bank ESSs, international Conventions and agreements related to ESIA reports.

1.6.5 Socio-Economic Baseline Survey

A socio-economic survey was undertaken with the overall objective of assessing the socio-economic impact of the project on people's lives and their properties. This involved an assessment of the living conditions of people, with the likelihood of being affected by the project in terms of income earnings and expenditures as well as occupation. This study captured the insights of different stakeholders about the potential positive and negative impacts once the project is implemented. In terms of data collection procedure, the study uses both quantitative and qualitative methods. The study therefore combines the advantages of both approaches of research to enable a detailed understanding of the socio-economic context and impacts of the project.

The sampling for the qualitative data was purposive, inclusive and participatory. A range of approved data collection tools were used during interviews. Secondary data were used to document the legal framework

underpinning the implementation of the project. Secondary sources of information include desk review of relevant documents, review of laws and regulations on land and other existing policies regarding constructions works in Tanzania.

1.6.6 Observation and Expertise Judgment

Observation method was used by the team to gather data on physical characteristics and human activities in the project host community. Field observations formed an integral part of the study as experts gathered considerable information through observations. This involved site visits and recording the situation on the ground. Observation was a key to establish the exactly location of the project site, shape, size, terrain and soil type. Also, the neighbourhood characteristics were assessed in terms of the nature of properties dominating the area, their sizes and type, tenure, dominant owners, uses, and others. Observations were used as a tool for validating the facts that were gathered through interviews and questionnaires.

1.7 STRUCTURE OF THE REPORT

This report is organized in twelve chapters. Chapter one is on the introduction while chapter two entails the project background and its description. Chapter three is on the policy, administrative and legal framework within which the project will operate. Chapter four presents the baseline or existing conditions of the project site and area of influence. Chapter five entails Stakeholders' consultation and public participation while chapter six deals with assessment of impacts and identification of alternatives. Chapter seven deals with mitigation measures while chapter eight present the environmental and social management plan. Environmental and social monitoring plan is presented in Chapter nine. Chapter ten is on resource evaluation or cost benefit analysis while chapter eleven is on decommissioning plan. The last part is chapter twelve which gives the summary and conclusions of the report.

This report is presented in accordance to the format of the Environmental Impact Assessment and Audit Regulations, 2005 and its amendment of 2018 and the World Bank's ESS1 – Assessment and Management of Environmental and Social Risks and Impacts on the Content of an Environmental Assessment Report.

Where the contents of this report include acknowledgement, executive summary, table of Contents, list of Figures, list of Tables, list of Abbreviations and Acronyms, Project Background, Project Description, Legal and Institutional Framework, Baseline Information, Stakeholder's Consultation and Participation, Assessment of Impacts and Identification of Alternatives, Impact Mitigation and Enhancement Measures, Environmental and Social Management Plan, Environmental Monitoring Plan, Cost Benefit Analysis, Decommissioning and Closure, Summary and Conclusions, References and Appendices.

CHAPTER TWO: PROJECT DESCRIPTION

2.1 IRDP MIYUJI AREA DESCRIPTION

2.1.1 Location and accessibility

The Institute of Rural Development Planning (IRDP) Dodoma Campus in Miyuji site is located on Plot No 2 Block "B", Miyuji Proper area at Miyuji Proper *Mtaa*, Miyuji Ward, Dodoma City, Dodoma Region (Fig. 2-1). The IRDP Miyuji area is accessible from City centre by the Babati-Dodoma road about 8.5 km to Kibaoni Njia Panda and then turning right and stretch about 1km and turn left stretch about 500m through the earth road to IRDP Miyuji Area. The earth road is accessible throughout the year. The IRDP Miyuji area is its bordered by residential plots and some business outlet to the Eastern, Northern and Western sides while to the Southern side is bordered by religious institution including St. Gemma Hospital. IRDP Dodoma Campus in Miyuji is surrounded by earth roads in all sides that acts as the buffer zone with other neighbours.

The geographic location of the proposed project is presented by corner point CP1 – CP4 in Fig 2-1. The corner points bear the GPS coordinates during field visit (CP1: -06.106706^{0}S, and 35.755803^{0}E, CP2: -06.106388^{0}S and 35.755769^{0}E, CP3: -06.106292^{0}S and 35.756483^{0}E, and CP4: -06.106673^{0}S and 35.756520^{0}E):

Figure 2-1 IRDP Dodoma Campus - Miyuji Site Location Map
Source; Field study, September 2023

2.1.2 Land Ownership

The IRDP Miyuji Area site is on land area owned by The Institute of Rural Development Planning (IRDP) who has legal documents for ownership and the land has been surveyed and planned for Educational Purposes of use Group "K" and use classes (b) as defined in the Town and Country Planning (Development and Zoning) (Capital Development Areas) Regulations, 1979. The whole land covers total area of fifteen decimal points zero five six (15.056) hectares equal to 150,560m^2.

2.1.3 IRDP Miyuji Area Site Description

The IRDP Dodoma Campus in Miyuji area is a new IRDP Dodoma Campus area which have been established since academic year 2022/2023. The IRDP provides various course including Regional Development Planning, Environmental Planning and Management, Population and Development Planning, Development Finance and Investment Planning, Economics, Urban Development and Environmental Management, Human Resource management, Community Development, Business Administration, Project Planning and Management, Urban and Regional Planning, Information and Communication Technology and Geomatics. All these courses are provided in different levels of Certificate Programmes, Ordinary Diploma Programmes, Bachelor Degree Programmes and Master Degree Programmes.

Within IRDP Dodoma Campus in Miyuji area there are many infrastructures currently used and others are still under construction. The existing building including two hostel buildings used by the students that have the capacity to accommodate 200 students each, one lecture theater that is used has the sitting capacity of 1,200 students at once, the theater is divided in three parts whereby at the center have the ability to carry about 800 students while at the right and left sides has one lecture room in each side with the capacity to be occupied with 200students each. Other existing infrastructures are football pitch, DUWASA water supply system with some above ground plastic storage tanks.

The ongoing construction involves one hostel building that have the capacity to accommodate 200 students, canteen building, one lecture theater with the sitting capacity of 1,200 student at once, the theater will be divided in three parts whereby at the center have the ability to carry about 800 students while at the right and left sides has one lecture room in each side with the capacity to be occupied with 200students each. Other ongoing construction activity is the concrete wall surrounding the whole boundaries of the IRDP Dodoma Campus in Miyuji area to strengthen the security issues and privacy.

2.1.4 Major adjacent developments

The IRDP Dodoma Campus in Miyuji Area is bordered by residential plots and business outlets to the Eastern, Western and Northern sides while to the southern is adjacent to Religion institution including St. GEMMA Hospital,

The IRDP Dodoma Campus in Miyuji area is also surrounded by earth road in all sides that act like a buffer zone with its neighbors.

2.2 DESCRIPTION OF PROPOSED PROJECT SITES

The Institute of Rural Development Planning (IRDP) Dodoma Campus in Miyuji through the support of World Bank intends to construct one eco-friendly academic block of four storey to be located on Plot No 2 Block "B" at Miyuji Proper *Mtaa*, Miyuji Ward, Dodoma City in Dodoma Region. The site for proposed academic block to be implemented is currently undeveloped area which covered by few burnt grasses within IRDP Miyuji area premise. This site will be for proposed construction of one eco-friendly academic block at IRDP Dodoma Campus – Miyuji with each floor of 2,028 sqm and will comprise of at least the following: the ground floor will comprise of 2 classrooms with a capacity of 200 students each, ICT office, 11 toilets, ramp, stairs and lifts; the first floor will comprise 2 studio each with 200 persons capacity and 22 toilets; the second floor will comprise 1 studio with 200 persons capacity. 22 toilets, and computer room with 200 persons capacity; the third floor will comprise 38 staff offices with a capacity of 76 persons, 1 seminar room with 100 persons capacity, 11 toilets and 1 tea room.

A proposed project site is undeveloped area situated within IRDP Miyuji area and it is bordered by undeveloped area to the Northern, Southern sides while to the Eastern is bordered by pond and IRDP concrete wall which is under construction, to the western side the project site is bordered by Academic complex building about 20meters. The site is undeveloped one covered by burnt grass. There is no any tree observed within the proposed project site, however to the southern side the project site is adjacent to some trees including *azardica indica* (Neem tree), *Mangifera indica* (Mango tree) and Syzygium cumini (Java Plum). The soil type at proposed site is sandy soil.

2.3 PROJECT ACTIVITIES

During the implementation of the proposed one eco-friendly academic complex building there will be some project activities that will be done in designing phase, mobilization and Construction Phases, Operation Phase and Decommissioning Phase. The project activities will observe and adhere to the operational and procedural steps stated in the HEET Project Operational Manual (POM). The project activities in both phases are summarized in the sections below.

2.3.1 Project Design Components/infrastructures

The project will involve the construction of an eco-friendly academic building complex.

The proposed construction of one eco-friendly academic block at IRDP Campus – Miyuji with each floor of 2,028 sqm and will comprise of at least the following: the ground floor will comprise of 2 classrooms with a capacity of 200 students each, ICT office, 11 toilets, ramp, stairs and lifts; the first floor will comprise 2 studio each with 200 persons capacity and 22 toilets; the second floor will comprise 1 studio with 200 persons capacity. 22 toilets, and

computer room with 200 persons capacity; the third floor will comprise 38 staff offices with a capacity of 76 persons, 1 seminar room with 100 persons capacity, 11 toilets and 1 tea room.
The proposed buildings have taken into account of the basic architectural principle such as orientation of the sun, placement of buildings so as to complete the west and east sun, larger opening to allow enough natural ventilation in the building, facades that not function well but also create an inviting element to passer-by, high quality materials, large terraces and car parking space. The design will pay attention the people with special needs namely physically challenged individuals/groups. For example ramp, and disabled toilets. Also, the design considered the provision of special room for lactating women workers and students as well as special room in the ladies toilets for menstrual hygiene.

2.3.2 Prioritization methodology and technical design of buildings

The proposed an eco-friendly academic building complex at IRDP Dodoma Campus in Miyuji area will consider environmental and social issues. The design will come up with a sustainable built environment by considering key issues like use of energy, use of water, use of materials and resources, use of site, and consider disabled people.

2.3.2.1 Use of Energy

A sustainable built environment will use a little energy as possible. A proposed academic building will have a design solution that involves the use of daylight and natural ventilation instead of electricity light. This will improve building's interior environmental and improve energy use efficiency during day time.

The buildings will consider satisfactory thermal environment whereby during construction will use materials that reduces rate heat gains from the outside to the inside in warmer climates. Sustainable design requires that windows be energy efficient and provide ventilation, photo sensor controls also help to reduce energy consumption.

2.3.2.2 Efficient Use of Water

The design will consider efficient water consumption in all phases of the project. Fresh water consumption could be reduced by the installation of water efficient equipment. The design will make sure it provides easy to clean surfaces to reduce fresh water consumption. Sustainable solution for efficient water use includes installation of water saving fixtures i.e. water efficient flush and flow fixtures. Flushing solution involves low flow or ultra-low flow toilets and flow solutions include low flow lavatories, sinks and showerheads. The design will consider water efficient technology fixtures. During operation the old and leaky units will be replaced with new equipment.

Easy to clean surface will reduce water consumption; floors in a building can be chosen from materials that are easy to clean and that use minimal amount of water during cleaning. Considering design that will allow rain water harvesting will improve water use efficient at IRDP Dodoma Campus in Miyuji area for the proposed buildings.

2.3.2.3 Efficiency use of materials

Materials used in interiors have a huge impact in terms of sustainability. Appropriate material type selection and specifications will involve compliance with building standards. Materials such as non-toxic and breathable features are recommended as sustainable material qualities.

Material type selection will contribute to sustainability, energy efficiency and recycling. In general, the design will consider four main factors when selecting building materials i.e. embodied energy; performance over lifetime of building; appearance and salvage-ability. When the design considers selecting durable materials is an effective way of extending the life of proposed buildings as well as reducing material consumption, using non-toxic building components, equipment, furniture and furnishings is vital to the health and safety of construction workers and the users of environments.

2.3.2.4 Key issues in the efficient use of Site

To use a site efficiently, it is necessary for designers to understand how humans will interact with proposed buildings environment. In order to maintain the natural environment, unnecessary cutting of trees at the areas where construction will not take place must be prevented. The buildings unit will be integrated with its site; this adds to the architectural quality and human wellbeing. The proposed project designer will consider how much light pollution will be produced through the design. Light pollution negatively could affect the interior and exterior environments and wastes energy.

2.3.2.5 Consider People with Disabilities

Proposed project Designer will consider people with disabilities in the buildings. The following issues will be considered during design: ramps, stair lift, an elevator, bathing barriers will not be installed, toilet for the people with disability to be installed, handrails in key areas will be installed and simplify pool entry.

Table 2-1 Project Design Components/infrastructures

Building type	Design Components	Designed Use
One (1) G+3 eco-friendly academic Block at IRDP Campus-Miyuji	Ground floor	Two (2) Classrooms with a capacity of 200 students each, ICT Office, Toilets (11), Ramp, stairs and Lift
	First floor	Studio rooms (2) each with 200 persons sitting capacity, Toilets (22)
	Second floor	Second Floor: Studio rooms (1) with 200 persons sitting capacity, Toilets (22), Computer room (200 persons capacity).
	Third floor	38 Staff Offices (76 persons sitting capacity), seminar room (1) with 100 persons capacity, Toilets (11), and Tea room.

2.3.3 Mobilization and Construction Phase

2.3.3.1 Mobilization Activities

This is the initial phase of project implementation; this phase will commence when all necessary permits and processes have been accomplished. During this phase the contractor shall recruit all necessary administrative and engineering staff for the project including transportation of construction equipment to the site. Mobilization phase also entails establishment of temporary offices on site, assembling equipment, as well as construction of materials and workforce.

2.3.3.2 Construction Activities

The major construction activities include excavation of foundation, transportation of the construction materials to the sites, concrete work, vertical construction, structural work, installation of electrical and water conduits, finishing work, painting and other minor associated civil works. Main activities of the proposed project during construction will include but not limited to the following:

- Earthworks: This entails excavation of soil/earth to required foundation level, hauling away excavated material and depositing at the designated site for disposal, dewatering of excavated area, protection of excavated sites from falling, backfilling with the excavated material around the foundations and walls, hard-core filling.
- Acquisition and transportation of construction materials from tendered suppliers.
- Concrete works; Steel reinforcement, cutting, bending and fixing, concrete mixing, transportation, vibrating, curing, masonry walling and plastering.
- Roofing of the main structure and other supporting structures like power house, pump house and others.
- Metal and Glass works for the entire structure.
- Electrical installation works; laying of PVC conduits in structural members, electrical wiring and such other related works.
- Plumbing and drainage works; installation of drain pipes, water distribution pipes, water tanks and general plumbing.

2.3.3.2.1 Materials to be used for construction phase

The materials that will be used for the construction of the proposed a four-storey academic complex building includes cement, sand, aggregates, steel reinforcement bars, timber, bricks, roofing sheets, water and sanitary ware; some components like power from TANESCO and water supply systems from DUWASA are connected at the project site, which will be used during construction and operation of the project. Most of materials to be used for the proposed buildings will be sourced within the country. The exact quantities of materials needed will be specified in the later stages during detailed design and development of the Bills of Quantities (BoQ).

Table 2-2 Estimated Materials needed for construction of proposed project

Type of materials	Quantity	Potential Source
Aggregates	100m^3	Local supplier in Dodoma City
Cement	200bags	Locally available in Dodoma City
Sand	150m^3	Local supplier in Dodoma City
Water	8.5m^3 per day	DUWASA
Steel bars	22tones	Local supplier in Dodoma City
Iron sheets	130pieces	Local supplier in Dodoma City
Electrical cables	500m	Locally available
Timbers	90tons	Local supplier in Dodoma City

Source: IRDP,2023

2.3.3.2.2 Storage Facilities and Materials Yard

There will be a store for building materials to be used during the construction phase. Bulky materials such as aggregates, sand, steel bars, cement, etc. will be properly stored at the proposed project site. The project Proponent will provide mechanisms for storage to safeguard human health for construction workers, students, staff, visitors, and communities/local vendors around the construction sites. The project proponent will order construction materials when the need arises in each stage of the project construction to prevent stockpiling of building materials and ease good storage at the site.

The materials from the borrow pits will be transported by trucks to the construction site. Some of the materials will be used immediately after delivery and others such as gravel, stones and sand will be piled up on the back yards to be established at the sites. Storage of construction materials will be done in the designated yard/facility within the Campus. At this stage, the exact location for establishing laydown areas for construction is not yet identified. Potential site locations will largely depend on the required land's size, available space, especially within IRDP Dodoma Campus in Miyuji Area, accessibility, haulage distances for transferring construction equipment, and sensitive environmental and social receptors within and adjacent.

2.3.3.2.3 Machinery and Equipment

Various equipment and machines will be used during construction activities at IRDP Dodoma Campus in Miyuji Area as detailed Table 2.3

Table 2-3 Equipments and machines to be used during construction

SN	Machinery/Equipment	Activity required
Construction Equipment: Type and Characteristics		
1.	Backhoe excavator	General earthworks (excavation of drains)
2.	Bulldozer with ripper	General earthworks
3.	Wheel loader	General transport of concrete
4.	Motor grader	General grading works, including earth works
5.	Vibrating/sheep foot roller compactor	Compaction works
6.	Truck-mounted crane	Lifting of construction materials e.g., pre-cast culverts, paving blocks etc.
Construction Machines		
1.	Concrete mixer	Preparation of concrete (batch concrete mixing)
2.	Concrete truck mixer (mobile concrete mixer)	Concrete mixing
3.	Small site dumper	Transport construction and waste materials
4.	Quarry dump trucks	Transport of stones and aggregates
5.	Dump trucks	Transport of construction materials and wastes
6.	Concrete batch plant	Concrete mixing in a concentrated way
7.	Equipment for geotechnical investigations	Geotechnical investigation works
8.	Concrete vibrator /poker	Vibrating concrete
9.	Dewatering pump	Dewatering to allow for waterless construction
10.	Generator, mobile workshop, welding facilities	Repair and maintenance of machinery and equipment
Transport Facilities		
1.	Light duty vehicles	Transport of light construction materials and machines
2.	Water tanker truck	Dewatering of earth surfaces to attain effective compaction, minimizing generation of dust
3.	Dump trucks	Transport of construction materials (sand, gravel, aggregated, cement etc.)

Source: IRDP, September 2023

2.3.3.3 Demobilization of construction phase

This phase involves activities related to the completion of the construction phase of the proposed project. Activities to be conducted during this phase include demolition of temporal structures that will be installed to support the construction phase, removal of installations and equipment from the workshop and transportation of all remain construction materials from site back to contractor office. Also, all machines used during construction phase will be removed from site and transport back to contractor office.

2.3.3.4 Trees planting program

This phase will involve the planting of indigenous trees to replace the removed one during construction stage and garden with aid for beautification of the areas. The program will be mainly for re-planting trees in all areas where during construction are disturbed and modern garden are designed to cover open space after construction to ensure in future the site will be green as it was before construction. The program will help to reduce wind effect in future and soil erosion effects.

2.3.4 Operation Phase

The activities that are expected to be done during the operation phase will include:

a) daily lecture and training operations;
b) daily cleanliness of student hostel and academic complex;
c) operation and maintenance of the buildings and ancillaries;
d) health and safety management;
e) waste management; and
f) storage and management of maintenance materials and equipment.

2.3.5 Decommissioning Phases

Since the building lifespan will be 50 years with proper maintenance and service, therefore the activities that will be undertaken are to demolish all structures and propose a completely new structure or different development project. The area may be used in other activities.

Demolition works: Upon decommissioning, the project components including buildings pavements, drainage systems, building foundation, etc will be removed and a lot of solid waste will be produced. Some of the waste will be reused for other construction works or if not reusable will be disposed appropriately by authorized licensed waste disposal companies available.

Dismantling of equipment and fixtures; All equipment including electrical installations, finishing fixtures partitions among others will be dismantled and removed from the site in decommissioning of the project. Priority will be given to reuse of this equipment in other projects.

Site restoration: Once all the waste resulting from demolition and dismantling works is removed from the site, the site will be restored accordingly through replenishment of the topsoil and re-vegetation using indigenous plant species.

Whenever required, the decommissioning plan will be prepared using guiding procedures and implemented by the client upon approval by NEMC. However, bearing in mind that this project will have a long-life span of 50 years, the client will invest in the appropriate technology and materials that will ensure quality and durability of the structure.

2.4 Waste Generation and Management

2.4.1 Waste to be generated during construction Phase

Major wastes generation associated with the project construction and their treatment/ disposal methods are described in the Table 2.4 below.

Table 2-4 Waste Generation and its management during Construction Phase

Type of waste	Sources	Disposal / Management procedure
Debris and Rubble (overburden)	-Site clearance -Excavation for foundation and storm water channel	Collected and stockpiled near construction site and to be used as a base material in other construction works. Also, sh`all be used for site recovery after construction
Biodegradable materials mainly domestic waste (food, paper, wood etc.)	-Construction crew - offices	Collected into area designed for temporary solid waste collection while waiting to be taken to authorized dump site (engage a private company)
Non- biodegradable materials (Plastic, glass, paint remain, cut piece of reinforcement bar)	-Construction crew	Collected into special area designed for hazardous waste temporary storage while waiting to be taken by authorized dealers for hazardous waste disposal
Domestic wastewater	Toilets and floor cleaning	Collected into septic tank with soak away pit and once full cesspit emptier truck will be employed to empty for disposal to Swaswa Waste Stabilization Ponds (WSP) for treatment. In the later days, wastewater will be treated in the constructed wetland. Also, when the Public sewerage system is in place, connection will be made.
Gaseous emission	Trucks delivering construction materials and machines used during compaction	All used machines will be regular serviced its engine for avoiding incomplete fuel burning and used fuel will be one accepted by EWURA of low sulphur contents
Dust emission	Excavation, trucks passing on unpaved road and construction materials at site	Water spray practice shall be employed twice a day for all area where dust emission expected, All stockpiles found at site shall be covered

Source: IRDP September 2023

Table 2-5 Waste generation and treatment during construction phase

Activity	Waste type	Amount	Treatment/ Disposal Method(s)
Excavation of Foundation	Spoil Soil	1,000-3,000m^3	This soil shall be stock piled along the foundation trenches. The soils shall be used to reinstatement site at the end of the project
Actual Construction	Rubbles	10-15kg/day	Will be stockpiled and used to fill cut sections
	Scrap metals	3-5kg/day	Sell to permitted waste dealers
	Timber	10-15m^3	Sell to recyclers

Domestic Wastes

Domestic shall include liquid wastes and general refuse.

- **Solid Wastes**

About 7.5 kg/day of domestic refuse will be generated at the site by workers based on the generation rate of 0.15kg/Person/day and 50 workers. A local solid waste transfer station shall be designated by the contractor to store domestic refuse before they are collected by the contracted city trucks to dump site.

- **Liquid waste**

Sanitation system to be used at the site is Septic tanks systems at the project area.

Assuming that

- There will be 50 workers
- Water consumption =40l/capita/day
- 80% of the water consumed become wastewater

Wastewater generation per day = 50x40x0.8

About 1.6m^3 per day of liquid waste will be produced from the site during construction period.

2.4.2 Operation Phase

- **Solid Wastes**

Solid wastes such as waste papers, packaging materials, plastic bottles and organic waste (food waste) are expected during the operation phase. The project will ensure that all solid wastes are sorted at the source for proper solid waste management. Collected recyclables will be sorted out by type such as papers, plastic bottles, food and general waste, office waste, paper and cardboard. All decomposable waste will be taken into separate chamber before collected by private company to Chidaya dump site while plastic bottles will be collected into separate chamber and taken by authorized dealer for disposal.

About 206.4 kg/day of domestic refuse will be generated at the site by students and workers based on the generation rate of 0.15kg/Person/day and 1376 students. A solid waste transfer station shall be designated by the proponent to store domestic refuse before they are collected by the contracted city trucks to dump site.

- **Liquid waste**

Generated liquid waste will include domestic wastewater to be generated from washrooms and toilets. Domestic wastewater will be directed into septic tank with soak away pit for management and once it become full cesspit emptier truck will be employed to empty it for disposal at Swaswa Waste Stabilisation Pond (WSP) for treatment.

Sanitation system to be used at the site is Septic tanks systems at the project area.

Assuming that

- There will be 1376 students and workers
- Water consumption =45l/capita/day
- 80% of the water consumed become wastewater

Wastewater generation per day = 1376x45x0.8

About 49.536m^3 per day of liquid waste will be produced from the site during construction period

- **Hazardous waste**

During project operation hazardous waste will include electrical equipment like bulb, damaged parts of computers, printer cartridges/ribbons and other metal waste. Generated hazardous waste shall be collected into special dustbin named for hazardous waste collection into area designed for hazardous waste storage while waiting to be disposed by authorized dealer.

2.4.3 Decommissioning Phases

In the decommissioning phase much of demolition waste will be generated, these will be demolished concrete from foundations, mild steels from piping network, electrical and firefighting equipment and some paint remains. The anticipated types of wastes to be generated at this phase are presented in Table 2.6.

Table 2-6 Expected wastes to be generated during Decommissioning Phase

S/N	Types of Waste	Quantity	Management
1	Hazardous waste	100kg	To be sold to authorized dealers registered by NEMC
2	Concrete	70m^3	reuse for street road maintenance
3	Electrical wastes	600kg	To be sold to authorized dealers registered by NEMC
4	Timber	5000kg	Reused as fire wood
5	Plastics	700kg	Collected by authorized dealers for recycling
6	Scrap metal	3,500kg	To be collected and sold to authorized dealers for scrap waste management (with permits for scrap wastes collection and disposal)

Source; IRDP on September 2023

2.5 Summary of proposed project schedule

The project schedule will include activities to be done for proposed project implementation and time to be used for each activity. In this report the proposed time frame may change depending on client financial status and other uncontrolled factors

Table 2-7 Summary of proposed project schedule

SN	PROJECT PHASE	TIME FRAME
1	Project Design and Environmental study	4 months
2	Project Mobilization	1 month
3	Project Construction	10 months
4	Project Demobilization	1 month
5	Project Operation	50 years
6	Project Decommissioning	6 months

2.6 PROJECT SUPPORTING FACILITIES

2.6.1 Labour Force

The proposed project is expected to employ about 50 people, both skilled and unskilled in the entire period of construction including labours senior managers, middle and junior managers, and support staff/hiring staff (part time) and technicians. Also, there will be workers at the project facility mainly to ensure good housekeeping to safeguard the students, staff, and non-staff worker's health and protect the environment during the project life span. Employment will be required to provide infrastructure, accounting and administrational back up.

The Priority of employment to unskilled labour will be given local communities found within and nearby the project site. However, skilled staff to be recruited from different parts while implementing the project include:

a) Engineers for general supervising of construction works;
b) Surveyors;
c) Technicians to supervise artisans; and
d) Other skilled labourers include artisans specialized in woodwork, steel fixing, concrete works, metalwork, operators and drivers for operations of construction machinery, equipment, heavy-duty trucks and light-duty vehicles, and construction machines, and support staff such as accountants etc.); and
e) All permanent staff will be on contracts, enrolled in the National Social Security Fund (NSSF) and received several benefits, including healthcare and a performance bonus. They will be paid under minimum wage regulations of Tanzania and all will receive more than the minimum wage. Women will be hired to perform some of the duties they are qualified for. Seasonal staff will not be on contracts. They will be paid based on performance. No underage labour will be employed to prevent child labour during project construction. This will be part and parcel of the Child Abuse and Protection Plan (CAPP) developed by the Contractor.

2.6.2 Sources of Water

The main source of water to facilitate all activities during construction and operation of the project will be from existing Dodoma Urban Water Supply and Sanitation Authority (DUWASA) pipeline. The site is already connected with DUWASA water infrastructure. It is estimated that, about 5,500 liters per day will be used during construction phase (where about 1,350litres (30capital x 45litres consumption rate per capital, according to water design manual of 2009 from Ministry of Water) per day will be used by construction workers and 4,150litres per day will be for other uses including construction activities).

During operation water demand at project site will depend on number of students and staff to be occupied by proposed eco-friendly academic complex building approximated total water of 61.92m^3 per day will be used (1,376 students x 45litres consumption rate per capital per day, according to water

design manual of 2009 from Ministry of Water) per day will be used for domestic uses) for running capacity of academic building at site.

If the proposed project will depend on existing water source for all project activities during construction, where about 5.5m^3 per day will be used and during operation where about 61.92m^3 per day will be used. The amount of water will impact on existing water source which may cause water shortage to students who will share water source on that time. To overcome such impacts; proponent have drilled a borehole at site that will be used as an alternative but also will consult DUWASA for changing the line and connecting with new system which will have enough water according to project demand, proponent during construction will install rainy water harvesting system to be used as alternative water source at project site which will help to reduce water shortage for residents around who rely on water supplied by DUWASA, the use of water storage tanks at project site which will be filled during non-peak hours to reduce water shortage to nearby residents.

2.6.3 Sources of Energy

IRDP Dodoma Campus in Miyuji area is already connected with TANESCO power system, before construction commence the proposed project site will also be connected and electricity will be used both during the construction and operation phases. It is estimated that 900units of power will be used per month during project construction phase and 700units of power will be used per month during operation phase. However, proponent will install a generator as alternative power source in case of emergency. At project site during construction phase electricity will be used in all metal works to be used in construction, offices uses and lighting during night for security issues while during operation phase electricity will be used in all academic complex building. The proposed project will not cause shortage of energy to surrounding residents, but proponent will consult TANESCO for extra power energy to be used during construction to identify if there is a need to install new Transformer for supporting the project.

2.6.4 Storm water management

Storm water channel will be among of facility for project supporting, where during construction phase storm water channel will be constructed for managing rainy water at project site. After the construction phase, the proponents must ensure that the roof top of building are equipped with gutter for rainy water collection and linked to storm water channel for easy management. Also constructed area will be paved by concrete to allow rainy water flows to the drainage systems more easily.

2.6.5 Occupational Health and Safety Management

2.6.5.1 Health and Safety

Before starting the construction, the Contractor must be given Health and Safety Management Plan (HSMP) submitted to the client. HSMP describes the measures to be taken to achieve a safe working environment, good housekeeping, and occupational health and safety standards at the workplace. The Contractor shall frequently provide training of occupational

safety and health to workers and disseminate important information about health risk (including toolbox meeting, proper use of First Aid Kit, Personal Protective Equipment (PPE) and designated location for assembly point. During the construction, the Contractor shall provide, equip and maintain adequate first-aid stations for case of emergency. Further, the civil works contract shall include the Contractor's requirement to conduct environmental, Social, Health and Safety awareness programme around project site using audio-visual presentation, questions and answers session and provide handouts (pamphlets and reflective stickers).

2.6.5.2 HIV/AIDS and STDs Issues

IRDP Dodoma Campus in Miyuji supports the Government's efforts to alleviate HIV/AIDS diseases and STDs. Thus, the Contractor shall develop and implement the HIV/AIDS prevention and awareness programme mechanisms within the construction site. Further, during the mobilization phase, the following measures shall be observed;

a) Raise awareness to all site staff and labour of the danger and impacts of unprotected sexual interactions, including the spread of STDs and HIV/AIDS in particular. The sub-Contractor (NGO, local health facilities HIV/AIDS experts) will be nominated to educate and conduct public awareness-raising campaigns on HIV/AIDS preventions at least every two (2) months, including supplies of educational materials;
b) Awareness campaigns and training will be raised to the immediate local communities and project staff;
c) Supply of adequate protective gears such as condoms for each site staff and labour;
d) Contacting NGOs experienced in the field of HIV/AIDS and STD alleviation program;
e) Evaluate and explore other opportunities for enhancing HIV/AIDS and STD related behavioural change; and

2.6.5.3 Traffic Management

As part of road safety management, the Traffic Management Plan (TMP) will be prepared by Contractor and supervised by the Client. Temporary traffic-control facilities within IRDP Campus in Miyuji area will be used to manage traffic during construction. The Contractor may designate the access road and alternative entry/exit gates around the project site to ensure the traffic's smooth during the construction phase. The adequate number of flag-persons, traffic control sign boards and warning devices will be deployed. The access road will be maintained regularly.

The existing internal access roads, a safe trafficable condition for continued smooth operations of the Campus activities will be maintained and used as a back-up where necessary. The Contractor will always arrange sufficient resources to carry out repairs, provide a smooth riding surface, and ensure that the road is safe for traffic at all times.

2.7 OFFSITE FACILITIES

During the project construction there are some offsite facilities that will be required to enhance project construction as follows:

2.7.1 Sand and Stone Borrow Sites

IRDP Campus in Dodoma does not own borrow site for sand, aggregates and stone mining, during construction contractor will receive the materials from a registered supplier who have all permit to provide such service at Dodoma City.

2.7.2 Others Construction materials

The contractor for the proposed eco-friendly academic building will be required to outsource construction materials such as cement, iron bars, nails, timbers, and paints from licensed shops in Dodoma City to overcome transport cost and transport them to the project site for construction activities.

2.7.3 Climate Change risks mitigation and adaptation in the Project Design

The design of the proposed project shall accommodate the infrastructures to mitigate and adapt the climate change risks namely floods during rain season, excessive heat, drought, water scarcity, among others. The design will enhance low energy use by installing energy saving bulbs and design that allow natural lights, roof-top rainwater harvesting, storm water management systems, adequate natural ventilation, and maintaining a significant green space. Details of the climate change risks mitigation and adaptation in the Project Design is described as follows.

i. The building with low energy use: The design of the proposed eco-friendly academic building considered the provisions for adequate openings for cross ventilation, that will ensure easy flow of clean air and reduce energy use (thus reducing emissions). Also, the design has got provisions for motion sensors in public areas, to enable auto switch ON/OFF of lights; installation of presence sensors in offices, class rooms; proper orientation to reduce indoor discomfort and capture natural air as much as possible and minimization of the sun effects (installation of fans; and provisions for solar lights along the pathways for sun shading). Also, maximizing the potential of utilization of renewable energy options such as solar. Further, the buildings to be oriented and constructed to take advantage of natural lighting and cross ventilation as a means of minimizing energy consumption during operation.
ii. Maintenance of Open spaces: In the open spaces, native plants have been recommended to add the benefit of being useful for storm water management and infiltration, as well as prevention of soil erosion. Open spaces are planned to maximize the tree canopy cover and shade provided by trees in the area and more provision of ecosystem services.
iii. Greenery walkways: The design maximizes pedestrian movement and minimizes motorized transport within the site to reduce air emissions

(greenhouse gasses (GHGs)) and maximizing Carbon sequestration. Walkways are provided to restrict free movement that causes vegetation destruction in the site and reducing land cover important for carbon sequestration. Trees are proposed to be planted along the vehicular access road and footpaths to improve landscape and reduce effects of sun radiation during the day Green areas. The natural vegetation cover, green belt and conservation zone are intended to preserve the ecosystem and control land degradation and enhance land scenery. Native and non-native trees and grasses will reduce soil erosion in all soil erosion prone areas.

2.7.4 Disaster risk management

The proposed project shall have provisions for disaster risk management such as fire prevention and firefighting equipments. Also, the building shall have provisions for solid waste and liquid waste management for diseases prevention. The roads shall be safely connected to the parking area huge enough to accommodate cars. IRDP has risk champions who identify and monitor potentials risks in all institute's business. Thus, the proposed project will be integrated into the IRDP's risk management plans.

2.8 DESCRIPTION OF INSTITUTIONAL, SPATIAL AND TEMPORAL BOUNDARIES

2.8.1 Institutional boundaries

Institutional boundaries refer to those institutions and sectoral boundaries in which the project rests. These can be determined from political boundaries, Acts, regulations and institutional mandates and administrative structures. At the national level, the key institutions that will oversee the implementation of the project activities include the Ministry of Lands, Housing and Human Settlements Development, Ministry of Education Science and Technology, Vice President's Office – Division of Environment. Other Government agencies like National Environment Management Council (NEMC), Occupational Health and Safety Authority (OSHA), Contractor Registration Board (CRB), Engineers Registration Board (ERB) and others will also have responsibilities on the management of the Project. At the City level; City Council of Dodoma through various experts within the City Executive Director's Office has mandates on monitoring the project. The Office of the City Executive Director work through the Ward Executive Officer and *Mtaa* Executive Officer.

2.8.2 Temporal boundaries

Temporal boundaries are referring to project life span and the reversibility of impacts. The project under consideration is envisaged to last for 50 years from the date of construction to the date when the concrete structures need replacement or refurbishment works on it.

Furthermore, the environmental and socio-economic influence of the project is anticipated to extend beyond the project area. Bio-physical parameters and socio-economic aspects such as employment dynamics, number of students

to be registered, markets of graduated students and diseases prevalence i.e. HIV/AIDS etc. have been used in assessing the temporal boundary.

2.8.3 Spatial boundaries

The spatial dimension encompasses the geographical spread of the impacts regardless of whether they are short term or long term. The spatial scale considers the receptor environmental component and can be local or broader. Following this, two zones of impacts have been considered;

The Core Impact Zone: This includes the area immediately bordering the project (local). In the case of this project local impacts will include the site of the construction and the immediate surrounding areas.

The Zone of Influence*:* This includes the wider geographical areas that are influenced by the proposed project.

2.9 THE COST OF PROJECT

The cost of the proposed project implementation is Tanzania Shilling 3,650,000,000.

CHAPTER THREE: POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

The proposed development is related to several laws and national policies; hence this section of the environmental study addresses relevant policies and legislations to the proposed project. The policies and legislations emphasize on both planning and implementation of this particular project. Furthermore, the study addresses Institutional framework which are relevant to the proposed project.

3.1 RELEVANT POLICIES

Clarifying spectral policies which relate to the proposed project is highly important when considering institutional and national boundaries currently and in the future. In this respect, the following national policies are addressed.

3.1.1 The National Environmental Policy, 2021

Paragraph 1.1 of the Policy say; Environment and natural resources are valuable national assets that have to be sustainably managed for the present and future generations. They offer a range of benefits and opportunities for local and national levels for socio - economic growth such as improved livelihoods and provision of environmental goods and services. Despite being the foundation on which sustainable development is anchored, the national analysis of the state of the environment identified six (6) environmental challenges that needed urgent actions to address the deterioration of the environment in the country. These challenges are: land degradation; lack of accessible good quality water for rural and urban inhabitants; loss of wildlife habitats and biodiversity; deterioration of aquatic systems; deforestation; and environmental pollution. These challenges not only threatened livelihoods of the people and the national economy, but also state of the environment which is crucial in supporting all forms of life.

Paragraph 2.2.3 was about the policy objective, where the overall objective was to provide a national framework for guiding harmonized and coordinated environmental management for the improvement of the welfare of present and future generations.

The specific policy objectives are:

i. To strengthen coordination of environmental management in sectors at all levels;
ii. To enhance environmentally sound management of land resource for socio-economic development;
iii. To promote environmental management of water sources;
iv. To strengthen conservation of wildlife habitats and biodiversity;
v. To enhance conservation of forest ecosystems for sustainable provision of environmental goods and services;
vi. To manage pollution for safe and healthy environment;
vii. To strengthen the national capacity for addressing climate change impacts;

viii. To enhance conservation of aquatic system for sustained natural ecosystem;
ix. To ensure safety at all levels of application of modern biotechnology;
x. To promote gender consideration in environmental management;
xi. To promote good governance in environmental management at all levels; and
xii. To ensure predictable, accessible, adequate and sustainable financial resources for environmental management.

To be in line with the policy objectives, the Proponents will institute an efficient waste management system both solid and liquid, where the liquid waste will be managed by septic tank and solid waste to be well managed by sorting at the source before collected by the authorized entities for disposal, enough dustbins will be provided to enable sorting of solid waste at source.

3.1.2 The National Land Policy, 1997

The policy recognizes the need for protecting the environmental. It stresses protecting the environment and natural ecosystem from pollution; degradation and physical destruction. Important paragraphs of the policy relevant to the proposed project are paragraph 2.4 (on use of land to promote socio-economic development; paragraph 2.8 (on the protection of land resources), paragraph 3 and paragraph 4 (on land tenure). These paragraphs are relevant and guides the proponents in terms of occupancy, land use and land-use change at the project site.

The proposed project implementation shall use existing land which planned for education use and generated waste (solid and liquid) will be managed properly at project site where septic tank will be used for management of domestic wastewater while generated solid waste will be collected into dustbins and taken by authorized dealer for disposal

3.1.3 The National Energy Policy, 2015

The Policy promotes welfare and living standards of Tanzanians and provides catalytic inputs in the development process of the country by establishing a reliable and efficient energy production, procurement, transportation, distribution and end-use system in an environmentally sound manner, also the policy insists the proper utilization of energy, therefore the project proponent ensure that proper utilization of power as well as considering the alternative source of energy shall be considered to be environmentally friendly of low gaseous emission and allowable noise level.

3.1.4 The National Policy on HIV/AIDS, 2001

The Policy provides the framework for leadership and coordination of the national multi-Sectoral response to the HIV/AIDS epidemic. This includes the formulation by all sectors of appropriate interventions that are effective in preventing transmission of HIV/AIDS and other sexually transmitted infections, protecting and supporting vulnerable groups and mitigating the social and economic impacts of HIV/AIDS.

The project proponent shall observe this policy by introducing awareness raising programmes, to protect workers and communities around the project area against HIV/AIDS, the project contractor will coordinate with the HIV/ AIDs ant-activists.

3.1.5 The National Investment Promotion Policy, 1996

The Policy seeks to promote investment in the growth of various sectors, construction inclusive. It encourages and promotes private sectors to actively engage into economic growth. The proposed project will contribute to the national economic growth agenda and improvement of social welfare, where private contractor will be employed to provide construction services, private authorized construction materials suppliers will be engaged to supply all construction materials and other services to be needed for project construction phase. The project will provide employment to local people for both skilled and unskilled during construction phase this will improve the living standards of those workers, where will be paid on time.

3.1.6 The Construction Industry Policy, 2003

The policy promotes among other issues, application of cost effective and innovative technologies and practices to support social economic development including utilities and ensure application of practices, technologies and products which are not harmful to both the environment and human health, therefore the proposed development will comply with the requirement of this policy by ensure that the materials to be used are those with less negative impacts to the environment and will be sourced from authorized dealers. The materials will be certified for construction as per TBS guidelines.

3.1.7 The National Gender Policy, 2000

The key objective of this policy is to provide guides to ensure that gender sensitive plans and strategies are developed in all sectors and institutions. While the policy aims at establishing strategies to eradicate poverty, it puts emphasis on gender equality and equal opportunity for both men and women to participate in development undertakings and values the role played by each member of society. The project proponent shall ensure equal opportunities at all levels during project implementation including number of employment opportunities will consider gender issues.

3.1.8 The National Health Policy 2017

The Vision of the policy was to attain a healthy community that contributes effectively to individual as well as to the nation's development towards becoming a middle-income country and the Mission of the policy is to facilitate the provision of basic health services that are of good quality, equitable, accessible, affordable, sustainable and gender sensitive.

The policy objective is to reach all households with essential health services attaining the needs of the population, adhering to objective quality standards and applying evidence-informed interventions through resilient systems for health. Project proponents ensure that basic health service will be provided to workers and working conditions will be enhanced to be conducive.

3.1.9 The National Employment Policy, 2008

The vision of the Policy is to have a society engaged in sustainable decent gainful employment, capable of generating a decent income for the improvement of the quality of life and social well-being for Tanzanians, and to reduce poverty as envisaged in the Tanzania Development Vision 2025, as well as addressing the emerging challenges of globalization and the mission of the policy is to enhance and develop human capital as well as its utilisation, to assure productive and sustainable employment in the rural and urban economies, by improving knowledge and skills, adequate income earning opportunities and labour market services.

The overall objective is to stimulate national productivity, to attain full, gainful and freely chosen productive employment, in order to reduce unemployment, underemployment rates and enhance labour productivity and the specific objective of the policy was;

a) Promote a common understanding of the unemployment problem among key stakeholders and generate collaborative and current efforts towards solving it;
b) Enhance skills and competencies for those in the formal and informal sector especially rural areas;
c) Promote the goal of decent and productive employment as a national priority and enable all participants in the labour force to gain productive and full employment;
d) Promote equal access to employment opportunities and resources endowments for vulnerable groups of women, youth and People with Disabilities (PWDs);
e) Put in place conducive and enabling environment to promote growth of the private sector and transformation of the informal sector into formal. Proponent shall observe the presence of the policy vision, mission and objectives.

3.1.10 The Education and Training Policy, 2014

The main Objective of the Policy is to have educated and knowledgeable Tanzanians able to quickly contribute to national development and competitiveness. One of its specific objective states that, the policy will ensure provided education and training will have standards of quality that recognized nationally, regionally and internationally. The proposed project in IRDP Campus in Dodoma is relevant to the policy objectives as will improve the quality and standards of education and training provided as the project will construct and enhance learning facilities.

3.2 RELEVANT LEGISLATIONS FRAMEWORK

This section addresses the legal conditions which are relevant to the proposed project. This study has been conducted in general compliance of the project proponent with the following legislations.

3.2.1 The Environment Management Act No.20, 2004

The Environmental Management Act, 2004, cap 191 seeks to provide for legal and institutional framework for sustainable management of the environment in the implementation of the National Environmental Policy. Under this Act NEMC is mandated to undertake enforcement, compliance, review and monitoring of environmental impact assessment and has a role of facilitating public participation in environmental decision making, exercise general supervision and coordinating over all matters relating to the environment. Section 82 makes EIA mandatory to all projects that fall under the EIA mandatory list (Schedule 3).

This Act also provides a legal framework necessary for coordinating harmonious and conflicting activities with a view to integrating such activities into an overall sustainable environmental management system by providing key technical support to sector Ministries. This is a cross-sectoral piece of legislation and supersedes all other written laws relating to environmental management. Specifically, section 232 stipulates that where the provision of this Act is in conflict or is otherwise inconsistent with a provision of any other written law relating to environmental management the provision of this Act shall prevail to the extent of such inconsistency.

NEMC is currently the designated authority to carry out the review of EIA, EA, monitoring and auditing of environmental performance of the project (periodic and independent reassessment of the undertaking). Environmental Impact Statement (EIS) will be submitted to the Technical Advisory Committee (TAC) for evaluation.

As per the EMA Cap 191, among others, the following obligations on the project Proponent have been imposed:

- As land user and occupier to protect, improve and nourish the land and using it in an environmentally sustainable manner (S. 72)
- To abstain from discharging any hazardous substances, chemicals, oils or their mixture into waters or into any segment of the environment (S. 110)
- To comply with environmental quality standards (S. 141)
- As a corporate body to comply with license conditions including the EIA certificate (S. 201)
- To control, manage and dispose in a sound manner waste including litter, liquid, gaseous and hazardous waste (Part IX)

The academic building operation will face waste management and pollution problems as one of the main environmental challenges. However, the Proponent will have effective waste management system in place. Solid wastes generated will be collected, sorted and sent to a collection point at the site waiting for removal by registered contractors for disposal.

Also, within project site septic tank and WSP will be constructed to be used for managing domestic wastewater.

3.2.2 The Land Act, 2019

The fundamental principles of the National Land Policy which is the objective of this Act to promote and to which all persons exercising powers under, applying or interpreting this Act are to have regard to,

a) recognize that all land in Tanzania is public and vested in the President, as trustee on behalf of all citizens;
b) ensure that existing rights in and recognized long-standing occupation or use of land are clarified and secured by the law;
c) facilitate an equitable distribution of and access to land by all citizens;
d) regulate the amount of land that any one person or corporate body may occupy or use;
e) ensure that land is used productively and that any such use complies with the principles of sustainable development;
f) take into account that an interest in land has value and that value is taken into consideration in any transaction affecting that interest;
g) pay full, fair and prompt compensation to any person whose right of occupancy or recognized long-standing occupation or customary use of land is revoked or otherwise interfered with to their detriment by the State under this Act or is acquired under the Land Acquisition Act;

Provided that, in assessing compensation of land acquired in the manner provided for in this Act, the concept of opportunity shall be based on the following-

i. market value of the real property;
ii. disturbance allowance;
iii. transport allowance;
iv. loss of profits or accommodation;
v. cost of acquiring or getting the subject land;

Section 4(1), all land in Tanzania shall continue to be public land and remain vested in the President as trustee for and on behalf of all the citizens of Tanzania.

(2) The President and every person to whom the President may delegate any of his functions under this Act, and any person exercising powers under this Act, shall at all times exercise those functions powers and discharge duties as a trustee of all the land in Tanzania so as to advance the economic and social welfare of the citizens

Project proponent shall observe the Act, and to be in line with the Act, she continues using the existing land for economic development by planning to construct a four-storey eco-friendly academic building.

3.2.3 The Land Use Planning Act No. 6, 2007

The Act provides procedures for: preparation; administration and enforcement of the Land Use Plans to facilitate an orderly management of land use. It empowers land occupiers and users to make better and more productive use of lands, to enhance security and equity in accessing land and

its resources, by developing the plot. Implementation of proposed project on the land will ensure that the proponent is complying with this act, where proposed project is compatible with land use plan.

3.2.4 The Urban Planning Act, 2007

The Act provides the guidance on orderly and sustainable development of land urban areas, to preserve and improve amenities, to provide for grant and consent to develop land and powers of control over the use of land. Moreover, Section 29(3) of the Act requires conducting EIA for development that need planning consent. It stresses on matters related to land acquisition and compensation. Furthermore, the Act provides for procedures for enforcement of urban planning, address issues related to urban planning and to enhance conservation and environmental protection to enhance social justice in acquisition of land for planning purposes, the proposed project its implementation will comply with the land use of the area according to town plan act.

3.2.5 The Occupational Health and Safety Act No. 5, 2003

This Act provide for the protection of human health from occupational hazards. It requires the employer to ensure the safety of workers by providing personal protecting gears at work place. It specifically demands: the provision of regular medical examination of employees, safe means of access and safe working place; prevention of fire; supply of clean and safe water to workers; sanitary convenience; washing facilities, first aid kit with recommended facilities and trained first aider will be provided at the site. Proponent ensure that he will observe the requirement of the Act, where firstly he will register a working place at OSHA and procedures for acquiring a compliance certificate will be followed during project operation. Basic requirement like safe and clean water will be provided to workers, toilets and changing rooms will be at project site, medical examination to workers will be done on time, induction training will be provided to workers in all phase, area for emergency assembly point will be at project site, enough warning sign shall be at project site and posted at all strategic area and water spray will be used at project site for dust management.

3.2.6 The HIV and AIDS (Prevention and Control) Act, 2008

The Act provides for prevention, treatment, care, support and control of HIV and AIDS for promotion of public health in relation to HIV and AIDS. The Act also requires, provisions for appropriate treatment, care and support to people living with or at risk of HIV and AIDS. It requires the employer in consultation with the Ministry of health to establish and coordinate a workplace program on HIV and AIDS for employees under his control and such program to include provision of gender responsive HIV and AIDS education, distribution of condoms and support people living with HIV and AIDS. The project proponent / contractor will adhere with this Act by ensure that construction workers will be aware of HIV /AIDs and other STDs, where special reminding programmes about HIV will be provided per month.

3.2.7 The Water Supply and Sanitation Act No. 12, 2009

The Act provides for sustainable management and adequate operation and transparent regulation of water supply and sanitation services; establishment of water supply and sanitation authorities as well as community owned water supply organizations; and appointment for service providers. The aim is to ensure: - the right of every Tanzanian to have access to efficient, effective and sustainable water supply and sanitation services for all purposes by taking into account among others protection and conservation of water resources and development and promotion of public health and sanitation; and protection of the interest of customers, since the project is connected with SHUWASA pipeline all regulations of this act will be abided. Any generated domestic wastewater at project area will be managed by septic tank and once become full it will be emptied per time to avoid overflow

3.2.8 The Standards Act No. 2, 2009

The Act provides for the promotion of the standardization and specifications of commodities and services re-establish the Tanzania Bureau of Standards (TBS) and provisions for the functions, management and control of the Bureau. This act is relevant to this project as it controls the quality of materials to be used for constructions of the proposed project. The proponent shall ensure that all the construction materials to be used will be those recommended by TBS and sourced from authorized dealers.

3.2.9 The Public Health Act, 2009

The Act stresses on Solid and Liquid Waste Management and recommends management of solid and liquid wastes generated in accordance with sustainable plans prepared by respective Authority; and ensure sorting of wastes are made at the source, and that it is in accordance with standards or specifications prescribed by the authority. It further requires solid and liquid wastes to be classified and appropriately stored depending on whether they are organic, plastic, glass or metal waste; and prescribe appropriate methods for storage of different categories of solid and liquid wastes. The Proponent shall adhere with all guidelines and requirements of this Act to ensure all generated wastes shall be properly collected, managed and finally disposed of accordingly where sorting of solid waste shall be done at project site and temporary solid waste collection point where it taken by City truck to dumpsite.

3.2.10 The Employment and Labour Relation Act, 2019

Sect 2(1), this Act shall apply to all employees including those in the public service of the Government of Tanzania in Mainland Tanzania but shall not apply to members, whether temporary or permanent, in the service of:

i. the Tanzania Peoples Defence Forces;
ii. the Police Force;
iii. the Prisons Service; or
iv. the national Service

Sect 3, the principal objects of this Act shall be -

a) to promote economic development through economic efficiency, productivity and social justice;
b) to provide the legal framework for effective and fair employment relations and minimum standards regarding conditions of work;
c) to provide a framework for voluntary collective bargaining;
d) to regulate the resort to industrial action as a means to resolve disputes;
e) to provide a framework for the resolution of disputes by mediation, arbitration and adjudication;
f) to give effect to the provisions of the Constitution of the United Republic of Tanzania,1977, in so far as they apply to employment and labour relations and conditions of work; and
g) generally, to give effect to the core Conventions of the International Labour Organization as well as other ratified conventions.

Section 5(1) No person shall employ a child under the age of fourteen years.
(2) A child of fourteen years of age may only be employed to do light work, which is not likely to be harmful to the child's health and development; and does not prejudice the child's attendance at school, participation in vocational orientation or training programmes approved by the competent authority or the child's capacity to benefit from the instruction received.
(3) A child under eighteen years of age shall not be employed in a mine, factory or as crew on a ship or in any other worksite including non-formal settings and agriculture, where work conditions may be considered hazardous by the Minister

Section 7(1), every employer shall ensure that he promotes an equal opportunity in employment and strives to eliminate discrimination in any employment policy or practice
(4) No employer shall discriminate, directly or indirectly, against an employee, in any employment policy or practice, on any of the following grounds:
(a) colour, (b) nationality, (c) tribe or place of origin, (d) race, (e) national extraction, (f) social origin, (g) political opinion or religion, (h) sex, (i) gender;
(j) pregnancy, (k) marital status or family responsibility, (l) disability;
(m) HIV/Aids, (n) age; or (o) station of life.
(5) Harassment of an employee shall be a form of discrimination and shall be prohibited on any one, or combination, of the grounds prescribed in subsection

Proponent shall observe the presence of the Act and ensure that in all project phases any kind of discrimination will be prohibited and employment opportunities will consider gender balance and age limit as per Act requirements.

3.2.11 The Engineers Registration Amendment Act No. 24, 2007

The Act establishes an Engineers Registration Board (ERB) which regulates the conduct of engineers, to provide for their registration and for related matters. It restricts any unregistered engineer to engage in professional engineering work or services which includes professional service, consultation, planning, designing or responsible supervision of construction

or operation in connection with any public or privately owned public utilities, buildings, machines, equipment, processes works or projects where public interest and welfare or the safeguarding of life, public health or property is concerned or involved and that requires application of engineering principles and data. It further prohibits the engagement of unregistered engineers into engineering works. In compliance with the Act, the proponent shall employ a registered engineer by the Engineers Registration Board (ERB) in supervising all construction work at site.

3.2.12 The Contractors Registration Act No. 17 of 1997

The act provides for registration of contractors and establishes a board to regulate the conduct of contractors. The act provides for the contractors' registration board to enter and inspect any site for construction, installation, erection or alteration works for the purpose of verifying and ensuring that the works are being undertaken by registered contractors and that all works comply with all governing regulations and laws of the country. The act stipulates that no body of persons whether corporate or unincorporated is allowed to practice unless is registered as a contractor or one of the shareholders in a firm is registered as a contractor. The board has the power to take legal action to the contrary. This act is in force and in complying with it; the proponent shall engage registered contractor to undertake all the construction activities at site not otherwise.

3.2.13 The Workers Compensation Act, 2015

This Act shall apply to Mainland Tanzania; it shall apply to all employers and employees including those in the public service of the Government of Tanzania in Mainland Tanzania;

Sect 3, is about the objectives of this Act, which is to-

(a) provide for adequate and equitable compensation for employees who suffer occupational injuries or contract occupational diseases arising out of, and in the course of their employment, and in the case of death, for their dependants;
(b) provide for the rehabilitation of employees who have suffered occupational injuries or contracted occupational diseases in order to assist in restoring their health, independence and participation in society;
(c) provide a framework for the effective, prompt and empathetic consideration, settlement and payment of compensation benefits to employees and their dependants;
(d) provide for the establishment, control and administration of the workers compensation fund, and the legal framework for the workers compensation fund, and the legal frame work for contributions to and payments from the Fund;
(e) give effect to the international obligations with respect to workers; compensation; and
(f) promote prevention of occupational accidents and occupational diseases.

Sect 19 (1), where an employee has an accident resulting in the employee's disablement or death, the employee or the dependants of the employee shall, subject to the provisions of this Act, be entitled to the compensation provided under this Act.

(2) Where an accident is attributable to the serious or wilful misconduct of the employee, no compensation shall be payable unless-

(a) the accident results in permanent total disablement;
(b) the employee dies as a result of the accident leaving a dependant wholly financially dependent upon the employee

Sect 22(1), where an employee contracts a disease set out in the Third Schedule to this Act, or any other disease, and the disease has arisen out of, and in the course of the employee's employment, the employee shall, subject to the provisions of this Act, be entitled to the compensation.
(2) Where an employee dies as a result of a disease referred to under subsection (I), the dependants of the employee shall, subject to the provisions of this Act, be entitled to the compensation.

The proponent is aware of the provisions of this Act and shall adhere to them accordingly, where in case of injury to his workers medical expenses will be covered by proponent. Also, if compensation is needed, it will be provided as recommended by the Act.

3.2.14 The Fire and Rescue Force Act, R.E 2007

The Act established a national fire brigade known as the Fire and Rescue Force for Tanzania Mainland. The Force is responsible for promoting safety and the prevention of fires and providing firefighting services (Section 6, 7). The Act empowers the Commissioner General of the force or his agent to enter premises to ascertain any contravention of the provisions of the Act and obtain information required for firefighting purposes. A court may issue an order for a closure or prohibit the use of any premises for human habitation or storage in case there is a failure to comply with fire prevention regulations. The proponent shall be abiding by the relevant provisions of the Act to ensure the safety and security of its work place and the general public where all construction crew will be trained on fire emergency response and firefighting equipment shall be at project site located at strategic area which can be easily accessible and seen. Fire emergency area shall be at project site. During operation fire inspection shall be done and all installed firefighting equipment shall timely test its durability.

3.2.15 The Finance Act, 2019

Section 43 "(5) Where a person is registered and issued with a Taxpayer Identification Number for the first time, for the purposes of carrying on a business or investment, the requirement to pay instalment tax under the Income Tax Act shall be deferred for a period of six months from the date when the Tax Identification Number was issued.
(6) A person referred in subsection (5) shall pay the whole of the deferred tax in the respective year in three equal instalments, in the remaining period.

(7) Where the deferment granted under subsection (5) has the effect of deferring the tax payable beyond the year of income to which the tax relates, the whole of the tax payable shall be paid in the last instalment period of the year of income.
(8) Nothing in this section shall be taken to preclude the person granted deferment under this section to pay the assessed tax during the deferment period.

The project proponent shall observe the presence of the Act and its requirement for tax payment as recommended.

3.2.16 Social Security (Regulatory Authority) Act, 2015

The functions and duties of the Authority shall be to;

(a) register all manager, custodians and schemes,
(b) regulate and supervise the performance of all managers, custodians and schemes,
(c) issue guidelines for the efficient and effective operation of the social security sector,
(d) protect and safeguard the interests of members

Section 18, the Authority may, subject to the provisions of this Act, register and issue the applicant with a Certificate of registration.

Proponent shall observe the Act, and ensure his workers will be registered with social security registered by Regulatory Authority.

3.2.17 The Persons with Disability Act, 2010

The basic principles of this Act are:

- Respect for human dignity, individual's freedom to make their own choices and independency of persons with disabilities,
- Non-discrimination,
- Full and effective participation and inclusion of persons with disabilities in all aspects of society,
- Equality of opportunity,
- Accessibility,
- Equality between men and women with disabilities and recognition of their rights and needs, and
- Provide basic standard of living and social protection.

Therefore, the proposed project will fulfil this legal requirement; by consider people with disability during project design, construction and operation.

3.2.18 The Child Act, 2009

Part II of the Act defines a child in Tanzania as a person below 18 years. Part II, Section 78 of the Act, provides for the 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/her health or development; (b) exceeds six hours a day; (c) is inappropriate to his/her age, and (d) the child receives inadequate remuneration.

Section 82 of the Act protects children from sexual exploitation. A child shall be protected from sexual exploitation and use in prostitution, inducement or coercion to engage in sexual activity and exposure to obscene materials. This Act will guide in protecting against child labour, especially during the construction phase.

3.2.19 The Architects and Quantity Surveyors Act, 1997

In this act there is established Board to regulate the conduct of Architects, Quantity Surveyors and Architectural and Quantity Surveying consulting firms, to provide for their registration and for related matters. The proponent will use the registered architects and surveyors for the project design and construction.

3.3 RELEVANT REGULATIONS FRAMEWORK

3.3.1 The Environment Impact Assessment and Audit Regulation, G.N No. 349, 2005 and its amendment of 2018.

The EIA and Audit Regulation (G.N. No. 349) 2005 and its amendment of 2018, provides guidance on how the Environmental Impact Assessment should be carried out. It prescribes the procedure to be followed in carrying out the environmental assessment and provides the format for the preparation of the environmental impact statement. The Regulations prohibit the project proponent (including IRDP Dodoma Campus in Miyuji) from undertaking any construction project without carrying out an EIA study required under the Environmental Management Act. This study has been prepared in line with EIA and Audit Regulations of 2005 and its amendment of 2018.

3.3.2 Environmental Management (solid waste management) Regulations 2009

This Act has been made to control a facility or premises which generates waste to minimize the waste generated by adopting the following cleaner production principles: -

(a) Improvement of production process through conserving raw materials and energy by:

i. Eliminating the use of toxic construction materials within such times as may be prescribed by the Minister; and
ii. Reducing toxic emissions and wastes to a level prescribed in the applicable national environmental quality standards.

(b) Monitoring the product cycle from beginning to end by-

i. Identifying and eliminating potential negative impacts of the product,
ii. Enabling the recovery and re-use of the product where possible; and
iii. Reclamation and recycling.

The Act requires any person intending to operate a hazardous waste treatment plant or disposal site or facility to apply to the Director of Environment for a license. The Project proponent will comply with this regulation by ensuring proper environmental management system within the project site during construction activities and operations of a project, where any generated hazardous waste shall be collected at a temporary storage area before disposed by authorized dealer. The area for hazardous waste storage will be paved its floor by concrete, roofed and has band wall

3.3.3 Environmental Management Act (Air Quality Standards) Regulations, 2007

These regulations have been made under sections 140, 145 and 230 (2) (s) of the Environmental Management Act, 2004. They are aimed at setting minimum standard of air quality as well as prohibit emission of hazardous substances, chemicals and materials or gas. They provide for emission limits, highest permissible quantity (emission), and special tolerance limits of emissions from special project which exhaust emissions.
The project proponent will be abiding by these regulations including adhering to permissible weight concentration (Emission limits) to the atmosphere as set out in the first schedule of the regulations.

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

These regulations have been made under Section 143, 144 and 230 (2) (s) of the Environmental Management Act, 2004. They are aimed at, among other things, prescribe minimum standard of soil quality to maintain, restore and enhance the inherent productivity of soil in the long term.
Section 21(1) stipulates that no person is allowed to discharge effluent from industrial, commercial or any other trade into soil without a consent duly granted by the National Environment Management Council or any other person designated by the council for that purpose.

Project proponent shall abide by the regulation by ensure that the area is paved by concrete / blocks and all generated domestic liquid waste shall be managed properly using septic tank and once become full it will be emptied per time by authorized dealer to disposal

3.3.5 The Environmental Management (Water Quality Standards) Regulations, 2007

These regulations have been made under Section 143, 144 and 230 (2) (s) of the Environmental Management Act, 2004. They are aimed among other things: setting permissible limits for municipal and industrial effluents, special permissible limits for chrome tanning industries, special tolerance limits for vegetable industry, special tolerance limits for fertilizer industry, taste, color and smell of potable water and Chemical and physical limits for quality of Drinking Water Supplies.

Project proponent shall adhere to the regulation by ensuring that waste water from premises shall properly be managed to avoid environmental degradation/pollution.

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

Regulation 2; these regulations shall 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

Regulation 4; 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

Regulation 24 (1) a registered environmental expert in any category shall not conduct any environmental study without a practicing certificate issued under these Regulations.
(2) A foreign environmental expert or a foreign firm of environmental experts shall not conduct any environmental study without a practicing permit issued under these Regulations.
(3) A certified environmental expert shall provide professional expertise in the area indicated in his practicing certificate

This Environmental study is conducted by a registered firm for environmental impact assessment and has experience in the field for eight years and also the experts conducted the ESIA study are registered by NEMC and have practising certificates issued by NEMC.

3.3.7 The Environmental Management (Fee and Charges) Regulations, 2021

These Regulations shall apply in relation to an act or service in respect of which fees and charges are payable under the Act and the regulations made there under.
4.-(1) Any person intending to carry on business related to-
(a) Environmental Impact Assessment; (b) environmental compliance monitoring and audit; (c) registration of environmental experts; (d) environmental quality standards; (e) ozone depleting substances; (f) management of waste; (g) noise and vibrations; or other activities related to

the environment, shall be required to pay fees and charges prescribed in the Schedule to these Regulations.
(2) The annual fees for environmental compliance monitoring and audit shall be payable on 1st day of July of each financial year.
(3) The annual fees for environmental compliance monitoring and audit paid after 31st day of December of every financial year shall attract a penalty of five per centum per month.
6.-(1) The fees and charges payable under these Regulations shall be collected and appropriated by the Council or an appropriate authority
8. Any person who contravenes or aids another person to contravene these Regulations commits an offence and shall on conviction be liable to a fine of not less than fifty thousand Tanzanian shillings but not exceeding one billion Tanzanian shillings or to imprisonment for a term not less than three months but not exceeding seven years.

The proponent is supposed to know different Fees and Charges. Fees and Charges which are supposed to be known by Proponent are Fees and Charges for Review of Environmental Impact Assessment and Audit, Annual Charges for Environmental Monitoring and Audit, fees for environmental quality standards. The proponent is aware of these Fees and Charges and he is ready to pay when needed.

3.3.8 The Environmental management (Standards for Control of Noise and Vibrations pollution) Regulations, 2015

The objectives of these Regulations shall be to;

(a) ensure the maintenance of a healthy environment for all the people in Mainland Tanzania by regulating noise and vibration levels,
(b) prescribe the maximum permissible noise and vibration levels from a facility or activity to which a person may be exposed
(c) ensure protection of human health and the environment from various sources of noise and vibration pollution

Regulation 7 (1); no person shall made or cause to make 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.

The proponent will observe the requirements of this regulation during the course of this project, where during construction a site will be fenced by iron sheet to minimize noise impact to community around and all equipment to be used shall be serviced regularly its engine and installed with muffle .

3.3.9 The Environmental Management (Prohibition of Plastic Carrier Bags) Regulations, 2019

These Regulations shall apply to the import, export, manufacturing, sale, supply, storage and use of Plastic carrier bags within Mainland Tanzania.
The objectives of these Regulations are to;-

(a) impose a total ban on the import, export, manufacturing, sale and use of plastic carrier bags regardless of their thickness;

(b) protect human and animal health as well as the environment from the likely adverse effects of utilization of plastic carrier bags; and
(c) provide economic and financial incentives for the production and importation of alternative carrier bags.

Regulation 8, any person who import, export, manufactures, sells, stores, distributes, supplies, possesses and uses plastic bags and plastic wrappings in contravention of this part commits an offence and shall be liable to a fine of not less than twenty million shillings but not exceeding one billion or imprisonment for a term not exceeding two years or to both.

Proponent is aware with the regulation, where his project is for education purposes. Plastic carrier bags will not be used at project site in any way.

3.3.10 Environmental Management (Solid Waste Management) Regulations 2016

These regulations have been made to control a facility or premises which generates waste to minimize the waste generated by adopting the following cleaner production principles: -

(a)Improvement of production process through conserving raw materials and energy by:

i. Eliminating the use of toxic raw materials within such times as may be prescribed by the Minister; and
ii. Reducing toxic emissions and wastes to a level prescribed in the applicable national environmental quality standards.

(b) Monitoring the product cycle from beginning to end by-

i. Identifying and eliminating potential negative impacts of the product,
ii. Enabling the recovery and re-use of the product where possible; and
iii. Reclamation and recycling.

The Act requires any person intending to operate a hazardous waste treatment plant or disposal site or facility to apply to the Director of Environment for a license.

Proponent ensuring that the proper environmental management especially proper solid waste management will be done, where generated solid waste will be collected, sorted and stored into dustbins before taken to collection point where it will be taken by City truck to dumpsite.

3.3.11 The Environmental Management (Hazardous Waste control and Management) Regulations, 2021

These Regulations shall 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. Without prejudice to sub-regulation (1), these Regulations shall also apply to all other wastes destined for transboundary movement.

4.-(1) Any person generating, collecting, storing, transporting, treating, recycling, reusing, recovering and disposing of hazardous waste or any person exercising jurisdiction under these Regulations shall, in relation to any decision, order, exercise of any power or performance of any function, be guided by the following principles of environment and sustainable development relevant to hazardous waste management-
(a) the precautionary principle; (b) polluter pays principle; and (c) the producer extended responsibility.
(2) For the purpose of this regulation "producer extended responsibility" means a policy approach which requires that any person producing or importing a product should internalize environmental costs in the production of the products and in whole life cycle of such product.

5. A person who owns or operates a facility or premises which generate hazardous and toxic waste shall minimize the waste generated by adopting the following cleaner production principles-

(a) improvement of production process through conserving raw materials and energy by; eliminating the use of hazardous and toxic raw materials within such times as may be prescribed by the Minister; and reducing toxic emissions and hazardous wastes to a level prescribed in the applicable national environmental quality standards.
(b) monitoring the product cycle from beginning to end by; identifying and eliminating potential negative impacts of the product; enabling the recovery and re-use of the product where possible; and reclamation and recycling.

6.-(1) every person living in Tanzania shall have a right to clean, safe and healthy environment; and have a stake and a duty to safeguard the environment from adverse effects of hazardous wastes and to inform the relevant authority on any activity or phenomenon resulting from hazardous waste that is likely to adversely affect the environment and human health.

(2) A generator of hazardous waste shall be responsible for the sound management and disposal of such waste and shall be liable for damage to the environment and injury to human health arising thereby
10. An Environmental Inspector may, stop and inspect any vehicle used for the transportation of hazardous waste; and enter upon any premises where hazardous waste is stored, processed or disposed of.
11.-(1) each local government authority, with respect to its area of jurisdiction-shall; (a) receive and scrutinize the applications for a permit to collect and transport up to five tones or up to one thousand litres of hazardous waste; (b) inspect and monitor hazardous waste management facilities; and (c) establish and maintain information register and data related to the control and management of hazardous waste.

(2) Without prejudice to the provisions of sub regulation (1), each local government authority shall, with respect to its area of jurisdiction, ensure that-
(a) standards prescribed for the hazardous waste management are in place and operational at all the time; (b) premises producing hazardous wastes are

adequately ventilated and fitted with air polluting control facilities and are in compliance with prescribed standards; (c) waste effluents are treated or are so modified as to comply with prescribed standards before final disposal; and (d) hazardous standards at factory or on site before their discharge into public sewers or municipal oxidation ponds or in an open land or into receiving water bodies.
(3) Any standards, bylaws and guidelines set by the local government authority for the purpose of these Regulations, shall conform to standards set under these Regulations and the Act.

13.-(1) A person shall not pack or store hazardous waste in a container or package, unless the container or package in which that waste is to be contained, packed or stored meets international requirements approved by the Council.
(2) A container or packaging material provided for under sub-regulation (1) shall be suitable for storage of hazardous waste for which an application for storage has been made and shall; not be reactive with the waste in question; be free from the possibility of leakage; and be capable of protecting the health of persons involved in handling the waste, the neighbouring community and the environment in general.

(3) A container or packaging materials provided for under this regulation shall be; labelled, punctured after its lifespan or after use, and disposed of in accordance with these Regulations.
(4) A person who; packs or stores wastes contrary to these Regulations; or sells or offers for sale a container which has been used for the storage of hazardous wastes to be used for any purpose other than storage of wastes, commits an offence and shall be liable to a fine of not less than five million shillings but not exceeding ten billion or to imprisonment for a term not exceeding twelve years or to both.

14.-(1) A person shall not sell, offer for sale, use, pack, store or transport hazardous waste in a container or package, unless the container has been affixed with labels written in English or Kiswahili language specifying the following:

(a) identity of the hazardous waste;
(b) name and address of the generator of waste;
(c) net contents;
(d) normal storage stability and methods for safe storage;
(e) name and percentage by weight of other ingredients or half-life of radioactive material
(f) a statement of First Aid measures to be taken when hazardous waste is inhaled or ingested to including the antidote be taken and direction that a physician must be contacted immediately;
(g) adequate directions for handling should be included in accompanying leaflets including safety precautions in transporting, storage, and disposal of hazardous waste and measures for cleaning any equipment used; and directions for the disposal of the container and hazardous waste in accordance with the Act and these Regulations

(4) A person shall not use a vehicle or other conveyance as means for carrying hazardous waste unless such vehicle or conveyance is labelled

The proponent shall observe the Act in all phases of his project and in case of generated hazardous waste it will be collected and stored in recommended labelled vessel for onsite hazardous waste storage while waiting to be collected by authorized person for disposal.

3.3.12 Fire and Rescue (Fire Precautions in Buildings) Regulations, 2015

The provisions of this Part shall apply in determining the design, construction, protection, location, arrangement and maintenance of exit facilities to provide safe means of escape for occupants from all buildings hereafter erected, altered or changed in occupancy.

Regulation 4 (1), the areas which are designated as means of escape shall include-

(a) exit staircase;
(b) firefighting lobby;
(c) smoke stop lobby;
(d) exit passageway; and
(e) escape corridors.

(2) The areas which are designated as means of escape shall not be turned into other usage

Regulation 17; all exits and access facilities shall be required to comply with the following:

(a) exits and access facilities shall be clearly visible or their locations shall be clearly indicated and shall be kept readily accessible and unobstructed at all times;
(b) every occupant or tenant within a building or storey of a building shall have direct access to the required exit or exits without the need to pass through the spaces or rooms occupied by other occupants or tenants; and
(c) when more than one exit is required from any room or space or a storey of a building, each exit shall be placed as remote as possible from the other as permitted under Regulation 247.

Regulation 18 (1), entry at every storey level to an exit staircase of any building or part of a building of more than four storey above ground level shall be through:

(a) an external exit passageway or external corridor that has openings for natural lighting and ventilation which are located to face and open upon-

i. external space;
ii. street, service road or other public space which is open to the sky; or

iii. an air-well which opens vertically to the sky and having a minimum width of 6 m and a superficial plan area of not less than 93m², except that for residential occupancy, the external corridors for smoke free.

The proponent shall observe the regulation and ensure that any space planned for emergency exit will be well identified, labeled and not change its use in all project phases.

3.3.13 The Urban Planning (Use Groups and Use Classes), Regulations 2018

For the purposes of planning and the control of land use development, all uses of land and buildings are categorized in the use groups and use classes in the First Schedule

4.-(1) the planning authority may, under special permissible circumstances (Second Schedule); permit any use not classified under a separate use class in these regulations provided that such use is in the public interest.

5.-(1) the making of any change of use of any land or buildings from a purpose within any use class prescribed under Part I of these Regulations to the use thereof for any other purpose within the same use class shall not be deemed to be "development" as defined in section 2 of the Act

6.-(1) Change of land uses shall aim the following:-

(a) to maximize use of land and the existing infrastructure;
(b) to control urban sprawl;
(c) to allow for new investment;
(d) to create employment and income opportunities;
(e) to increase the number of good shelter; and
(f) to improve the environment.

The IRDP Miyuji Area site is on land area owned by The Institute of Rural Development Planning (IRDP) who has legal documents for ownership and the land has been surveyed and planned for Educational Purposes of use Group "K" and use classes (b) as defined in the Town and Country Planning (Development and Zoning) (Capital Development Areas) Regulations, 1979. The whole land covers total area of fifteen decimal points zero five six (15.056) hectares equal to 150,560m² as per title dead provided as appended in this EIS report which is in line with the requirement of the regulation.

3.3.14 The Urban Planning (Planning and Space Standards) Regulations, 2018

These regulations shall apply to all planning areas declared by the Minister under section 8 of the Act

Regulation 3 (vi), provide the minimum planning and space standards of education facilities in an university of number of students range from 1,000 to 10,000 shall be in area of range from 10ha to 100ha, where a proposed project shall be in area of 15.056hectares. The project site its area is reasonable and complies with requirement of regulations on area size.

3.3.15 The Urban Planning (Application for Planning Consent) Regulations, 2018

Regulation 5, where a scheme has been approved by the Director as required by regulation 17(1-3) and where the Director is satisfied that it is in the public interest that planning consent should be granted, so long as

(a) it does not conflict with the general intentions of the scheme
(b) it does not involve a substantial departure from the provisions of the scheme
(c) it does not injuriously affect the amenities of any adjoining land

Regulation 6, an application to be granted planning consent referred to under regulation 4 shall be made in writing by the Planning Authority to the Director for approval

Regulation 8, the Director shall consider an application under regulation 6 within thirty (30) days of the receipt thereof and may approve the modification as submitted or may modify it. Thereafter, within thirty (30) days of granting approval thereof the Planning Authority shall announce in any local newspaper circulating in the area and any other means to the effect that such modification has been approved.

In regard to project proposed site, the area is planned for Educational purposes which is according to the proposed project, so no any application consent will be made.

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

Regulation 2; is about application of the Regulations which is to all categories of electrical and electronic equipment wastes with respect to generation, collection, storage, transportation, importation, exportation, distribution, selling, purchasing, recycling, refurbishing, assembling, dismantling and disposal of electrical and electronic equipment waste or components, and their movement into or outside Mainland Tanzania.

Regulation 7(1) is about main objective of Regulations which is to provide for and promote proper management of e-waste to protect human health, and environment while ensuring sustainable development

(2) The specific objectives of these regulations shall be to-

(a) control the importation, exportation, transportation of e-waste;
(b) institute mechanisms for technology selection for guiding importation and use of electrical and electronic equipment that are friendly to human health and environment;
(c) facilitate generation of sufficient and reliable data on Electrical and Electronic Equipment and their waste;
(d) promote environmentally sound management practices and technologies on design, sorting, handling and use of Electrical and Electronic Equipment and their waste that will provide for on-site and off-site recovery and recycling, treatment, dismantling, storage (temporarily and permanent) and disposal means;

(e) strengthen regulatory regime and institutional capacity of the e-waste management;
(f) promote proper environmentally sound management of e-waste including handling, transportation, reuse, dismantling, refurbishing, recycling, treatment and disposal of such waste;
(g) promote public and private investment in environmentally sound management practices for electrical and electronic equipment and their waste in handling, storage, use, recovery, recycling and clean-up of the hazardous substances in their waste streams, treatment and disposal;
(h) institute mechanisms that prevent the importation of electrical and electronic equipment with short end of life and set standards for management and minimization of environmental pollution;

16-(1) a person shall not pack or store e-wastes in a container or package, unless the container or package in which that e-waste is to be contained, packed or stored meets international requirements approved by the Council.
(2) A container or packaging material provided for under sub-regulation (1) shall-
(a) be suitable for the particular e-waste applied for;
(b) not reactive with the e-waste; and
(c) capable of protecting human health and the environment.
(3) A container used in the storage of e-waste shall, after the life span of the container, be disposed of in accordance with these Regulations
(4) A person shall not sell or offer for sale a container which has been used for the carriage or storage of e-waste to any person other than a dealer in e-waste or a licensed person under these Regulations.

(5) A person who packs or stores e-waste contrary to these Regulations; or obtains or buys a container which has been used for the carriage or storage of e-waste to be used for any purpose other than carriage or storage of e-waste, disposes of or sells a container which has been used for the carriage or storage of e-waste to a person who is not licensed to handle-e-waste, commits an offence and shall on conviction be liable to a fine of not less than five million shillings but not exceeding ten billion shillings or to imprisonment for a term not exceeding twelve years or to both.

17 (1) A person shall not sell or offer for sale, use, pack, store or transport e-waste in a container or package, unless the container or package has been affixed with labels written in English or Kiswahili language specifying the following-
(a) identity of the e-waste;
(b) name and address of the generator of e-waste;
(c) net contents;
(d) normal storage stability and methods for safe storage;
(e) name and percentage by weight of other ingredients or half-life of e-waste material;
(f) warning or caution statements which may include some or all of the following as appropriate-
i. the word “WARNING” or “CAUTION” or “ONYO” or “TAHADHARI”;
ii. the word “DANGER! “KEEP AWAY” and “HATARI! KAA MBALI”; and

iii. a pictogram of a skull and crossbones

19.-(1) A person who intends to collect and transport e-waste up to one tone shall apply for a permit to the Minister by filling Form No. 1 prescribed in the Second Schedule to these Regulations and submit it to the city, municipal, district or town council environmental officer for scrutiny.
(2) A person who intends to collect or store or transport e-waste shall apply for a permit to the Minister by filling Form No. 1 prescribed in the Second Schedule to these Regulations and submit it to the Council for consideration.
(3) A person who intends to own or operate a plant or facility or site for treatment or recovery or recycling or refurbishing or dismantling or assembling or disposal of e-waste shall apply for a permit to the Minister by filling Form No. 3 prescribed in the Second Schedule and submit it to the Council for consideration.

The Proponents will observe the presence of the regulation for managing e-wastes to be generated from project operation by ensuring that electrical and electronic equipment to be installed at project site will have long working life and in case of damaged e-wastes recommended labelled vessels for e-waste collection will be at site to enable for collection and area for temporary handling e-waste will be paved, roofed and has band wall to avoid contamination with rainy water. Also recommended authorized dealer is the one who will collect e-waste from project premise to disposal.

3.4 National Development Plans and Related Strategies

3.4.1 Tanzania Development Vision (TDV) 2025

The National Development Vision is intended to guide economic and social development efforts in Tanzania up to 2025. For the country to undergo unprecedented economic transformation and development to achieve middle income status, characterized by high levels of industrialization, competitiveness, quality livelihood, rule of law; and an educated and pro-learning society. The TDV 2025 has identified enabling environment essential for the country to flourish economically, socially, politically and culturally. The Vision clearly states that the 21st Century will be dominated by those with advanced technological capacity, high productivity, modern and efficient transport and communication infrastructure. Construction of a four storey academic complex building at IRDP Dodoma Campus in Miyuji will support the Vision by unlocking the country's socio-economic growth potentials in the learning environment and facilities

3.4.2 National Plan Action to End Violence against Women and Children in Tanzania 2017/18 – 2021/22

The plan's mission is to prevent and respond to all forms of violence against women and children through comprehensive multi-sectoral collaboration at all levels. The mission aims to eliminate violence against women and children in Tanzania and improve their welfare. The proposed project has to comply with the plan by preventing all forms of gender-based violence, sexual harassment and abuse, promoting more women involvement in learning institution, employment, and avoiding the employment of children.

3.5 WORLD BANK ENVIRONMENTAL AND SOCIAL FRAMEWORK

The World Bank Environmental and Social Framework (ESF) is a set of policies and guidelines established by the World Bank Group to help ensure that the projects it funds are environmentally and socially sustainable. The World Bank's ESF covers a wide range of environmental and social issues, including biodiversity conservation, climate change, involuntary resettlement, indigenous peoples, labor and working conditions, pollution prevention, and community health and safety. It provides detailed guidance on how to assess and manage these issues within the context of World Bank-funded projects.

3.5.1 Objective of the Environmental and Social Framework

The proposed project will be developed and implemented according to the requirements of the World Bank Environmental and Social Framework (ESF). The ESF sets out the World Bank's commitment to sustainable development. The ESF protects people and the environment from potential adverse impacts that could arise from Bank-financed projects and promotes sustainable development. The ESF enables the World Bank and Borrowers to better manage environmental and social risks of projects and to improve development outcomes. The ESF also places more emphasis on building Borrower governments' own capacity to deal with environmental and social issues.

The ESF offers broad and systematic coverage of environmental and social risks. It makes important advances in areas such as climate change; labour standards; transparency; non-discrimination; social inclusion; public participation; and accountability - including expanded roles of grievance redress mechanisms. The ESF codifies best practice in development policies. It brings the World Bank's environmental and social protections into closer harmony with those of other development institutions; and encourages Client countries to use, and improve, their own national environment and social policies, when these policies are materially consistent with the ESF and supported by adequate implementation capacity. The ESF provides an incentive for countries to develop and build their own environmental and social policies and capacity.

3.5.2 World Bank Environmental and Social Framework (ESF), 2018

As per ESMF, 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 projectsThe applicability of each ESS in the proposed project is summarized in Table 3.1

Table 3-1 Application of World Bank's ESSs to the proposed project

ESSs	**Application (Yes/No)**	**Remarks/Description**
ESS1 Assessment and Management of Environmental and Social Risks and Impacts	Yes	The ESS1 calls for IRDP to undertake EIA study for the proposed a four-storey academic complex building to establish a mechanism to determine and assess future potential environmental and social risks. Also, the impacts during the implementation of the project. Set out mitigation, monitoring and institutional measures to be taken during operations of eco-friendly academic building. It also eliminates adverse environmental and social impacts, offset them, or reduces them to acceptable levels. The structure and contents of this ESIA study comply with the requirements of the ESS1. Application of the relevant requirements of the Environmental Health and Safety Guidelines (EHSGs). Avoid performing any activities result from material adverse environmental or social risks or impacts until completion of relevant plans, measures or actions according to the Environmental and Social Commitment Plan (ESCP).
ESS2 Labor and Working Conditions	Yes	• Workers will be contracted for the construction works and operation of the project. In order, to ensure fair treatment of workers, the project will ensure that terms and conditions of employment (hours, rest periods, annual leave, non-discrimination, equal opportunities and workers organizations) are aligned with the requirements of Tanzania law and ESS2. To protect workers appropriate Occupational Health and Safety (OHS) shall be applied to avoid the risk of ill health, accidents and injuries. • Project workers to be involved in the construction works to be paid as required by national laws and labour management plan (LMP).

ESSs	Application (Yes/No)	Remarks/Description
		• Written notice of termination of employment and details of severance payments to be given promptly. • There is a need to ensure equal opportunity and fair treatment to workers. • The project requires provision of appropriate protection measures and vulnerable groups of project workers, such as women, people with disabilities, migrant workers, and children (of working age according to the ESS2). • Forced and child labour must not be used in the project.
ESS3 Resource Efficiency and Pollution Prevention and Management	Yes	• The project activities will involve construction works which will generate dust, pollutant gases, noise, vibrations, erosion, wastes (solid and liquid) that will be properly managed via ESMP and EMoP. More or less similar impacts are likely to be experienced during operation phases and will be managed by the same tools as well as operation and maintenance plans. • Construction and operation activities need to implement measures for improving efficient consumption of energy, water and raw materials. • Construction and operation activities to avoid, minimize, and control pollutants' release by applying measures in EHSGs or in national laws. • Project to address potential adverse project impacts on human health and the environment and Generation of hazardous wastes should be avoided/minimized
ESS4 Community Health and Safety	Yes	• The project will not have substantial risk to community health and safety. Only localized negative impacts (like dust emissions, pollutant gases, vibration, noise pollution etc.) to sensitive receptors will need to be managed. • Also, community safety especially is an issue of concern due to the influx of the project workers, and later on participants of the project, which might lead to GBV/

ESSs	Application (Yes/No)	Remarks/Description
		SEA/SH, as well as transmission of HIV/AIDs and other communicable diseases. Guidance on HIV/AIDs, COVID-19, GBV/SEA/SH and HEET project GRM shall be followed. • There is a need for identification, evaluation and monitoring of the potential traffic and road safety risks to workers, affected communities and road users throughout the project life cycle. • Also, enforcement of the procedures such as driver training to improve driver and vehicle safety are inevitable. • Any direct or contracted workers hired to provide security to safeguard its personnel and property should assess risks brought to those within and outside the project site.
ESS5 Land Acquisition, Restrictions on Land Use and Involuntary Resettlement.	No	The proposed project at IRDP Dodoma Campus in Miyuji does not trigger land acquisition and involuntary resettlement. Existing undeveloped space within IRDP Campus will be used for construction activities. Raw materials such as aggregates will be sourced from existing and licenses quarries to avoid further resettlement issues.
ESS6 Biodiversity Conservation and Sustainable Management of Living Natural Resources	No	IRDP Campus is located in an urbanized area with highly fragmented habitats.
ESS7 Indigenous People/Sub-Saharan African Historically Underserved Traditional	No	This standard is not considered relevant as the project will mainly be implemented in areas where communities that meet the requirements of ESS7 are generally not available in the area.

ESSs	Application (Yes/No)	Remarks/Description
Local communities		
ESS8 Cultural Heritage	Yes	Applicable for the proposed project due to chance finds of physical cultural resources during excavation activities for new construction..
ESS9 Financial Intermediaries (FIs)	No	ESS is not relevant to the project.
ESS10 Stakeholder Engagement and Information Disclosure	Yes	• Undertake relevant consultations with all stakeholders throughout the project. • Keep a documented record of stakeholder engagement. • Develop and implement a Stakeholder Engagement Plan (SEP), which describes the timing and methods of engagement with stakeholders throughout the project. • Disclose project information to allow stakeholders to understand the risks and impacts of the project.

3.5.3 World Bank EHS Guidelines

The project proponent shall comply with the relevant requirement of environment, health and safety (EHS) of the World Bank Group (WBG). The World Bank Environmental Health and Safety General Guidelines containing quantitative limits and good international management practice to manage potential impacts.

Table 3-2 World Bank EHS Guidelines applicable

EHS Guideline	**Content & Relevance to IRDP Dodoma Campus Project**
General EHS Guidelines (2007)	These guide performance levels and measures that are generally considered in the achievement of new facilities by existing technology at reasonable costs. Application of the EHS guidelines to existing facilities may involve establishing site-specific targets, with an appropriate timetable for achieving them.
EHS Guidelines for - Air Emissions and Ambient Air Quality, 2007	Requirements of the guidelines have been incorporated in the analysis and management measures for emissions management during construction and operation phases of the proposed project at IRDP Campus. This provides guiding approach to managing significant sources of emissions, including specific guidance for assessment and monitoring of impacts.
General EHS Guidelines 3 Community Health and Safety (2007)	These address project activities implemented outside of the traditional project boundaries but that are nonetheless related to the project operations, including water quality and availability, traffic safety, transport of hazardous materials, disease prevention, and emergency preparedness and response.
EHS Guidelines: Waste Management Facilities (2007)	If significant waste management activity such as incineration is included in the project scope/design basis, leading to creating a separate waste management facility, the World Bank guidelines for dedicated waste management facilities could apply.
General EHS Guidelines 1 Environmental (2007)	It covers a range of environmental aspects that apply to most industrial development projects. The subsections are air emissions and ambient air quality, energy conservation, wastewater and ambient water quality, water conservation, hazardous materials management, noise and contaminated land.
WHO Ambient Air Standards	The ambient air quality guidelines specified in the Standard have been incorporated in the analysis and development of management measures to avoid or minimize human health risks.

3.6 SAFEGUARDS WORKING TOOLS

3.6.1 Environmental Safeguard Policy

These policies minimize adverse impacts on the environment as a primary area of safeguards. The objective of this group of policies are to ensure that the potential environmental impacts are identified, minimized and mitigated. Once the operational is screened one or more of these policies may be triggered.

3.6.2 Social safeguard policy

Social safeguard policies are intended to identify and mitigate the potential social risks including adverse social impacts of Bank financing projects.

3.6.3 Consultation and Access to information policy

Consultation and Access to information policy are governed by different environmental and social safeguards but are often linked since they are integral parts of the safeguards process. Requirement for consultation procedures are detailed under specific safeguard (e.g. ESS1, ESS10,) while a new environmental and social safeguard i.e. access to information details how information is provided about bank projects and activities.

3.6.4 Environmental and Social Management Framework (ESMF)

Given the nature of the activities to be supported under the project (particularly the buildings to be financed under the project), the World Bank environmental and social safeguard (ESS1) has been triggered. Specific project activities (such as the types of buildings, the scope of civil works, solid waste, water and waste water management process, among others) and site locations have not been clearly identified at the project preparation stage; hence the need for an ESMF that provides a general impact identification framework to assist project implementers to screen the projects and institute measures to address adverse environmental and social impacts. The ESMF documented all key potential environmental and social issues related to project implementation as per WB requirements. Preparation of this Environmental and Social Impact Assessment (ESIA) study report for a four-storey academic complex building at IRDP Campus trigger World Bank environmental and social safeguards on environmental and risk assessment (ESS1) and ESMF.

Overall Objective of ESMF is summarized as follows:

(a) Assessment of potential adverse environmental and social impacts commonly associated with the project implementation
(b) To establish clear procedures and methodologies for the environmental and social assessment, review, approval and implementation of subprojects to be financed under the project,
(c) To specify appropriate roles and responsibilities, and outline the necessary reporting procedures, for managing and monitoring environmental and social concerns related to project;
(d) To determine the training, capacity building and technical assistance needed to successfully implement the provisions of the ESMF; and

(e) To provide practical resources for implementing the ESMF.

3.6.5 RPF (Resettlement Policy Framework)

RPF establishes the resettlement and compensation principles and objectives, organisation arrangements and mechanism that will guide any resettlement operation and implementations to execute a fair compensation to Project Affected Persons (PAPs), should the need for resettlement arise. The principles are based on the both the WB ESS5 and Tanzanian National Laws and Regulation guiding compensation and resettlement. In case requirement in WB ESS5 and the Tanzanian laws are not in full agreement, the WB ESS5 standard will apply but for the proposed project at IRDP Dodoma Campus in Miyuji, resettlement policy framework does not trigger.

3.7 INTERNATIONAL AGREEMENTS AND CONVENTIONS

- ILO Convention; C148 Working environment (Air pollution, Noise and Vibration) Convention, 1977 (Ratified by United Republic of Tanzania on 30:05:1983) which protects workers against Occupational hazards in the working Environment due to Air pollution, Noise and Vibration.
- ILO Convention; C182 Worst Forms of Child labour Convention, 1999 (Ratified by United Republic of Tanzania on 12:09:2001)
- The Basel Convention on control of Trans-boundary Movements of hazardous wastes and their disposal of 1989.
- The 1991, Bamako Convention on the ban of the Import in Africa and Control of Trans boundary Movement and Management of Hazardous wastes within Africa was ratified in 1993 Tanzania is a party to the convention on climate change of 1992
- The 1977 Geneva Convention concerning the protection of workers against occupational hazards.
- The Vienna convention on the ozone layer prevention of 1985.

3.7 INSTITUTIONAL FRAMEWORK FOR ENVIRONMENTAL MANAGEMENT

The Tanzania ESIA practice gives different functions and responsibilities to all parties involved in the ESIA process of any proposed development undertaking to which ESIA is obligatory. The Environmental Management Act (EMA, Cap 191) give mandate NEMC to undertake enforcement, compliance, review and monitoring of environmental impact assessment and has a role of facilitating public participation in environmental decision making, exercise general supervision and coordinating over all matters relating to environment.

The Act empowers NEMC to determine whether the proposed project should be subjected to an ESIA, approves consultants to undertake the ESIA study, invites public comments and has the statutory authority to issue the certificates of approval via Minister responsible for environment. NEMC is currently the designated authority to carry out the review of ESIA including site visit and handling TAC meeting, monitoring and auditing of environmental performance of the project.

Table 3-3 Legal and Institutional arrangement

Level	Institution	Role and responsibility
National Level	Vice President's Office Division of Environment	• Approval and signing of EIA certificate, • To co-ordinate Environmental Management Policy, Environment Management Act and EIA guidelines. • To approve, sign and issue an Environmental Certificate. • To advise Government on all environmental matters. • To enforces and ensures compliance with the national environmental quality standards. • To provide policy direction and leadership in all matters, particularly those about hazardous waste management under the Environmental Management Act
	National Environment Management Council (NEMC)	• Project registration, approval of ToR, and ESIA review; • Environmental Monitoring and Compliance Auditing; and • Advise Government on all environmental matters.
	Ministry of lands, housing and human settlements development	• Authority over the national land including the project area, • Enforce law and regulations in the area of influence of the project
	Ministry of Education, Science and Technology (MoEST).	• To develop and implement Policies on Education, Research, Library Services, Science, Technology, Innovation, Skills, Training Development and their implementation; • To improve Basic Education Development through Teachers Training Accreditation and Professional Development; • Teachers' Professional Standards Development; • Schools Accreditation and Quality Assurance; • Development of Local Expertise in Science, Technology and Innovation; • Coordinates roles of Departments, Parastatal Organizations, Agencies, Programmes and Projects under the Ministry.

Level	Institution	Role and responsibility
	Dodoma Urban Water Supply Authority (DUWASA)	• Potable water supply and sanitation (sewerage) within the project area • Owner of the water supply and sewerage utility in the project site
	Occupational Safety and Health Authority (OSHA) under Prime minister office	• Issuing certificates of compliance, • Designated Authority for occupational safety issues • Registration of workplace
	IRDP Dodoma Campus	• Project investment and project cycle implementation, monitoring and auditing; Conducting ESIA study and follow-up on ESIA certificate • Land acquisition and payment of compensations • Paying of applicable taxes and charges, • Project operation and decommissioning
Project Proponent	World Bank	• Project financing • Ensure the project is carried out to the highest environmental standards strictly in accordance with the ESIA and the mitigation measures set out in the ESMF • Provide second line of monitoring compliance and commitments made in the ESMPs through supervision
Project Financial	Dodoma Region	• Oversee and advice on implementation of national policies at Regional level • Oversee enforcement of laws & regulations • Advice on implementation of development projects and activities at Regional level
Regional Level	City Council of Dodoma	• Oversee and advice on implementation of national policies at City level, • Oversee enforcement of laws & regulations • Advice on implementation of development projects and activities at City level

Level	Institution	Role and responsibility
Local Government Authorities & Communities	Ward Office and *Mtaa* Office at (IRDP Campus)	• Project monitoring (as watchdogs for the environment, ensure the well-being of residents) and participate in project activities • To extend administrative assistance and advice on the implementation of the project, • Managing the community's relations
	Local communities, NGOs, CSOs, FBOs	• Project monitoring (as watchdogs) • Provides assistance and advice on the implementation of the project, • Part of the project beneficiaries through employment opportunities, income generation and CSR projects

3.8 Indicative Permits, Licenses and Authorizations

In compliance with the legal and regulatory framework described in the previous sections, IRDP Dodoma Campus will be required to apply the following pertinent certificates, licenses and permits summarized in Table 3.4, if this arrangement has not been initiated. However, the list may not be exhaustive; hence, IRDP Campus in Dodoma is responsible to apply any other relevant permits from the responsible authorities.

Table 3-4 Legal certificates, permits to be secured

SN.	Required Certificate, Licence or Permit	Relevant Act/Regulation	Responsible authority	Remarks
1.	EIA Certificate	EMA No. 20, of 2004	VPO-DoE through NEMC	This report is part of the application
2.	Building permit: Obtain permission to commence construction works	Local Government Act (District Authorities), 1982	City Council of Dodoma	Obtained before commencing construction
3.	Fire and Rescue Certificate	Fire and Rescue Act, No. 14 of 2007	Commissioner General of Fire and Rescue Force, Ministry of Home Affairs	To be acquired during operation phase
4.	Certificate of Registration of Workplace	Occupational Health and Safety Act, 2003, S. 15-17	Occupational Safety and Health Authority (OSHA)	To be acquired before commencing construction

S N.	Required Certificate, Licence or Permit	Relevant Act/Regulation	Responsible authority	Remarks
5.	Workplace Compliance Certificate	Occupational Health and Safety Act, 2003, S. 15-17	Occupational Safety and Health Authority (OSHA)	To be acquired during operation phase

Source: IRDP on September 2023

3.9 Key Players in Proposed Project Implementation

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 Government of the United Republic of Tanzania and World Bank,
ii Institute of Rural Development Planning (IRDP),
iii The Consultants (ESIA, Building Design and Archtectural Drawing, Construction Supervisor, and
iv The Contractor.

3.9.1 Government of the United Republic of Tanzania 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.

3.9.2 PIU of Institute of Rural Development Planning (IRDP)

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). IRDP 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. The PIU is guided by management meetings that are chaired by the Rector (Head of Institution). The management meetings provide support, guidance and oversight of the progress of the PIU. In general PIU consists of Environmental Expert, Gender and Social Specialist, Civil Engineer, Planning Expert (Overall Coordinator), Occupationa Health and Safety Expert and Special Needs Expert. The PIU team is responsible for the implementation of the proposed project.

3.9.3 The Consultants (ESIA, Building Design and Archtectural Drawing, Construction Supervisor

The project Consultants will be responsible for project preparation in early stages (ESIA study and design of the building) as well as project implementation stages (construction and supervision). The Consultants shall ensure compliance of EIS and ESMP. The Consultant shall have a 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.

3.9.4 The Contractor

The project will be implemented by a Registered Contractor by CRB 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 management 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 IRDP 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.

CHAPTER FOUR: BASELINE CONDITIONS OR EXISTING CONDITIONS

4.1 INTRODUCTION

This chapter provides a description of relevant environmental characteristics of the project core area and areas in the immediate vicinity (IRDP Dodoma Campus area at Miyuji Proper *Mtaa* in Miyuji Ward) and within the area of influence (mainly Dodoma City and Dodoma Region). The level of details in the various sections depends on the interactions between the project activities and the particular environmental aspect. Information provided in this chapter will be superimposed onto the project concept and components for impact identification, evaluation and development of mitigation measures.

4.2 Administrative unit

The City Council of City Council of Dodoma is one of the seven districts of the Dodoma Region of Tanzania. City Council of Dodoma is administratively divided into one parliamentary constituency, 4 divisions, 41 wards, 18 Streets *(Mitaa*), 180 mitaa and 89 hamlets. Miyuji is among the 41 wards in City Council of Dodoma made up of three *mitaa* which are Miyuji proper, Mpamaa and Mathias. The proposed project site is located within Miyuji Proper *Mtaa*.

4.3 Geographical location

The City Council of DodomaCity Council of Dodoma is located in the middle of the Country. It is boarded by Chamwino district in the East and Bahi district in the West. It lies between Latitudes 6.00º and 6.30º South, and Longitude 35.30º and 36.02º East. It is 456 kms to Dar es Salaam and 426 kms to Arusha (**Source:** City Council of DodomaCity Council of Dodoma: Socio-Economic Profile, 2018).

Miyuji Ward is bordered by Msalato to the Northern side, Nzuguni to the Eastern side, Dodoma town centre to the South and Mnadani Ward to the Western side.

The proposed project site for construction of four storeys academic building is located at Miyuji Proper *Mtaa*, Miyuji Ward, City Council of DodomaCity Council of Dodoma in Dodoma Region. The proposed project site lies between latitude 6.104407º South of the Equator and longitude 35.756210º East of the Greenwich Meridian. The proposed site is bordered by hostel to the Northern side, lecture theater (ongoing construction) to the western side, rough road, commercial and residential buildings to the Eastern side and open area to the southern side.

4.4 Climatic condition

The climate of Dodoma is semi-arid, characterized by a marked seasonal rainfall distribution with a long dry and short wet season, an average annual rainfall of about 550 – 600mm per year, which falls between December and

April each year. The average temperature varies from 20°C in July to 30°C in November each year.
The climate of the project area is identical to the overall climate of the City Council of Dodoma. The average air temperature ranges from 16°C (lowest) in June/July to 36°C (highest) in November.

4.5 Topography and Land forms

The City Council covers an area of 2,769 square kms. It is characterized with both Urban and rural qualities. It stands on broad upland plateau with an altitude ranging between 900-1000 meters above sea level, with beautiful stony hills such as Image, Isanga, Mkalama and Mlimwa. It experiences a long draught and short rainfall seasons. Due to unreliable rainfall, the area has scanty vegetation such as shrubs, grasses as well as conspicuous baobab and acacias trees. There are seasonal rivers, deep and shallow wells including dams in few areas.

Miyuji Ward area is relatively flat with valleys that form seasonal rivers, deep and shallow wells including Ilamba la Miyuji dam. The proposed project site area is relatively flat.

4.6 Soil

The soil was observed to be of low fertility, deficient in organic matter, moderate to poor in permeability and of shallow depth. Salt content is generally high and, in some areas, salt pans form under the top soil. Surface soil crusting is common.

The majority of soils would be classified as silty-sandy mixes with a trace of clay, very dense, compacted, lightly permeable and no-plastic. There are a few deposits of sandy-silty clays and in some areas pure cracking clay deposits can be found. The permeability of the soil exhibits great local variations depending mainly on the clay content. The soil of the proposed project site area is sandy-silty clays.

4.7 Hydrology

City Council of Dodoma has seasonal rivers, deep and shallow wells including dams in few areas (**Source:** City Council of Dodoma: Socio-Economic Profile, 2018).
Miyuji Proper *Mtaa* where the proposed project site area is located, there are deep and shallow wells including Ilamba la Miyuji dam. It should, however, be noted that the proposed project site is not close to any major water sources.

4.8 Biological Environment

4.8.1 Flora

Vegetation in the sub-urban area is characterized by bush or thicket type. Depressions, which are seasonally inundated *mbuga* (areas with impeded drainage) support grasses to form grasslands and sometimes a mixture of grasses and woody plants. These are the wooded grasslands. Woodlands are observed as patches on many hills in Dodoma (**Source:** City Council of Dodoma: Socio-Economic Profile, 2018).

The project area has scanty vegetation due to unreliable rainfall. The project site area is well cleared and covered by few scattered trees including Miti Maji ***Trichilla emetica***, Acacia and baobab. The project site area is not a protected area, it is surveyed and planned for institution uses and all vegetation found within area intended for project implementation can be replaced if disturbed during project implementation.

4.8.2 Fauna

City Council of Dodoma is urbanized municipal center and there virtually no game species. The ecological setting of the larger part of the municipality does not allow wildlife game species to flourish (**Source:** City Council of Dodoma: Socio-Economic Profile, 2018). There are few birds, and reptiles such as lizards and a significant number of butterflies, grasshopper and ants were observed on proposed project site.

4.9 Population

According to the national population and housing census of 2022, City Council of Dodoma had a population of 765,179 of which 373,440 are males and the remaining 391,739 are females. The average household size is 3.6 persons per household. The Municipality has experienced a slight population increase from 410,956 in 2012 to 765,179 in 2022.

Miyuji Ward had a population of 36,588 people, of which 17,531 are males and 19,057 are females, the average household size of 3.6 persons per household (Source: Population and housing and Settlement census 2022). The ward tends to experience significant population increase during IRDP study period. Currently, IRDP 40 acres campus had a population of 1,528 people, of which 1,474 are students, 36 IRDP staffs including teaching and non-teaching staffs, 11 cleaners and 7 SUMA JKT security guards (Source: IRDP Administration, August 2023).

The proposed project will result to increased population in Miyuji proper *Mtaa* and Miyuji Ward in general. The increased population will depend on social services, food and accommodation within Miyuji Ward area hence, benefit the existing population.

4.10 Ethnicity and Family Structure

While the original inhabitants of the Municipal are believed to be the Wagogo and Warangi there are now a quite good number of mixed tribes from neighboring regions; this is due to trade and cultural relationships in the area (**Source:** City Council of Dodoma: Socio-Economic Profile, 2018). Miyuji ward and Miyuji Proper *Mtaa* accommodate many people with different ethnic groups due to existence of education institutes, health facilities and business opportunities.

The family structure in the project vicinity comprises both polygamous and monogamous systems. Men as the heads of households, are responsible for providing food security to family members, family caring including the provision of required services to the family. However, some families are female-headed households with different reasons such as the husband's death, divorce, and others are not married at all.

The proposed project will provide employment to the surrounding community in the Miyuji Ward and Miyuji Proper *Mtaa* area hence will improve the ability of some residents to provide services in their families.

4.11 Land tenure and Land use

City Council of Dodoma is an urban area that covers an area of 2,769 square kilometers. The Council has a mixture of land tenure system including human Settlements, commercial, Institutions, Industrial and agricultural/livestock keeping. About 71% of the total area is suitable for agricultural production. The estimated area for food crop production is 107,249 hectares and about 49,304 hectares are for cash crops production. The rest of the land is subdivided into grazing land (39,447 hectares), forest reserves (30,046 hectares), open land (11,362 hectares) and urban area covers 39,492 Hectares (**Source:** City Council of Dodoma: Socio-Economic Profile, 2018).

The largest land area of Miyuji Ward is covered by residential/settlement followed by private and government institutions (i.e; Institute of Rural Development Planning (IRDP), City Collage of Nursing, St. Gemma Hospital, Tunza Dispensary, primary and secondary schools), commercial, agriculture and livestock keeping. The common land tenure is acquired through inheritance and purchasing, only 20% of the population obtained the land through inheritance and the remaining 80% acquire land through purchasing. About 60% of the land owners at Miyuji Ward have title deeds while the remaining 40% of the land owners have no title deeds (**Source:** *Mtaa* Chairperson, August 2023).

Institute of Rural Development Planning (IRDP), has an area of 40 Acres with a title deed and occupied by various existing land use development including

administration block, student hostels and ongoing construction of lecture halls and canteen. The main land uses adjacent to IRDP comprises of Private institution, Commercial and Residential areas.

4.12 Housing Condition

Housing density distribution varies from one ward to the other by being determined by kind of activities taking place in that particular ward/area. The central part of city has high-density houses because it is the commercial/business area, offices, as well as residential (**Source:** City Council of Dodoma: Socio-Economic Profile, 2018).

Miyuji Ward and Miyuji proper *Mtaa* is accommodated by houses constructed by using cement bricks with iron sheet roofing/ or tile roofing. The existence of IRDP 40 Acres campus motivate most of residents to construct high standard houses for renting businesses.

4.13 Economy service

During the study, it was revealed that 10% of residents in Miyuji Ward are employed in public sector, 30% in private sector, and the remaining 60% are self-employed engaged in petty traders, business, small-scale agriculture, handcraft, transport business, livestock rearing, and others depend on renting business. Mostly, women are engaged in small scale agriculture producing fruits and vegetables such as tomatoes, eggplants, okra, cucumber, green pepper, Chinese cabbage, pea leaves and spinach, and food vendors while youth are engaged in construction works, hand craft and transport businesses.

The implementation of the proposed project will increase employment opportunities to many youth and women at Miyuji Ward area.

4.13.1 Agriculture

Miyuji Proper *Mtaa* has deep and shallow wells including Ilamba la Miyuji dam that play a vital role in agriculture as it acts as sources of water for horticulture crops production. The proposed site is not located near water sources.

During project implementation, food vendors and food crops sellers will benefit from the proposed project as construction workers will obtain their food from within the project area.

4.13.2 Livestock Keeping

Miyuji Ward residents are engaging in urban livestock keeping. During the study, it was revealed that zero-grazing is the most preferred option of feeding livestock due to absence of large grazing land. Livestock such as cattle, goats, sheep, pigs and poultry are kept by most of the ward residents. Livestock keeper will benefit from the proposed project as construction workers will obtain dairy milk, eggs and meat from within the project area.

4.13.3 Industries

Miyuji Ward has few small-scale industries including Sunflower oil processing, carpentry, welding, garages, maize milling, food processing, electrical works and civil works. The proposed project will stimulate industrial production and attract new investors in the area.

4.13.4 Trade and Business

There are no entrepreneur/commercial activities carried out at the IRDP 40 Acres campus, all students and staffs depend on off campus services. Due, to that a large number of commercial activities such as bar, restaurant, fruits and fresh juice kiosk and mobile money services (Airtel Money, Tigopesa, Halopesa and M-Pesa) are carried out around the campus area. During the proposed project implementation these entrepreneurship activities and commercial establishments will benefit as most of the construction workers will be getting food, fruits, drinks and mobile money services from them.

4.13.5 Fisheries

Very few populations of Miyuji ward residents do engage in fish farming. More effort is needed to sensitize and train the community on fishing activities by using water sources in their area and have a new source of income to meet their daily needs and improve socio-economy of the area.

4.13.6 Mining

There is no mining quarry in Miyuji Ward but few residents are employed in this sector. The proposed project will benefit this sector by utilizing building materials extracted from legalized quarry for construction activities.

4.13.7 Forestry

Dodoma City has about 68,392 ha of forests comprised of forest reserves and greenbelt forest. These include *Adousonia digidata*, *Acacia species*, *Dalbergia nulano xylon, Terminalia species*, *Euphorbia triculi*, *Mangifera Indica, Ficus species* and many others. Most of these are used for different purposes such as firewood, medicine, construction and fruits. The Greenbelt forest includes natural forests and exotic species. This forest surrounds City Council of Dodoma through Ihumwa, Zuzu, Bahi - road and Arusha-road. Most of the enriched species in this forest are; *Leucaena lucocephala*, *Azadrachita indica, Adansoniadigitata and Syzigium cuminii* (**Source:** City Council of Dodoma: Socio-Economic Profile, 2018).

4.13.8 Beekeeping

Zuzu and Ng'hong'hona were among the potential areas for bee keeping in the City. The City had about 11,938 beehives supporting self-employed residents in the area to earn considerable amount of income through selling wax and honey. The farmers lacked capacity to practice modern beekeeping. Instead, they practiced traditional processing, which does not attract international markets (**Source:** City Council of Dodoma: Socio-Economic Profile, 2018).

Beekeeping offers an easy possibility for the poor and landless farmers to gain income as it requires minimal start up investment and area. Beekeeping also supports agricultural production, forestry, and maintenance of biodiversity and natural resources through pollination services. Thus, if well addressed and managed, community can make the most of the potential of beekeeping to provide income for families and communities and to contribute to socio-economic development in general.

4.13.9 Financing facilities

Financial facilities are essential for trading activities in any City. These provide for access to credit and facilitate management of business plans for institutions and individual businessmen and women. There are 14 banks operating in the City including CRDB, NMB, NBC, BARCLAYS, Postal Bank, DCB, EQUITY, DIAMOND TRUST BANK, BOA, ABC, UTT, FINCA ACB, TWIGA BANCORP and Women Bank.

4.14 Social Services

4.14.1 Health Services

Miyuji Ward residents obtain health care services from health centers, dispensaries and hospitals. There is one Council Designated Hospital (St Gemma), 2 health centres in which one is owned by the Government and the other one is privately owned, and two dispensaries owned privately (**Source:** VEO, August 2023).

IRDP 40 acres campus has no health facility, but obtain the health services from the IRDP main campus health centre and St. Gemma hospital (nearby) (**Source:** IRDP Assistant Dean of Student, August 2023).

The consultation with IRDP health centre officials, revealed that top ten frequently occurring diseases are Acute respiratory infection (ARI), Urinary Tract Infections, Skin infections, anemia, stomach ulcers, Diarrhea, eye diseases, Pneumonia, Intestinal worms and Malaria. HIV/AIDS cases are not high among 100 patients only one is HIV positive. Also, it was revealed that IRDP students and staffs are provided with Family Planning, sexual relationships, condom uses, HIV/AIDS and STDs awareness training programme as well as voluntary HIV testing twice per semister and free condoms are provided through boxes allocated within the campus.

During the meeting with Ward and *Mtaa* Council, it was revealed that IRDP administration and contractor should work closely with Ward and *Mtaa* Office during project implementation and provide HIV/AIDS and STDs awareness training to IRDP students and staffs, construction workers and surrounding community in order to control sexual interaction and prevent new infections.

4.14.2 Water supply

Most of Miyuji ward residents depend on water supplied by DUWASA (Dodoma Urban Water supply and Sewerage Authority) and only 10% of the total population have boreholes.

The consultation with Miyuji Proper *Mtaa* and two members revealed that, most of *Mtaa* residents depend on water supplied by DUWASA (Dodoma Urban Water supply and Sewerage Authority) and few residents are supplied by private organization (congregasionne preciossissimo sangue) (CPPS) water project. The water project has 62 members and the project stopped adding new members in 2012, for the new member to join into the project should replace the existing member who fail to pay bills and removed from the project.

IRDP 40 Acres campus depend on water supplied by DUWASA (Dodoma Urban Water supply and Sewerage Authority) and borehole. Also, for the anticipated water demand there are water storage tanks.

4.14.3 Drainage system/storm water drainage

Miyuji ward is not connected with sewerage system. Most of the residents (70%) use flash toilets that direct wastewater to the septic tank and soak pits and 30% of the population use latrine pits when are full Municipal and/or private Liquid waste truck empty them and dispose to approved wastewater treatment pond located at Swaswa area.

IRDP 40 Acres campus use septic tank and soak pits for collection and pretreatment of wastewater from toilets and bathrooms. During project implementation, the contractor will be required to have temporary toilets for construction workers (**Source:** Assistant Dean of Students, August 2023).

4.14.4 Education and literacy

Miyuji Ward has 15 primary schools of which 2 are Government owned and 13 are owned by religious and private organization. There are three secondary schools in the ward which are privately owned and one centre Cheshire for people with disabilities. Moreover, there are two registered collages and university which are Institute of Rural Development Planning and City Collage of Nursing (**Source:** VEO, August 2023).

Currently, IRDP 40 Acres campus amounts to 1,474 students of which 762 are males and 712 are females. The proposed project for expansion of IRDP 40 Acres campus is expected to enroll more students.

4.14.5 Energy source and supply

Miyuji Ward is supplied and connected with electricity from National hydroelectric power grid (TANESCO); most of the population use it for lighting and run machinery and equipment while charcoal and gas used for cooking. Standby generators and solar power used as a backup power source.

There are electrical lines passing through the project site area and existing buildings including: administration block and student hostels are connected to the services. Also, there is a generator with capacity of 230 V used to run microphones in the classrooms when there is power cut.

4.14.6 Solid Waste generation and management

Dodoma Municipality is estimated to generate 278 tons of Solid Waste daily from different sources as follows: Domestic and Commercial – 178 tons, Institution 70 tons, Industries 30 tons and164 tons of solid waste is from urban proper.

The capacity of Council to remove solid waste is only 74 tons out of 164 tons which generated in City Centre per day which is 45%. The Council is using only 2 old refuse vehicles; I tractor and a wheel loader to remove the generated solid waste in the centre. It is well known that Solid Waste Management is part and parcel of environment hygiene, which needs to be integrated with total environmental planning.

The maximum of handling, collection, storage, treatment and disposal can lead to reduce health risk. The remaining waste which is about 54% of daily waste generated may direct or indirect be associated with disease and health risks in the municipality. Under the Tanzania Strategic Cities project the council is expecting to get several vehicles and machines which will ease the refuse collection work to the council (**Source:** City Council of Dodoma: Socio-Economic Profile, 2018).

The consultation with Environmental Management Officer from City Council of Dodoma revel that, all solid wastes generated within the Council are collected and sorted, health care wastes are incinerated, plastic wastes taken by plastic recycling plants and the rest disposed to Chidaya Sanitary facility. Also, other wastes such as hazardous wastes including oil are taken by recognized contractors for proper disposal. The Municipality is responsible for supervising the franchisees involved in Solid Waste Management.

Solid wastes generated at Miyuji Ward mainly are domestic, commercial and health care wastes. All wastes generated by households, shops and food stalls/kiosks are taken by City Council truck to Chidaya Sanitary facility three times per month others are disposed in open pits at the households while health care wastes are incinerated.

Solid wastes generated at IRDP 40 Acres campus include sanitary pads, papers, boxes, plastic bottles and plastic wrappings of which are collected in dustbins strategically located within the campus. Plastic bottles and wrappings are taken by local plastic waste collectors then taken to recycling plants, sanitary pads, boxes and paper are burnt in open pits at the campus area. There are no organic wastes including food remains since there is no

canteen at the campus and all IRDP students and staffs obtain the service off campus.

The operation of the proposed project will lead to generation of various solid wastes in each development stage. The proponent and contractor will ensure that there are designated solid waste collection facilities and point onsite. All solid wastes generated will be collected, sorted and taken to the designated dumpsite by contracted licensed solid waste handler.

4.15 Economic infrastructure

4.15.1 Road network

Dodoma City has a road network length of 917.34 km. This includes Tarmac road 105.91 km, Gravel 227.79 km and Earth 583.64 km. Of these, 902.56 km is passable throughout the year while 14.87 km is not passable most of the year, particularly during rainy seasons. The main mode of intermediate transport is by motorcycle (bodaboda) followed by minibuses and then the main conventional ones such as buses. In their absence, using of bicycle, walking and head loading are the commonest mode of travel and transport in the City (**Source:** City Council of Dodoma: Socio-Economic Profile, 2018).

IRDP 40 Acres campus is accessed through a gravel road and within the campus area there are feeder earth roads used by IRDP 40 Acres community.

4.15.2 Railway

Dodoma City is well connected with most areas through the central line which is a major railway line in Tanzania. It runs west from Dar es Salaam to Mwanza and Kigoma. In the City, there are three railway stations at Zuzu, Kikombo and Dodoma town (Tambukareli). However, services provided by the Railway Corporation have not been impressive due to number of factors including having old facilities and detonating infrastructure and managerial problems (**Source:** City Council of Dodoma: Socio-Economic Profile, 2018).

4.15.3 Air transport

There is one operating airport in the City at Kiwanja cha ndege Ward. A Mission Aviation Fellowship Company (MAF) and other undetermined air service providers mostly provide the air services. The air services are not used commercially effectively since the business has not captured well the market. However, in most cases the airport serves well for Government business when top Government officials visit the capital of Dodoma. Plans are underway for designing and construction of Dodoma International Airport at Msalato. Compensation has been affected and designs are in progress. There is also an airstrip at Hombolo that is privately used by the Catholic Missionaries (**Source:** City Council of Dodoma: Socio-Economic Profile, 2018).

4.15.4 Communication network

Dodoma City has good communication services. There are several service providers offering postal services, telephone lines, Internet, radios, TVs and newspapers. Key service providers include: Airtel, Vodacom, TTCL mobile, Tigo and Halotel. Radio stations include: RTD, RFA, KISS FM, Nyemo FM, Dodoma FM, RADIO MWANGAZA FM, RADIO ONE, East Africa Radio, Capital Radio FM, Kifimbo Radio FM, RASS FM, Clouds FM and RADIO UHURU. The provided services have been important in terms of social and economic prosperity of the City, particularly the use of online payment systems.

The City has access to TV stations namely Television ya Taifa, Independent Television, Star Television, Agape Television Net Work and Channel Ten. Common newspapers in the City include Mwananchi, The Guardian, Uhuru, Mtanzania, Mzalendo, Tanzania Daima, Daily news, The Citizens and East African newspaper (**Source:** City Council of Dodoma: Socio-Economic Profile, 2018).

Miyuji Ward and Miyuji proper *Mtaa* is well connected and serviced with all mobile communication network, Televison and radio channels.

4.15.5 Police and Judiciary services

Miyuji Ward obtain police services at the posts nearby including Nzuguni and Makutupora, also Police central. IRDP 40 Acres campus depend on police services from Nzuguni and Makutupora posts. Moreover, they work closely with gender desk from Police central.

4.16 Gender-Based Violence (GBV), Women and Children Vulnerability Issues

4.16.1 GBV Context at Country, Regional and Municipal Levels

Results from the consulted stakeholders show that, community awareness on GBV and VAC is widespread in the City of Dodoma including City Council of Dodoma, Miyuji Ward and Miyuji Proper *mtaa* where the proposed project is located as well as Tanzania in general. They mentioned several forms of GBV, including intimate partner (psychological, or sexual harm/beating to those in the relationship), Neglect, Sexual violence, Emotional violence, economic violence, divorced leading to family separation as results children lack parental care and support, Child Sexual Abuse (CSA) mainly rape and sodomy, early marriage, and early pregnancies. It was revealed that most of GBV and VAC cases start at the family level (family members and house helper are the one committing these acts) hence, are not reported to the relevant authority due to negligence, hiding secrets and fear of social isolation and/or violation of traditional norms.

Tanzania Gender Assessment 2022, shows that 40% of all women aged 15 - 49 years have experienced physical violence, while 17% have experienced

sexual violence and 44% have experienced either physical or sexual violence by an intimate partner. Spousal violence prevalence is highest in rural areas, averaging 52% while the prevalence in urban areas averages 45%. Almost 30% of girls experience sexual violence before the age of 18. VAC also remains a serious issue whereby 75% of children experienced physical violence by a relative before the age of 18 years, and more than half of females aged 13 – 17years experienced physical violence in the past year. In Tanzania, GBV and VAC have become major problems due to negative cultural beliefs and practices, existing gender norms, and economic, social and gender inequalities.

The consultation with Project Officer from NGO-Network for Dodoma revealed that, most of construction projects conducted in the Dodoma City are done by foreigners and people from outside Dodoma Region. These contractors and construction workers use their power and money to sexually harass young girls and women in the project areas. Also, poor economic situation of most of families in Dodoma City leads to young girls and women engage in prostitution within the project area and results to early and/or unwanted pregnancies, children abandonment and neglect.

The consultation with DCC Social Welfare Officer disclosed the presence of a wide range of GBV and VAC in the Council caused by increased population influx in the Dodoma City and bad economic situation that leads to men to abandon their families and the burden of raising those families remains to women alone. The presence of colleges and universities with good number of people also lead to increased number of abandoned and discarded children mostly are found dead and few of them are alive. She mentioned several forms of GBV including intimate partner (psychological, or sexual harm/beating to those in the relationship), Sexual violence mainly rape and sodomy, emotional violence, economic violence, rejection/neglect and divorce. The form of GBV that occurred in high rate and women are mostly affected with is beating, economic violence and abandonment. Also, she said that Violence Against Children cases have increased, and these children experience Child Sexual Abuse mainly rape and sodomy from close family members and people they trust in families, schools, school buses and worship houses. Other forms of VAC are early pregnancies, early marriage, beating, emotional violence, rejection and neglect especially to those raised by one parent. The Table below presents a summary of GBV and VAC cases at the City Council level.

Table 4-1: Summary of GBV and VAC cases at the City Council level

Year	**Type of GBV and VAC Cases**	**Category of GBV survival in terms of age and gender**					
		Old Age (below 18 yrs)			**Children (18yrs and above)**		
		Male	**Female**	**Total**	**Male**	**Female**	**Total**

2021/2022							
	Early pregnancies	0	207	207	0	0	0
	Early marriages	0	25	25	0	0	0
	Sexual (Sodomy and Rape)	21	51	72	0	16	16
	Physical violence	1	2	3	7	85	92
	Abandoned	25	57	82	0	105	105
	Economic violence	0	0	0	0	70	70
	Emotional violence	10	14	24	30	69	99
	Total Overall	**57**	**356**	**413**	**37**	**345**	**382**
2022 – June 2023							
	Early pregnancies	0	138	138	0	0	0
	Early marriages	0	15	15	0	0	0
	Sexual (Sodomy and Rape)	12	18	30	0	10	10
	Physical violence	0	0	0	15	187	202
	Abandoned	45	55	100	0	196	196
	Economic violence	0	0	0	0	5	5
	Emotional violence	1	1	2	0	40	40
	Total Overall	**58**	**227**	**285**	**15**	**438**	**453**

Source: Social welfare office at City Council of Dodoma, August 2023

4.16.2 GBV and VAC Context at Ward and *Mtaa* Levels

The consultation with Acting WEO and Miyuji Proper Mtaa chairperson revealed that, GBV cases mainly beating occurred in high rate at Miyuji Ward, most of men are beating their wives. Other form of GBV are sexually harassment, emotional violence and economic violence. Violence Against Children cases are in low rate and usually they receive cases of sexually abuse among children themselves mostly aged 5 – 10 years who are cancelled and whipped not to do it again. Moreover, they revealed that no cases on GBV and VAC against IRDP students has been reported may be due to low population at IRDP 40 Acres campus.

4.16.3 Existing Support System and Service Providers

Consulted stakeholders from Municipal to *Mtaa* level plays a great role to help the victims of GBV and VAC. Most services provided by the government and CBOs/NGOs in the project vicinity comprise legal support services, GBV and VAC awareness education, economic empowerment in the form of groups, and creating the center for caring survived-children and giving them basic needs including education, as well as the formation of gender desks in primary and secondary schools, colleges and universities and police stations making frequent fall-up to GBV and VAC cases. Consultation with City Council of Dodoma Social Welfare Officer reveal that there are 41 Wards in the City Council of which each 3 wards are attended by one social welfare officer who is responsible to provide GBV and VAC awareness education to schools, motorcycle business centres, councilors meetings, public meetings, churches and mosques. Also, the DCC Community Development department has a radio shows every week at Maisha and Dodoma FM radio stations to provide GBV and VAC awareness education to the community. Moreover, it was pointed out that, there are centres for caring survived children in Dodoma City and the Community Development department working together with police gender desks to ensure that all GBV and VAC cases (e.g. physical violence, economic violence, rape and sodomy) are taken to the court and the accused get the right punishment.

At City Council, ward and *mtaa* level the system of handling GBV and VAC is clearly organized; the entry point for a help seeker is often the lowest-level representative, Street/*Mtaa* leader. Depending on the type of GBV and VAC case, usually GBV victims/survivors and abused children report to their local leaders (*Mtaa* Executive Officer (MEO)/*Mtaa* Chairperson primarily for advice and marital reconciliation services. In case the issue is not resolved, they make their referrals to the Ward Social Welfare Officer and afterwards to the Municipal level (Social Welfare Officer) and/or police Gender Desk. Victims may also pursue help (legal and counselling support) from existing CBOs/NGOs within the project area. This process is summarized in Table 3 below.

Table 4-2: Existing GBV and VAC service provider and support system in the project area

SN	Level	Relevant official	Role and responsibilities related to GBV
1.	*Mtaa*	*Mtaa* Executive Officer (MEO) and *Mtaa*	(i) Advice and counselling (ii) Marital reconciliation/mediation, including suggesting compensation (iii) Provide a referral letter toward (Ward Social Welfare Officer) (iv) Provide referral letter to Police

SN	Level	Relevant official	Role and responsibilities related to GBV
		Chairperson	Post –mainly for cases such as rape, sodomy, beating, early pregnancy for students/young girls (below 18 years)
2.	Ward	Ward Social Welfare Officer	(i) Advice and counselling (ii) Marital reconciliation/mediation, including mandating compensation, (iii) Provide a referral letter to Gender Police Post (UDSM) (iv) Mandate to convene and hear a case (v) Make a referral to Municipal Social Welfare Officer
3.	City Council	Social Welfare Officer	(i) Advice and counselling (ii) Reconciliation/mediation, including negotiating family/child support (iii) Mandate payment of compensation (iv) May offer exemptions for medical bills/other payments (v) Provide referral letter to police/court
4.	Police post	Police	(i) Provide PF3 to GBV and VAC survivor for investigation and medication (ii) Catching criminal and taking to the court
		Gender desk	1. Advice, Counselling and mediation and 2. Provide a referral letter to the court
5.	Court	Magistrate	(i) Resolution of the problem (judgment)
6.	CBOs/NGOs	-	Legal support, Counselling, Child care and protection, economic support to GBV survival (e.g. forming VICOBA) and re-unification of abused children with their families.

Source: Fieldwork, August 2023

4.16.4 The Context of Gender Based Violence (GBV) at IRDP

Gender based violence is a serious violation of human rights and a complex problem in many educational institutions which can affect both men and women including students, staff and non-staff workers. The consultation with IRDP department of students' affairs (IRDP gender desk member) revealed that, the university has Gender desk of which complaints regarding staff, non-staff and students including GBV related cases have been reported and solved. An in-depth discussion with the Dean of Students and his assistant, the reported GBV cases are those that happened in the IRDP campus which involve;

i. IRDP students (student against the student) and
ii. IRDP student against non-staffs.

The form of GBV cases that occurred at the campus are abandonment and neglect/rejection of pregnant girls' students by their partners, fights for suitors, economic violence and abandonment, neglect and rejection of students by their parents.

Also, they revealed that most of cases occurred are not officially reported and for the reported cases victims are not cooperatives. Moreover, several measures have been taken to end various forms of GBV (as mentioned above) including giving warnings, relocating students to other rooms, providing gender, HIV/AIDS and STDs, safe sexually relationship and family planning awareness educations, cancelling, general awareness and adherence to the institute's rules and regulations. Moreover, free condoms are provided at the campus premises.

Table 4-3: The Context of GBV forms, effects and handling mechanisms at IRDP

SN	Forms/Key dimension of GBV	Number of reported	How happened	Year	Effects	Handling mechanism and resolution
1.	Abandonment, neglect and rejection of pregnant girls' students	1	A certificate female student and last year degree male student were in relationship, when a girl got pregnancy a male student rejects the pregnancy and abandoned the girl. Since, the male was in his last year he goes back home and cut communication with a girl who ask for help from female security guard for accommodation after her parents rejected her with the pregnancy.	2021	A girl experience emotional violence, abandonment, neglect and rejection.	A girl was counseled by the dean's office and Clinic officers at IRDP health centre, then City Council Social welfare were involved to pursue her parents to accept her and allowed to go back home at Tabora Region.
2.	Economic violence	2	A female and male student were in sexually relationship. A female student gives her boyfriend all of her school fees and when that money is needed a male student didn't have money to pay back	2021	They both went angry leading to verbal insult and psychological effects	Both of them were counselled and male students forced to pay back

SN	Forms/Key dimension of GBV	Number of reported	How happened	Year	Effects	Handling mechanism and resolution
		1	A female and male student were in sexually relationship. A female student gives her boyfriend her personal computer and when they broke up a male student refuse to give back the Computer to her.	2022	They both went angry leading to verbal insult and psychological effects	Both of them were counselled and male student forced to give back the computer to its owner
3.	Early pregnancies	38	Most of certificate girls' students aged below 18 years engaged into sexually relationships without knowing how to prevent pregnancies.	2022/2023	Abortion, abandonment, neglect and rejection.	For those attending clinic are counselled and educated to have a health pregnancy and safe delivery. These pregnant students are not allowed to be in campus when are 6-month pregnancy. Also, family planning, safe sexually intercourse education is provided to the students during orientation and free

SN	Forms/Key dimension of GBV	Number of reported	How happened	Year	Effects	Handling mechanism and resolution
						condoms provided at the campus premises.
4.	Abandonment, neglect and rejection of students by parents	1	A male student who his parents are separated (divorced) was brought to the university by his father. During admission process his mother sent him some money for meals and accommodation for one week and his father forced him to give the money to him without caring how the child will survive.	2022	A male student experience emotional violence, abandoned and neglected	A student was advised not to give the money to the parent and that father was counselled to ensure that he support his child while studying and not leave the burden to mother alone.
5.	Verbal or physical violence/abuse (e.g. Psychological harm to an individual, bit, verbal insult or	2	Two male students were sharing one girlfriend without knowing. When truth come to light leads to misunderstanding among them	2023	They both went angry leading to verbal insult and beating.	Both were counseled
			2 female students who shared one room entered into love jealousy after one discovers her room met want	2023	They both went angry and their	Both were counseled

SN	Forms/Key dimension of GBV	Number of reported	How happened	Year	Effects	Handling mechanism and resolution
	harassment, etc.)		her boyfriend. This caused misunderstanding among them including verbal insult		friendship was broken	

Source: Consultation with IRDP's Department of Students Affairs and Nurse at IRDP health centre, August 2023

4.16.5 Existing Support System within IRDP

IRDP has gender desk and grievance redress department involving students, IRDP staffs including teaching and non-teaching staffs. Under this category, the system is clearly structured; all GBV cases are directly handled by the gender desk that include dean of students, the human resources office, IRDP health centre and student's organization. The entry point for a help seeker is often the lowest-level representative, of which all GBV cases involving students are initially reported to the dean of student and staff cases are reported to human resource office. The office of the dean of the students has been receiving Gender-Based Violence cases – students against students, or students versus non-staff within the Institute. This is also applied by the human resource department whereby all GBV cases among staff are handled (Though since its establishment there is no reported GBV case to the human resources department, consultation with the Department of Students affairs and IRDP workers, August 2023).

For the GBV cases that results to physical injury are taken to the police station and other cases are handled in collaboration with Social Welfare Officers at DCC.

4.16.6 Baseline Measurement for Air quality and noise level

Measurement and analysis of environmental parameters within the project area were carried out at the established sampling stations while targeting general environment, site workers and public health. Other criteria include areas that are easily definable and with easy future access in case of need for comparison measurements or another monitoring study. The baseline data will be used as a reference for monitoring during construction phase and project operation phase for mitigation implementation and operation. Moreover, the selection criteria for sampling stations considered point source emissions and nearby receptors that are likely to be affected by existence of the proposed project. Environmental parameters identified were PM_{10}, $PM_{2.5}$, NO_2, SO_2, H_2S, NO, O_2, CO and noise level measurements.

All measured parameters were then compared with the available air quality standards stipulated in the Tanzania Environmental Management (Air Quality Standards) Regulations, as well as National and International Standard and Guidelines specifically TBS, IFC and WHO.

Environmental measurement locations were selected based on the climatic status of the area and the different activities' and across to the area were the dust and gases might be dispersed to. Moreover, noise measurements taken at the receptors nearby or outside the proposed project surroundings. At sampling locations stations for environmental conditions measurement were taken and given sampling ID.

4.16.6.1 Dust Level Measurements at the Identified Onsite receptors

Particulate Matter (PM_{10} and$PM_{2.5}$) levels were determined by using an environmental kit instrument with a very fast response known as Temtop PMD351 Aerosol Mass Monitor. The used portable air sampler complies with Electromagnetic compatibility. Generic emissions standard, Residential, commercial and light industry (EN50081-1:1992 and EN 50081-2:1993), the manual determination of mass concentration of particulate matter (ISO 9096:2003) and meets the requirements of Air Quality General Considerations TZS 836-part 1:2004 and Manual determinations of mass concentration of particulate matter; TZS 837 parts 3:2004.

During testing, the sampling equipment fixed at a breathing height of approximately 1.5 meters above the ground for PM_{10} and $PM_{2.5}$ at all selected sampling stations. After initial measurements, a reading of the sampler recorded in the logbook and the instrument switched off. All monitoring and sampling equipment's were checked and calibrated before used and they were maintained in accordance with equipment manual.

Based on the study results, the average $PM_{2.5}$ and PM_{10} concentrations measured at most of all stations were found to be above the respective standards stipulated by TBS, WHO/IFS and Environmental Management (Air Quality Standards) Regulations, 2007 as seen in Table 4.6. This was contributed due to the heavy winds at site leading to the dust blowing as the area is characterized with bare land, passage of trucks nearby the trucks and open burning from the residents nearby the proposed site.

4.16.6.2 Ambient Pollutant Gases

The aim of gas sampling in air is to get data on the variations of concentrations of different gases over time. Levels of ambient gases was done using a Portable Gas Detectors and/or with detector sensors for the targeted gases in accordance to ISO 8760:1990; ISO 8761:1989; ISO 4219:1979; TZS 837-part 1 to 5:2004 and/or equipment manufacturer method. Parameters measured include Carbon monoxide (CO), Nitrogen dioxide (NO_2), Nitrogen Monoxide (NO), Ozone (O_3), Sulfur dioxide (SO_2) and Hydrogen Sulphide (H_2S).

4.16.6.3 Noise Measurements at the Identified Onsite Receptors

The measurements and assessment of environmental noise levels were determined in accordance with procedures from ANSI/ASA S1.4.-3 (2014)/IEC61672-3 (2013) Electroacoustic – Sound Level Meters – Part 3: Periodic tests using Integrating Averaging Sound Level Meter type (model **Piccolo II** (Class 2)), serial number P0223030801 with Mic Sensitivity 15.88Mv/Pa (-1.0dB from nominal). The noise survey performed in accordance with the recommended method for evaluating the environmental noise impact on surrounding communities with respect to annoyance: The measurement and rating of environmental noise with respect to land use, health, annoyance and speech communication.

Each individual measurement was taken over a representative period to ensure that all possible variations in noise generation in the area i.e. all possible noise sources are included in the measurement.
Care was taken to take enough measurements over long enough periods and in normal working conditions as to evaluate noise levels as near as possible to representative potential exposure levels.
The general principles employed for measuring sound pressure levels at the site briefly described below:

- All microphone measuring points were at least 1.5 m above ground level and away from reflecting surfaces;
- A suitable windshield was used on the microphone for all measurements in order to minimize wind interference;
- The sound level meter was set to A-weighting for all measurements;

The measurement time intervals were as far as reasonably practicable, chosen to be representative of the reference time intervals (Considerable care therefore taken to ensure that variations in noise propagation & representative cycles adequately covered by the selected time intervals. The sound level meter checked immediately before and after each series of sound level measurements using the acoustic calibrator.

Based on noise measurements taken during the daytime (10:35 PM – 13:37PM) at four sampling stations, the recorded average equivalent continuous noise levels were 40.3dBA. It was noted that the main contributor of the measured noise is associated with the movement of vehicles near the proposed site, noise from students at the existing campus and wind currents blowing through the project proposed site.

Tanzania Standard TZS 932:2007 stipulates maximum permissible day and night time noise levels for an institute of higher learning areas to be 45dBA during day hours and 35dBA during night hours. Likewise, the maximum permissible noise level for a construction site within institution of higher learning should be less than 60 dBA in day and 50 dBA in night hours.

The recorded noise levels at all most of the measured locations found to be below the established TBS and WHO standards, the fluctuation of the graph in Figure 4.8 were contributed to the passing of vehicles and motorcycles along the earth road and noise from students. However, the background noise levels shows that the noise level within and outside the vicinity of the proposed project site in the most of the sampling location is already below the Environmental Management (Standards for the Control of Noise and Vibrations Pollution) Regulations, 2014 for Construction sites within the institution of higher learning.

4.16.6.4 Meteorological conditions (temperature, relative humidity, wind speed and direction)

Digital Environmental meter used to determine ambient temperature and relative humidity of the site surroundings. Meteorological conditions during the measurement periods were favourable and noted to be representative of typical conditions for sunny seasons. Existing meteorological conditions measured at four sampling stations to document their baseline representative levels.

The general meteorological conditions include clear cloudy, average daytime temperatures of ranging from 24.3 to 29.3^{0}C. Average relative humidity ranges from 41.4 to 50.4% during daytime that favours the environmental and occupational safety of the workers during the construction, operations and daily activities of the proposed project. The wind speed from the proposed site ranges from 6.5-0.0m/s during daytime.

4.16.6.5 Ground Vibrations

In seismology, ground vibrations are associated with elastic waves propagating through the ground. Typical frequency range for environmental ground vibrations is 1 – 200 Hz. Ground vibrations are mostly man-made vibrations of the ground, with sources ranging from explosions, construction works. Peak Particle Velocity (PPV) is the measure for quantifying vibrations, as velocity is correlated to both building damage and annoyance levels to people. The human body can detect PPV of about 0.2 mm/s with clearly perceptible levels of detection at 1.0 mm/s. To cause cosmetic or structural damage to ordinary buildings, PPV is in the range of 5.0 to 50.0 mm/s (ISO 10137 of 1992, British Standards BS7385 1993, the Environmental Management (Standards for the Control of Noise and Vibrations Pollution) Regulations, 2014). The threshold level for cosmetic damage to residential construction ranges between 12.0 - 50.0 mm/s and frequency dependent. The human response and annoyance to blast vibrations can be aggravated by secondary noises such as walls and furniture rattling.

From measurements of sampled sites, baseline vibration levels for the IRDP Dodoma Campus in Miyuji area and its environs ranged between 0.0 – 0.1mm/s, which according to IFC and BS 5228-2:2009, is within the limits and perceptible in residential environments.

Depending on equipment used and soil characteristics, ground vibration levels from compaction can span a wide range from 0.4 mm/s PPV to a maximum of 11.0 mm/s PPV. There is often expectation that the softer soils would produce higher amplitude vibrations but this is not always the case. Also contrary to expectation, there is usually no significant correlation between weight of compaction equipment and resulting ground vibration level.

Nearby sensitive receptors are likely to perceive vibration levels to be produced during the project proposed activities though it will be of no impact although the vibration generation interaction with the ground and its transmission through the ground from the source to the receiver is possible.

4.16.7 Baseline Measurement for Water quality test

For baseline measurement in water quality analysis, water samples were taken from existing DUWASA piped water and open pond for analysis. Water samples were taken from existing piped water supplied by DUWASA at IRDP Campus in Miyuji area and existing pond, where the aim of this baseline data is to understand the existing situation of water source which will be used in all phase of project, where the baseline data for water quality analysis will be used as a reference for monitoring during construction phase and project operation phase for mitigation implementation and the data enable us to understand if supplied water is polluted to enable us to advice client to find alternative water source or introduce treatment method for quality improvement.

Referring to the laboratory analysis results in the tables above, it is evident that all analyzed parameters for water samples collected from piped water which is currently used by staff and students within IRDP Campus in Miyuji area are complied with the limits of Tanzania standard (TZS 789:2005) while for the pond are not safe for the drinking uses as they are polluted.

CHAPTER FIVE: STAKEHOLDERS ENGAGEMENT AND PUBLIC INVOLVEMENT

This Chapter presents all the stakeholders identified, consulted, and elaborates as main issues and concerns. The stakeholder engagement activities during the ESIA process conducted in accordance with:

- The Environmental Management Act, 2004
- The EIA and Audit Management (Amendment) Regulation (2018)
- The world Bank Environmental and Social Framework (2018)

Stakeholders are persons or groups of people who are directly or indirectly affected by a project or those who may have interests in a project positively or negatively. In this project, emphasize has been placed on the key stakeholders' involvement, their fundamental concerns and incorporation of the stakeholders' issues in the decision-making process and the entire project life cycle. Stakeholder engagement was conducted in August 2023.

Stakeholders' identification and engagement process was conducted based on EIA and Audit Regulations, 2005 and its amendment of 2018 and World Bank Environmental and Social Standards (ESS10) and Stakeholders Engagement Plan (SEP).

Public consultation entailed sharing information and knowledge about the project, seeking to understand key stakeholders' concerns and building relationships with the community. Stakeholders' identification considered all aspects of stakeholders that may be affected or have interest to project activities whether positively or negatively and/or based on their roles in implementation of the project.

The SEP covers both national and sub-national engagement; however, a greater focus was placed on sub-national stakeholders. The SEP provides details on the engagement needed associated with project activities.

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).

5.1 OBJECTIVE OF THE CONSULTATION AND PUBLIC PARTICIPATION

The overall objective of the consultation process was to solicit concerns, opinions, views, and attitudes of the stakeholders; disseminate project information and incorporate the views of stakeholders in the project design and operation, including environmental and social mitigation measures, management and monitoring plans. The specific objectives of the consultation process were to:

- Ensure the community and other key stakeholders are aware of the project process and operations;
- Consult stakeholders to gather the information needed to complete the assessment;
- Improve project design to minimize conflicts and delays in implementation;
- Obtain stakeholders' inputs into the scope of the EIA, impact identification, potential sources of cumulative impact and impact mitigation;
- Solicit stakeholders' questions and concerns from stakeholders and ensure these are addressed in the EIA;
- Enhance long term project sustainability;
- Reduce problems of institutional coordination;
- Incorporate the stakeholders' concerns in the project development and life cycle.

5.2 STAKEHOLDERS IDENTIFICATION AND ENGAGEMENT PROCESS

Stakeholders' identification and engagement process was conducted based on World Bank's OP 4.01, EIA and Audit Regulations, 2005 and its 2018 Amendment, and IFC PS1 (para 25-33). Public consultation for the IRDP project entailed an inclusive and culturally appropriateness of the on-going process, which involved sharing information and knowledge, seeking to understand key stakeholders' concerns and building relationships with the community. The exercise allowed stakeholders to understand the risks, impacts, and opportunities of the project to achieve desired outcomes. The public participation process was designed to provide information and receive feedback from stakeholders about the overall project phases that will be carried out during project implementation. Thus, the exercise would provide opportunities to organizations and individuals to advice about the project through comments and suggestions.

Identification of key stakeholders was based on the role, relevance and influence of an organization, group or individual on the proposed project. A tentative Stakeholders Engagement Plan (SEP) for EIA study was prepared by the Consultant. This was done by identifying and mapping all key stakeholders including engagement strategies before the actual commencement of the fieldwork. The SEP was prepared for EIA to inform upcoming phases of the project, including gender-related matters. Stakeholders that influence and/or affect the project and those influenced and/or affected by the project were predetermined based on their roles and pertinence. Since stakeholder's engagement is a continuous process, it's committed to continuing with planned engagements during the project's operation phase.

The main stakeholders were identified and drawn from different categorical project proponents, relevant administrative and regulatory authorities, agencies, local communities, and other interested parties. Stakeholders are found at both national and local levels and range from government authorities to local community members. Relevant stakeholders were identified based on their roles and pertinence to the Project. Some of the stakeholders were predetermined based on the nature of the proposed project activities. Classification by levels allowed the establishment of adequate planning and strategies for the development of the consultation meetings.

5.3 Stakeholders' involvement

Key stakeholders were categorized into groups according to the types of concerns raised from the implementation of the project. Stakeholders were mainly consulted through interviews, focus group discussions, group meetings, and through written documents that are pertinent to stakeholder's affiliation, etc.

The guiding questionnaire and/or themes was prepared before holding an in-depth discussion with all stakeholders. In-depth interviews and focus group discussion were held with staff /key informants from government institutions, agencies, Municipal levels and Non-Governmental Organizations (NGOs) depending on the type of data required.

Consultation meetings were also done with Ward and *Mtaa* leaders where the proposed project is located. Data collected during consultation included views, concerns, opinions and recommendations on the proposed project.

The summary of the consulted stakeholders is presented in Tables 5.1 and up to 5.6 for Names and issues raised and signatures of all consulted parties are presented in Appendix 3 while meeting minutes are presented in Appendix 4.

These consultations were held to ensure that these groups were informed about the project and their views are incorporated in the project development process. The discussion allowed members of the community to present their views concerning the proposed project.

Table 5-1 : List of stakeholders' consultations

SN.	Category of Stakeholder	Institutions
1.	Government Departments, Agencies and Authorities	• Ministry of Education, Science and Technology • Fire and Rescue Force – Dodoma Region • Occupational, Health and Safety Authority (OSHA)-Dodoma • Tanzania Building Agency • National Council for Technical and Vocational Education and Training (NACTVET)

		• Geological Society of Tanzania (GST)
2.	Municipal Council	• City Council of Dodoma officials
3.	Ward	• Miyuji Ward Officials
4.	*Mtaa*	• Miyuji Proper officials
5.	Institute of Rural Development Planning (IRDP)	• IRDP Administration and Project coordinator • Department of student affairs • IRDP workers • IRDP Health clinic • Students
6.	Non-Government Organization (NGOs)	• Dodoma Youth Development Organization (DOYODO) • NGO-Network for Dodoma
7.	Adjacent land users	• Residents of Miyuji Proper *Mtaa*

Source: Field study on August, 2023

Table 5-2: General Issues and concerns raised from Stakeholders. The detailed views are presented in appendix 3 on page 175-180.

Views, concerns, and recommendations
• Provision of academic building with facilities for disabled and people with special needs; • The project will observe conditions and needs of public buildings; • Increase in student enrolment; and • Providing quality education and skills to students using ICT technology. • Improvement of the workplace to the IRDP staffs; • Availability of buildings with friendly infrastructure for teaching and learning; and • Provision of reproductive health, mother and child health, sexual relationship, HIV/AIDS and STDs as well as GBV awareness education to construction workers, IRDP students and staffs, and surrounding community. • The project site area should be fenced; • There should be special path routes to be used by construction workers to prevent interaction between them and students, teaching and non-teaching staffs at IRDP; • Sexually interaction between construction workers, IRDP students and workers, and surrounding community; and • Employment opportunities to surrounding community; • Noise pollution from construction activities; • Construction workers should have identification cards while working at IRDP compound; • Provision of PPEs to construction workers • Provision of store for storage of construction materials, equipment and machinery; • Proper management of hazardous wastes onsite; • Proper arrangement of site to avoid injuries and accidents to construction workers;

Views, concerns, and recommendations
• The university should consider compendium of NACTVET academic quality standards • The land use is compatible with the proposed project development; and • Building permit should be acquired before project commencement. • Increased income generation to the community; and • Business expansion

Source: Field study, August 2023.

CHAPTER SIX: ASSESSMENT OF THE IMPACTS AND IDENTIFICATION OF ALTERNATIVES

6.1 INTRODUCTION

This chapter seeks to identify and analyze environmental and social impacts that may result from the proposed project. Identification of the impacts is based on the following: -

- Issues of concerns raised at various stakeholders' consultation or interview meetings
- Expert observations or experiences and judgment

The identified impacts are based on project phases namely: - Mobilization, Construction, Operation as well as Decommissioning phase.

6.2 MOBILIZATION PHASE

This phase will include recruiting of labour, site clearance (cutting of existing vegetation, transportation of waste materials from site to dump site), transportation of construction materials from point source to project site and fencing area ready for starting construction phase. This phase will be implemented once client acquire all recommended certificates i.e. Construction permit, NEMC EIA Certificate etc.

6.2.1 Potential Environmental Impact

6.2.1.1 Vegetation clearance to accommodate project development

The current status of the project proposed site is developed land which is found within IRDP Dodoma Campus in Miyuji. The site is not a built-up, its undeveloped and is covered by some grasses. No species of the amphibians and reptiles that are included in the IUCN Red list of threatened species. During mobilization and project construction phase vegetation on the project sites will be cleared to make the sites clear for the proposed project implementation. IRDP Campus and Contractor will ensure that the removal of vegetation is done only when it cannot be avoided. *This impact is negative, short term and of high significance.*

6.2.1.2 Dust emission during site clearing

Dust will be generated at the proposed project sites and along the access roads (internal access roads) at the project sites due to sites preparation activities like clearing and grubbing, offloading of construction materials etc. Further, the required construction materials will be sourced and transported to the sites for the preparatory activities, where during offloading dust will be emitted. Also, movement of trucks delivering construction materials will be a source of dust emission to community around the site. *This impact is negative, short term and of high significance.*

6.2.1.3 Occupational Health hazards to mobilization workers

For the whole activities of sites clearance, workers will be exposed to situation that will affect their health like dust emission, noise pollution and injuries due to use of machines or cut of sharp objects. This will affect the general environmental health to workers. *This impact is considered negative, short term and of high significance.*

6.2.2 Potential Social Impact

6.2.2.1 Employment Opportunities to local people

During mobilization phase, local people will be employed for site preparation activities as direct employment as both skilled and unskilled labours to perform various mobilization activities such as site clearance, construction of materials storage yard, mobilization of machinery and site preparation/setting. Also, food vendors and other local suppliers adjacent to the project (Miyuji *Mtaa*) will have additional income generating opportunities. *This impact will be positive, short term and of high significance.*

6.3 IMPACT IDENTIFICATION DURING CONSTRUCTION PHASE

6.3.1 Environmental Impacts

6.3.1.1 Nuisance from noise and vibration impacts during construction

During construction phase, noise and vibration nuisance will be generated from activities such as excavations, drilling, earthworks, processing of construction materials, haulage of construction materials or mixing of construction materials at site. The machines to be used in the construction works will be a source of noise pollution during extraction and processing of construction materials and transporting construction materials. The movement of heavy construction equipment will generate nuisance primarily to students, workers, staff and visitors at the project site. *This impact is negative, short term and of high significance.*

6.3.1.2 Disturbance to contractor due to effect of storm water flowing during rainy season

During the heavy rainfall, storm water runoff at the project is a normal situation. Storm water runoff could cause nuisance to contractor if construction material like cement and sand is not well kept. Contactor will make sure that all construction materials are well kept to mitigate the impacts of storm water runoff during the heavy rain. *This impact is negative, short term and of high significance.*

6.3.1.3 Occupational Health and Safety Hazards/Risk

The labour force to be employed to carry out the construction activities will pose several health and safety hazards if care not considered. The occupational health and safety issues to be associated with the construction of the proposed project include physical, chemical, noise and health hazards. Many of the project construction activities will involve the handling of potentially harmful objects, working at heights, transporting of construction

materials from point source to project site and lifting of heavy equipment, vehicular traffic, and contact with electrical conductors, exposure to dust and excessive noise. Thus, construction workers will be at risk of injuries such as falls, cuts, fractures and electrical shocks, and ailments from harsh ambient effects and unsanitary conditions. Workers will be prone to all sorts of safety and health risks during construction. *This impact is negative, short term (during construction) and of high significance.*

Table 6-1 Occupational health and safety hazards during construction

Category	**Description**	**Hazards/Risks**
Physical hazards	Operational and workplace hazards, working at elevation, overhead works, on storey building	• Slips, trips, and falls (inadequate workplace) resulting in sprains, strains, and fractures • Ergonomics hazards from manual handling, lifting weights, or repetitive movements • Sharp and moving objects in the workplace (e.g., foot injuries from thorns on oil palm fronds and fruit) • Over-exposure to noise, vibration, and extreme or adverse weather conditions • Wounds from equipment or sharp objects • Exposure to extremes of weather, including sustained exposure to the sun or cold, can be harmful • Typical problems include hypo- or hyperthermia dehydration, ultraviolet damage to skin or eyes, and heat or cold exhaustion cases • Noise and vibration from hand-held equipment (such as chainsaws, brush cutters, or trimmers) can cause hand/arm problems or hearing loss
	Machinery and vehicles operations	• Accidents may occur in the use of machines, equipment and vehicles. This may include vehicle and machinery roll-overs; uncontrolled movement resulting in personal injury (e.g. crushing by moving vehicles); damage or loss of asset; injury, entrapment, or death due to faulty or unguarded equipment and machinery (e.g. moving parts and pinch points on machinery and vehicles); entrapment due to unplanned starting, activation, or engagement of equipment (e.g. rollers); or injury during inspection or repair of vehicles (e.g. vehicle lift not secured while personnel working underneath)

Category	Description	Hazards/Risks
	Confined and restricted space entry	• Risk of asphyxiation; explosions due to gas, dust, or fumes (e.g. residual petroleum fumes); and entrapment or enclosure within the confined space, injury or fatality can result from inadequate preparation when entering a confined space or in attempting a rescue from a confined space • Entry into all confined spaces will be restricted and subject to permitted supervision by properly trained persons
	Risk of fire and explosion	• Combustion of stored oil/fuel residues, which can lead to a loss of property or cause possible injury to or fatality of project workers
Chemical hazards	• Exposures to dust during construction and paving activities • Exhaust emissions from heavy equipment and motor vehicles • Inhalation during preparation, mixing, and application	
Noise	• Exposure to extremely high levels of noise from heavy equipment operation and from working in proximity to vehicular traffic	
Health hazards	• Exposure to bronchial and other respiratory tract diseases, HIV/AIDS, STDs and other communicable diseases • Exposure to infectious diseases, especially water supply and sanitation-related diseases. • Poor sanitation due to sharing of sanitation facilities: Construction workers sharing sanitation facilities such as toilets with IRDP Campus students and other members of the community could lead to hygiene challenges and a risk of hygiene-related diseases.	

Source: Fieldwork, September 2023 & EHS Guidelines

6.3.1.4 Air pollution due to dust and gaseous emission during construction

Air emissions due to release of particulate matters (dust) during construction and exhaust from vehicles and construction traffic (vehicular emissions) will be of high concern. It is noted that construction activities may contribute to local PM_{10} concentrations (which can potentially impact upon human health), where this will be more critical in dry season. Regarding exhaust emissions from construction equipment/ machines and vehicles, the operation of the construction vehicles and equipment powered by internal combustion engines will result in the emission of exhaust gases containing pollutants, including NOx and Volatile Organic Compounds (VOCs) and carbon monoxide. The quantities emitted depend on engine type, service history, usage pattern, and fuel composition. Dust and fumes are likely to deteriorate ambient air quality and will have major impact to workers and neighbours. *This impact is negative, short term and of high significance.*

6.3.1.5 Water Pollution and siltation effect due to generation of soil materials

For proposed project facilities implementation, soil materials will be from excavation of foundation, trenches. Poor management of generated soil materials will lead to water pollution in receiving water bodies and siltation issues which disturb depth of water bodies and affect aquatic organism due change of water pH. Also, the effect of water Turbidity may affect oxygen circulation in water bodies and this will lead to death of aquatic organism. *This impact is negative, short term and of moderate significance.*

6.3.1.6 Spread of communicable disease due to mismanagement of domestic wastewater

During construction phase, local people will be employed to work in construction activities. Also, services providers like food vendors and supplier of construction materials will enter at project site. The presence of high number of people at site will generate liquid waste from toilets/wash rooms. Mismanagement of such generated wastewater may be a source of communicable disease to community around. *This impact is negative, short term and of high significance.*

6.3.1.7 Health hazards due to mismanagement of hazardous waste

During construction activities various materials like iron sheets, iron bars, electrical wires, and wire mesh will be used. During fixing cut pieces of such materials will be generated, where such waste will be termed as hazardous wastes. Mismanagement of such waste may lead to injuries to workers as sharpness to be generated. *This impact is negative, short term and of high significance.*

6.3.1.8 Bad visual/ smell due to mismanagement of solid waste

During construction phase people to be employed will need food for survival, where food remain, empty water bottles, offices papers and alike will be generated at site but the rate will be minimum. Mismanagement of domestic solid waste may lead to bad smell and bad visual due to scattering of generated solid waste like water bottles and food remains. *This impact is negative, short term of medium significance.*

6.3.2 Social Impacts

6.3.2.1 Gender Inequality in Employment opportunities

During construction, it is likely that the population within and beyond the proposed project area will be subject to exclusion from formal employment opportunities offered within the project's construction phase due to common types that undermine their perceived occupational capabilities and productivity. Gender inequality might be perpetuated through unequal distribution of work, discrimination against women during recruitment, and unequal pay for women. Women are likely to be least favoured in the employment opportunities in the project area. This is because the nature of jobs available during construction is perceived to be done mainly by men. Sexual exploitation and immorality could result, especially with the young

girls of the area, to gain favour for employment opportunities. This can result in the spread of sexually transmitted diseases such as HIV/AIDS and other sexually related diseases. *This is a negative impact that can be characterized as local, medium magnitude, short term and probable.*

6.3.2.2 Spreading of HIV and other STDs in the project area and surrounding environs

Construction of a four-storey academic building complex in the area may cause an influx of people from various places in search for jobs and other opportunities that come with construction of a project. The project may facilitate interaction of people of different sex which may lead to sexual relationships and eventually spreading of HIV and other Sexually Transmitted Infections.

6.3.2.3 Knowledge and skill increase to local labour

Since the project will provide direct employment to local people to work during construction, so those who will get opportunity to work particularly unskilled and semi-skilled labour will get an opportunity for skills development. Skills to be acquired may include construction equipment, heavy machinery operation, materials preparation and mixing, construction standards, health and safety procedures at construction sites, laying drainage, laying pavements, and excavating trenches, building works etc. Apart from gaining working skills and knowledge qualified experts, the employed people will benefit from formal training opportunities, which contractors expect to offer during the construction phase. Consequently, would be employable in the construction industry projects, earn more income and improve their standard of living. *This is positive impact that can be characterized as regional, high magnitude, long term and highly probable.*

6.3.2.4 Revenue Generation to Local Governments and Agencies

The construction activities will generate additional revenues to the central, regional and local government in the form of taxes, fees, levies and other charges generated throughout construction activities. The project will contribute to local and central government revenue through corporate taxes, duties, levies, fees, contributions to the National Social Security Fund (NSSF), and monthly PAYE income tax of all full-time employees.

The Contractor will make sure that payment for various utilities providers such as TANESCO and DUWASA will be done per time to enhance for better service. *This is a positive impact that can be characterized as regional, high magnitude, short-term and definite.*

6.3.2.5 Benefit to local producers and suppliers of construction materials

Construction of a four-storey academic building complex at the area will consider the use of local contractors as well as local building materials available in the country. This will contribute to the boosting of income among local suppliers of materials, labours and the economy of the country as a whole. *This impact is considered positive, short term and of high significance.*

6.3.2.6 Increase income to offsite services providers

Construction workers required will provide a ready market for various goods and services, leading to several business opportunities for small-scale traders such as shop owners, accommodation providers, and food vendors near the project proposed site. With the commencement of construction activities, workers' influx to the project site will attract small-scale business opportunities. These may include the growth of eateries and hawkers that may seek to market food and products to the project workers. Construction work will indirectly cause an increase of individuals from the informal sector and service providers come from different areas beyond the project's primary influence area. The increase in small vendors and businesses in the area will increase income and indirect employment opportunities. This will affect positively the life of those who provide offsite services and increase flow of cash in the area. *This is a positive impact, short term and of high significance.*

6.3.2.7 Disrupted Traffic Flow and Public Safety/Accidents

The project site can be accessed using Dodoma-Babati Road and Kibaoni Njia Panda from either direction. The main entrance/exit is located adjacent to Njia Panda Road, which is currently not experiencing traffic congestion. Traffic may be disrupted on all the roads and junctions under construction due to slow and interrupted traffic flow and potential diversions. The use of heavy moving construction vehicles and machinery in project sites is generally known to cause traffic reducing movement and vehicle flow during construction, this may increase congestion, delays, road accidents (especially along Dodoma-Babati Road) and IRDP Campus internal access roads (within construction project site), and reduce road safety, especially at peak hours. The impact can be further severe, particularly during morning and evening peak hours. The traffic disruption could potentially cause disruption, health and safety impacts, and economic impacts from delays for road users going to or from work and other destinations.

Further, accidents to the project site access road may increase due to additional movements generated by vehicle traffic during the transportation of construction materials to the project site and failure to observe safety rules in traffic movements and mobility. The likely sensitive receptors are students, staff, visitors, pedestrians and commuters along Dodoma-Babati Road at Miyuji area. If drivers will not take due caution, haulage trucks might be an accident risk to students. *This is a negative impact that can be characterized as site-specific, high magnitude, short term and highly probable.*

6.4 IMPACTS DURING OPERATION PHASE

During operation of proposed buildings, it is anticipated that there will be both negative and positive environmental, social and economic impacts.

6.4.1 Social Impacts

6.4.1.1 Creation of Direct Employment Opportunities

The construction of new facilities for student academic, teaching and learning programmes at IRDP Campus in Dodoma will create demand for additional skilled and non-skilled labours, who will be employed directly by IRDP.

Operation and maintenance of the facilities will create employment as well. Increased employment opportunities will be created as more students enrol when facilities are improved and increased at IRDP Dodoma Campus.

6.4.1.2 Enhanced Income to the Surrounding Local communities

The improved infrastructures for student's hostel and teaching within IRDP Dodoma Campus in Miyuji will translate to more opportunities for the local economy as demand for goods and services trickle down to the local businesses. The petty traders and various service providers at Miyuji areas are likely to benefit from an increased market for various goods and services. The program will translate to overall measurable economic and employment growth for the country. *This impact is positive, long term and of high concern*

6.4.1.3 Increase Skills for all students graduate

The project will increase the likelihood of students' employment after graduation by producing graduates with high quality and relevant training aligned with the country's vision. There will be significant exchange opportunities for trainers and management staff in the academic, given the high-quality training. The quality graduates from IRDP Campus in Dodoma will work across the borders in East Africa, where such skills are still inadequate. *This impact is positive, long term and of high concern*

6.4.1.4 Spreading of HIV/AIDS and other STIs

Establishment of the project in the area will add to the already existing students from various places in search for learning vacancy and non-students for searching opportunities that come with project development. The project may facilitate interaction of people of different sex which may lead to sexual relationships and eventually spreading of HIV and other Sexually Transmitted Infections. *This impact is considered negative, long term and of high significance.*

6.4.1.5 Gender-based Violence, Sexual Exploitation and Harassment

The project's operation may lead to sexual abuse and exploitation-related incidences. The majority of victims might be young female students and employees at the project site. Cases like this can be mostly between students, students and lecturer/trainers, staff and staff, students and neighbours communities. The common acts of sexual misconduct are groping, sexual rubbing, unwelcomed sexual touching, sexually suggestive or degrading remarks and sexually explicit or abusive language. Frequently, sexual abuse behaviours may include sexual bribery in connection to various favours or facilitations like promotions, allowances, examination performances/marks/grades and other personal benefits. *This is a negative impact characterized as site-specific, high magnitude, long term and probable.*

6.4.1.6 Reduction of Gender Gap

The proposed project at IRDP Campus in Dodoma is expected to increase capacity for gender-friendly and responsive learning environments due to the development of infrastructure and facilities with increased capacity to enrol

women and attract them to enrol in various programmes. *This impact is considered positive, long term and of high significance.*

6.4.2 Environmental Impacts

6.4.2.1 Soil/water pollution due to solid waste mismanagement

Management of solid wastes especially from domestic sources needs to be well designed to avoid soil pollution and other associated health hazards. In regard to the proposed project development is concerned with increase number of students at the area, the issue of solid wastes disposal is particularly important as it is anticipated that there will be more number of students meet at a time. So mismanagement of generated solid waste may cause soil contamination due from leachate to be regenerated when such waste decompose, where this may change the soil pH and cause death of important micro-organism needed for soil decomposition to increase soil fertile. *This impact is negative, long term and of high significance.*

6.4.2.2 Water and soil pollution due to domestic wastewater mismanagement

Generation of liquid waste in the form of sewage is inevitable in a community such as proposed development project. This calls for proper design and management of sewage systems to avoid water/soil and human health risks. The poor management of generated domestic waste at site like improper maintenance of damaged sanitary system for wastewater control and may cause direct contamination of such waste into soil and then to water body. *This impact is considered negative, long term and of high significance.*

6.4.2.3 Soil Erosion due to Runoff Effects and Loosened Top Soil

Removal of soil cover will expose the remaining area to runoffs, which may in turn result in soil erosion. Inadequate backfilling and resurfacing may result into erosion which in turn may damage the built structures and may result in siltation of receiving water bodies. *This impact is considered negative, long term and of high significance.*

6.4.2.4 Fire outbreak

During project operation, the facilities will be connected with electricity source from national grid (TANESCO). So improper wiring system, use of electrical equipment which not meets recommended standards may be a source of heat at project site. This may result into loss of lives and properties around project area. *This impact is considered negative, long term and of high significance.*

6.4.2.5 Loss of properties due to Natural Disaster Risk

The natural disasters considered include flooding and earthquake impacts. Since the proposed project site is located at flat area, it means that during rainy season water runoff will be from southern area to northern area, if care not considered this will affect the use of the proposed and other existing facilities at IRDP Campus in Miyuji. Also, the historical of Dodoma region on earth quake impact indicate that it likely to occur but at low intensity. If care not considered during design, this will affect the proper use of the building

and ultimate stage may cause death. *This impact is negative, short term and of high significance.*

IMPACTS DURING DECOMMISSIONING PHASE

The structures might remain in operation for 50 years provided maintenance of the facility is given due attention. However, even if maintenance is done as it should, a time will come when the facility may be dilapidated and deemed unsuitable for proposed operations. This is what is meant by decommissioning phase. Decommissioning of the proposed project may set in anytime due to financial challenges, high operating costs, decision of the investor to change the line of business etc. If this happens environmental as well as socio-economic impacts may occur. The following are impacts to be associated with decommissioning phase;

6.4.3 Loss of aesthetic value due to abandonment of infrastructure

The proposed project is planned to run for a long time unless there happen unforeseeable events which may curtail the project life span of 50 years. The proponent may abandon buildings and other supporting facilities that may permanently render the project site unattractive.

6.4.4 Dust and noise Pollution from demolition activities

In closure of the project the proponent may decide to demolish the structure. Solid waste, dust and noise are expected from demolition works of the structures. *This impact is considered negative, short term and of high significance*

6.4.5 Loss of aesthetics due to haphazard disposal of demolition waste

Loss of aesthetics may result from the demolished waste remaining on site for a long time to the extent of becoming an eyesore.

6.4.6 Loss of employment and learning place

If for whatever reason the project is closed down, the people employed by the project will lose their jobs, students will loss halls for learning and staffs will loss offices for working. The offices will be affected during the project decommission. This will have significant impact to the people and their dependents. *This impact is considered negative, long term and of high significance*

6.5 SUMMARY OF IDENTIFIED ENVIRONMENTAL AND SOCIAL IMPACTS

The Table 6.2 presents summary of identified environmental impacts based on expert opinions or observations. At this stage the identified impacts are categorized with project phases as well as proposed project activities. The Table 6.2 also indicated the affected environmental media, namely the Physical, Biological, Socio-Economic-and Cultural Environment.

Table 6-2 Summary and Categorization of identified impacts

Phase	**Key Activities**	**Identified Environmental. Impacts**	**Physical**	**Biological**	**Socio Economic / Cultural**
Mobilization	Site clearance	Noise pollution	X		X
		Dust emission		X	X
		Occupational health hazards			X
		Vegetation clearance	X	X	
Construction	High number of people in the area for those construction workers and services providers.	Potential for increase of social interaction which may lead to spread of HIV/AIDS, STDs			X
	Using local materials for construction activities	Degradation at Point of Sourcing construction materials	X	X	
	Improper relocation of construction materials	Loss of construction materials to caused by rain water flow rate	X		X
	Generation of spoil materials from the construction activities	Pollution of water bodies and siltation impact	X	X	
	Generation of hazardous wastes (cut pieces of iron sheets, steel bar etc.)	Injuries to construction workers due to sharpness of such waste			X
	Generation of domestic wastewater by construction workers	Pollution of water bodies		X	X
	Construction of a proposed buildings	Income, skills and knowledge increase to local labours			X
	Using heavy equipment in construction activities	Potential to noise and vibration impact	X		X
	Working during construction of the project	Potential to Occupational Health issues			X

Phase	Key Activities	Identified Environmental. Impacts	Physical	Biological	Socio Economic / Cultural
	Movement of Construction Machines and vehicles	Potential to air pollution due to dust and gaseous emission		X	X
	Use of local materials for construction	Benefit to Local Producers and Suppliers of Construction Materials			X
	Trucks carrying construction materials meet at project site	Impacts due to Traffic congestion	X		X
	Transportation of construction materials from point source to project site using trucks	Dust emission, noise pollution and traffic jam around the project site	X		
Operation	Operation of buildings at project site	Enhanced income, employment opportunities and local business			X
	High number of students to be admitted for learning per year	Reduction in gender gap in education provision			X
	Increasing number of people in the area	Potential for sexual interaction which may spread HIV/AIDS			X
	Improper backfilling and resurfacing	Soil erosion due to runoff effect	X		X
	Fire accident	Potential to loss due to fire accidents	X		X
	Liquid waste overflow	Pollution of surface water source due to mishandling of liquid waste	X		X
	Increase number of people in the area	Increase bad act in the area which result to security imbalance	X		X
	Haphazard spreading of solid wastes	soil pollution due to mishandling of solid Wastes	X		X
	Demolition of structures	Loss of employment			X

Phase	Key Activities	Identified Environmental. Impacts	Physical	Biological	Socio Economic / Cultural
Decommission Phase	Abandonment of infrastructure	Loss of aesthetics	X		X
	Demolition of structures	Loss of Aesthetics due to Haphazard Disposal of Demolition Waste	X	X	
	Demolition activities	Dust and noise pollution	X		X

6.6 ANALYSIS OF IMPACTS

Table 6.3 presents summary of analysis of identified environmental impacts, the analysis is based on the following criteria:

- Nature of impacts (positive/negative)
- Magnitude/significance i.e. depending on the severity
  - Major (if severe)
  - Minor (if not severe)
  - Wide scale (if it affects large areas)
  - Local scale (if it affects a locality)

- Sequence (i.e. depending on reach)
  - Direct (if there is a direct impacts)
  - Indirect (if there are indirect impacts)

- Duration/time frame
  - Long duration/time (if the impacts will persist for more than 5 years)
  - Medium duration/time (if the impacts will persist for 1-5 years)
  - Short duration (if the impacts will persist for a couple of months/weeks/days

- Reversibility
  - Reversible (if impacts can be mitigated)

- Irreversible (if impact cannot be mitigated)

Table 6-3 Consequence Assessment According to Score/Scale

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

In order to determine the overall significance of the impacts, a matrix of the scores of the Consequence and Likelihood is then used as shown in Figure 6.1 below. The Color codes in the figure are used to show the significance of the impact, i.e., White for Very Low, Green for Low, Orange for Moderate, Red for High and Black for Very High. The implications of these descriptions of the impact's significance are shown in Table 6.5. Based on these implications, the mitigation measures and hence the Environmental Management Plan are drafted

LIKELIHOOD OF IMPACT (Compound: Exposure x Probability)	CONSEQUENCE OF IMPACT (Aggregate: Magnitude + Duration + Scale)				
	Very Low	Low	Moderate	High	Very High
Very Low	VL	VL	L	L	M
Low	VL	L	L	M	H
Moderate	L	L	M	H	H
High	L	M	H	H	VH
Very High	M	H	H	VH	VH

Figure 6-1 Significance Analysis from the Consequence Vs Probability Evaluation

Table 6-4 Methodology/criteria for impact analysis magnitude/significance

Criterion	**Description**	**Possible Results**		
		Term	**Description**	**Score**
Magnitude of the Impact	An indication of the severity of the impact, either positive or negative.	Very High	Extreme effect – where natural, cultural or social functions or processes permanently cease.	5
		High	Severe effect – where natural, cultural or social functions are altered to the extent that they temporarily cease.	4
		Moderate	Moderate effect – the affected environment is altered but natural, cultural or social functions continue, albeit in a modified way.	3
		Low	Minimal effect – affects the environment in such way that natural, cultural or social functions and processes are not affected.	2
		Very Low	Minimal or negligible effect	1
		Unknown	Magnitude of the impact unknown.	0
Scale of the Impact	An indication of geographical extent of the impact	National	Affects the resources of the country	5
		Regional	Affects the resources of the region	4
		District	Affects the resources of the district	3
		Local	Affects the project area and surrounding mitaa	2
		Site – specific	Localized, confined within the license area.	1
		Unknown	Extent of the impact unknown	0
Duration of the Impact	An indication of the duration or time over which the impact will be experienced.	Permanent	Will remain permanently	5
		Long term	Extends into the post- closure phase, but not permanently	4
		Medium term	During the operational life of the project	3
		Short term	Shorter than the operational life of the project	2
		Transient	Very short duration	1
		Unknown	Duration of the impact is unknown	0

Table 6-5 Methodology/criteria for analysis of probabilities

Criterion	**Description**	**Possible Results**			
		Term	**Description**		**Score**
			Discrete Event	**Prolonged Exposure from a single activity or event**	
Exposure to Impact	An indication of the frequency of the activity that may cause the impact, or the continuity of the exposure.	Very High	Daily or continuous	Exposure in perpetuity	5
		High	Weekly/once per week	Continuous exposure into closure or post-closure phases	4
		Moderate	Monthly/once per month	Continuous exposure during construction and operations phases	3
		Low	Bi-annually	Continuous exposure throughout one phase	2
		Very low	Annually or less frequently	Prolonged exposure yet finishes before end of a phase	1
		Unknown	Frequently of activity unknown	Continuity of exposure unknown	0
Probability of the Occurrence	An assessment of the degree of certainty associated with a potential impact	Highly likely	Very likely or certain to occur		5
		Likely	Likely to occur		4
		Possible	May possibly occur		3
		Unlikely	Unlikely to occur		2
		Highly Unlikely	Very unlikely to occur, or almost impossible		1
		Unknown	Probability of the occurrence unknown		0

Table 6-6 Summary of analysis of identified environmental impacts

Phase	**Identified environmental. Impacts**	**Analysis of environmental Impacts**													
		Nature of impacts		**Magnitude/significance**				**Sequence**		**Duration/term**			**reversibility**		**Significance Rating**
		+ve	**-ve**	**high**	**low**	**wide**	**local**	**direct**	**indirect**	**long**	**mid**	**short**	**reversible**	**irreversible**	
Mobilization	Vegetation clearance to accommodate project development		X	X				X				X	X		-ve Major
	Dust emission during site clearing		X	X				X				X	X		-ve Major
	Occupational Health hazards to mobilization workers		X	X				X				X	X		-ve Major
	Employment Opportunities to local people	X			X			X							+ve high
Construction	Nuisance from noise and vibration impacts during construction	X			X		X	X		X					+ve Moderate
	Disturbance to contractor due to effect of storm water flowing during rainy season		X	X		X		X		X			X		-ve Major

Phase	Identified environmental. Impacts	Analysis of environmental Impacts													
		Nature of impacts		Magnitude/significance				Sequence		Duration/term			reversibility		Significance Rating
		+ve	-ve	high	low	wide	local	direct	indirect	long	mid	short	reversible	irreversible	
	Occupational Health and Safety Hazards/Risk		X		X		X	X		X			X		-ve major
	Air pollution due to dust and gaseous emission during construction		X		X		X	X		X			X		-ve Major
	Water Pollution and siltation effect due to generation of soil materials		X	X			X	X				X	X		+ve Moderate
	Spread of communicable disease due to mismanagement of domestic wastewater		X	X			X	X				X	X		-ve major
	Health hazards due to mismanagement of hazardous waste		X	X			X	X				X	X		-ve Major

Phase	Identified environmental. Impacts	Analysis of environmental Impacts													
		Nature of impacts		Magnitude/significance				Sequence		Duration/term			reversibility		Significance Rating
		+ve	-ve	high	low	wide	local	direct	indirect	long	mid	short	reversible	irreversible	
	Bad visual/ smell due to mismanagement of solid waste		X	X			X	X				X	X		-ve Moderate
	Gender Inequality in Employment opportunities		X		X		X	X				X	X		-ve Moderate
	Spreading of HIV and other STDs in the project area and surrounding environs		X	X				X			X		X		-ve Major
	Knowledge and skill increase to local labour		X	X				X			X		X		+ve Major
	Revenue Generation to Local Governments and Agencies	X		X		X		X		X			X		+ve Major

Phase	Identified environmental. Impacts	Analysis of environmental Impacts													
		Nature of impacts		Magnitude/significance				Sequence		Duration/term			reversibility		Significance Rating
		+ve	-ve	high	low	wide	local	direct	indirect	long	mid	short	reversible	irreversible	
	Benefit to local producers and suppliers of construction materials	X		X		X		X		X			X		+ve Major
	Increase income to offsite services providers	X		X		X		X		X			X		+ve Major
	Disrupted Traffic Flow and Public Safety/Accidents		X		X	X		X		X			X		-ve Moderate
Operation	Creation of Direct Employment Opportunities	X		X		X		X		X			X		+ve Major
	Enhanced Income to the Surrounding Local communities	X		X		X		X		X			X		+ve Major
	Increase Skills for all students graduate	X		X		X		X		X			X		+ve Major

Phase	Identified environmental. Impacts	Analysis of environmental Impacts													
		Nature of impacts		Magnitude/significance				Sequence		Duration/term			reversibility		Significance Rating
		+ve	-ve	high	low	wide	local	direct	indirect	long	mid	short	reversible	irreversible	
	Spreading of HIV/AIDS and other STIs		X	X			X	X				X		X	-ve major
	Gender-based Violence, Sexual Exploitation and Harassment		X	X			X	X				X		X	-ve major
	Reduction of Gender Gap	X		X		X		X		X			X		+ve Major
	Soil/water pollution due to solid waste mismanagement		X		X	X		X		X			X		-ve Major
	Water and soil pollution due to domestic wastewater mismanagement		X	X			X	X				X		X	-ve major

Phase	Identified environmental. Impacts	Analysis of environmental Impacts													
		Nature of impacts		Magnitude/significance				Sequence		Duration/term			reversibility		Significance Rating
		+ve	-ve	high	low	wide	local	direct	indirect	long	mid	short	reversible	irreversible	
	Soil Erosion due to Runoff Effects and Loosened Top Soil		X		X			x					x		-ve major
	Fire outbreak		X	X		X		X		X			X		-ve major
	Loss of properties due to Natural Disaster Risk		X	X		X		X		X			X		-ve major
Decommission	Loss of aesthetic value due to Abandonment of infrastructure		X	X			X	X		X			X		-ve Moderate
	Dust and noise Pollution from demolition activities		X	X			X	X		X			X		-ve Major

Phase	Identified environmental. Impacts	Analysis of environmental Impacts													
		Nature of impacts		Magnitude/significance				Sequence		Duration/term			reversibility		Significance Rating
		+ve	-ve	high	low	wide	local	direct	indirect	long	mid	short	reversible	irreversible	
	Loss of aesthetics due to haphazard disposal of demolition waste		X	X			X	X		X			X		-ve Major
	Loss of employment and learning place		X	X			X	X				X	X		-ve Major

6.7 CONSIDERATION OF PROJECT ALTERNATIVES

6.7.1 Alternatives site

The proposed project site is currently continuing with core activities of providing education services (certificates and diploma programmes) and has available land space suitable for the proposed project. It is worth noting that it is very difficult for one to get land for investment wherever she/he wishes, thus limiting the flexibility for allocating and relocating project site. In that view, considering site relocation alternative based on the proposed project will entail negative financial and time implication to the client. The provided site is economic feasible for proposed project implementation since not require fund for purchasing extra land.

6.7.2 Alternative Power Supply

Currently the existing buildings within IRDP Campus in Miyuji have been connected with TANESCO infrastructure as main power source. However, there is a generator with capacity of 230 V used to run microphones in the classrooms when there is power cut. High running cost, gaseous emission during operation and noise pollution hinder the smooth operation of diesel generator as alternative power source. The consideration of solar panel as alternative power is considered since it will be silence operating, no gaseous emission and low running cost. The use of solar panel will be considered as best option due to environmentally friendly of no gaseous emission and economically feasible for low running cost compared to diesel generator.

6.7.3 Water Supply Alternatives

Reliable access to suitable quality water is critical to supporting the water demands of the proposed academic eco-friendly building. The project proponent therefore evaluated three main alternatives for securing water supply:

Alternative 1: Piped Water Supply from DUWASA

DUWASA operates the municipal water network within IRDP. Connecting to this existing infrastructure for use would provide a clean, regulated supply without requiring establishment of independent sources. However, reliance on a single utility poses risks if the network experiences disruptions.

Alternative 2: Drilling of Boreholes

Drilling boreholes could ensure a locally controlled source. However, upfront drilling and treatment system costs are involved. Seasonal yield and quality variations may also occur without robust investigation and monitoring. However, this option will impact nearby boreholes due to excessive abstraction. Currently, IRDP has a newly drilled borehole for multipurpose use at Miyuji area.

Alternative 3: Rainwater Harvesting

Capturing rainwater offers a supplemental local source reducing overall demand on municipal supply. A storage and collection system would need designing and constructing. Quantity harvested depends on unpredictable rainfall patterns.

Conclusion: Based on analysis of the three alternatives the most preferred one is Alternative 1 which will be supplemented by alternative 2.

6.7.4 Liquid Waste Management Alternatives

Five alternatives were considered for managing liquid waste from the proposed eco-friendly academic buildings at IRDP:

Alternative 1: Use of waste stabilization ponds (WSP)

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

Alternative 2: Up-flow anaerobic sludge blanket (UASB)

UASB would treat wastewater using anaerobic digestion to break down organic matter and produce biogas and nutrient-rich effluent. This promotes resource recovery and generation of energy. However, additional aerobic treatment may be needed to fully remove nutrients before discharge depending on location. Moreover, UASB has higher cost implication and requires space, infrastructure and technical operation and maintenance.

Alternative 3: Constructed wetland

Wetlands mimic natural systems to biologically treat wastewater through physical, chemical and biological processes. They are lower maintenance than mechanical plants but require land area. Surface flow wetlands could produce unpleasant odour while subsurface flow has operational challenges.

Alternative 4: Septic tank and soak away pits

Individual septic tanks connected to underground soak away pits would be a low-cost option but require regular emptying and pose contamination risks if not properly managed and maintained. Space is also required for multiple soak pits.

In conclusion, given the space limitations and benefits of connecting to existing sewer infrastructure, Alternative 4 is recommended as the most feasible for the time being but later alternative 3 is most applicable (there is a plan) because of low opereational costs, eceological benefits (water will be reused for gardening in the campus) and very efficient and sustainable liquid waste management alternative for the proposed project.

6.7.5 No-Project Alternative

This alternative is considered not feasible from the following facts:

a) The revenue envisaged from the project and other incomes for local people will not be realized;
b) Availability of academic building will not be realized hence enhance quality of students graduated and learning halls for student and staffs within IRDP Campus will be thwarted.
c) It is against the Tanzania Development Vision 2025 to encourage developments of projects especially if there are no negative irreversible impacts associated to such project.

Based on the above, it is considered that No-Project alternative is not a plausible alternative.

6.7.6 Alternative construction materials

In considering alternative construction materials we consider ability of materials in heat reduction, cost of materials, time taken to get those materials (delivering time from supplier/ point source, reuse of those materials after construction and colour of materials for sun ray reflection during summer period. The use of construction opted in this alternative may be hinder by other factors like availability of such materials and technology used to manufacture such materials. The construction materials opted in this project include sand, timber, iron sheets, aggregates, steel bar of 1" x 3mm for window and steel plates of 2mm thickness (4ft x 8ft) for door gate. All construction materials will be locally obtained from authorized suppliers

6.7.7 Alternative construction technology

Various technology was considered such as use of concrete framework, use of steel framed, use of structural insulated panels and use of cob technology. Structural Insulated Panels (SIPs) is considered a best method as it provides a cost effective, environmentally friendly and labour-saving alternative to traditional timber framing and masonry construction methods. A method reduces energy consumption and CO_2 emissions.

CHAPTER SEVEN: MITIGATION MEASURES

Chapter six has identified potential impacts and their significance. This chapter provides a summary of mitigation measures of those impacts which are considered to be of a moderate to high significance.

7.1 MOBILIZATION PHASE

7.1.1 Mitigation measures for Environmental Impacts

7.1.1.1 Noise pollution due to site clearance.

To mitigate this impact, the following will be considered;

- regular maintenance of all used machines,
- site mobilization works will be on day time only not otherwise
- The site will be fenced by iron sheet before levelling
- The machines to be used will be of low noise emission
- noise protective gear will be provided to workers

7.1.1.2 Dust emission due to site clearance

To mitigate this impact, the following will be considered;

- Application of water spray for all area where dust emission is high
- Fence the area using iron sheets to minimize wind effects
- All cleared materials will be covered while at project site waiting for disposal schedule,

7.1.1.3 Occupational Health Hazards to workers

To mitigate this impact the following will be done;

- Apply water spray to all area where dust emission is high
- All used trucks their engines will be serviced regularly
- Cover all stockpile found at site
- Any trucks used for transporting waste from site will be covered
- Provide safety gears to site clearance crews like safety boots, uniform etc.
- Emergency assembly point shall be designed
- Induction training shall be given to mobilization crews

7.1.1.4 Vegetation clearance

To mitigate the impact during mobilization, the vegetation clearance shall be for those hinder project implementation and after construction vegetation planting program shall be initiated.

7.1.2 Enhancement measures for Social Impact

7.1.2.1 Promoting Local Employment and Income Generating Opportunities

Semi-skilled and unskilled labour will be sourced locally to provide communities with employment and the opportunity to earn an income during the construction phase of the proposed project. The contractor will engage nearby local communities and those offsite to perform various construction activities that do not require specialized skills. A special clause that requires

residents to be employed as labourers during construction will be included in the contract.

Equal opportunities shall be provided for both females and males for all jobs that can do. Further, the project proponent/contractor will encourage/permit small businesses that support the construction, such as cafes, food vendors, *kiosk* etc. to provide services to the construction staff in consultation with the local government authority.

Vulnerable groups, particularly the disabled and elderly, have lower employment opportunities than youths and non-disabled. As part of an economic empowerment, the Contractor shall ensure vulnerable groups are given priorities to all works that can perform. For example, involving female-headed family/ poor households and women-widow groups to prepare food for his/her staff.

7.2 CONSTRUCTION PHASE

7.2.1 Mitigation Measures for Environmental Impacts

7.2.1.1 Noise pollution due to movement of construction equipment

To mitigate the impact, during construction the contractor and project owner shall ensure that proper maintenance of machines and vehicles is done to minimize the presence of noise and emissions from engines. Equipment and engines that are not serviced regularly are more likely to cause much noise than regularly serviced ones. Furthermore, the construction during the night will be avoided to ensure quietness in the neighbourhoods at night.

7.2.1.2 Air pollution due to dust

In order to mitigate air pollution due to dust emission which is caused from earth moving equipment on site, water shall be sprayed on unpaved surfaces to suppress dusts followed by paving of surfaces at the project site. All construction materials at site will be covered for non-active hours. The area will be fenced by iron sheets to prevent wind effects

7.2.1.3 Generation of excess soil or spoil materials

To mitigate this impact, the contractor and the proponent shall:

- Resurface and level debris in the course of compaction and construction of the foundation for the structures,
- Ensure proper backfilling and resurfacing of the construction site. Light compaction will be necessary to stabilize the soil. Planting of grass on bare land to minimize soil erosion tendencies will be given a high priority.

7.2.1.4 Impacts associated with transportation of construction materials

To mitigate impacts associated with transportation of construction materials, the contractor shall cover well all trucks transporting construction materials

7.2.1.5 Occupational health and safety of construction workers

The following are the mitigation measures:

a) The Contractor shall adopt and implement Health and Safety Management Plan (HSMP) attached in appendix 7. HSMP at the site will be strictly adhered by all construction workers and visitors at the site, See Appendix 7 for indicative HSMP for the proposed project at the project site;
b) Before the commencement of any activity, Point of Work Risk Assessment shall be conducted by responsible personnel (activity-specific risk assessment and mitigation measures before actual commencement);
c) The contractor will be fully responsible for the health and safety of workers on-site, including providing all workers with appropriate PPE and training on the use of protective equipment;
d) Ensure provisions of first aid for staff, insurance, and access to ambulance service at all worksite, and arrangement to access local hospital/dispensary with qualified medical staff by workers;
e) All construction workers must undergo HSE induction training before commencement of construction works;
f) The HSE Officer shall conduct periodic workshops and training to create awareness amongst construction workers;
g) Adequate PPE such as reflective vests, helmets, and hazard cones to demarcate the working area will be provided. This will improve the visibility of the construction work to drivers on nearby roads and thereby help prevent accidents;
h) A well-stocked First Aid kit (administered by a trained first aider) shall be made available at active work site;
i) Adequate access and egress shall be maintained; a fire-fighting system will be established;
j) Effective safety and warning measures will be taken to reduce accidents. Safety signal devices and signage will be installed to ensure safety during construction;
k) Minimizing pedestrians and vehicles (IRDP Campus Community and Visitors) interaction with construction vehicles. The proposed project site shall be fenced off and provided with security at the access gates to reduce potential accidents and injuries to the public;
l) Contractor shall adhere to construction guidelines and directives issued by Occupational Safety and Health Authority (OSHA),
m) Implementation of the additional specific measures related to physical, chemical, health and noise hazards as recommended by EHS Guidelines and best practices (see Table 7.1)

Table 7-1 Management of occupational health and safety hazards during construction

Category	Description	Management Practices to Prevent/Control
Physical hazards	Moving equipment and traffic safety	• Development of a transportation management plan for road repairs that include measures to ensure work zone safety for construction workers and the travelling public, • Establishment of work zones to separate workers on foot from traffic and equipment • Speed controls in work zones • Training of workers in safety issues related to their activities
	Elevated overhead works	• Barricading of the works area to prevent unauthorized access • Hoisting and lifting equipment will be rated and properly maintained, and operators trained in their use • Elevating platforms will be maintained and operated according to established safety procedures, including use of fall protection measures • Working at height training and safety measures, equipment and personnel movement protocols
	Fall protection	• Implementation of a fall protection program e.g. training, use of fall protection equipment, measures, inspection, maintenance, rescue of fall-arrested workers • Worker's training of working at heights • Ensure availability and use of correct PPE for the fall protection
	Confined and restricted space entry	• Entry into all confined spaces will be restricted and subject to permitted supervision by properly trained persons • Worker's training and awareness creation
	Risk of fire and explosion	• Fire protection measures, including spill prevention • Signage and markings • Controlled access, surveillance and tight security controls in risky zones
Chemical hazards	• Reduction of engine idling time in construction sites • Maintenance of work vehicles and machinery to minimize air emissions • Ventilation of indoor areas where vehicles or engines are operated, or use of exhaust extractor hose attachments to divert exhaust outside	

Category	Description	Management Practices to Prevent/Control
	• Provision of adequate ventilation in tunnels or other areas with limited natural air circulation • Use of protective clothing when working with cutbacks diesel fuel, or other solvents • Use of extenders or other means to direct exhaust/fumes away from the operator	
Noise	• Use of personal hearing protection by exposed personnel • Implementation of work rotation programs to reduce cumulative exposure	
Health hazards	• VCT on HIV/AIDS, STDs, awareness campaigns • Proper waste management and sanitation in all works areas • Provide adequate sanitation facilities for workers	

Source: Fieldwork, September 2023 & EHS Guidelines

7.2.1.6 Vibration due to construction and installation activities

To mitigate this impact, the contractor shall do all high noise polluting works during daytime in order to avoid disturbance to the neighbours. Neighbours and workers will be informed the day of installation of machines which might cause vibration.

7.2.1.7 Health hazards due to mismanagement of hazardous waste.

In order to mitigate impacts; generated cut pieces of iron sheets, steel bars and a like shall be collected into a designed area for temporary hazardous waste storage while waiting to be collected by authorized dealers for disposal and the area for temporary hazardous waste storage will be roofed, paved its floor and has band wall

7.2.1.8 Pollution due to mismanagement of domestic solid waste

In order to mitigate this impact, the following are suggested mitigation measures:

- Ensuring proper design of systems for collection, transportation and disposal of solid wastes
- Ensuring availability of sufficient waste bins at appropriate locations
- Design and construct solid waste collection chambers for collecting waste before transported to dump site,
- Sorting of solid waste shall be done at source
- Constructed temporary solid waste collection chamber at project site shall be paved and roofed to ensure no contamination due to rainy water effect

7.2.1.9 Pollution due to mismanagement of domestic wastewater

In order to mitigate this impact, the following shall be done:

- Installation of a movable toilet or construction of temporary toilets and bath to be used during construction.
- Emptying of provided toilets will be done to avoid overflow.

7.2.2 Enhancement Measures for Social Impacts

7.2.2.1 Gender inequity in Employment Opportunities

The proposed mitigation measures include:

- implementation of the Gender Action Plan (GAP);
- jobs will be equitably distributed to both women and men as long as they qualify rather than based on gender to allocate jobs. Employment records disaggregated by sex will be kept by the contractor and easily accessed by the monitoring and supervising team;
- livelihood support strategies will be extended to the vulnerable groups and their income levels monitored closely during the implementation process;
- human resource management training concerning equal opportunity, gender-inclusive recruitment and non-discriminative employment terms, and on-the-job capacity development for labours representing vulnerable groupings;
- establishing affirmative action involving the preparation of equal opportunity, gender-inclusive procurement plan; and
- Capacity-development opportunities (e.g. internships, training seminars) for women and minority employees and women

7.2.2.2 Impacts due to HIV/AIDS

In order to address and alleviate spreading of HIV/AIDS among construction crew, sensitization campaigns against the danger of HIV/AIDS shall be organized including voluntary Counselling and Testing programs in collaboration with agencies dealing with control of HIV/AIDS.

7.2.2.3 Increase income to offsite service providers

The project proponent/contractor will encourage/permit small businesses that support the team involved with construction activities. For instance, food vendors (*mama Lishe*), transport services including motorcycle and tricycle motorcycle (*bodaboda* and *bajaj* respectively), kiosks, etc., can provide the construction staff services. This will enhance internal money circulation and growth of business in the project area. The Contractor's procurement plan shall be required to incorporate affirmative actions involving the preparation of equal opportunity and gender-inclusive procurement.

7.2.2.4 Revenue generation to Government

The Contractor and all sub-contractors will be required to pay all the applicable corporate taxes, charges to appropriate local and central authorities or government agencies. On the other hand, the government is encouraged to develop a streamlined, efficient system for the clearance and monitoring and create a transparency system for computation and collection of all taxes, levies, customs duties, and revenues.

7.2.2.5 Knowledge and skill increase to local labour

Proposed enhancement measures include:

- use of locally registered and certified contractors and sub-contractors;

- provisions of on-job training for the workers (unskilled and semi-skilled) in various areas of construction. This could be achieved by deliberately placing unskilled workers with semi-skilled personnel and semi-skilled with skilled workers;
- offering capacity-development opportunities (e.g. internships, training seminars) for women and minority employees, and women and minorities pursuing education within the civil engineering sector;
- Contractors and sub-contractors will be encouraged to deliver skills and training to local staffs (both skilled and unskilled); and
- transfer of the skills into other livelihood activities, seek opportunities in other similar projects in the region and beyond.

7.2.2.6 Benefit to local supplier of construction materials

The Contractor will strive to source materials, equipment and other resources that can be provided by local suppliers adjacent to the project site and Dodoma City in general

7.2.2.7 Disrupted Traffic flow and public accidents

The mitigation measures for controlling and managing traffic flow and ensuring public safety at the proposed project site within IRDP Campus in Miyuji and along access routes are outlined below:

a) Contractor to prepare and implement a Traffic Management Plan (TMP) for construction purposes for his work activities. The plan is intended to guide and specify traffic flow and adequate safety measures during construction. TMP will include a description of measures to be taken to protect pedestrians and community health and safety, proposed diversions, detours, traffic flow and scheduling in the key intersections, haulage routes, traffic signage and monitoring mechanism;
b) Avoid delivering materials onsite during peak hours along Dodoma-Babati Road (morning and evening), and the peak of operations within IRDP Campus in Miyuji. Ideally, materials will be delivered at night hours/less busy hours;
c) Initiation of a safety program and measures by creating awareness and educational campaigns for drivers, workers and local communities, including observation of speed limits;
d) Installation and maintenance of all signs, signals, markings, and other devices used to regulate traffic, including posted speed limits, warnings of sharp corners, or other special access road conditions;
e) Establishment of the support mechanism for the movement of the vulnerable groups such as disabled people, including wheelchair users, children, students, and patients;
f) Provision of safe corridors and crossings along internal access roads and construction areas within IRDP Campus in Miyuji;
g) Installation of barriers (e.g. fencing, plantings) to deter pedestrian access to the roadway except at designated crossing points; and
h) Minimizing pedestrian interaction with construction vehicles especially inside IRDP Campus in Miyuji.

7.3 OPERATION PHASE

7.3.1 Social Impacts

7.3.1.1 Income, skills and knowledge to local labors

In order to enhance this positive impact, the proponent shall take deliberate measures to ensure that human labours are employed as much as possible in carrying out normal activities during construction and operation phases. This is meant to increase the number of people that would benefit through wages, skills and knowledge transfer during all phases of the project life cycle.

7.3.1.2 Enhanced income, employment opportunities and local business

To enhance this positive impact, the proponent shall make deliberate effort to employ local people to work at the site. Also, efforts shall be made to pay workers handsomely so as to improve their livelihood. Outsourcing of services needed at the site shall be procured locally to benefit the local community around the project area.

7.3.1.3 Reduction of Gender Gap

The proposed enhancement measures include:

a) women (and girls) to benefit from affirmative actions during admission to reduce the enrolment gap and enabling learning environment including provision of accommodation for women to be enhanced; and
b) Develop, implement, and monitor a Gender Action Plan (GAP). This will be integrated in IRDP's HIV/AIDS and Gender Policy.

7.3.1.4 Spreading of HIV/AIDS and other STIs

Measures for mitigation of this impact include:

- Raising awareness of the dangers of the HIV/AIDS to workers, lessors and visitors,
- Support voluntary HIV counselling and testing.

7.3.1.5 Gender-based Violence, Sexual Exploitation and Harassment

The suggested mitigation measures are presented below:

a) Strict implementation of the IRDP's policy on Gender and HIV/AIDS issues including utilization of the existing structure and system for management of gender-related issues within the Institute;
b) Developing and implementing Code of Ethical Conduct for IRDP Campus employees, students, operators and throughout the supply chain, including service providers and suppliers operating within the Institution;
c) Development, implementation, monitoring and periodic review of the Gender Action Plan (GAP), including protection of female students and women against all forms of sexual abuse, harassment, and violence;
d) Establishment of the transparent and accessible system/mechanism for the victim support, protection, reporting and other forms of counselling;
e) Development and dissemination of mechanisms to report, address and register incidents of violence and harassment (e.g. help desks, warning

posters, posted hiplines, emergency buttons in the facilities etc.); and

f) IRDP's Gender Unit to conduct continuous gender-sensitive training and awareness creation in collaboration with various stakeholders such as Social Welfare Officers (Miyuji Ward and Dodoma City) and nearby NGOs.

7.3.2 Measures for Environmental Impacts

7.3.2.1 Fire break out

To mitigate this impact the following are suggested mitigation measures

- Portable fire extinguishers shall be put in place in all strategic areas.
- Firefighting system incorporating water hydrants shall be installed in the buildings including fire detection alarm system to avoid the risk of fire break out.
- Routine checking for performance of firefighting equipment shall be done as recommended
- Fire assembly area shall be designated in the project area
- Fire escape routes shall be designed,
- All facilities used during wiring system must be approved by responsible organ,
- Induction training to worker shall be given on how to response in case of fire emergency

7.3.2.2 Pollution due to mishandling of domestic solid Wastes

In order to mitigate this impact, the following are suggested mitigation measures:

- Ensuring proper systems for collection, transportation and disposal of solid wastes
- Ensuring availability of sufficient waste bins at appropriate locations
- Design and construct waste collection chambers for collecting waste before transported to dump site.
- The constructed temporary waste collection chamber shall be paved its floor, roofed and has band wall to control leachate spill into soil

7.3.2.3 Pollution due to mishandling of domestic liquid Waste

In order to mitigate this impact, the following are suggested mitigation measures:

- Ensuring proper design and construction of septic tank system
- Ensuring routine maintenance of sanitary facilities
- Ensure frequency emptying of septic tank to avoid overflow

7.3.2.4 Soil Erosion due to Runoff Effects and Loosened Top Soil

To mitigate this impact, the following shall be considered

- Proper backfilling and resurfacing of the constructed area
- Stabilize the soil by applying light compaction,
- Planting of trees and grass on bare land at project site

7.3.2.5 Occupational Health and Safety hazards to workers

The following will be implemented;

- Develop and implement Health, Safety and Environment Plan (HSEP)
- Develop and implement the Emergency Response Plan (ERP) for unplanned events
- Periodic HSE, emergency response, fire drills and first aid training for the employees
- Ensuring at least two first aider trained personnel are available at project site
- Offering various types of HSE training in collaboration with the OSHA
- Zoning of heavy moving parts and machinery away from employees and public paths as much as possible

7.4 DECOMMISSIONING PHASE

7.4.1 Loss of aesthetic value due to abandonment of structures

At decommissioning, Proponent may either demolish the structures or undertake major rehabilitation in an environmentally sound manner in order to restore the environment to its original appearance.

7.4.2 Contamination and impairment of Environment

To mitigate the impact during demolition, the contractor and developer shall ensure that proper decommissioning procedures are followed.

7.4.3 Loss of Employment

The major impact that will result from the project decommissioning will be loss of jobs. In order to minimize the impacts that may result from this eventuality, the following measures will be taken:

- Prepare workers for forced retirement by providing skills for self-employment, and wise investment of the retirement benefits,
- Ensure that all employees are members of the Social Security schemes,
- Consider redeploying employees in other projects of the proponent.

CHAPTER EIGHT: ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

An Environmental and Social Management Plan (ESMP) entails managing and monitoring the impacts during different phases of the proposed project at IRDP Dodoma Campus in Miyuji. The plan attempts to guarantee that suggested measures are practically feasible or implementable depending on the prevailing ground conditions if the proposed project becomes fully operational as envisaged.

8.1 COMPONENTS OF THE ESMP

The standard ESMP comprises the following major components:

a) Description of an impact, i.e. positive or negative;
b) Description of proposed mitigation and enhancement measures;
c) Institution responsible for implementation;
d) Cost estimates (whenever possible); and
e) Implementation time frame such as mobilization, construction, operation or decommissioning.

The ESMP for the proposed project at IRDP Campus in Miyuji is given in Table 8.1 below.

8.2 IMPACT MANAGEMENT STRATEGY

The ESMP points out essential obligations for IRDP Campus, construction Contractor and operator to meet relevant environmental guidelines in line with the recommendations provided in this ESIA report. Concerning the proposed a four-storey eco-friendly academic building complex, the ESMP requires that the contractor and/or operator;

- possesses an Environmental Policy statement;
- addresses contractual and regulatory requirements;
- provides procedures developed to address the environmental aspects and risks related to the construction;
- provides for the implementation and operation of the ESMP to ensure that structure and responsibilities are assigned; staff are trained, aware and competent; and that there is proper communication, documentation, operational control, reporting and emergency preparedness and response;
- provides clear and precise organizational and technical procedures for implementation of the ESMP, which ensure that construction and operation activities associated with potential environmental and social impacts are carried out in a controlled and responsible way;
- provides checking and corrective action through monitoring and measurement; and
- provides records collection and storage, and programme audit that includes a management review of the ESMP and enables improvements to be incorporated in the Plan.

8.3 IMPLEMENTATION ARRANGEMENT AND COORDINATION

The ESMP incorporated in the detailed design will be handed over to the Contractor prior to the construction period. The Contractor has to take stock of the contents of the ESMP of the Project and implement them during the construction period under the close supervision of the consultant's management. During the Operation Phase, IRDP Campus will manage the facility and implement the ESMP.

The overall implementation of the enhancement and mitigation measures is the primary responsibility of IRDP Campus (Proponents) as per national requirements and World Bank ESS1. The supervision of the construction works and implementation the E&S Safeguards (including ESMP) for this project will be carried out primarily by Proponent's Health, Safety and Environment Department. Specifically, the Environmental Expert shall be appointed to assist the Resident Engineer. He/she will be responsible for making sure that the aspects of the ESMP that are to be implemented during construction are included in the Contractor's tender documents and are responsible for the overall monitoring of the Contractor to ensure that the enhancement and mitigation measures are implemented. The cost of implementing mitigation measures will be covered by project proponent. Also, environmental and social protection clauses for contracts and specifications will support the implementation of mitigations.

IRDP (Proponent) will forward Miyuji project monitoring reports to the World Bank and NEMC during project implementation as part of their monthly, quarterly, semi-annual and annual progress reports. The World Bank and NEMC may conduct an audit to ensure that the approved mitigation measures are implemented. The project implementation has not led to the emergence of new impacts. To ensure effective implementation of the ESMP, including the associated monitoring activities, both the Contractor and Proponent shall have Environmentalists or personnel responsible for ensuring environmental compliance (e.g. HSE Officers). The Contractor's Environmentalist/HSE Officer shall be responsible for translating and implementing the provisions of the ESMP. At the same time, the Proponent's Environmentalist shall supervise the Contractor for the implementation of the provisions of the ESMP.

The project will require the support of various institutions in the implementation of ESMP to minimize potential environmental and social negative impacts. The organization framework for the ESMP is designed to evolve as the project progresses through Mobilization, Construction and Operation phases. Proponent's key institutions will liaise with NEMC, OSHA, TANESCO, DUWASA, LVBWB, TBA, local authorities, and surrounding communities. The responsible authorities for compliance audits, principally NEMC and OSHA, may wish to visit, inspect and monitor the site or specific activities at their own convenient time.

8.4 REVIEW AND REPORTING PROCEDURES

IRDP (Proponent) will provide the Environmental monitoring reports during implementation as part of the semi-annual progress reports and annual reports and will forward those reports to NEMC and World Bank. Depending on the status of environmentally sensitive locations in areas where there are project activities, NEMC will perform annual or bi-annual Environmental reviews to ensure that the project's environmental aspects are reviewed alongside project implementation.

The parameters, timing, frequency and responsible parties are thoroughly presented in the monitoring table. During the implementation process of the ESMP and Mitigation measures, the key player and follow up team from Environmental and Social issues will be IRDP (proponent), Local government, Resident engineer, World Bank and NEMC (See Figure 8.1). The contractor shall be responsible for daily implementation and internal monitoring of all activities that under his care. NEMC will be responsible for overseeing that all Environmental construction activities are conducted to adhere to regulations outlined in Environmental Impact Assessment and Audit Regulations (2005) as amended 2018. The project Proponent will be responsible to cover all costs for implementing mitigation measures

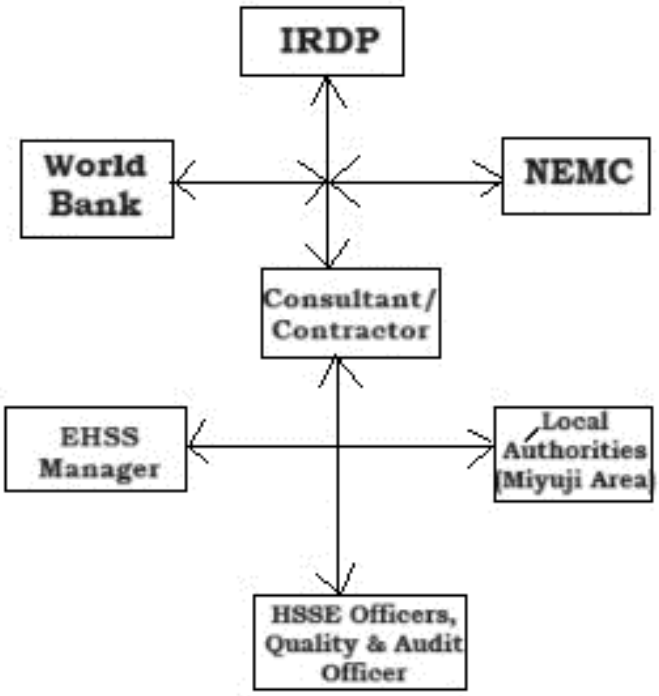

Figure 8-1 Proposed ESMP Reporting and Responsibilities
Source: IRDP, September 2023

Table 8-1 ESMP for the proposed project at IRDP Campus

Identified Impacts			Mitigation and/or Enhancement Measures	Implementation	
Project Phase	**Type**	**Description**		**Responsibility**	**Relative/ Costs (TSH)**
Mobilization	+ve	Employment and income generation opportunities	• Priority to local communities around Miyuji area and vicinity • Sourcing semi-skilled and unskilled labour locally/affected community • Special clause that requires nearby residents to be employed as labours to be included in the contract • An inclusive, transparent and gender-sensitive recruitment process to be established and implemented • Encourage small businesses that support the construction, such as cafes, food vendors, *kiosk, tricycle motorcycle (bajaj), Motorcycle (bodaboda)* etc. • Equal employment to be provided to both women and men regarding gender and equity • Vulnerable groups to be considering the employment opportunities for the works that they can perform • Develop and implement a Labour Recruitment and Management Plan (LRMP)	Contractor.	No cost
	-ve	Dust emission	• Dust suppressive agents such as water to be used/sprinkling along excavated routes • Activities producing excessive dust levels to be confined within working areas • Fine earth materials such as sand and gravel to be covered during haulage to prevent spillage and dusting • Excavated soils will be compacted to reduce the amount of dust spreading by wind • Administer adequate Personal Protective Equipment (PPE) • Haulage trucks to have tailgates that close properly and tarpaulins to cover materials being transported	Contractor	2,000,000

Identified Impacts			Mitigation and/or Enhancement Measures	Implementation	
Project Phase	**Type**	**Description**		**Responsibility**	**Relative/ Costs (TSH)**
	-ve	Occupational Health and Safety Hazards to workers	• Apply water spray to all area where dust emission is high • All used trucks their engines will be serviced regularly • Cover all stockpile found at site • Any trucks used for transporting waste from site will be covered • Provide safety gears to site clearance crews like safety boots, uniform etc. • Emergency assembly point shall be designed • Induction training shall be given to mobilization crews	Contractor	2,000,000
	-ve	Vegetation clearance	• Vegetation clearance to be limited to the specific space (footprint) required for construction • Ground clearance to be minimized and, if possible, concentrate on the footprint area and when it is necessary • Trees planting program will be implemented after construction to replace all removed trees	Contractor, and, IRDP	2,000,000
	-ve	Disturbances from noise emissions	• Limit noise level during construction within works areas • Activities that generate excessive noise will be limited to day time hours • Maintain proper function of equipment and comply with required noise level standards • Noise emission devices are properly maintained, and mufflers will be affixed to construction equipment in use • Unnecessary idling of equipment within noise-sensitive areas will be avoided	Contractor, sub-contractors	2,000,000
Sub-total I (once-off cost) during project preparation/mobilization					**8,000,000**
Construction	+ve	Income increase to offsite service providers	The project proponent/contractor will encourage/permit small businesses that support the team involved with construction activities. The Contractor's procurement plan shall be required to incorporate affirmative actions involving the preparation of equal opportunity and gender-inclusive procurement	Contractor	No cost

Identified Impacts			Mitigation and/or Enhancement Measures	Implementation	
Project Phase	**Type**	**Description**		**Responsibility**	**Relative/ Costs (TSH)**
	+ve	Benefit to local supplier of construction materials	• Sourcing materials, equipment and other resources locally • Procurement plan to incorporate affirmative actions involving the preparation of equal opportunity, gender-inclusive procurement • Procurement from registered and licensed suppliers throughout the supply chain	Contractor, IRDP	No cost
	+ve	Revenue generation to government agencies	• Timely payment of all applicable charges, fees, taxes, levies etc. • Strengthening of a streamlined system for the taxes/charges clearance and monitoring • Transparency system for clearance and monitoring	Contractor, sub-contractors	No cost envisaged
	+ve	Skills and knowledge transfer to local labour	• Deliver skills and on-job training (both skilled and unskilled) in various areas of construction • Use of locally registered and certified contractors and sub-contractors • Capacity-development opportunities (e.g. internships, training seminars) for women and minority employees in civil engineering • Construction staff will be encouraged to further develop the acquired knowledge and skills through Vocational Training • Transfer of the skills into other livelihood activities, seek opportunities in other similar projects in the region and beyond	Contractor, sub-contractors	No cost
	-ve	Noise pollution due to movement of construction equipment	The contractor and project owner shall ensure that proper maintenance of machines and vehicles is done to minimize the presence of noise and emissions from engines. Modern machines (all with low noise emission) will be used at project site. Furthermore the construction during the night will be avoided to ensure quietness in the neighbourhoods at night.	Contractor, sub-contractors	3,000,000
	-ve	Air pollution due to dust	Water shall be sprayed on unpaved surfaces used by such equipment to suppress dusts during construction followed by paving of surfaces at the project site. All construction materials at site will be covered for non-active hours. The area will be fenced by iron sheets to prevent wind effects	Contractor, sub-contractors,	2,000,000

Identified Impacts			Mitigation and/or Enhancement Measures	Implementation	
Project Phase	**Type**	**Description**		**Responsibility**	**Relative/ Costs (TSH)**
	-ve	Generation of spoil materials	• Resurface and level debris in the course of compaction and construction of the foundation for the structures, • Ensure proper backfilling and resurfacing of the construction site. Light compaction will be necessary to stabilize the soil. Planting of grass on bare land to minimize soil erosion tendencies will be given a high priority	Contractor/,	2,000,000
	-ve	Impacts associated with transportation of construction materials	• the contractor shall cover well all trucks transporting construction materials • the trucks will be service regularly its engine to minimize noise and gaseous emission • fuel used will be certified by EWURA	Contractor/sub-contractor	3,500,000
	-ve	Occupational health and safety hazards	• Contractor will adopt and implement developed Health and Safety Management Plan (HSMP), • Contractor will have a qualified health and safety officer onsite • Performing task or activity-specific risk assessment and mitigation measures before the actual commencement • Providing all workers with appropriate PPE and enforcement of the use • Adequate access and egress shall be maintained, a fire-fighting system will be established, and hazard cones will be used to restrict the working area. • Well-stocked First Aid kit (administered by a trained first aider) shall be made available at active work sites • Regular induction training course on health, safety, security and environment to all workers before beginning of construction activities.	Contractor, sub-contractors	7,000,000

Identified Impacts			Mitigation and/or Enhancement Measures	Implementation	
Project Phase	**Type**	**Description**		**Responsibility**	**Relative/ Costs (TSH)**
	-ve	Health hazards due to mismanagement of Hazardous waste including scrap metals, electronic waste, plastic waste	• Generated cut pieces of iron sheets, steel bars, electronic waste, plastic waste and a like shall be collected into a designed area for temporary hazardous waste storage while waiting to be collected by authorized dealers for disposal and the area for hazardous waste temporary storage will be roofed, paved its floor by concrete and has band wall. • Contractor to prepare a waste management plan for hazardous waste	Contractor	5,000,000
	-ve	Disrupted traffic flow and staff and student safety	• Contractor to prepare and implement a Traffic Management Plan (TMP) for construction purposes for his work activities. • Avoid delivering materials onsite during peak hours (morning and evening), • Installation of warning signs i.e. speed limits signs for truck drivers.	Contractor, sub-contractors, IRDP, Traffic Police	5,000,000
	-ve	Pollution due to mismanagement of domestic wastewater	• Installation of a movable toilet or construction of temporary toilets and bath to be used during construction. • Timely emptying of provided toilets will be done to avoid overflow. • Contractor to prepare a waste management plan for liquid waste	Contractor	4,000,000

Identified Impacts			Mitigation and/or Enhancement Measures	Implementation	
Project Phase	**Type**	**Description**		**Responsibility**	**Relative/ Costs (TSH)**
	-ve	Pollution due to mismanagement of domestic solid waste	• Ensuring proper solid waste for collection, transportation and disposal • Ensuring availability of sufficient waste bins at appropriate locations • Design waste collection chambers for collecting waste before transported to dump site, • Sorting of solid waste shall be done at source • Constructed temporary solid waste collection chamber at project site shall be paved and roofed to ensure no contamination due to rainy water effect • Contractor to prepare a waste management plan for solid waste	Contractor, sub-contractors	5,000,000
	-ve	Exposure to HIV/AIDS and new transmission	• Sensitization campaigns against the danger of HIV/AIDS shall be organized including voluntary Counselling and Testing programs in collaboration with agencies dealing with control of HIV/AIDS	Contractor, sub-contractors, NGOs, IRDP	3,000,000

Identified Impacts			Mitigation and/or Enhancement Measures	Implementation	
Project Phase	**Type**	**Description**		**Responsibility**	**Relative/ Costs (TSH)**
	-ve	Workplace sexual harassment and violence against women & vulnerable segments	• Implementation of the Gender Action Plan (GAP) • Develop and implement Child Abuse Protection Plan (CAPP) and Gender-Based Violence Action Plan (GBVAP) that will contain and address Protection Against Sexual Exploitation and Abuse (PSEA), response to PSEA, engagement with community, mainstreaming of PSEA, Management and coordination including the integration of PSEA in the job description • Establishing a Gender Help Desk at the construction site and ensuring adequate and transparent referral mechanisms are in place for reported cases • Review of specific project components and activities that are known to heighten sexual abuse/harassment/abuse/GBV risks at the community level • Implementing the Code of Ethical Conduct for the construction workers • Sensitization of employees and supervisors about sexual harassment and periodic inductions • Promote women involvement in all stages of project activities and ensure that vulnerable people are involved in taking decisions on matters that affect them directly • Jobs will be equitably distributed to both women and men • Employment records disaggregated by sex will be kept and easily accessed by the monitoring and supervising team	Contractor, sub-contractors, NGOs, Health facilities, City councils (Social Welfare Depts.), Police, Community, IRDP (Gender Unit),	6,000,000

Identified Impacts			Mitigation and/or Enhancement Measures	Implementation	
Project Phase	**Type**	**Description**		**Responsibility**	**Relative/ Costs (TSH)**
	-ve	Gender inequity in employment, fair labour terms and Exclusion from economic opportunities	• Implementation of the Gender Action Plan (GAP) • Jobs to be equitably distributed to both women and men as long as the candidate has the qualification rather than based on gender to allocate jobs • Livelihood support strategies will be extended to the vulnerable groups and their income levels monitored closely during the implementation process • Human resource management training concerning equal opportunity, gender-inclusive recruitment and non-discriminative employment terms, and on-the-job capacity development for labours representing vulnerable groupings • Establishing affirmative action involving the preparation of equal opportunity, gender-inclusive procurement plan • Capacity-development opportunities (e.g. internships, training seminars) for women and minority employees and women and minorities pursuing education within transport sector services	Contractor, sub-contractors, City council, *Mtaa* authorities, IRDP (Gender Unit),	7,000,000
Sub-total II (once-off cost) during actual construction					***52,500,000***
Operation	+ve	Reduction of Gender Gap	Women (and girls) to benefit from affirmative action during admission to reduce the enrolment gap and an enabling learning environment including provision of accommodation for women to be enhanced; and Develop, implement, and monitor a Gender Action Plan (GAP). This will be integrated with the existing IRDP HIV/AIDS and Gender Policy.	IRDP (Human Resources Dept., Gender Unit)	Part of IRDP HR budget

Identified Impacts			Mitigation and/or Enhancement Measures	Implementation	
Project Phase	**Type**	**Description**		**Responsibility**	**Relative/ Costs (TSH)**
	+ve	Enhanced incomes to the surrounding petty traders	• Sourcing materials, equipment and other resources locally • Permit shall be given to small businesses that support for service providers near project site to benefit for selling their goods • Procurement plan to incorporate affirmative action on local procurement, provision of equal opportunity, gender-inclusive procurement • Procurement from registered and licensed suppliers throughout the supply chain	HR Dept., Gender Unit, Procurement & Logistics Dept.	No cost
	+ve	Improved students' enrolment and capacity building	• Development of infrastructure and associated facilities that will enhance access to programs offered at IRDP programs • Offering relevant courses as demanded in the market. • Timely and appropriate operation and maintenance of the developed facilities • Initiating exchange programmes with other non-participating Institutes • Fostering collaborations and partnership through students and staff visits and practical training	IRDP Academic department	No cost
	-ve	Pollution due to mismanagement of domestic solid waste	• Ensuring proper systems for collection, transportation and disposal of solid wastes • Ensuring availability of sufficient waste bins at appropriate locations • Design and construct waste collection chambers for collecting waste before transported to dump site, • The constructed temporary waste collection chamber shall be paved, roofed and has band wall	IRDP	5,000,000 per year
	-ve	Spread of HIV/AIDS and other STIs	• Raising awareness of the dangers of the HIV/AIDS to workers, lessors and visitors, • Support voluntary HIV counselling and testing.	NGOs dealt with HIV and IRDP	4,000,000

Identified Impacts			Mitigation and/or Enhancement Measures	Implementation	
Project Phase	**Type**	**Description**		**Responsibility**	**Relative/ Costs (TSH)**
	-ve	Pollution due to mismanagement of domestic liquid waste	• Ensuring proper design and construction of sanitary facilities and connected to septic tank • Ensuring routine maintenance of sanitary facilities • Ensure frequency emptying septic tank to avoid overflow	IRDP	8,000,000 per year
	-ve	Occupational health and safety risks/hazards	• Develop and implement Health, Safety and Environment Plan (HSEP) • Develop and implement the Emergency Response Plan (ERP) for unplanned events • Periodic HSE, emergency response, fire drills and first aid training for the employees • Ensuring first aider trained personnel will be at project site • Offering various types of HSE training in collaboration with the OSHA • Zoning of heavy moving parts and machinery away from employees and public paths as much as possible	IRDP	8,000,000
	-ve	Possibility of Fire outbreak	• Portable fire extinguishers shall be put in place in all strategic areas. • Firefighting system incorporating water hydrants shall be installed in the building including fire detection alarm system to avoid the risk of fire break out. • Routine checking for performance of firefighting equipment shall be done as recommended • Fire assembly area shall be designated in the project area • Fire escape routes shall be designed, • All facilities used during wiring system must be approved by responsible organ, • Induction training to worker shall be given on how to response in case of fire emergency	IRDP	15,000,000

Identified Impacts			Mitigation and/or Enhancement Measures	Implementation	
Project Phase	**Type**	**Description**		**Responsibility**	**Relative/ Costs (TSH)**
	-ve	Gender-based violence, sexual exploitation & harassment	• Strict implementation of the IRDP's policy on Gender and HIV/AIDS issues • Developing and implementing Code of Ethical Conduct for the IRDP employees, service providers and suppliers • Implementation of the GAP and protection of women against all forms of sexual abuse, harassment and violence • Development and dissemination of mechanisms to report, address and register incidents of violence and harassment • Establishment of a transparent and accessible system/mechanism for the victim support, reporting and other forms of counselling, where IRDP's Gender Unit to conduct continuous gender-sensitive trainings and awareness creation in collaboration with various stakeholders	IRDP	12,000,000 per year
Sub-total III (once-off costs) during the operation phase					**52,000,000**
Grand total (indicative)					**112,500,000**

CHAPTER NINE: ENVIRONMENTAL MONITORING PLAN

Environmental and social monitoring plan (Table 9.1) provides the application of EMP as well as dealing with ad hoc or unforeseen issues which need to be mitigated. Details of parameters to be monitored have been considered along with costs estimates and responsible institution (s) and developer will be responsible for all cost to implement monitoring mitigation measures.

Table 9-1 Environmental and Social Monitoring Plan

Phase	**POTENTIAL DIRECT IMPACT**	**Parameter to Monitor**	**Frequency**	**Monitoring Area**	**Measurement unit**	**Target Level/Standard**	**Responsibility**	**Estimated costs (Tsh)**
MOBILIZATION	Dust emission due to site clearance	$PM_{2.5}$ and PM_{10}	Daily	Project area	$\mu g/m^3$	As per TZS 837 Parts 1, 2 and 3. PM2.5 - 25 $\mu g/m^3$ PM10 - 50 $\mu g/m^3$	Contractor	2,000,000
	Noise pollution due to demolition	Noise level	Daily	Project area	dB(A)	As per TZS 837 Parts 1, 2 and 3 70 dBA	Contractor	2,000,000
	Vegetation clearance	Number of trees before mobilization and after	Mobilization period	Project area	Number	Minimum vegetation clearance	Contractor	2,000,000
	Occupational Health hazards	Occupational status of environment	Daily	Project area		Zero injury	Contractor	2,000,000
CONSTRUCTION	Depletion or degradation at points of source of construction materials	Quantity of concrete mixer used	Daily	Construction site	m^3	No burrow pit formed	Contractor	8,000,000 paid once

Phase	POTENTIAL DIRECT IMPACT	Parameter to Monitor	Frequency	Monitoring Area	Measurement unit	Target Level/Standard	Responsibility	Estimated costs (Tsh)
	Noise due to Construction Equipment and Materials	noise level	Quarterly	Project area	dBA	In compliance with WB and TBS standards: • Daytime noise levels < 60 dB • Night-time noise levels < 50 dB	Contractor	5,000,000 yearly
	Impacts associated with transportation of construction materials	$PM_{2.5}$ and PM_{10} and toxic gases	Daily	Using road	µg/m^3	PM2.5 - 25 µg/m^3 PM10 - 50 µg/m^3	IRDP	3,500,000
	Impacts of dust from movement of construction equipment	Particulate matter in the air	Quarterly	Project area	µg/Nm^3 per hr	As per TZS 837 Parts 1, 2 and 3. PM2.5 - 25 µg/m^3 PM10 - 50 µg/m^3	IRDP	4,500,000 yearly
	Occupational Health and Safety of Construction Workers	Number of injuries	Daily	Project site	NA	Zero injuries	IRDP	7,000,000 yearly

Phase	POTENTIAL DIRECT IMPACT	Parameter to Monitor	Frequency	Monitoring Area	Measurement unit	Target Level/Standard	Responsibility	Estimated costs (Tsh)
	Potential for spread of HIV/AIDS, STDs	Number of cases of HIV reported	Quarterly	Project workers	Number	prevalence rate to be reduced	IRDP	4,000,000 annually
	Health hazards to workers due to poor management of hazardous waste	Quantity of hazardous waste generated and its management	Weekly	Construction site	Kg	No injury due to hazardous waste	IRDP	5,000,000 per year
	Pollution due to mismanagement of solid waste	Quantity of solid waste generation	Weekly	Project site	Kg	Zero pollution	IRDP	5,000,000 annually
	Gender inequity in employment opportunities	Gender balance in employment opportunities	Quarterly	Project site	Number	No gender imbalance	IRDP	No cost

	Pollution due to mismanagement of domestic wastewater	Water pH, -Faecal coliform -BOD -COD, Turbidity, Color, Na	Quarterly	Monitoring borehole at IRDP Campus	m^3	Physical Components Below 30 mg/L of BOD5 at 20°C using TZS 861 (Part 3):2006 Five-Day BOD method 100mg/L TSS using TZA 861(Part 1):2006 Gravimetric Method pH range of 6.5-8.5 using TZS 861(Part2):2006 – Electrometric Method Inorganic Components Below 0.1mg/L Pb using TZS 861(Part 7):2006 Flame Atomic Absorption Spectrometry -Below 500mg/L SO4 using APHA Standard Methods: 4110 B. Ion Chromatography with chemical suppression of eluant conductivity Organic Components Below 0.5mg/l of Alkyl benzene sulfonate (ABS) using ISO 7875-1:1996 (Part 1)	IRDP	6,000,000

Phase	POTENTIAL DIRECT IMPACT	Parameter to Monitor	Frequency	Monitoring Area	Measurement unit	Target Level/Standard	Responsibility	Estimated costs (Tsh)
						Determination of surfactants by measuring the methylene blue index (MBAS) Below 10mg/L of Fatty matter and hydrocarbons using APHA Standard methods 5520		
OPERATION PHASE	Pollution of surface water source due to mismanagement of liquid waste	Water pH, -Faecal coliform -BOD -COD, Mg, K, Turbidity, Color, Na	Quarterly	Monitoring Borehole at IRDP Campus	mg/l	As per TZS 344:1989 pH – 6.5 – 8.5 FC – 0 counts/ml BOD – 30mg/l COD – 60mg/l Turbidity – 300NTU Color – 300TCU	IRDP	6,000,000 annually
	Fire break out and safety system	Number and state of firefighting equipment	Semi annually	Project buildings	Number	No fire incidents	IRDP	15,000,000 annually
	Gender based violence and harassment	Gender balance	Quarterly	Project area	Number of employment by gender	No gender imbalance	IRDP	12,000,000
	Soil erosion due to runoff effects	Tendency of soil erosion	Rainy season	Project site	-	No soil erosion	IRDP	10,000,000
	Spreading of HIV and other STIs in the District	New cases of HIV infected staff	Thrice per year	Staff and Lessors	Number of cases	Minimized to zero	IRDP	5,000,000

Phase	POTENTIAL DIRECT IMPACT	Parameter to Monitor	Frequency	Monitoring Area	Measurement unit	Target Level/Standard	Responsibility	Estimated costs (Tsh)
	Pollution due to mishandling of solid Wastes	Quantity of solid waste	Weekly	Project area	Kg	No pollution	IRDP	5,000,000 annually
DECOMMISSIONING	Loss of Employment,	Payment of social security remittance for workers	Semi-annually for workers	Social Security schemes for workers	Number of workers registered with NSSF	Workers' remittances paid in time	IRDP	30,000,000
	Loss of Aesthetics		During decommissioning	Project Area	NA	restore environment into original state	IRDP	16,000,000
	Noise and dust from demolition activities	Particulate matter (PM_{10}, $PM_{2.5}$) and Sound level	Daily	Project area	ppm, mg/m^3, dBA	As per As per TZS 932:2006 and TZS 837 Parts 1, 2 and 3. PM2.5 - 25 $\mu g/m^3$ PM10 - 50 $\mu g/m^3$ Noise limit - 70 dBA	IRDP	10,000,000
TOTAL COST TSH							165,000,000/=	

CHAPTER TEN: COST BENEFIT ANALYSIS OF THE PROJECT

Cost-benefit analysis is done in the framework of feasibility study of an activity. The analysis assists the proponent to make a decision on: whether it makes economic sense to continue with the project; whether the chosen option is cost effective; and estimate the size of a project. In this project the costs will include: capital expenditures, operating and maintenance costs, construction materials, environment, health and other social costs.

10.1 QUANTIFIABLE AND NON-QUANTIFIABLE BENEFITS TO COMMUNITIES

There will be direct and indirect benefits to the communities. The project will employ local people during different phases. Through taxes to the Government, the proponents will indirectly be contributing to development projects such as roads, medical care, education services, etc. The presence of project in the area will drastically increase business opportunities in the area; hence increase revenue to the community as well as to the government.

10.2 QUANTIFIABLE AND NON-QUANTIFIABLE BENEFITS TO DEVELOPER

The proponent will benefit directly from the numbers of students to be admitted during operations through school fees and other costs.

10.3 QUANTIFIABLE AND NON-QUANTIFIABLE BENEFITS TO THE GOVERNMENT

The Government will directly and indirectly benefit from taxes from the investor who run different businesses and services in the country including private sector who will be invest due to project operation. Apart from tax generation, this investment will enhance the economic growth and ancillary private sector development spurred by the operations and activities associated with this project operation. The image of the government in investment sector will be enhanced nationally and that will increase attractions from other local and foreign investors and ensure continued market growth.

10.4 POSSIBLE COSTS TO COMMUNITIES

It is a fact that the proposed project will entails social and environmental impacts. These have been more elaborated in Chapters 6 – 9. There will be individuals in the communities who will be affected more than others. Moreover, the proponent is committed to mitigate the negative social and environmental impacts associated with the proposed development in different phases of the project.

10.5 ENVIRONMENTAL COST BENEFIT ANALYSIS

Environmental cost benefit analysis is assessed in terms of the negative versus positive impacts. It considers whether the impacts are mitigated and the costs of mitigating the impacts are reasonable. As addressed in Chapters 6 – 9, potential benefits of the project, both financial and social benefit are substantial. The environmental impacts are reasonably mitigated and the financial resources needed to mitigate negative impacts when compared to the required investment, are relatively small.

CHAPTER ELEVEN: DECOMMISSIONING

The decommissioning phase is part of the reversal phase, which has the additional and often dominant risk factors associated with the materials produced during the life of the project as well as potentially decreased structural integrity due to renovations and/or wear and tear. Similar impacts encountered during the renovation/upgrading phase will be experienced in much the same way when the reserve process is set in motion.

11.1 DECOMISSIONING PLAN

A decommissioning plan that takes environmental issues into consideration is prepared by the proponent prior to decommissioning works. The decommissioning may entail change of use (functioning change) or demolition triggered by change of land use. The product of this project will have a life span of 50 years with proper maintenance and services. Therefore, the decommissioning will take place for long time to come.

Table 11-1 Decommissioning and closure plan

Activity	**Closure Plan**	**Responsibility**	**Budget (Tsh)**
Filling all excavation and trenches formed	• Removal of all concrete materials and metals pieces from all excavation, • Filling of trenches/excavation with soil from the designated borrow pit. • Compaction of soil accordingly to avoid possibility of soil erosion	Environmental Managers and Closure Committees	10,000,000
Disassemble all equipment and demolish the structures	• Disassemble electrical appliances including Air conditions, Generator, water pumps to mention but a few. • Consult TANESCO to disconnect electricity from the project. • Demolition of all concrete and metal from building and all pavements. • Warning signs will be posted • All demolition activities will be supervised by qualified engineers. • Closure Committee will monitor all closure activities to ensure they are done appropriately where relevant stakeholders will be consulted for technical assistance during the closure phase	Environmental Managers and Closure Committees	18,000,000
Personal Protective Equipment (PPE)	All workers during the closure phase shall use appropriate PPE including helmet, safety boots, dust mask, safety gloves, goggles, protective garment and safety reflected vest.	Environmental Managers and Closure Committees	5,000,000
Waste Management	• All waste generated during the closure phase will be sorted for easy management • A review process will be introduced so that the closure plan for waste dumps adjusted and updated for the inevitable changes to institution plans schedules,	Environmental Managers and Closure Committees	12,000,000

Activity	Closure Plan	Responsibility	Budget (Tsh)
	community standards and recognized best practices • Debris may be used on the road to fill on feeder roads instead of dumping over land. • Metal materials will be collected and stored at recommended area while waiting to be collected by authorized dealer for disposal. • All hazardous wastes (for example used batteries, tires, acids, scrap metals, e-waste, etc.) found at the institution during decommissioning will be cleaned up and disposed of in accordance with the regulations, where responsible dealer will be contracted for disposal. • The closure committee will make sure that no wastes will be disposed in the water bodies.		
Restore the environment into its original appearance	• All formed holes will be filled, all debris plus metal removed to disposal by authorized dealer who will be contracted. • All disturbed areas will be landscaped and re-vegetated using indigenous trees.	Environmental Managers and Closure Committees	15,000,000
Total Cost TShs		**60,000,000**	

11.2 PROJECT REMOVAL PROCESS

The proponent shall fund and implement all aspect of project decommissioning, including but not limited to all engineering, permitting and mitigation activities associated with the removal of the project; in accordance with the plan to be developed. The proponent shall monitor environmental impact during and after project removal to respond to defined events during the monitoring phase. Project removal will commence six months after its closure and continue for six months within this month, the proponent will make inventory of all components that need to be removed and disposed of. This inventory will include buildings to be demolished /dismantled and debts to be settled. Also, mode of disposal will be finalized. This information will assist in the preparation of the final decommissioning plan for approval by the relevant authorities. Project decommissioning has five phases: pre – removal monitoring; permitting; interim protective measures; project removal and associated protective actions; and post – removal activities, including monitoring of environment and socio economic activities:-

Pre – removal monitoring: includes environmental and social economic status of the buildings and the surrounding. This period will be used to inventories all assets and facilities that need to be disposed of and to prepare a final decommissioning plan for approval.

Permitting: The proponent shall obtain all permits from relevant authorities required for removal of the buildings.

Interim Protective Action: This will take care of any internal protective measures that need to be implemented to protect human health and environment.

Post – removal Activities: post – removal activities monitoring will continue afterward.

CHAPTER TWELVE: SUMMARY AND CONCLUSIONS

12.1 SUMMARY

The findings from this environmental and social impact assessment report can be summarized as follows:

a) The project is generally accepted at the community, city, regional and national levels, based on its potential socio-economic benefits. The potential long-term social and economic benefits that the project is likely to bring are much greater than the negative impacts that can be managed to acceptable levels.

b) All key stakeholders, including Miyuji Proper *Mtaa* and Miyuji Ward Offices, Ministry of Education, LVBWB, DUWASA, Neighbours to project, Fire and Rescue Force, and among others accept the proposed project and will be involved at all stages of the project.

c) The project will not trigger involuntary resettlement and compensation-related issues since it will be implemented within IRDP Campus in Miyuji and the land use of the area is compatible with proposed project as per provided right of occupancy.

d) Ecologically, the project site is located in a highly urbanized area with low species diversity. It is characterized by a continuum of highly modified environment resulting from long-term anthropogenic activities. It is dominated by non-native floral species, secondary species attempting to recover. Species recorded are of low conservation concern, no species of either IUCN standards or CITES appendices was recorded; There are no officially recognized critical habitats or IUCN-designated Key Biodiversity Areas (KBAs) that exist within the core area.

e) The design, construction and operation of a proposed academic and student's hostel buildings will consider the needs of the PWDs. The gender requirements (gender-responsive design, construction, operation and maintenance), health and safety standards and conformity to national and international standards/guidelines.

f) The negative impacts of concern are:
   i. disturbances from construction noise and vibrations;
   ii. air emissions impact from dust and exhaust fumes during construction;
   iii. occupational health and safety hazards in all phases of the project;
   iv. accidental contamination of surface and groundwater resources;
   v. exposure to HIV/AIDS and new transmission; and
   vi. workplace sexual harassment and violence against women & vulnerable segments.

g) The significant positive impacts of concern are:
   i. employment and income generation opportunities in phases of the project;
   ii. income to surrounding petty traders, materials/equipment suppliers and service providers during construction phase;
   iii. revenue generation to local government and agencies;
   iv. skills and knowledge transfer;
   v. reduction of gender gap in enrolment;

12.2 CONCLUSIONS

Given the above findings, it can be concluded that the proposed project activities from design, construction to operations stage will have manageable/reversible negative impacts on the biophysical and social-economic environments, provided that if the proposed mitigation measures will be appropriately implemented. In this way, the project will have minimal environmental, socio-economic, and cultural concerns that would inhibit its implementation and development. It is anticipated that the project will potentially result in more positive than negative impacts in the long term.

This ESIA report recommends that the proposed project be allowed to proceed on condition that the proponent implements the ESMP and EMP proposed in this report as appropriate and any other conditions imposed by NEMC, World Bank ESF, HEET Project ESMF, HEET Project Operation Manual (POM), 2021 and other relevant authorities.

Further, it is recommended that IRDP will develop, implement and periodically review an operative Environmental and Social Management System (ESMS) for the project life cycle and other operations at the IRDP Campus.

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APPENDICES

Appendix 1: Certificate of Occupancy

Plot Number : 2

Block : B

Location : Miyuji North

CDA/L.D.No

C/4/L.O. No. 96253/4764

CAPITAL DEVELOPMENT AUTHORITY

GROUND LEASE NO. 4764

LEASE AGREEMENT

Made and entered into this 25th day of July 2002

BETWEEN

CAPITAL DEVELOPMENT AUTHORITY

a body corporate established under the Public Corporations Act. 1969, by Order published in the Official Gazette as Government Notice No. 230 of P.O. Box 913, Dodoma, (hereinafter referred to as "the Lessor") of the one part,

AND

INSTITUTE OF RURAL DEVELOPMENT PLANNING a body corporate established by Act of Parliament No. 8 of 1980 of P.O. Box 138 - DODOMA

(hereinafter referred to as "the Lessee") of the other part

TANGANYIKA
STAMP DUTY PAID ON
ORIGINAL Shs. 150/=
Receipt No. 15692156 of 25-7-02
Asst. Registrar of Titles

TITLE No. 10444-DLR
REGISTERED ON
28-8-2003
at 9.30 A.M.
Asst. Registrar of Titles

Stamp Duty Shs. 75/= Paid
and Revenue Receipt No. 15692156
of 25-7-2002 issued
Asst. Registrar of Titles

THIS AGREEMENT WITNESSES as follows:

WHEREAS the Lessor has been endowed with Right of Occupancy registered in the Land Registry at Dodoma under Title No 4585 DLR in respect of land within the Capital Development Area as described in the Dodoma National Capital Planning Order G N 63 of 1978, except alienated lands; and in the terms thereof is authorised to grant leases, the Lessor hereby enters into a Lease Agreement (hereinafter referred to as "the Lease") whereby the Lessor demises and the Lessee(s) takes/take a piece of land (hereinafter referred to as "the land") in extent

containing fifteen decimal point zero five six (15.056) hectares

being

Plot No. 2 Block 'A' Nkuyuji North
Dodoma Municipality

as more fully described in the schedule hereto, for

a term of thirty three years

commencing on the 1st day of July 19

and expiring on the 30th day of June ~~19~~ 2023

subject to the provisions of the Land Ordinance, Cap. 113 of the laws and any regulations made thereunder and subject to the following special conditions:—

PART A: THE LESSEE (S) SHALL

1. PAY in advance to the Lessor the following Ground Rent and/or other charges of shillings one thousand (Tshs. 1,000/=) a year on the first day of July in each year of the term without any deduction PROVIDED that the rent may be revised after every five years thereafter

2. ERECT or cause to be erected on the land a building or buildings (hereinafter referred to as "the improvements") in such materials and in accordance with specifications as the Lessor may require, and to that end shall:

(i) On or before the 31st day of December 19 90 submit for approval by the Lessor such plans drawings, specifications and other information as may be required by the Lessor in respect of the improvements proposed to be erected;

... THE LAND ORDINANCE IN THIS CONTEXT REFERS TO THE LAND ACT, 1999.

9. YIELD up to the Lessor the land and improvements in good order and condition upon determination of the Lease by effluxion of time or otherwise

PART B: THE LESSOR SHALL

1. ENSURE that the Lessee paying ground rent and/or other charges hereby reserved in PART "A" Clause 1 hereof and complying with other terms and conditions hereinbefore contained shall peaceably and quietly hold and enjoy the land and improvements during the said term without interruption from the Lessor or any other person claiming under or in trust for the Lessor.

2. NOTWITHSTANDING the restrictions contained in Part "A" Clause 4 hereof permit the Lesse to grant a sublease or subleases in respect of the land and improvements for a term or terms not exceeding five years provided the Lessee has complied with the development conditions set out in Part "A", Clause 2 hereof.

3. UPON breach by the Lessee of any of the foregoing terms and conditions re-enter upon the land and improvements thereon and forfeit the Lease and immediately thereupon the said term shall absolutely determine and whenever this power of re-entry and forfeiture shall arise the Lessor shall serve upon the Lessee a written notice specifying the nature and extent of the breach and requiring the Lessee to remedy the breach within the time to be sepcified in the said notice and also the action to be taken by the Lessor if the breach is not remedied within the specified period.

4. GRANT to the Lessee at the Lessee's option and on satisfactory performance of the obligations hereinbefore contained, an extension of the Lease on such terms and conditions as may be agreed by the parties provided that the Lessee serves upon the Lessor not more than six months' notice in writing prior to the expiry of the Lease provided that such an extension will not be granted where the land is required by the Lessor for other development.

PART C: ARBITRATION

In the event of any dispute arising between the parties hereto in respect hereof either the Lessor or the Lessee may apply for arbitration to the Minister for the time being responsible for land matters and the Minister's decision shall be binding on both parties.

(ii) an amount or amounts leviable by the duly authorized institutions by way of rates or like local property taxes.

(iii) an amount or amounts equal to any rates or like levy paid by the Lessor in respect of the land or improvements thereon.

(iv) such sum as the Lessor shall assess as a proper share attributable to the land of the cost of making up the roads or improvements of the same upon which the land fronts, abuts or adjoins, whether demand for such sum is made during or after such making or improvement thereof. (This condition does not oblige the Lessor to make up or improve the roads).

7 USE the land solely for educational purposes use Group 'K' use classes (b) as defined on the Town and Country Planning (Development and Zoning) (Capital Development Area) Regulations, 1979

8 BE responsible, where applicable:

(i) for protecting and preserving throughout the term of the lease all the existing and future infrastructure facilities on the land. Any damage, destruction or loss caused thereto shall be made good at the Lessee's expense.

(ii) for further protecting and conserving existing and future horticultural amenities such as trees, flower gardens etc provided within or immediately adjoining the land. Any damage, destruction or loss caused thereto shall be made good at any time at the Lessee's expense.

SCHEDULE

All that land known as Plot No. 2 Block B Miyuji North Dodoma Municipality bein, part of the land within the Capital Development Area registered under certificate of TITLE NO 4585-DLR containing fifteen decimal points zero five six (15.056) hectares

Square metres, shown for identification only edged red on the plan attached to this Lease Agreement and defined on the registered Plan Numbered 23900 deposited at the office of the Director of Surveys and Mapping at Dar es Salaam.

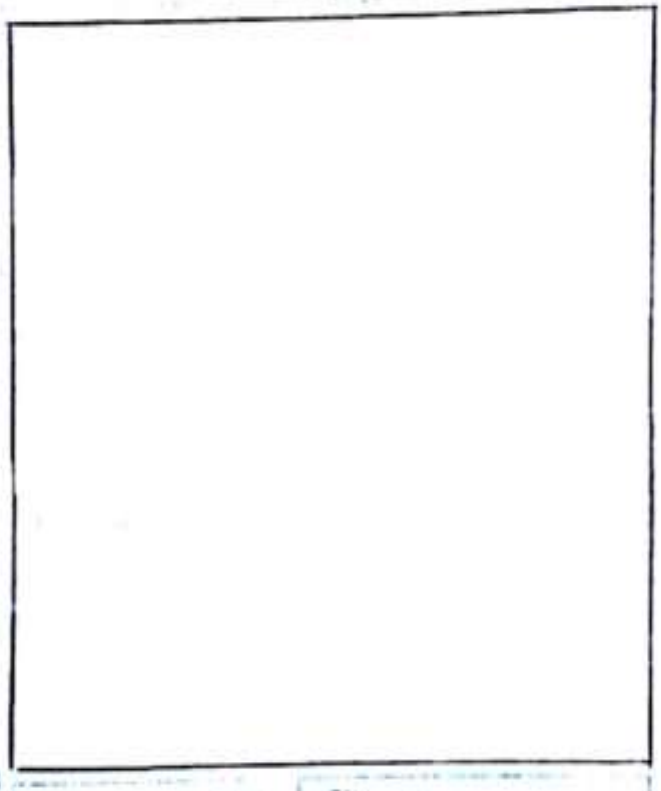
We the LESSOR and the LESSEE (S) hereby accept the terms and conditions contained in the foregoing Lease Agreement.

SEALED with the COMMON SEAL of the said)
CAPITAL DEVELOPMENT AUTHORITY and) SEAL
DELIVERED In the presence of us)
this 24th day of August 20 13)

Signature: .....
Name: EVARIST BABISI KIMBA
Postal Address: P.O.Box 913, DODOMA
Qualification: DIRECTOR GENERAL

Signature: .....
Name: ABDALLAH SAID ILLONGA
Postal Address: P.O. BOx 913, DODOMA
Qualification: DIRECTOR OF FINANCE & ADMINISTRATION

SEALED with the COMMON SEAL of the)
said INSTITUTE OF RURAL DEVELOPMENT)
PLANNING and DELIVERED on the presence)
of us this......15TH................)
day of....AUGUST.......20.03.......)
)
Signature:...........................)
)
Name:..................................)
Postal Address:....P.O. BOX 138......)
........DODOMA.........................)
DIRECTOR
Qualification:........................)
)
)
Signature:...........................)
Name:..................................)
Postal Address:....P.O. BOX 138.......)
........DODOMA.........................)
Qualification:.....EXECUTIVE SECRETARY)



Kugakwa

13·5·2003

Appendix 2: Baseline data for Water quality

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ENVIRONMENTAL ENGINEERING LABORATORY

Water Analysis Results

Client: COLBA
Date Received: 31 August 2023
Source: Water (Duwasa)

S/N	PARAMETER	Units	Results	TZS:789:2005 standards
1	pH		7.43	6.5-8.6
2	Turbidity	NTU	0	25
3	Colour	Hazen°	0	50
4	Salinity	‰ (ppt)	0.49	na
5	Electric conductivity	µS/cm	995.0	2000
6	Total Dissolved solids	mg/l	497.5	2000
7	Phosphate	mg/l	0.064	na
8	Nitrate-Nitrogen	mg/l	2.1	10
9	Ammonia-Nitrogen	mg/l	0.234	0.5
10	Chloride	mg/l	123.0	800
11	Sulphate	mg/l	67.70	600
12	Bicarbonate Alkalinity	mg/l	35.0	na
13	Iron	mg/l	0.090	1.0
14	Manganese	mg/l	<0.01	0.5
15	Carbonate Alkalinity	mg/l	0	na
16	Total Alkalinity	mg/l	35.0	na
17	Total Hardness	mg/l	234.0	500
18	Magnesium	mg/l	4.215	100
19	Calcium	mg/l	82.0	75
20	Sodium	mg/l	26.20	na
21	Potassium	mg/l	0.448	na
22	Lead	mg/l	<0.01	0.01
23	Copper	mg/l	<0.01	0.05
24	Cadmium	mg/l	<0.01	0.05
25	Chromium	mg/l	<0.01	0.05
26	Zinc	mg/l	<0.01	5
27	Nickel	mg/l	<0.01	na
28	Faecal coliform	Count/100ml	0	0
30	Total coliform	Count/100ml	0	0

Sampling done by client, na= Not available/applicable

Reporting Officer

Ndimbo A.M

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ENVIRONMENTAL ENGINEERING LABORATORY

Water Analysis Results

Client: COLBA
Date Received: 31 August 2023
Source: Water

S/N	PARAMETER	Units	POND
1	pH		7.40
2	Turbidity	NTU	15
3	Colour	Hazen°	146
4	Salinity	‰ (ppt)	0.51
5	Electric conductivity	µS/cm	1021
6	Total Dissolved solids	mg/l	510.5
7	Phosphate	mg/l	0.012
8	Nitrate-Nitrogen	mg/l	0.3
9	Ammonia-Nitrogen	mg/l	0.250
10	Chloride	mg/l	136.0
11	Sulphate	mg/l	58.60
12	Bicarbonate Alkalinity	mg/l	65.0
13	Iron	mg/l	0.603
14	Manganese	mg/l	0.017
15	Total Alkalinity	mg/l	65.0
16	Magnesium	mg/l	7.315
17	Calcium	mg/l	160.p
18	Lead	mg/l	0.012
19	Copper	mg/l	0.029
20	Cadmium	mg/l	<0.01
21	Chromium	mg/l	<0.01
22	Zinc	mg/l	0.474
23	Nickel	mg/l	<0.01
24	Chemical oxygen demand	mg/l	123.0
25	Total suspended solids	mg/l	30.0
26	Grease &oil	mg/l	4.23
27	Faecal coliform	Count/100ml	$4*10^{6}$
28	Total coliform	Count/100ml	$9*10^{6}$

Sampling done by client.

Reporting Officer

Ndunha A.M

Appendix 3: Issues and Concerns raised from Stakeholders

Issues and concerns raised from Institute of Rural Development Planning (IRDP)

Department /Unit	Views, concerns, and recommendations
Administration and project coordinator	• Provision of academic building with facilities for disabled and people with special needs; • The project will observe conditions and needs of public buildings; • Increase in student enrolment; and • Providing quality education and skills to students using ICT technology.
Department of Student Affairs	• Increase in student enrolment; • Improvement of the workplace to the IRDP staffs; • Availability of buildings with friendly infrastructure for teaching and learning; and • Provision of reproductive health, mother and child health, sexual relationship, HIV/AIDS and STDs as well as GBV awareness education to construction workers, IRDP students and staffs, and surrounding community.
	• Increase in student enrolment; • Provision of enough venues to the students; • The project site area should be fenced; • There should be special path routes to be used by construction workers to prevent interaction between them and students, teaching and non-teaching staffs at IRDP; • Sexually interaction between construction workers, IRDP students and workers, and surrounding community; and • GBV, HIV/STDs, corruption and safety awareness education should be provided to construction workers, IRDP students and workers as well as surrounding community.
IRDP workers	• Increase in classrooms/venues to meet the needs at IRDP; • Reduce congestion of the lecture sessions and exams timetable; • Increase of offices to facilitate the provision of services and the performance of IRDP workers; • Employment opportunities to surrounding community; • Local income generation; • Sexual interaction between construction workers, IRDP students and staffs, and surrounding community; • Noise pollution from construction activities; and • Improve education quality through the use of ICT technology.
	• Construction workers should have identification cards while working at IRDP compound; • The contractor should hire security guards; and • Importation of building materials to the project site should be reported to the IRDP administration and security officer.
	• Increase in student enrolment; • Employment opportunities to cleaners; • Fencing the project site; • Provision of path route to be used by construction workers to avoid interaction with IRDP students and staffs; and • There should be rules and regulation that manage construction activities at IRDP area.
IRDP clinic	• Provision of PPEs to construction workers; • Provision of store for storage of construction materials, equipment and machinery; • Proper management of hazardous wastes onsite;

Department /Unit	Views, concerns, and recommendations
	• Proper arrangement of site to avoid injuries and accidents to construction workers; • Provision of condoms onsite; • Provision of HIV/AIDS and STDs awareness education to construction workers, IRDP students and staffs, and surrounding community.
	• Provision of condoms onsite; • Provision of HIV/AIDS, STDs and sexual relation awareness education to construction workers, IRDP students and staffs, and surrounding community; and • There should be voluntary HIV testing to construction workers and those affected person should be encouraged to use medicine properly.
Institute of Rural Development Planning Students	• Availability of enough venues/lecture rooms; • Increase in student enrolment; • Expansion of IRDP campus; • Business expansion; • Project implementation timeframe should be managed and project completed on time as outlined on the signed contract; • The project design should have toilets for disabled people and privacy room for girls' students; • Minimum clearance of vegetation cover at the project site; • Dust and noise from construction works; • Trees should be planted to replace the cleared ones; and • HIV/AIDS, STDs and GBV awareness education should be provided to construction workers, IRDP staffs and students as well as surrounding community.
Students	• Assuring no noise pollution during daily construction activities • Students safety and signage safety accompany with safety fence to demarcate the construction • Blasting activities should be conducted at night so as no injuries obtained mainly students • Managing flying particles or dust during construction time • All hazardous and dangerous works must be performed efficiency to keep the institute general condition at peace • Managing flying particles or dust during construction time • Protect underground and ground (water flowing) sources during construction

Issues and concerns from Government Departments and Agencies

Agency/Department	Issues, Concerns, Comments and Recommendations
Ministry of Education, Science and Technology	• Control dust and exhaust emissions from construction activities and operations of construction machinery and equipment; • Control noise pollution due to operations of trucks and construction machinery and equipment; • Allocate solid waste collection bins onsite; • Proper handling and disposal of solid wastes; and Proper handling and disposal of waste oil.
National Council for Technical and Vocational Education and Training (NACTVET)	The university should consider compendium of NACTVET academic quality standards

Agency/Department	Issues, Concerns, Comments and Recommendations
Tanzania Building Agency (TBA)- Dodoma Region	• The proposed building should have facilities for disabled people; • The building should have escape route and safety signs for emergencies; • Building design should have enough ventilation and able to use natural lights; • Fire resistant construction materials should be used; and • Provision of firefighting equipment including detectors in the proposed building.
Geological Survey of Tanzania (GST)	Since geological hazards may have adverse effects to the construction project, it is advised to conduct assessment in order to identify any potential hazards and suggest for the appropriate mitigation measures during construction. In view of that, and considering that the effects of geological hazards mainly depends on the geological condition of a specific activity to be undertaken within the project area prior to construction: i) Surface geological investigation, characterisation of lithological units, and assessment of radioactive elements in the soil; ii) Ground Magnetic Survey and Electrical Resistivity Tomography Survey in order to characterise subsurface geological condition particularly for determining the competence of rocks based on magnetic and electrical conductivity properties, and delineating subsurface geological structures; iii) Geotechnical investigation for the assessment of rocks and soil mechanics; iv) Seismic survey for detailed information on the surface conditions; site response analysis to assess the ground response due to seismic waves; soil implication; soil layers; seismic wave velocity; seismic load; just to mention a few; ultimately make an informed decision regarding earthquake-resistant design.
Occupational, Health and safety Authority (OSHA)- Dodoma	• Project should be registered to OSHA; • Architectural drawings should be submitted to OSHA for approval; • Risk assessment should be conducted; • Provision of OHS Policy, emergency Preparedness Plan, Health and safety Management Plan and standard operating procedures in each project phase; • Provision of First Aid trainings, and Health and safety representative courses to construction workers; • There should be trained safety officer onsite; • Medical examination to construction workers should be conducted; • Adequate PPEs should be provided to construction workers; • There should be safe means of access and working condition onsite; • Provision of toilets and changing rooms for construction workers onsite.
Fire and Rescue Force – Dodoma Region	• The proposed building should have rescue and exit route; • The proposed building should have firefighting equipment including fire extinguishers that are serviced after every 6 months; • There should be assembly point at the project area; • Fire and Rescue Force emergency number 114 should be posted onsite;

Agency/Department	Issues, Concerns, Comments and Recommendations
	• Construction workers and IRDP staffs should be provided with fire and rescue training; and • Before project implementation, architectural drawings should be submitted to Fire and Rescue Force for approval and be given safety recommendations
Wami Ruvu Water Basin Board	• Construction activities should observe protection of the environment • Seek for permits once the construction activities started of effluent discharge • Ensure water resources protection and geophysical survey is conducted • Ensure water safety for the sustainable use

Issues and concerns from City Council of Dodoma

Department/Unit	Issues, concerns, comments and recommendations
Environmental Conservation and Natural Resource	• Geotechnical survey should be conducted; • PPEs should be provided to construction workers; • Fencing the proposed project site; • First aid box should be provided onsite; • Safety net should be provided on constructed building to avoid dust and accidents; and • Solid waste management should be done by registered and recognized contractor by City Council of Dodoma.
Land Department	• The land use is compatible with the proposed project development; and • Building permit should be acquired before project commencement.
Community development and planning	• Provision of quality education to the students at IRDP through ICT technology; • Increase the IRDP status to the society; • Employment opportunities to the locals; • Business expansion; • Increase aesthetic value of Miyuji Proper *mtaa*; • Increase student enrollment; • Population influx; • Spread of HIV/AIDS and STDs; • Early and/or unwanted pregnancies to young girls at the project area due to the influence of money from construction workers; • Corporate social responsibility should be planned for the surrounding community to benefit through project implementation; • There should be good relationship between contractor, IRDP and surrounding community; and • Trees plantation at the project site area.
	• Sexually interaction between construction workers, IRDP students and staffs, and surrounding community; • Early and/or unwanted pregnancies to young girls at the project area; • Fencing the project site area; • Construction workers should be provided with social services within the site camp to avoid frequent interaction with IRDP students and community; and • Provision of GBV, HIV/AIDS awareness education to construction workers, IRDP students and staffs, and community.

Concerns and issues from Ward and *Mtaa* Levels

Department/ unit	**Views/Concerns/Issues**
Miyuji Ward	• The proposed project has been accepted in Miyuji Ward; and • Procedures and agreements for the project implementation should be observed throughout the project lifecycle.
Miyuji Proper *Mtaa*	• Availability of enough venues/ lecture rooms to be used by students; • Increase aesthetic value of Miyuji Proper *Mtaa*; • Business expansion; • Sexually interaction between construction workers and community; and • HIV/AIDS and GBV awareness education should be provided to the construction workers and community.
Miyuji Proper *Mtaa* Council	• *Mtaa* Council has accepted the proposed project in their area; • Prior employment opportunities to Miyuji Proper *Mtaa* residents; • Friendly employment contract should be provided for the surrounding community to have a chance to be employed at the project; • All construction workers should be introduced to *Mtaa* office; • Business expansion; • Proponent and contractor should introduce themselves to *Mtaa* office and participate in community development projects; • HIV/AIDS, STDs and GBV awareness education should be provided to the community and construction workers; and • Proponent and contractor should ensure that the proposed project benefit Miyuji *Mtaa* community.
Neighbors	• Provision of high-quality education to IRDP students; • Dust emission from construction works; • There should be gender equality on project employment opportunities; • Increase in student enrolment; • Business expansion; • Increased income generation to locals; • Provision of PPEs to construction workers; • Advanced technology equipment and machinery should be used in construction activities; • Surrounding community should be involved in each project phase for them to feel ownership of the project.
	• Increase in student enrollment; • Increased income generation to the community; and • Business expansion.
	• Business expansion; • Increase income generation; • Provision of high-quality education to IRDP students; and • Dust emissions from construction works.
	• Employment opportunities to the surrounding community; • Business expansion; • Increase income generation; • Sexually interaction between construction workers, IRDP students and staffs, and community; • Provision of enough security at the project area in collaboration with ward police; and • Sexual and reproductive health education should be provided to prevent sexual misconduct at the project area.

Issues and concerns from NGOs/CBOs within the project area

Stakeholder	Views/Concerns/Issues
Dodoma Youth Development Organization (DOYODO)	• Employment opportunities should be given to youth within the project area (Miyuji Ward); • Construction activities should consider the safety of workers; • Solid waste Management Plan should be onsite; and • Project implementation should consider safety and human rights including controlling acts of sexual violence in the project area.
NGO-Network for Dodoma	• Employment opportunities should be given to youth within the project area; • Employment opportunities should consider gender equality and involve people with disabilities; • Youth and women in the project area should be involved in the project implementation for them to feel be part of the project and sense of ownership; • Procurement procedures should be observed and followed during project implementation; • Bill of quantity should be followed and all facilities for people with disabilities provided in the proposed building; • Contractor should cooperate with NGOs and CBOs dealing with GBV and VAC issues to provide education to construction workers and surrounding community, and condemn acts of sexual violence in the society; • The contracts between IRDP administration and contractor should have guidelines to prevent sexual violence; and • University gender desk should be empowered to monitor the issues of GBV at the project site area

Appendix 4: Baseline data on Air quality, Noise, Vibrations and Water quality

Appendix 4a: Sampling points description

S/N	Sampling location	Geographical Location	
		Latitude	Longitude
1	SP1	-6.106536	35.756051
2	SP2	-6.106543	35.756445
3	SP3	-6.106571	35.755828
4	SP4	-6.106082	35.755989

Source: Field work on August 2023

Appendix 4b: Ambient Particulate Matter measured at proposed site

Sampling Location	Weather Condition	Ambient Particulate matter	
		$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)
SP1	Clear Cloud	49.9	233.6
SP2	Clear Cloud	30.1	143.4
SP3	Clear Cloud	40.7	127.1
SP4	Clear Cloud	46.7	121.9
Overall Average		44.4	169.1
The Environmental Management (Air Quality Standards) Regulations, 2021 and TBS Standards		75	150
WHO Standards		25	50

Appendix 4c: Average values of measured ambient gases

Sampling Location	Weather Condition	Ambient Air quality for pollutant gaseous						
		O_2 (%)	CO (ppm)	H_2S (ppm)	NO (ppm)	SO_2 (ppm)	NO_2 (ppm)	CO_2 (ppm)
SP1	Clear Cloud	20.4	<0.01	<0.01	<0.01	<0.01	<0.01	322
SP2	Clear Cloud	20.9	<0.01	<0.01	<0.01	<0.01	<0.01	352
SP3	Clear Cloud	20.9	<0.01	<0.01	<0.01	<0.01	<0.01	319
SP4	Clear Cloud	20.9	<0.01	<0.01	<0.01	<0.01	<0.01	325
Average		20.9	<0.01	<0.01	<0.01	<0.01	<0.01	330
The Environmental Management (Air Quality Standards) Regulations, 2007 and TBS Standards		19.5-23.5	87 ppm for 15 minutes of exposure	-	-	0.2 ppm for 10 exposure minutes	0.1 ppm for 8 hours of exposure	-
WHO Standards		21	90 ppm for 15 minutes of exposure	-	1000	0.175 ppm for 10 minutes of exposure	0.05 ppm for 8 hour mean of exposure	-
OSHA Standards								1000

Source: Field measurement on August 2023

Appendix 4d: Noise Level Measurement Locations in the Study Area – Day-time

Sampling Location	Equivalent Continuous Noise Level, DbaLaeq	LAFmax, Dba	LAFmin, Dba	Category of Area	Environmental Management (Standards for the Control of Noise and Vibrations Pollution) Regulations, 2015 for Institutional area	
					Day	Night
SP1	54.7	59.6	47.5	Institutional	60	50
SP2	53.4	65.4	40.9	Institutional	60	50
SP3	42.6	47.2	39.8	Institutional	60	50
SP4	42.3	45.7	39.1	Institutional	60	50
Average	50.2	57.5	43.7		60	50

Source: Field measurement on August 2023

Appendix 4e: Recorded Meteorological Values at the Proposed Site

Sampling Point	Weather Condition	Temperature(° C)	Relative humidity (%)	Heat Index (° C)
		Day-time	Day-time	Day-time
SP1	Clear Cloud	25.7	47.1	25
SP2	Clear Cloud	25.7	49.7	25.1
SP3	Clear Cloud	25.4	45.3	24.6
SP4	Clear Cloud	29.3	42.1	29.4

Source: Field measurement on August 2023

Appendix 4f: Results from ground measurements for IRDP Dodoma Campus in Miyuji area

Site	Velocity (mm/s)				Source of Vibrations
	Min	Ave	Max	IFC Limit	
SP1	0.0	0.05	0.1	20.000	Light vehicles along the earth road
SP2	0.0	0.0	0.0	20.000	

Appendix 4g:Water Quality Analysis Report for DUWASA Sample

SN	Parameters	Units	DUWASA	TZS: 789: 2005
1	pH	Scale	7.43	6.5-8.6
2	Turbidity	NTU	0	25
3	Colour	Hazen°	0	50
4	Salinity	%(ppt)	0.49	NA
5	Electric conductivity	µS/cm	995	2000
6	Total dissolved solids	mg/l	497.5	2000
7	Phosphate	mg/l	0.064	NA
8	Nitrate-Nitrogen	mg/l	2.1	10
9	Ammonia-Nitrogen	mg/l	0.234	NA
10	Chloride	mg/l	123.0	800
11	Sulphate	mg/l	67.70	600
12	Bicarbonate Alkalinity	mg/l	35.0	1.5
13	Iron	mg/l	0.090	NA
14	Manganese	mg/l	<0.01	NA
15	Carbonate Alkalinity	mg/l	0	NA
16	Total Alkalinity	mg/l	35.0	NA

17	Total Hardness	mg/l	234.0	NA
18	Magnesium	mg/l	4.215	500
19	Calcium	mg/l	82.0	100
20	Sodium	mg/l	26.20	75
21	Potassium	mg/l	0.448	1.0
22	Lead	mg/l	<0.01	0.5
23	Copper	mg/l	<0.01	5.0
24	Cadmium	mg/l	<0.01	0.05
25	Chromium	mg/l	<0.01	NA
26	Zinc	mg/l	<0.01	0.05
27	Nickel	mg/l	<0.01	0.01
28	Faecal coliform	Count/100ml	0	0
29	Total coliform	Count/100ml	0	0

Source: Ardhi University Laboratory analysis: September, 2023, NA=Not Analysed

Appendix 4h: Water Quality Analysis Report for Pond Sample

SN	Parameters	Units	DUWASA
1	pH	Scale	7.40
2	Turbidity	NTU	15
3	Colour	Hazen^{o}	146
4	Salinity	%(ppt)	0.51
5	Electric conductivity	µS/cm	1021
6	Total dissolved solids	mg/l	510.5
7	Phosphate	mg/l	0.012
8	Nitrate-Nitrogen	mg/l	0.3
9	Ammonia-Nitrogen	mg/l	0.250
10	Chloride	mg/l	136.0
11	Sulphate	mg/l	58.6
12	Bicarbonate Alkalinity	mg/l	65.0
13	Iron	mg/l	0.603
14	Manganese	mg/l	0.017
15	Total Alkalinity	mg/l	65.0
16	Magnesium	mg/l	7.315
17	Calcium	mg/l	160
18	Lead	mg/l	0.012
19	Copper	mg/l	0.029
20	Cadmium	mg/l	<0.01
21	Chromium	mg/l	<0.01
22	Zinc	mg/l	0.474
23	Nickel	mg/l	<0.01
24	Chemical Oxygen Demand	mg/l	123.0
25	Total Suspended Solids	mg/l	30.0
26	Grease & Oils	mg/l	4.23
27	Faecal coliform	Count/100ml	$4*10^{6}$
28	Total coliform	Count/100ml	$9*10^{6}$

Source: Ardhi University Laboratory analysis: September, 2023, NA=Not Analysed