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MZUZU UNIVERSITY

SKILLS FOR A VIBRANT ECONOMY (SAVE)

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP) FOR CONSTRUCTION OF ENTREPRENEURS TRAINING AND INCUBATION CENTRE (ETIC).

JUNE, 2024.

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LIST OF ACRONYMS AND ABBREVIATIONS

ACESA	Advisory Committee of Environmental and Social Assessments
AIDS	Acquired Immunodeficiency Syndrome
ALS	Active Learning Style
ART	Anti-Retroviral Treatment
BSc	Bachelor of Sciences
CBOs	Community Based Organisations
CDSS	Community Day Secondary Schools
CHAM	Christian Health Association of Malawi
Covid-19	Coronavirus disease 2019
CoW	Clerk of Works
CSO	Civil Society Organisations
dB	Decibels
DC	District Council
DCPO	District Child Protection Officer
DEPRP	Disaster Emergency Preparedness and Recovery Plan
DHS	Directorate of Health Services
DLO	District Labour Officer
DoDMA	Department of Disaster Management Affairs
DRMP	Disaster Risk Management Plan
DSWO	District Social Welfare Officer
DYO	District Youth Officer
EAD	Environmental Affairs Department
EDO	Environmental District Officer
EGENCO	Electricity Generation Company

EHS	Environmental, Health and Safety
EHSG	Environmental, Health and Safety Guidelines
EMA	Environment Management Act
EoI	Expression of Interest
ERPP	Emergency Response and Preparedness Plan
ESCOM	Electricity Supply Corporation of Malawi
ESCP	Environmental and Social Commitment Plan
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESMMP	Environmental and Social Management and Monitoring Plans
ESMP	Environmental and Social Management Plan
ESS	Environmental and Social Standards
ESSUP	Education Sector Support Programme
ETIC	Entrepreneurs Training and Incubation Centre
FGM/C	Female Genital Mutilation/Cutting
GBV	Gender-Based Violence
GoM	Government of Malawi
GRC	Grievance Redress Committee
GRM	Grievance Redress Mechanism
Ha	Hectare(s)
HIV	Human Immunodeficiency Virus
HSP	HUB Subcontracting Plan
HTS	HIV Testing and Counselling
ICT	Information and Communication Technology
IDA	International Development Association

IFC	International Finance Corporation
IHS3	Third Integrated Household Survey
IHS5	Fifth Integrated Household Survey
ISO	International Organisation for Standardisation
ITCZ	Inter-tropical Convergence Zone
IUCN	International Union for Conservation of Nature
km	Kilometre
km/hr	Kilometre per Hour
KV	Kilovolt
L	Litre
LEA	Local Education Authority
LMP	Labour Management Procedures
LUANAR	Lilongwe University of Agriculture and Natural Resources
M and E	Monitoring and Evaluation Officer
MACRO	Malawi AIDS Counselling and Resource Organization
MASM	Medical Aid Society of Malawi
MCC	Mzuzu City Council
MDF	Malawi Defence Force
MEPA	Malawi Environment Protection Authority
MERA	Malawi Energy Regulatory Authority
MGDS	Malawi Growth and Development Strategy
MoAIWD	Ministry of Agriculture Irrigation and Water Development
MoE	Ministry of Education
MoGCDSW	Ministry of Gender, Community Development and Social Welfare
MRA	Malawi Revenue Authority

MRDRMP	Malawi Resilience and Disaster Risk Management Project
MSc	Master of Sciences
MTL	Malawi Telecommunication Limited
MW	Megawatts
MWK	Malawi Kwacha
MZUNI	Mzuzu University
N/A	Not Applicable
NCIC	National Construction Industry Council of Malawi
NEAP	National Environmental Action Plan of 2002
NGO	Non-Governmental Organisation
NOYD	Ntchisi Organisation for Youth and Development
NRWB	Northern Region Water Board
NSO	National Statistics Office
NWRA	National Water Resources Authority
ODeL	Open Distance e-Learning
OPD	Outpatient Department
OSH	Occupational Safety and Health
OSHWA	Occupational Safety Health and Welfare Act
PGD	Postgraduate Diploma
PIU	Project Implementation Unit
PPE	Personal Protective Equipment
RHA	Risk Hazard Assessment
SADC	Southern African Development Community
SAVE	Skills for a Vibrant Economy
SEA	Sexual Exploitation and Abuse

SEP	Socio Economic Profile
SOBO	Southern Bottlers Limited
SoPs	Standard Operating Procedures
SSB	Stabilised Soil Blocks
STDs	Sexually Transmitted Diseases
STIs	Sexually Transmitted Infections
TEVET	Technical Entrepreneurial and Vocational Education and Training
TEVETA	Technical Entrepreneurial and Vocational Education and Training Authority
TGA	Thermo gravimetric Analyser
TIP	Trafficking in Persons
TNM	Telekom Networks Malawi
ToRs	Terms of References
UMCs	University Management Committees
URTI	Upper Respiratory Tract Infections
US$	United States Dollar(s)
VAT	Value Added Tax
VCT	Voluntary Counselling and Testing
VIP	Ventilated Improved Pit
VLS	Versatile Learning Space
VSBK	Vertical Shaft Brick Kiln
WASH	Water Sanitation and Hygiene
WB	World Bank
WGRC	Workers Grievance Redress Committees
WSP	Wastewater Stabilisation Pond

A. EXECUTIVE SUMMARY

I. Nature of the Assignment

The Government of Malawi through the Ministries of Education and Labour is implementing a project funded by the World Bank-International Development Association (IDA) with a resource facility of US$100 million for a period of 5 years. The project aims to improve access to market-relevant skills programmes in priority areas of the economy, ensuring equity in skills training with the empowerment of women and girls and vulnerable youth through targeted skills in priority areas of the economy and creating a conducive policy environment and strengthening systems and institutional capacity for skills development, which will centre on: Technical, Entrepreneurial, and Vocational Education and Training (TEVET) and Higher Education Reforms, Student loans, Industrial links, Digital technology and Safeguards, Capacity Building, and Technical Assistance among other systemic issues. The SAVE Project at Mzuzu University (MZUNI) will finance the construction of an Entrepreneurs Training and Incubation Centre (ETIC)

II. Scope of the Project

The scope of the project includes planning and designing, construction, operational and demobilisation activities. The main planning and designing activities include identifying the land where the project will be carried out. Currently, the identified land is within Mzuzu University's Luwinga Campus. Other planning and designing activities include carrying out topography and geo-technical studies, preparing site plans and technical drawings and preparing budgets and time lines.

The ETIC building has the following design features:

a. The proposed building will be 4 storeys high;

b. The building will have two wings – one for Energy systems and the other for ICT;

c. The postgraduate section and seminar rooms are to be located on the uppermost floor; and

d. Common facilities and workshops will be at the ground floor level.

The main construction activity will be the construction of an Entrepreneurs Training and Incubation Centre (ETIC). The ETIC will consist of various facilities for student skills development and training. The facilities will include two wings – one for Energy systems and the other for ICT.

The ETIC will also include a 500-seater Lecture Theatre; 16 laboratories dedicated to Artificial Machinery and Data Science, ICT for Development, Internet, Hardware and Networking, Energy, Workshop and Testing, and a Testing Centre. Each laboratory will accommodate up to 60 students. The ETIC will also incorporate 8 offices, 2 workshops, 4 classrooms, learning and research equipment and furniture.

Key activities to be implemented include: recruitment of a Design Consultant; recruitment of a Supervision Consultant; recruitment of a Contractor; site mobilisation; purchasing of construction materials; setting out the ETIC building using approved plans; building sub-structure of the ETIC building; building superstructure of the ETIC building; and maintenance works during operation phase as may be required.

The demobilisation phase is expected to include the following activities: scaling down of the workforce; removal of temporary structures; removal of construction machinery and surplus construction materials; cleaning the site; and waste disposal at a site authorised by Mzuzu Council.

Operational activities of the centre will include teaching and learning activities associated with Technical, Entrepreneurial, and Vocational Education and Training on ICT and Energy. This will unleash the potential of youth, vulnerable students and women through formal and informal skills transfer for improved economy and livelihoods.

This Environmental and Social Management and Monitoring Plan (ESMMP) document has been prepared to describe the principles and procedures to be followed in addressing the relevant safeguards policies that will be triggered by the proposed Skills for A Vibrant Economy (SAVE) Project, which is to be financed by the International Development Association of the World Bank.

III. Brief Description of the SAVE Project

The Government of Malawi through the Ministry of Education and Ministry of Labour and Vocational Training, with funding from the World Bank would like to implement the Skills for a Vibrant Economy Project (SAVE). The estimated cost for the proposed project is US$ 100 million and the expected duration is 5 years (from 2021 to 2026). The proposed Project aims to improve access to market-relevant skills programmes in priority areas of the economy, ensuring equity in skills training with the empowerment of women and girls and vulnerable youth through targeted skills in priority areas of the economy and creating a conducive policy environment and strengthening systems and institutional capacity for skills development, which will centre on: Technical, Entrepreneurial, and Vocational Education and Training (TEVET) and Higher Education Reforms, Student loans, Industrial links, Digital technology and Safeguards, Capacity Building, and Technical Assistance among other systemic issues.

The Project will help to among others: (i) Increase equitable access to market-relevant skills development programs in priority areas of the economy in public higher education institutions (ii) Increase equitable access and market-relevance to technical and vocational education and training opportunities in priority areas of the economy and (iii) support Tertiary education student financing and system strengthening, project management, M&E and communications.

The project consists of 4 Components which are;

Component 1. Supporting public higher education institutions in increasing equitable access to market-relevant skills development programs;

Component 2 - Supporting Technical, Entrepreneurial, and Vocational Education and Training to increase equitable access to market-relevant skills development;

Component 3- Tertiary education student financing and system strengthening, project management, M&E and communications; and

Component 4- Contingency Emergency Response

IV. Potential Environmental and Social Impacts of the SAVE Project

The interventions proposed under the SAVE project will not likely result in significant adverse environmental or social impacts. However, the implementation of building structures under Components 1 and 2 may lead to some negative environmental and social impacts which will have to be managed properly. The potential impacts are likely to occur in the 3 main phases of Pre-construction, Construction and Operation, and Maintenance.

a. Pre-Construction Phase:

The likely impacts during this phase include; an increase in employment opportunities, an increase in business opportunities, loss of vegetation, increased risk of soil erosion and blockage of some footpaths.

b. Construction Phase

A considerable number of potential impacts are likely to occur under this phase. These include; an increase in employment opportunities and associated labour issues, an increase in business opportunities, source of Government revenue, noise, vibration and emissions, soil erosion, generation of waste, HIV & AIDS and other STIs, increased risk of spread of COVID-19, traffic disruption, Gender-based violence and sexual exploitation of students, disruption of classes, occupational health and safety, public safety, water pollution, gender-based violence, violence against children, risk of exposure to hazardous wastes and chemicals and theft cases increase.

c. Operation and Maintenance Phase

The likely potential impacts under this phase will include an increase in employment opportunities, an increase in the number of students enrolled, promotion of teaching and learning of labour market-relevant skills, increased knowledge in ICT, Improved learning space and equipment, generation of solid and liquid waste, soil and water pollution, sexual exploitation of students, HIV & AIDS and other STIs and increased risk of spread of COVI-19, increased energy and water use as well as safety and access issues to students and staff concerning building design.

V. Mitigation and enhancement plans

These Social Management Plans (ESMPs) have been prepared to address environmental and social issues during project implementation. These mitigation and enhancement measures are impact-specific but some include but are not limited to employing locals, creating space for the

market to boost businesses, awareness and sensitizations, enforcing the use of PPE, replanting vegetation, restricting speed limits, engaging community and community policing structures, employing alternative technologies e.g., water harvesting etc. Thus, this generic ESMP and monitoring plan acts as a guide to the project implementers.

VI. Conclusion and recommendations

This ESMP has presented the major guidelines that have to be followed for safeguards implementation in the SAVE Project. Mitigation measures for the identified potential environmental and social impacts have to be well followed during the development and implementation of ETIC specific ESMPs.

CHAPTER 1: INTRODUCTION AND BACKGROUND

1.1 Introduction

Mzuzu University (MZUNI) is one of the participating institutions that is implementing the Project under components **1** (Supporting Increased Access to Skills Development Programmes in Higher Education) and **2** (Supporting Increase in Access to TEVET Skills Development). The project will also support Energy and Information Communication Technology (ICT) priority areas of the economy. In the project implementation period, MZUNI will increase access to skills training programmes for 9,560 students via the Open Distance and e-Learning (ODeL) delivery mode (4,560 students) and face-to-face delivery mode (5,000 students). This will comprise degree programmes (1,840 students), diploma programmes (1,320 students), certificate programmes (2,080 students), short course programmes (2,400 students), and bridging programmes (1,920 students). The University will increase the market relevance of skills training programmes by updating four courses and introducing nine new courses offered via ODeL and face-to-face in consultation with the industry. The University will increase equity in skills training programmes following a 50:50 equity policy in the enrolment of students. The SAVE project at MZUNI has an estimated total cost of $6,300,000.00; with $2,576,000 dedicated to the construction of the Entrepreneurs Training and Incubation Centre (ETIC) building.

To facilitate increased access, equity and market relevance of skills training programmes, MZUNI, through the Skills for a Vibrant Economy (SAVE) Project, will expand infrastructure for Energy and ICT which will form an Entrepreneurs Training and Incubation Centre (ETIC). The Centre will provide a platform for youth, instructors/mentors and an industry interface for innovation development, incubation and up-scaling and out-scaling. The ETIC will offer youth, vulnerable groups and female students assistance in the development and implementation of business strategies by providing mentoring, entrepreneurial training and basic support, as well as marketing and distribution support through various forums. The ETIC will provide a suitable learning environment for innovators and will support MZUNI's research, extension and development continuum with youth, vulnerable groups and communities.

1.2 Project Background

The government of Malawi through the Ministries of Education and Labour is implementing the Skills for a Vibrant Economy (SAVE) project funded by the World Bank-International Development Association (IDA) with a resource facility of US$100 million for a period of 5 years. The project aims to improve access to market-relevant skills programmes in priority areas of the economy, ensuring equity in skills training with the empowerment of women and girls and vulnerable youth through targeted skills in priority areas of the economy and creating a conducive policy environment and strengthening systems, and institutional capacity for skills development, which will centre on: Technical, Entrepreneurial, and Vocational Education and Training (TEVET) and Higher Education Reforms, Student loans, Industrial links, Digital technology and Safeguards, Capacity Building, and Technical Assistance among other systemic issues.

1.3 Components of the SAVE Project

The SAVE Project consists of 4 Components which are; 1-Supporting increased access to skills development programmes in higher education; 2-Supporting an increase in access to TEVET skills development; 3-Tertiary education system strengthening, project management, Monitoring and Evaluation, and Communications; and 4-Contingent emergency response component.

1.3.1 Component 1: Supporting Increased Access to Skills Development Programmes in Higher Education

Under this component, nine public higher education institutions, Mzuzu University (which is the subject of this ESMP), Malawi University of Business Studies and Applied Sciences, Lilongwe University of Agriculture and Natural Resources, Malawi University of Science and Technology, Kamuzu University of Health Sciences, Domasi College of Education, Nalikule College of Education, are being supported to expand enrolment from almost 31,000 in 2020 to over 60,000 by 2029 in priority areas of the economy. The project finances institutions to provide skills development opportunities offered through ODeL, face-to-face and blended models of instruction. The Project supports increased market-relevance of the programmes by ensuring private sector and industry engagement, updating existing curricula and developing new courses by participating institutions, expanding and improving existing infrastructure, providing students and staff opportunities for practical experience and industry attachments and supporting instructor and faculty professional development.

1.3.2 Component 2: Supporting Increase in Access to TEVET Skills Development

Under this component, the Project will increase access to formal TEVET-level tertiary education in seven National Technical Colleges (Lilongwe, Soche, Salima, Nasawa, Mzuzu, Livingstonia and Namitete), selected public and private technical colleges and community skills development centres doubling the intake capacity. This will be done by targeting youth, particularly females, strengthening training capacities in priority sectors of the economy, providing grant funding, especially to female students, investing in safe and gender-friendly facilities, supporting systematic development and application of institutional gender policies, and further training of teaching staff in gender sensitisation and other measures to improve the attractiveness of technical college training among girls. The project will also support building and rehabilitating training infrastructure, improving training quality including the acquisition of needed equipment, machinery and tools or technologies, creating capacities to provide incubation services for self-employment promotion through national technical colleges taking their role as innovation hubs, spearheading digital skills development, deepening cooperation with industry, and piloting new curricula to serve a wide variety of target groups including workers in the industry, informal sector operators, unemployed, and others.

1.3.3 Component 3: Tertiary education system strengthening, project management, Monitoring and Evaluation and communications

Under this component, the project will support system-level capacity building to create a conducive policy environment for tertiary education including the provision of student financing through increased financing for student grants and loans by the

Higher Education Student Grants and Loans Board, amendment of Student Grants and Loans Board Act and student financing options for TEVET. This component will also support overall project management and implementation, M&E and communications to ensure effective coordination, implementation and reporting.

1.3.4 Component 4: Contingent Emergency Response

The Contingent Emergency Response Component (CERC) is included under the project by Bank Policy Investment Project Financing, for situations of urgent need of assistance and rapid reallocation of financing in the event of a natural, man-made disaster or crisis that has caused or is likely to imminently cause a major adverse economic and/or social impact.

1.4 Nature and Scope of Construction Works

This is an infrastructure development project whose scope of work includes architectural and engineering designing; construction of the building and associated structures; finishing, furnishing, fittings and installations; and operation and maintenance.

The ETIC building will be a 4-storey building which will have two wings - one for Energy Systems and the other for ICT. Common facilities will include reception, computer lab, recreation, auditorium, entrepreneurship workshop, seminar rooms, boardroom and office space. Facilities for ICT will include an Artificial Intelligence (AI) and Data Science lab, hardware and networking lab, classroom (Active Learning Style (ALS)/Versatile Learning Space (VLS), workshop, equipment room, server room, classrooms, lavatories and office. The Energy Systems building will have a testing laboratory, mechanical workshop with benches, electrical and electronics laboratory, bio-resources processing laboratory, innovators room, classrooms, offices and lavatories. Specifically, the building will consist of a 500 seating capacity Lecture Theatre; 16 ICT and Energy Laboratories with a seating capacity for 60 students; 8 offices, 2 workshops and 4 classrooms; and associated external works (including construction of access roads).

The project will develop a building designed, planned and managed in such a way that it meets the physical and organisational requirements necessary for efficient and effective performance of the ETIC.

The project is expected to employ approximately 160 people at construction phase who will include technical staff, unskilled labourers and drivers. It is estimated that at least 40% of the people to be employed will be women to attain the recommended gender balance. At the operational phase, the building is expected to have 30 professional staff (lecturers and laboratory technicians) and 26 support staff (including cleaners, guards and office assistants).

Construction works for the proposed project are expected to commence in August, 2024, following the completion of preparatory activities; and will be done within 18 months. Activities to be carried out before construction include: the preparation of an Environmental and Social Impact Assessment (ESIA) report, preparation of an ESMP, recruitment of a design consultant, recruitment of a construction supervision consultant, review of project designs, tendering and award of a construction contract. At present the project is at the planning and design stage. An ESIA assessment report has been prepared and was approved by the Malawi Environment Protection Authority (MEPA) in August 2023. A design and supervision consultant has been engaged and detailed designs have been prepared.

1.5 Project Location

The proposed Project is being developed at Mzuzu University (11° 25' 19" S and 33° 59' 35" E), which is in Mzuzu City, Malawi. Specifically, the project will be developed within Mzuzu University (Luwinga Campus), which is the main institution of higher education in the city and the whole Northern Region. The University is located along the Mzuzu - Karonga M1 road and is positioned at a latitude of 11° 25'20"S and 33° 59'38"E.

Mzuzu City is located in the Northern Region of Malawi. To the East and South, the city borders with Nkhatabay district, whereas to the North, West, and South it shares a common boundary with Mzimba District. The City has a land area of 143.81 km 2.

The proposed project will be developed within Mzuzu City which is in Mzimba District located in the Northern Region of Malawi. Mzimba District which shares borders with Rumphi District to the north, Nkhata Bay District to the east, Zambia to the west and Kasungu District to the south; and lies between 33º 35’ and 33º 37’ Eastings and 11º 50’ and 11º 55’ Northings in the southern hemisphere (Mzuzu Urban Profile, 2013-2018).

The Entrepreneurs Training and Incubation Centre (ETIC) will use 0.365 Ha out of the 42.5Ha land belonging to MZUNI. Current land use of the area mainly consists of a built-up area with structures already serving and supporting teaching and learning at MZUNI. 95% of the proposed project site is bare land. See Figure 1. below

Fig. 1: Site Location

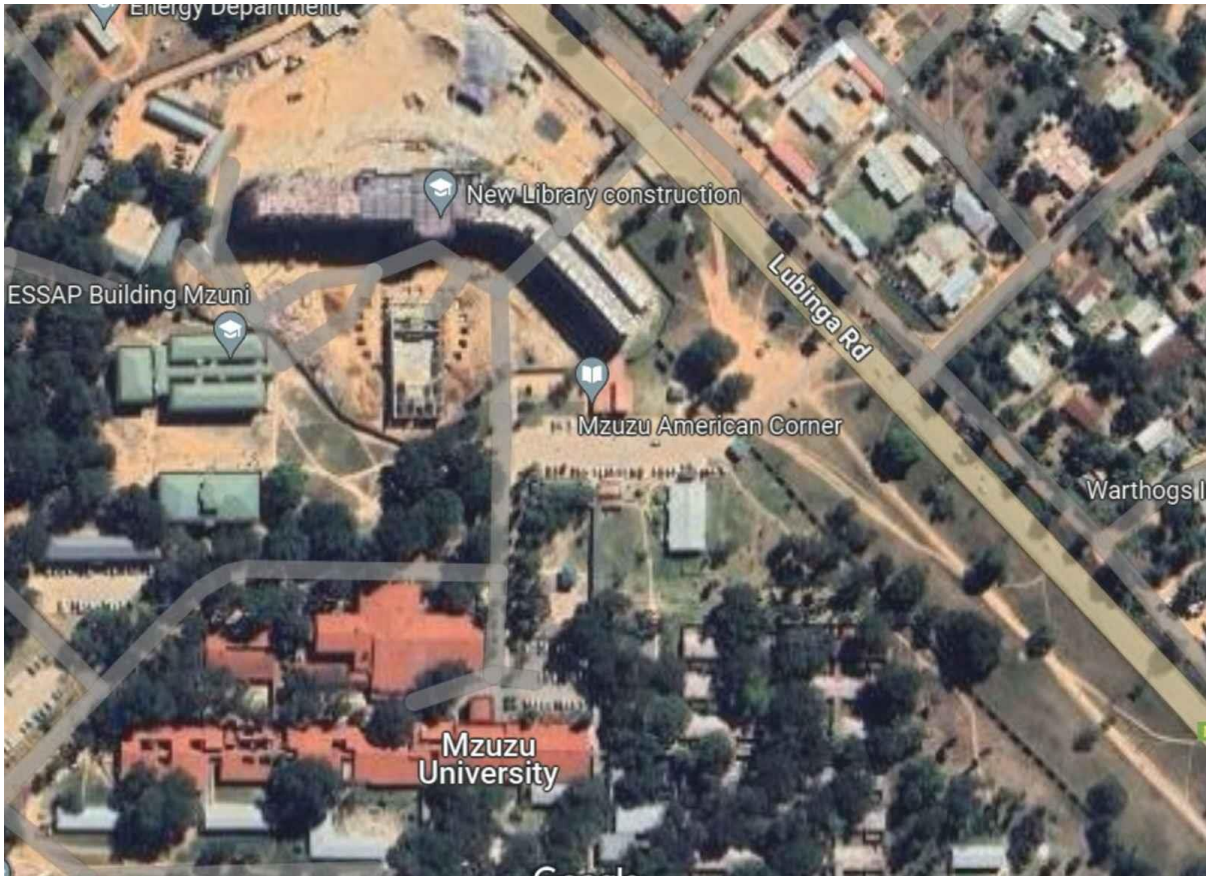


Figure 2: Site Map

1.6 Project Proponent

The project proponent is Mzuzu University. Details of the project proponent are provided as follows:

Project Developer:	Mzuzu University
Project Details:	Construction of ETIC Building
Postal Address:	Private Bag 201 Luwinga MZUZU 2
Contact Person:	The Vice-Chancellor
Email :	vc@MZUNI.ac.mw
Phone :	+265 111 620 568

1.7 Project Justification

An efficiently functioning higher education sub-sector, producing quality educational outcomes, is recognised as a key driver of growth, and a critical precondition for improving competitiveness in the global economy in the Malawi Growth Development Strategy (MGDS).

While Malawi has made progress in addressing challenges relating to access to higher education, the country continues to lag the performance of comparator countries. Malawi's higher education system is small compared to those of the other countries in the Southern African Development Community (SADC) region, and the total university enrolment rate is only 0.4 percent. As the country moves to accelerate access to education it faces significant challenges, as the demand for university-level education is increasing due to a rapid expansion of the secondary education system, and the capacity of the system to absorb aspirant applicants is insufficient across both the public and private sub-sectors of higher education in Malawi[1].

Enrolment at MZUNI increased from 8,102 in 2019/2020 to 9,507 in 2020/2021[2]. Expanded enrolment generates increased systemic pressures and presents challenges to the education sector with regard to the maintenance of quality.

SAVE project will help address the challenge in higher education by constructing an Entrepreneurs Training and Incubation Centre (ETIC) for ICT and Energy at Mzuzu University, which will assist in strengthening systems and institutional capacity for skills development. Importantly, the SAVE project aligns with and directly supports the strategic objectives for higher education in the National Education Sector Investment Plan 2020-2030.

1.8 Project Objectives

1 International Bank for Reconstruction and Development/ The World Bank (2016). ***Improving Higher Education in Malawi for Competitiveness in the Global Economy.*** 1818 H Street NW, Washington, DC 20433

2 Education Management Information Systems (2021). ***Malawi Education Statistics Report.*** Ministry of Education, Lilongwe.

The proposed project aims to construct a 4-storey building comprising:

a) A 500 seating capacity Lecture Theatre;

b) 16 ICT and Energy Laboratories with a seating capacity for 60 students;

c) 8 offices, 2 workshops and 4 classrooms; and

d) Associated external works (including construction of access roads).

All environmental and social safeguards will be implemented during the entire duration of the project.

1.9 Justification of the ESMP

Section 31 of the Environment Management Act (EMA) of 2017 provides that all development projects must get environmental clearance from the Malawi Environment Protection Authority (MEPA) prior to obtaining other licences and their implementation while the Environmental Impact Assessment Guidelines of 1997 provide guidance on the nature and size of projects that should be subjected to environmental and social impact assessment. Screening for the project as provided for by the guidelines showed that construction of the ETIC at Mzuzu University requires preparation of an Environmental and Social Management Plan (ESMP). Further, the Environmental and Social Management Framework (2020) for the project showed that an ESMP should be developed for the project activities. This ESMP has therefore been developed to comply with both national as well as World Bank Environmental and Social Standards (ESS 1, ESS 2, ESS 3, ESS 4, ESS 8 and ES 10) requirements and the World Bank Environmental, Health and Safety Guidelines to ensure that the project is in line with sound national and international environmental and social management practices. Furthermore, screening of the project that was conducted by the District Environmental Sub-Committee from Mzimba District Council showed that an ESMP should be developed to complement ESIA.

1.10 Objectives of the ESMP

This Environmental and Social Management Plan (ESMP) has been prepared to facilitate the integration of environmental and social management measures in the implementation of project activities. The ESMP contains:

- Anticipated impacts;
- Mitigation or enhancement measures of the identified impacts;
- Schedule for implementation of the mitigation or enhancement measures;
- Responsible institutions to implement the mitigation measures; and
- Implementation cost.

The ESMP aims to ensure that the developer prevents, reduces, mitigates and compensates for the impacts of the proposed project on the biophysical and socio-

economic environment. The estimated budget for implementing the ESMP is MWK 35.5 Million. The ESMP is presented in Table 7.1 following.

1.11 Potential Users of the ESMP

The ESMP has been prepared for use by different stakeholders to be involved in the planning, implementation, management and monitoring of the proposed project activities. Some of the users will include the World Bank; Mzuzu University; Contractors; Mzuzu City Council; Malawi Environment Protection Authority (MEPA); the Ministry of Lands, Housing and Urban Development; and MZUNI surrounding community members. The report contains useful information on policies and procedures to be adhered to, implementation modalities, analysis of potential environmental and social impacts and suggested mitigation measures at various stages of the project activities.

1.12 Methodology for Preparing ESMP

Environmental and social assessment for preparing the ESMP for the project was conducted between August and November 2023. Environmental and social assessment for the project was conducted through literature review, surveillance visits, and stakeholder consultations. This ESMP has been prepared following approval of the ESIA for the ETIC project by MEPA in August 2023.

1.12.1 Literature Review

This involved the review of existing literature related to the project. The literature that was reviewed included the World Bank's Environmental and Social Framework (ESF); Environmental and Social Impact Assessment Guidelines; Environmental Management Act; National Construction Industry Act; Physical Planning Act; Forestry Act; Water Resources Act; Public Health Act; Occupational Safety, Health and Welfare Act; Employment Act; National Construction Industry Policy; National Education Policy; National ICT Policy; National Water Policy; National Environment Policy; Malawi National Land Policy; Malawi 2063, National Girls Education Strategy; among other pieces of relevant legislation and policies. In addition, a review of other Environmental and Social Impact Assessment reports related to infrastructure development projects in higher learning institutions was conducted. These documents have been included in the reference section.

The Consultant reviewed documents containing socio-economic and ecological information and data for the project area and these included; NSO Integrated Household Survey and census reports; M'mbelwa District Council Socio-Economic Profile; Mzuzu Urban Profile; ESIA for MZUNI ODL; Soil Atlas; The Birds of Malawi an atlas and handbook; Checklist and Atlas of the mammals of Malawi; Species Fact sheet; IUNC Website; and Maps and Satellite Images for the project area. The reviewed documents have been included in the reference section.

The Consultant also reviewed project documents which include: the SAVE Project Environmental and Social Management Framework (ESMF); ETIC Building requirements document; and MZUNI Environmental and Social Screening Report. The reviewed documents have been included in the reference section.

1.12.2 Surveillance Visits

Site investigations started with a reconnaissance survey which was done for familiarity with the environmental and social components of the project area. Transect walks, observations and consultations with college representatives were used to clearly describe the baseline environment. A check-list was used to record the characteristics of the physical environment for the project site. Meetings, interviews and on-site interactions with college management were used to substantiate the description of the baseline environment. Special interest was given to:

a) the presence of vegetation including trees,

b) other infrastructure (such as buildings and electric power lines and water pipes),

c) accessibility of the site,

d) presence of water courses,

e) other institutions and villages near the project area.

f) Existing infrastructure and facilities in relation to the proposed project features and capacities (solid and liquid waste management, traffic, water supply, etc.)

1.12.3 Stakeholder Consultations

At the **city/ district level**, consultations were conducted with the Mzuzu City Council (including its town planning office), as well as the M'mbelwa District Council. The officers included the Assistant Director of Parks, Leisure and Environment; the Acting Director of Planning and Development; Regional Occupational Safety and Health Officer; Acting Director of Engineering Services; District Labour Officer (DLO); District Social Welfare Officer (DSWO); District Social Welfare Assistant (DSWA); and representatives of the Environmental District Officer (EDO) and District Youth Officer (DYO).

At the **institutional level**, consultations were conducted with MZUNI Management, Staff and Students, Plan Malawi, Ungweru, and Northern Region Water Board

At the **community level**, consultations were conducted with Mzuzu Central Hospital, GVH Singini, VDC members, Mzuzu Foundation LEA Primary, Luwinga Secondary School, St Augustine Market Committee, St Augustine Catholic Church and members from the surrounding communities.

The summary of the main issues raised during consultations has been attached in Appendix 3 and the registers are shown in Appendix 4.

1.13 Existing Land Use in the Project Area

The land for the proposed project belongs to Mzuzu University. Its land use mainly consists of a built-up area with structures already serving and supporting teaching and learning at Mzuzu University. The project will not require any additional land outside the Mzuzu University campus hence no issues of land take, resettlement and compensation will arise.

1.14 Grievances Redress Mechanism

1.14.1 Grievance redress mechanisms for the workers

Dealing with a grievance promptly and fairly is vital for employers aiming to reduce the risk of employment tribunal claims. Below is a five-step guide for HR on how to conduct a successful grievance procedure.

a) Informal Action

If the grievance is relatively minor, the employer should have a discussion with the employee to see if it can be resolved informally. In most cases, a quiet word is all that is needed to prevent an issue from escalating. An employer should keep a paper trail of all stages of the grievance procedure, including any informal resolution that has been agreed upon. Suppose the grievance is serious, or the employee feels that it has not been satisfactorily resolved. In that case, the employer should deal with the complaint under its formal grievance procedure, and ask the employee to put his or her grievance in writing. All employers should have a written grievance procedure in place and HR should ensure that line managers familiarise themselves with it.

b) Investigation

As soon as possible after receiving a grievance, the employer should carry out an investigation. In many cases, this will be a relatively straightforward fact-finding exercise. If the grievance involves other members of staff, they should be informed and given an opportunity to provide their own evidence. The investigation process will depend on the specific circumstances of the case. Ultimately, the investigation aims to establish the full facts of the grievance before any decision is taken.

c) Grievance Meeting

After the investigation, the employer should hold a meeting with the employee so that he or she has an opportunity to explain the complaint. The employee should be asked how he or she thinks the grievance should be resolved and what outcome he or she is seeking. An employee should be given a statutory right to be accompanied by a companion at a grievance meeting. Tribunals take the code into account when considering relevant cases, and can increase awards of compensation by up to 25% for an unreasonable failure to comply with it.

d) Decision

Having considered the evidence, the employer will need to decide whether to uphold or reject the grievance. The decision should be communicated to the employee, in writing, as soon as possible. If the grievance is upheld or partially upheld, the employer should tell the employee what action it proposes to take and how this will be implemented. The letter should also provide the employee with a right of appeal.

e) Appeal

If the grievance has been rejected or partially rejected, the employer should be prepared for an appeal. This should be dealt with by an impartial manager and, where possible, a more senior manager than the person who dealt with the grievance. Most appeal hearings will be in the form of a review but can take the form of a rehearing if the initial stage is procedurally flawed. After the hearing, the employee should be informed in writing of the outcome of the appeal.

1.14.2 Grievance Redress Mechanism for the Project

The project has established a Grievance Redress Mechanism (GRM) structure, which has been activated to support the project. The grievance procedure has five major stages. These stages include: (i) complaint or grievance uptake (ii) assessment, analysis and response (iii) resolution and closure (iv) registry and monitoring (v) GRM Evaluation. The GRM assists in addressing several issues that will arise as a result of the implementation of the project. These will include but are not limited to increased risk of Gender Based Violence (GBV), increased risk of Sexual harassment, increased risk of Sexual Exploitation Abuse, increased risk of domestic violence and marriage breakdown, increased risk of defilement and early marriages, and increased risk of child and forced labour. The Contractor will employ several interventions to minimise and eliminate the impacts as presented in Section 6.3.2 under negative social impacts from construction.

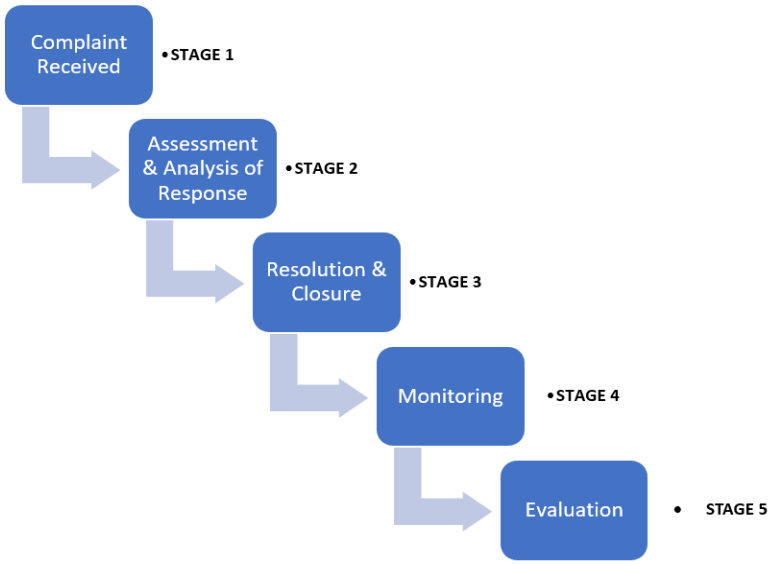


Figure 3. Grievance Redress Mechanism for the Project

1.14.3 Grievance Redress Mechanism for Communities and Individuals

Grievance and complaints about construction, expropriation, construction activities, social issues and any other subjects related to the project from the start of the project till the end of the monitoring will be redressed for effective project implementation. In this respect, all grievances and complaints will be recorded and processed at all stages of the project implementation. For more information, on the GRM process, refer to the figure below.

a) The Aim of the Grievance Redress Procedure

The Grievance Redress Procedure aims to settle or redress any individual grievance or complaint of Project Affected Persons (PAPs) promptly, fairly and as much as possible in a manner that is acceptable to all parties. The general approach will be to seek a solution to the problem in the earliest stage of the project and avoid taking complaints

to courts for redress. The GRM also seeks to establish a continuous feedback mechanism between beneficiaries and implanting agencies to encourage increased citizen engagement. The following will be considered when applying this approach:

i) Provide straightforward and accessible ways to PAPs for to make complaints or resolve any disputes that may arise due to the project activities;

ii) Identify and implement appropriate and mutually acceptable actions to address complaints;

iii) Ensure that complainants are satisfied with the outcomes of the corrective actions; and

iv) iv) Avoid the tendency to resort to judicial proceedings.

Grievances are useful indicators of a project's performance. A high number of grievances may point out a need to adjust work practices or procedures in order to mitigate adverse impacts or conflicts with PAPs. In this respect, the effectiveness of the related procedure will be evaluated at all stages of the implementation.

b) Establishment of the Grievance Redress Committee

The Project has established a Grievance Redress Committee (GRC) to handle grievances related to environmental and social concerns. The GRC is an ad hoc committee established primarily for the sub-project investment. It will have no legal mandate and will follow the Grievance Redress Process provided in Table 1.4 where taking grievances to the court of law will be the last resolution. The GRC was formulated under the guidance of PIU and is composed of the following:

Table 1.3 List of the GRM Committee Members

	Name	Sex	Institution	Designation	Contact Details (Phone numbers)
1.	Eng. Jeremiah Nkowani	M	National Construction Industry Council	Chairperson	0995618132
2.	Mrs.Samba Kambalame	F	Mzuzu University	Secretary/Environmental & Social Safeguards	0999286368
3.	Mr. Cliff Kawanga	M	Mzuzu University	Public Relations Officer	0888555470
4.	Dr.Chrispine Mphande	M	Mzuzu University	Social-Economic Expert	0888862403
5.	Mr.Symon Njikho	M	Mzuzu University	Auditor	0994876882
6.	Mr. Osman Tebulo	M	Mzuzu University	Students' Representative (President)	0995253376
7.	Ms. Atupele Natasha Rashid	F	Mzuzu University	Students' Representative (Secretary)	0887550530
8.	Mr.Monica Mwalwanda	M	Mzuzu City Council	Land Development	0997385376
9.	Mr. James Pelani	M	Mzimba District Council	Environmental Matters	0999769395
10	Ms. Naomi Mwale	F	Mbelwa District Council	Gender Matters	0994747568
11	Ms. Veronica Linyama	F	Mzimba District Council	Labour Matters	0999391224
12	Group Village Headman. Wayinga Singini	M	Traditional Leader	Local Community Representative	0888866355
12	Mr. Peter Yelesani	M	Ministry of Education	PIU Gender and Social Safeguards Specialist	0999140956

c)

Duties and Responsibilities

The grievance redress mechanism is managed by Mzuzu University. The University has put in place a Grievance Redress Committee (GRC), which is comprised of the representatives of the Mzuzu City Council, National Construction Industry Council (NCIC), Labour Office, Gender Office, Environmental Office, Police, Traditional Leaders, Students' Representatives, Contractor's Representative, workers union representative (when construction commences).

The purpose of including these stakeholders in the grievance redress committee is to ensure the participation of local authorities and associations in the problem-solving processes. Thus, these institutions functioning as a balancing body between the PAPs and the project will contribute to the fairness and transparency of the grievance redress mechanism. The decisions of the Committee will be binding for all the local implementing agencies.

The committee meets once a month to receive, process and propose corrective/precautionary actions. If required, the committee also invites the applicants,

relevant governmental authorities and/or third parties to these meetings. The committee also monitors the grievance mechanism via the reports and proposes improvements when necessary.

d) Types of Grievances

All types of grievances related to the project are received at the project implementation unit at Mzuzu University. In addition, grievances can be received through the project-dedicated phone line, which will be active throughout the project. By this phone line, PAPs who cannot come to the project office or are away from the affected areas can express their concerns and grievances regarding the project. The phone number shall be widely advertised in the project area through community information meetings. In addition, each site will have grievance boxes where affected PAPs can deposit grievances.

These are likely to include:

- Damages to buildings and assets;
- Disruption or damages to local roads;
- Closure of passageways;
- Gender Based Violence (GBV);
- Sexual harassment;
- Sexual Exploitation and Abuse (SEA);
- Domestic violence and marriage breakdown;
- Defilement and early marriages;
- Child and forced labour
- Damages to lands outside the project demarcated working area;
- Reinstatement of immovable assets after temporary use (establishment of easement rights, rental or temporary occupation);
- Nuisance from dust, noise and vibration;
- Disruption or damages to water sources and infrastructures;
- Increase in the traffic load;
- Health problems, injuries and accidents;
- Misconduct of project personnel/workers; and
- Unfair selection practice of employees for project-related jobs.

e) Procedure for Receiving and Responding to Complaints, Grievances, Appeals and Claiming Processes

All types of complaints, appeals and claims related to the project are received through the Grievance Committee secretariat located at the project office at Mzuzu University. Complaints can be lodged through the toll-free phone line, which will be established

during construction project implementation and complaint boxes to be located on project sites.

All types of grievances will be received by the Secretariat (or other designated Project Official in person or via project-dedicated phone/site boxes) at the project office, which will operate throughout the project cycle. These grievances are recorded in Grievance Forms, which contain the details regarding the grievance as well as the name and address of the applicant, application date, type of application and the name of the person receiving the grievance. For proper functioning of this procedure, all grievances will be recorded by the PIU Social Expert and Secretariat located at Mzuzu University.

Social experts will monitor the implementation of different social impacts, which will include increased student intake at the University, improved teaching and learning at the university, increased traffic flow – increased accidents, increased incidences of Cholera cases, creation of employment opportunities, skills transfer to local community, creation of market for goods and services in the project area, increased business activities within the project area, source of government revenue, anxiety about the disruption of teaching and learning activities, increased accident incidences due to construction works, increased risk of illicit behaviour and crime, increased risk of communicable diseases such as HIV and AIDS, increased risks of workers and community members to occupational, health and safety, disruption of teaching and learning activities at the university, increased risk of child and forced labour, loss of employment for workers, and loss of business opportunities.

Gender experts will monitor the implementation of different social impacts, which will include increased risk of Gender Based Violence (GBV), increased risk of Sexual harassment, increased risk of Sexual Exploitation Abuse, increased risk of domestic violence and marriage breakdown, and increased risk of defilement and early marriages.

When receiving the grievances of the vulnerable PAPs such as the elderly, disabled, and illiterate people, the PIU will pay special attention and help them to receive their grievances properly. The grievances depending on the gravity of the matter will be solved via the Grievance Committee and in consultation with the contractor if they occur during the implementation period of the project. When required, site investigations will be undertaken involving technical staff from relevant organisations such as the Developer, District Lands Officer, District Council officials, and PAPs representatives. Technical reports to serve as a basis for the discussions will be prepared and tabled before the Grievance Redress Committee. During this site observation, the complainant or his/her representative shall also be present.

Grievances related to criminal offences such as sexual harassment, human trafficking, or theft will be handled by law enforcement agents within the GRC.

The Committee will inform the complainant about the status of their grievances within 10 working days after receiving the complaint and carrying out the investigations. In case the applicant is not satisfied with the result, the Social Expert will forward the case to the Grievance Redress Committee and notify the applicant. In addition, in case the applicant cannot receive a response within the designated time frame, s/he can apply directly to the Grievance Redress Committee. See Table 1.4 below:

Table 1.4 Grievance Redress Process

Process	Description	Time Frame	Other information
Identification of grievance	Face-to-face; grievances box; phone; letter, e-mail; recorded during public/community interaction; others	1 Day	Email address; hotline number
Grievance assessed and logged	Significance assessed and grievance recorded or logged (i.e. in a log book)	4-7 Days	Significance criteria: Level 1 – one-off event; Level 2 – complaint is widespread or repeated; Level 3- any complaint (one-off or repeated) that indicates a breach of law or policy or this ESMP provisions
Grievance is acknowledged	Acknowledgement of grievance through appropriate medium	7-14 Days	
Development of response	Grievance assigned to the appropriate party for resolution Response development with input from management/ relevant stakeholders	4-7 Days 7-14 Days	
Response signed off	Redress action approved at appropriate levels	4-7 Days	Project staff to sign off.
Implementation and communication of response	Redress action implemented and update of progress on resolution communicated to complainant	10-14 Days	
Complaints Response	Redress action recorded in grievance log book Confirm with the complainant that the grievance can be closed or determine what follow-up is	4-7 Days	

	necessary		
Close grievance	Record final sign-off grievance If the grievance cannot be closed, return to step 2 or refer to the sector minister or recommend third-party arbitration, or resort to a court of law.	4-7 Days	Final sign-off by Mzuzu University Project Management Unit Manager and the Chair of the Grievances Redress Committee

1.15 Institutional Structure, Implementation Arrangements, Roles and Responsibilities, and Capacity Building

1.15.1 Institutional structure

Mzuzu University will engage a Project Manager/Consultant who will be the client's representative on the ground. The Consultant shall act on behalf of MZUNI in supervising all project design, construction and monitoring activities.The Consultant shall act as a link between MZUNI and the Contractor. Furthermore, the University has a Project Monitoring Team (PMT) which supervises and monitors standards and quality of all infrastructural development projects. In addition, the PIU has a team of well-trained staff to look at issues of environmental and social safeguards and has an Environmental and Social Performance Specialist. The PIU will ensure that the Contractor implements all the measures outlined in the ESMP report. The Contractor will develop his own site-specific Construction ESMP (CESMP), and a Health and Safety Plan based on this ESMP before commencing any civil works. PIU will review and approve these. The PIU will work with the Supervising Engineer responsible for supervising the works and ensuring mitigation measures and any necessary corrective actions are being followed for the smooth execution of the works. The monitoring results will be used to improve project implementation and provide information for project supervision. MEPA will use the legal mandate to monitor project activities' implementation and enforce compliance with national and international laws and regulations.

1.15.2 Implementation Arrangements

The successful implementation of this ESMP lies on the concerted efforts of various key stakeholders and these include MEPA, Mzuzu University, SAVE- PIU, Mzuzu City Council, and the Contractor. The responsibilities of each of the key role-players have been provided as follows:

1.15.2.1 SAVE-PIU will be responsible for coordinating, planning, implementing and monitoring environmental and social issues. In addition, the PIU will conduct inspections and monitoring of the activities, as well as review monthly and incidence reports from the project.

1.15.2.2 Contractors will develop contractors' ESMP (C-ESMP) and associated auxiliary management plans and ensure their implementation and compliance. In

addition, the contractor will ensure that all workers have signed the *'Code of Conduct'* and are compliant with it. The contractor will be responsible for the orientation of the workers.

1.15.2.3 Mzuzu City Council will work with PIU to monitor the implementation of the CESMP and auxiliary plans. Therefore, the District Environmental Officer will work with the SAVE-PIU Safeguards Team in monitoring the implementation of the ESMP.

1.15.2.4 Mzuzu University IIT will ensure that financial resources for capacity building and implementation of the ESMP are allocated. Further, it will be responsible for carrying out regular maintenance of the proposed project structures during the operational and maintenance (O & M) phase. Mzuzu University will:

- Ensure coordination between the communities and contractor during the construction phase;
- Ensure there is proper management of the project
- Participate in the supervision of works at the site; and
- Monitor the implementation of CESMP

The University will hire a Consultant/Project Manager to supervise the construction works to ensure that the contractor complies with the design standards.

1.15.2.5 Malawi Environment Protection Authority (MEPA) will conduct inspections and monitor compliance with the implementation of the ESMP during the construction, demobilisation, operation and maintenance phases of the project.

1.15.3 Capacity Building

As the mitigation and enhancement measures will be implemented for the multiple impacts, there will be a need to provide the necessary training and capacity-building programmes for the PIU as well as the different agencies and state institutions that will be responsible for environmental and social actions, including monitoring important parameters over time as well as the implementation of mitigation and enhancement measures. The training will assist in building the capacities of the agencies to be responsible for monitoring activities to effectively determine compliance of the project activities with national and international laws, regulations, and guidelines.

The following training requirements have been planned to facilitate the capacity building of the implementing stakeholders in order for them to effectively execute the roles and functions they have been assigned under this project. Table 1.5 provides areas that require training and target audience including time frame and responsible institution to deliver.

Table 1.5 Required training on Environmental and Social Safeguards

#	Type of Training	Targeted Stakeholder	Responsible Institution	Time Frame
1	ESMP and Auxiliary Management Plans	Project staff, supervising engineers, contractors, and contractor workers	SAVE PIU/ IIT	Planning, Construction Phase
#	**Type of Training**	**Targeted Stakeholder**	**Responsible Institution**	**Time Frame**
2	Occupational Safety and Health,	Project staff, supervising engineers, contractors, and contractor workers, Sewer attendants,	SAVE PIU/ IIT	Construction; Operation and Maintenance Phases
3	Emergency prevention and preparedness and response arrangements to emergencies	Project staff, supervising engineers, contractors, contractor workers and ETIC users.	SAVE PIU/ IIT	Construction; Operation and Maintenance Phases
4	Grievance Redress Mechanism	GRM Committee members	SAVE PIU/ IIT	Planning; Construction; Operation and Maintenance Phases
5	Code of Conduct	Contractor	SAVE PIU/ IIT	Construction; Operation and Maintenance Phases
6	GBV, SEA and Child Labour	GRM Committee members	SAVE PIU/ IIT	Construction; Operation and Maintenance Phases
7	Risk Management	Project staff	IIT	Construction; Operation and Maintenance Phases

CHAPTER 2: PROJECT DESCRIPTION

This is an infrastructure development project whose scope of work includes architectural and engineering designing; construction of the building and associated structures; finishing, furnishing, fittings and installations; and operation and maintenance.

The ETIC will be a 4-storey building which will have two wings-one for Energy systems and the other for ICT. Common facilities will include reception, computer lab, recreation, auditorium, entrepreneurship workshop, seminar rooms, boardroom and office space. Facilities for ICT will include Artificial Intelligence (AI) and Data Science (DS)/Versatile Learning Space (VLS), workshop, equipment room, server room, classrooms, lavatories and office. The energy system will have a testing laboratory, mechanical workshop with benches, electrical and electronics laboratory, bio-resources processing laboratory, postgraduate room, classrooms, offices and lavatories.

The project will develop a building designed, planned and managed in such a way that it meets the physical and organisational requirements necessary for efficient and effective performance of the ETIC (the proposed designs are presented in Appendix 14).

Table 2. 1 Details, Size and Capacity of the ETIC Building

Item	Description	Unit of measure	Quantity
1	Building Footprint	m^2	2,450
2	Number of Floors	No	4
3	Total Floor Area	m^2	9,800
4	Total Number of Occupants	No	2000
5	Total Number of Toilets	No	68

The ETIC building will use approved construction materials such as cement blocks, steel, glass, sand, rock aggregate, quarry dust, reinforced steel bars, metal and polymer fittings. Construction activities of the project will promote the use of construction materials, which are environmentally friendly, durable, and vandal-proof and those, which require minimal periodic maintenance.

Construction activities will be done by a private contractor and Mzuzu University has engaged a Consultant to supervise the construction works to ensure that the contractor complies with the design standards.

2.1 Project Design Considerations

The overall design of the ETIC Building facility has taken into consideration the different local government building guidelines and standards developed by the National Construction Industry Council (NCIC) and the National Council for Higher Education (NCHE) Architectural Metric Handbook and the different disasters that Malawi faces from time to time. The design has taken into consideration the following:

a) **Ventilation:** The design caters to natural ventilation with features that encourage natural air circulation (including the use of permanent air vents above all doors and windows).

Malawi's prevailing wind is Easterly, from the Indian Ocean. An East-West orientation, with windows facing North and South, will be preferred as the low morning and evening sun will not penetrate the rooms of the building.

b) **Lighting**: The design caters for various types of energy-efficient luminaries including fluorescent lamps and natural lighting through glass windows and doors as appropriate for both security and lighting.

c) **Sustainable resource use:** The design of the development incorporates landscaped gardens, which will be planted with suitable species of trees/shrubs and grass to prevent ecological deterioration and improve the aesthetic value of the site. Part of the excavated soil will be used for landscaping therefore reducing the amount of soil to be transported away from the site.

d) **Fire protections**: The design of the proposed developments incorporates fire-fighting equipment (including fire alarm systems) to be installed in each building.

e) **Building resilience to heat waves:** Climate change is affecting temperature patterns worldwide and in Malawi in particular, which at times is resulting in heat waves. The design of the proposed facility should take into consideration resilience to heat waves and other heat effects.

f) **Building resilience to drought:** Climate change is affecting rainfall patterns across the world and in Malawi in particular. The design of the proposed facility should take into consideration resilience to drought. This could include installation of water harvesting facilities and water saving faucets.

g) **Building resilience to flooding:** Climate change is affecting rainfall patterns across the world and in Malawi in particular. The design of the proposed facility should take into consideration resilience to flooding by adhering to sound structural engineering approaches.

h) **Building resilience to cyclones and strong winds:** Climate change is affecting temperature patterns worldwide and in Malawi in particular, which at times is resulting in strong winds, storms and cyclones. The design of the proposed facility should take into consideration resilience to strong winds, storms and cyclones.

i) **Disability-friendly structures:** The ETIC facility has been designed to provide access to all students and staff including those with disability by providing two lifts and a ramp with slopes of not more than 1:10. The surface will be designed to be non-slippery to prevent any trips and falls.

j) **Earthquake resistant:** Mzuzu University does not experience earthquakes but experiences tremors. This is because the campus is not directly situated in the East African Rift Valley, which is prone to earthquakes. The design of the structure has taken into consideration the requirements to withstand considerable levels of tremors, which are in most cases not very devastating.

2.2 Climate change vulnerability, climate resilient structures and hazard consideration

2.2.1 Climate Change Vulnerability

Climate Change is a development challenge and should be considered carefully during the Detailed Design to ensure the long-term viability of the projects. An effective way to increase the resilience of an infrastructure is to identify, develop, revise, and subsequently implement design and construction standards. These activities should be incorporated into a standardised and well-described process aiming at increasing the overall resilience of the infrastructure.

The design for construction of the ETIC infrastructure has incorporated climate-smart development and sustainable infrastructure as per GoM focusing on the needs of women and those most vulnerable to climate change. From an engineering design perspective, the team has considered the temperature and hydrological regimes, any options for reducing embodied carbon in materials, identifying local sources of materials to the greatest possible extent, etc. GHG accounting estimates can be obtained from several existing models and economic analysis from the RED/HDM models.

2.2.2 Climate Resilient Structures

Drainage structures such as storm water drains are most at risk due to climate change. Increased precipitation intensity and frequency can cause severe scour due to increased water flow. Increased flow can also cause increased overtopping of these drainage structures. The hydrological and hydraulic studies have considered the need to make the drainage structures climate resilient. The design concluded that the design flow must be increased by 20% to cater to the increased extreme weather events and precipitation intensity and frequency.

2.2.3 GreenHouse Gas (GHG) Emission Baseline

Most GHG emissions from vehicles and construction trucks are associated with decisions made by private vehicle users, and the designer has little ability to affect those decisions where designers can have a more immediate impact on how the teaching complex will be constructed and maintained over time. Construction activities will generate carbon emissions from a variety of direct and indirect sources, including:

a) Construction work includes land preparation, embodied carbon in concrete, steel, and other raw materials used to build the infrastructure and emissions from construction vehicles;

b) Tree felling to make way for the infrastructure to be constructed, reducing carbon capture; and

c) Maintenance and servicing work.

The Designer recognises the importance of the GoM strategies to integrate climate change considerations more fully into its core business components and the benefits of greenhouse gas reductions, increased resilience, and improved natural resource management. The Team during the detailed design, selected feasible materials used for inclusion in the project that have the lowest footprint for GHG emissions.

In addition, the Team has considered opportunities to further reduce greenhouse gas (GHG) emissions by adopting design specifications, material specifications, material transport and storage, material sourcing, etc., with the lowest footprint for GHC emissions.

2.2.4 Hazard Consideration

The design of ETIC was guided by the Safe School Construction Guidelines of 2019, which promote local practices, low-cost technologies and identify strategies for multi-hazard risk reduction. The most prevalent hazards in Malawi are floods, strong winds, earthquakes, landslides and wildfires. Annex 6 provides details for an Emergency Management Plan. For this reason, in most cases, site assessment considers these key issues. Table 2.2 provides guidelines that are considered when selecting a site for constructing different structures.

Table 2. 2 Guidelines for Site Selection

Potential hazard	Preventive measures at site selection
Flooding	• Site is on an existing well-planned drainage system • Site is surrounded by vegetative cover • Site is away from a water body • Site is away from an area that has a history of being a flood hazard zone
Strong winds	● Site is not under trees. There is a good distance from trees.
Earthquake	• Site does not have fault lines • Site has firm subsoil, to avoid liquefaction • Site does not have groundwater levels above the foundations.
Landslides	• Site is away from escarpments • Site does not have deep cuts into a hill or slope • Site has relatively stiff and compact soil • Site does not have uncompacted fill material
Wildfires & Fires	• Site is away from forests to protect against wildfires • Site is large enough to allow a safe distance between buildings • Site is not too close to power lines

2.3 Description of Main Project Activities

Activities for the project shall be implemented in four phases namely planning, construction, demobilisation, and operation and maintenance phases. Details of each of the phases are provided in the sections that follow.

2.3.1 Planning Phase

The planning phase for the project commenced in April 2022 and will be concluded in December 2023. Activities during the planning phase include identification of land for the project; land surveying; preparation of a master plan; preparation of detailed layout plans; preparation of building designs, tender processing, obtaining approvals under the Physical Planning Act No 17 of 2016 and the Bye-Laws; and obtaining different approvals necessary for construction and operation of the project facilities and preparation of an Environmental and Social Management Plan for the project.

2.3.2 Construction Phase

a) Consideration for Constructing Different Structures

Different considerations will be given when constructing the teaching complex facility. The considerations will aim to provide stability and durability to the facility to make it climate resilient. Some of the considerations are discussed in the sections that follow:

i) Drainage System

Construction of the drainage system will consider the occurrence and form of water that will be drained, slope shape, slope gradient, slope length, stream drainage characteristics, depth to bedrock, bedrock characteristics and soil texture and permeability. A drainage system taking into consideration all the factors mentioned above will be constructed to keep the grey water from overflowing into roads and lawns, which will divert storm water to the natural watercourses. To maintain safety within the university campus and to prevent students and staff from injury by falling into drains, the drainage system should adopt a closed drainage channels system.

ii) Foundation Conditions

ETIC building will require foundation on a good and uniform soil to avoid differential settlement. A full geo-technical investigation shall be conducted to ascertain the exact foundation conditions of the structures for the buildings. A soil raft of a minimum 300 mm thick G 5 material will be used as the pioneer layer.

iii) Durability of the Concrete

The durability of any concrete is dependent on the cement being used, aggregates, admixtures, concrete mix design and curing. Ordinary Portland cement shall be used to construct the different infrastructures. Rapid hardening cements will be avoided due to the greater evolution of heat, which can lead to increased shrinkage cracking.

Local quarries will be inspected and quarry stone, which will be used, will be tested and certified. Care shall be taken not to use admixtures containing calcium or chlorides, as these will increase the risk of reinforcement corrosion. Plasticizers will be considered, as increased workability is advantageous when working with complex shaped structures and structural forms.

b) Construction Workers

In all, about 100 people will be employed during the construction phase. The people to be employed will include a minimum of 40% women in the workforce. The people will include supervisors, skilled and unskilled labourers. For the semi-skilled and unskilled workers, the Contractor will employ people from the communities, which live around the project area as a way of making sure that the project benefits the community members in the project area.

c) Construction Material and Equipment

To avoid or reduce the environmental impacts, the project will incorporate environmental guidelines, health and safety measures in the sourcing and use of these materials including:

a) Use of environmentally friendly construction materials;
b) Obtaining sand, quarry, timber and other suppliers from licensed dealers, especially those that have complied with environmental management guidelines;
c) Using adequately serviced construction machinery; and

d) Sourcing the materials locally where available, to ensure that the project results in economic benefits in the local community. Examples of materials include: steel, glass, metal and polymer fittings, and associated electrical fittings among others. It is also important to know the type of equipment, which will be used during construction, as they can be sources of environmental and social concerns. Some of the machinery and equipment expected to be used are as follows:

a) A Bulldozer for site clearing, removal of topsoil and vegetation materials and pushing out stumps;
b) Crane, JCBs, bowsers:
c) A Grader for grading and levelling the ground;
d) A Tipper for the transportation of materials and workers;
e) A concrete mixer;
f) Wheelbarrows for transportation of construction materials and mixture;
g) Hoes, picks and shovels for digging, moving soils and mixing concrete;
h) A Welding Machine for welding steel and metals;
i) Pedestrian Rollers for soil compaction;
j) An Excavator for digging pits for the tanks;
k) A vibrating compactor for increasing the density, shear strength, and stiffness of the concrete fill; and
l) Hammers, and bolt and nut fasteners, saws, grinders, load roller, hand drillers, drill bits, and wire cutters.

d) Sources of Construction Materials

Different raw materials will be required during the construction phase. Materials such as sand, gravel and quarry stone will be sourced from the surrounding areas. Quarry stone will be obtained from Ekaiweni Quarry owned by a private quarry. Sand will be obtained from Kafulufulu while gravel will be obtained from Ekaiweni or Wade borrow pits. The sites where quarry stone, gravel and sand will be collected from are approved existing sites. Permission to extract sand and gravel will be obtained from the Mzuzu City Council. Water for construction activities and for reducing the impacts of dust will be obtained from Lunyangwa River while water for domestic use by the contractors' workforce will be obtained from the Northern Region Water Board (NRWB) since the site is located within NRWB jurisdiction and the University is not allowed to explore the use of groundwater for domestic use in that area. The Contractor will give serious consideration when abstracting water for construction purposes to the requirements for local potable water supplies and take into consideration the riparian rights of the people downstream. Water abstraction permission will be obtained from the National Water Resources Authority (NRWA). The Contractor will not use piped water for construction activities and for reducing the impacts of dust.

The project will use concrete blocks (as opposed to burnt bricks) for construction of different infrastructure in accordance with NCIC regulations. The use of concrete blocks will be more environmentally friendly than the use of burnt bricks, which contribute to deforestation and greenhouse gas house emissions. The concrete blocks are stronger and long-lasting, and do not lead to deforestation as burnt bricks do. Procurement of large quantities of cement for making the concrete blocks will also contribute to increased growth of the local economy.

Other materials such as cement, paints, timber, roofing materials, windows, doors and other joinery, tilt and roller doors, wall board and plasterboard, light fittings, fuel and oil, electricity, water, ceramic tiles, polythene, steel, steel pipes, PVC pipes, adhesives, copper wires, gas (acetylene and oxygen), the cardboard will also be sourced for the project. Construction materials will be sourced depending on the construction stage.

Construction will be done by a contractor and a design and supervision firm will be hired to supervise the construction phase of the project to ensure that the contractor complies with the design standards. The developer together with the Ministry of Transport and Public Works Officials (Buildings Department) will work hand in hand in supervising works and monitoring progress. Construction will require various input materials to produce several outputs. Table 2.4 outlines the inputs and outputs during the construction and operation phases.

Table 2. 4 : Overview of the Main Inputs and Outputs from the Proposed Project

Category of developments on the site	Main inputs into the activities	Main outputs from the activities	Waste produced
Construction of service infrastructure			
Site clearing, land surveying	Excavators, hoes, graders and surveying equipment, cement, quarry stones, sand, gravel and water,	Cleared area for construction of different infrastructures	Dust, noise, Fumes, smoke, and oils
	picks, shovels, water bowsers and cement mixers, planks		
Construction of temporary site offices, including ablution blocks for workers	Excavators, hoes, graders and surveying equipment, cement, quarry stones, sand, gravel and water, picks, shovels, water bowsers and cement mixers, planks	Cleared area for construction of different infrastructures	Dust, noise, Fumes, smoke, and oils
Site development activities			
Land harrowing and land levelling	Excavators, hoes, graders and surveying equipment, cement, quarry stones, sand, gravel and water, picks, shovels, water bowsers and cement mixers, planks	Cleared area for construction of different infrastructures	Dust, noise, fumes, smoke, and oils
Construction of access roads	Graders, caterpillars, compactors, gravel	Earth access road upgraded to gravel standard	Dust, noise, fumes, smoke and oils.
Reticulation of water facilities	Water pipes and accessories	Underground reticulation of water facilities	Dust, noise, fumes, smoke, oils, broken pipes and water reticulation materials
Reticulation of electricity facilities	Wooden poles, a transformer, Electrical wires and tubes	Installation of electricity facilities in the new and rehabilitated structures	Dust, noise, fumes, broken wooden poles and Cables.

Telecommunication	Poles, wires, radio receivers, dual channel lines	Installed telecommunication network	Dust, noise, fumes, broken wooden poles and cables
Construction of ETIC Building			
Construction of ETIC building	Cement blocks, cement, quarry, planks, iron sheets, aluminium windows, pressed metal door frames, window panes, sand, gravel and water	Completed ETIC Building, access roads and car parks	Dust, noise, Fumes, smoke, oils, construction and material.
Construction of waste water management systems			
Construction of a septic tank specifically for the ETIC Building.	Septic Tank and Pipes	Septic Tank to accommodate the extra 2000 users.	Dust, noise, Fumes, smoke, oils and construction materials.

e) Construction Activities

The construction activities will span from August 2024 to February 2026. The Project is expected to employ approximately 160 people who will include technical staff, unskilled labourers and drivers. It is estimated that a minimum of 40% of the people to be employed will be women to attain the recommended gender balance in every category at any point of the Project.

Construction activities will be done by a contractor and the University will hire a Consultant/Project Manager to supervise the construction works to ensure that the contractor complies with the design standards. Activities under construction will involve land clearing; landscaping; grading; excavation; compacting; trenching; backfilling with compaction consolidation; levelling and earth marking; and transportation of construction materials, excavation of foundation footing, laying down a brick base; pouring a concrete slab, installation of framework, installation of plumbing workers, putting a wall frame, roofing and finishing.

Construction will generally be of plain concrete strip footing, load-bearing cement block walls in foundations, load-bearing cement block walls, reinforced concrete ground slab, steel frame structure, steel roof structure, steel door frames and windows, timber doors, ceramic tiles to some floors and glazed tiles to walls in toilets, lime putty plaster and paint to the rest of the walls internally, fair face pointed externally, painted ceiling, joinery fittings, sanitary, plumbing and electrical services.

Construction of external works infrastructure will consist of paved access and parking areas, lined storm water drains, foul and waste drainage systems and landscaping. Side walks will be provided for pedestrians. Storm water drains will assist in controlling water movement with the project site into natural drains.

Once construction activities are finalised and before the facility is handed over to Mzuzu University, Mzuzu City Council and NCIC will test the integrity of the structure in order to ascertain its safety for use for the intended purpose.

Detailed project activities are as below:

Preliminary Project Activities Phase

Activities under this phase will include but not limited to:

a) Securing of the site (cordoning off, CCTV). The cordoning off will involve construction of a site holding fence using iron sheets, timber and cement;

b) Approvals and procurement of consultancy and contractor services

c) Mobilisation of construction machinery and movement to the site;

d) Construction of temporary structures such as site office, storeroom and sanitation (toilet) facilities. It is anticipated that there will be a need for temporary site offices and store facilities for cement and tools.

e) Land clearing and soil stripping for areas designated for the construction;

f) Preparation of storage areas for top soil and waste oils;

g) Removal of any services lines (water / electricity); and

h) Excavation and levelling of the site.

Construction Phase

This phase will commence after all approvals and permits are acquired. This will involve the construction of the ETIC building and related civil works which will require the use of water and energy (electricity). Water and electricity at Mzuzu University are through the Northern Region Water Board (NRWB) and Electricity Supply Corporation of Malawi, respectively. The Contractor will access water and electricity from the NRWB and ESCOM using new installations which will have a separate metre and accounts for payments.

The construction phase will commence with the engagement of the Construction Works Contractor, and will be followed by mobilisation and site preparation including the following activities:

a) Recruitment and mobilisation of construction workers by the Contractor;

b) Mobilisation of construction equipment and machinery;

c) Removal of trees;

d) Site clearance, grading, excavation and levelling; and

e) Procurement and delivery of construction materials e.g. sand, steel, wood, water, cement, sand, quarry and cement blocks.

In this phase, activities will include the construction of substructure and superstructure.

Construction of substructure; this will typically constitute the construction of foundation footing and foundation walls of the proposed structures. The main works will involve:

a) Ripping of the land, harrowing, terracing and levelling of the proposed site;

b) Digging of foundation trenches to the design-specific depths;

c) Treatment of the soil for termites using approved pesticides;

d) Construction of concrete footing, masonry foundation walls and retaining walls; and

e) Placing of well-compacted hardcore, sand blinding, damp-proof membrane and concrete slabs.

Construction of the superstructure; the ETIC will consist of:

a) 500 seating capacity Lecture Theatre.

b) 16 ICT and Energy laboratories.

c) 8 offices, 2 workshops and 4 classrooms.

The structures will consist of concrete pad foundations and strip concrete foundations for walls.

Demobilisation Phase

Demobilisation of the contractor's works to vacate the site will follow immediately after construction. This will involve the removal of remaining construction materials, plant and equipment, redundant contractor's offices, toilets and other related items. It will be the responsibility of the contractor to remove all the machinery, wastes and temporary structures from the project site. A demobilisation plan will be developed and submitted to the PIU.

Operation and Maintenance Phase

In this phase, the ETIC building will be occupied and used for daily learning as well as office work. Utilities such as water and electricity will be used daily. The ETIC building will be connected to a water supply system from the Northern Region Water Board while electricity will be accessed from the Electricity Supply Corporation of Malawi as is currently done for other structures within the University. However, due to the occasional intermittent water supply from NRWB, the ETIC building has been designed to have four water tanks of 20,000 litres capacity each. to serve as reservoirs.

The Project Proponent is also expected to carry out maintenance activities including cleaning common areas, removing trash regularly, repairing items that are broken and painting walls. Activities will also include inspecting, repairing, and maintaining electrical systems and associated structures and utility services. Some of the repair work will involve the procurement and use of construction materials such as sand and quarry, and paint and oils, which can result in environmental and social impacts.

The ETIC will have a combined capacity of about 2000 people. It is expected that during its operation, about 80,000 litres ($80m^3$) of wastewater will be generated daily and this will be channelled to a dedicated septic tank within the site. This volume is calculated based on the assumption that in an institution setting one individual generates about 40 litres of wastewater per day. Reduction of wastewater will include regular checking and repairing of leaks.

It is also estimated that on average, 0.5Kg of solid waste is generated per capita per day. Therefore, about 1000 Kg of solid waste including waste paper will also be generated daily during the operation of the ETIC. Measures to minimise solid waste such as paper

will include reusing the paper for packing of fragile materials. All generated waste will be collected, segregated according to type and disposed of at Msilo.

Decommissioning Phase

Currently, there are no decommissioning plans for the ETIC building. However, if decommissioning is to be conducted, the following activities are expected to be undertaken:

a) Removal of installations and fittings;

b) Demolition of the building

c) Removal of debris and disposal; and

d) Cleaning and decontamination of the project site.

A decommissioning plan including an Environmental and Social Management and Monitoring Plan (ESMMP) will have to be prepared and approved by the authorities before the commencement of decommissioning activities

2.3.2 Labour Management

The proposed project is expected to create job opportunities in the project area. This may be a training ground for the local people who may not have been employed before elsewhere. It is recommended that the local pool of labour should be used. For some of the less complex tasks, local unskilled labour should be given short-term contracts and on-the-job training. For work that can be done using human labour the use of machinery will be discouraged. To ensure that local people are being employed, the District Labour Office and traditional leaders will be involved in the recruitment of the workers.

2.3.3 Source of Sand for Construction

There will be a need to take extra care in sourcing raw materials especially sand for the construction works. The project will obtain written approval from the District Council where the sand is to be extracted. The local council, through the Environmental District Office, will also guide the project on any required permits or licences they are to obtain.

2.3.4 Construction and General Operations

Precautionary measures for environmental health and safety procedures will be taken into consideration. The contractor will ensure that precautionary measures for safety procedures are taken into consideration to prevent accidents. The contractor will submit to the project proponent a Contractors' Environmental and Social Management Plan for approval before the start of works.

2.3.5 Water Abstraction

The project does not plan to abstract groundwater water. However if the need arises at any point of the construction phase/general operations, the contractor will be required to obtain permission from the National Water Resources Authority for water abstraction.

2.3.6 Tree Planting

Planting of trees at the University campus is a continuous activity that is done with the guidance of the Department of Forestry under the Faculty of Environmental Sciences which advises on the choice of tree species to be planted. In addition, some trees will be

planted around the ETIC Building by the contractor as part of the external works and landscaping. This will be done after completion of the building. The University periodically hires landscaping contractors who are responsible for the continued care and nurturing of planted trees as well as flowers.

CHAPTER 3: CONSIDERATION OF ALTERNATIVES

Alternatives to projects are different ways to achieve the same purpose that the proposed project intends to achieve. Environmental and Social Assessments require looking into alternatives to the proposed projects in order to make informed decisions.

3.1 Alternatives Considered

3.1.1 Policies, Legislation and Standards Regarding Construction Industry Alternatives

A review of available policies, legislation and standards of the construction industry in Malawi was carried out to ensure that the Entrepreneurs Training and Incubation Centre (ETIC) that will be constructed conforms to the required standards to ensure the safety of the facility.

3.1.2 Environmental Alternatives

Environmental alternatives were considered in the choice of building materials, citing other facilities such as storm drains, wastewater treatment facilities and choice of wastewater treatment technologies. This was done to ensure that the project does not cause irreparable damage to the environment.

3.1.3 Cost-benefit Analysis Alternative

An analysis of the technologies to be used was made to ensure that the cost of the proposed project is adequate. In addition, consideration of climatic conditions was also put into perspective. Further, functionality, in terms of the required size of the rooms and supporting facilities was also an important factor in the design.

3.1.4 Location and Layout Alternatives

Location alternative was not considered as the ETIC facility is expected to be constructed at Mzuzu University (MZUNI) main campus, where other facilities that support learning and teaching are located. The ICT Department is currently operating from a metal prefabricated structure which has outlived its lifespan. It is planned that the current structure will be removed to pave the way for the construction of the ETIC building.

3.2 Project Alternatives

The assessment has considered the following alternatives: Do-nothing / No action alternative; Develop the project; Technologies alternatives; Alternatives to building materials; and environmental and social considerations alternatives.

3.2.1 Do Nothing / No Action Alternative

This alternative describes a situation where the proposed project is not implemented. If this happens, the university will not get the benefits that the project would generate. However, from an environmental and social management perspective, this alternative will be beneficial in the sense that any negative impacts that the project would generate will not occur. Table 3.1 presents the advantages and disadvantages of the Do Nothing alternative. The Do Nothing

alternative should not be adopted, as we need to encourage development as long as it is undertaken sustainably.

Table 3. 1 Advantages and Disadvantages of the "Do Nothing Alternative"

Advantages	Disadvantages
The natural resources meant to be used for the construction of the ETIC facility such as sand, water, and quarry will not be exploited	The ETIC facility at Mzuzu University will not be constructed. Instead, access to university education will still be limited and students' learning and academic performance will be affected negatively as the institution will not have modern and adequate facilities to assist with student learning and teaching.
The different social-economic impacts the project would generate in the project area and beyond will not be generated.	The access roads that will connect the different facilities at the university will not be constructed.
	There will not be increased employment opportunities for both skilled and non-skilled workers during the construction and operation of the ETIC facility.
	There will not be modern and adequate infrastructure at Mzuzu University which would assist in increasing students' enrolment and their academic performance.

3.2.2 Develop the Proposed Project Alternative

The alternative is to implement the proposed project at Mzuzu University. There is a lot of space at the University, which is not developed. The alternative will generate various positive and negative impacts. Table 3.2 provides the positive impacts (advantages of the alternative) and the negative impacts (disadvantages of the alternative).

Table 3. 2 Advantages and Disadvantages of the "Develop the project alternative"

Positive impacts (advantages of the alternative)	Negative impacts (disadvantages of the alternative).
Increased employment opportunities at local and national levels especially during the construction phase	Increased waste generation (solid and liquid) from construction site office and construction sites
Creation of a market for goods and services	Population influx due to migration of construction workers to the site
Increased economic activities within the project area	Generation of construction waste
Skills transfer to different people at local and national level	Construction related accidents
Increased students' enrolment	Increased risk of illicit behaviour and crime
Improved students' performance	

Increased population of users	Increased pressure on waste management (liquid and solid) during operation phase.

The alternative will generate several positive and negative impacts once the project activities proceed as proposed. However, the anticipated negative impacts can be easily mitigated during the construction and operation phases. The "Develop the Proposed Project" alternative is, therefore, a preferred alternative since it will lead to the socio-economic development of the country through increased employment opportunities for academic and non-academic members of staff, increased students' intake and improved students' performance.

3.3 Alternative Building Technologies

In the construction industry, there are several choices on building materials. The choice of building materials can determine the durability of the structures, the beauty of the structures, the cost of building the structures and the damage that the environment can suffer. The options that were considered included the use of burnt bricks, use of eco-bricks, use of stabilised soil blocks and use of cement blocks.

3.3.1 Use of Burnt Bricks

In Malawi, most people use burnt bricks for constructing different structures because they are made locally and can be readily available. The bricks are made from soil, which is mixed with water. The dough is moulded into bricks that are dried in the sun and thereafter baked using wood fuel.

Disadvantages of Burnt Bricks

For large projects, large amounts of firewood and soil will be required to produce an adequate number of bricks. This can lead to the destruction of natural forests and land degradation due to the formation of borrow pits. If left open, the borrow pits can become ponds and serve as a breeding area for the mosquitoes resulting in the spread of malaria

Advantages of Burnt Bricks

The advantages of bricks are that they are strong and durable; they require low maintenance costs; have excellent thermal mass i.e., in winter they keep the buildings warm while in summer they keep the buildings cool; and they are fire resistant.

3.3.2 Stabilised Soil Blocks (SSB)

Stabilised soil blocks are made by mixing soil and cement in appropriate proportions. The process requires skilled labour because the strength of the bricks depends on the mixture and quality of soil used.

Disadvantage of SSB

The use of soils for large projects can lead to borrowing pits, which can lead to ponding and the creation of breeding grounds for disease vectors. However, the cost is lower than the cement blocks.

Advantages of SSB

SSB allows users to produce uniform blocks of greater strength than typical fired blocks that provide better thermal insulation; The total cost of building a structure with SSB is 20%-30% cheaper than building with fired bricks because far less mortar is required; SSB can be made on site so transportation costs are minimised; SSB are environmentally friendly because they

are cured in the sun as such do not contribute to deforestation as compared to fired/burnt bricks; and the bricks have an appealing aesthetic with an elegant profile and uniform size that doesn't require plastering.

3.3.3 Cement Blocks

Cement blocks are made from a mixture of quarry dust and cement to which water is added. Like SSB, the mixture is compacted using a manual machine to ensure strength and quality.

Disadvantage of Concrete Blocks

The bricks are usually expensive due to the increasing costs of cement.

Advantages of Concrete Blocks

Like SSB, concrete blocks allow users to produce uniform blocks of greater strength; concrete blocks can be made on site so transportation costs are minimised; because Concrete blocks are cured in the sun, there is no fuel needed thereby helping to curb deforestation as such they are environmentally friendly like SSB; concrete blocks are strong and durable; and concrete blocks are fire resistant.

After analysing the advantages and disadvantages of using SSB, concrete blocks and burnt bricks, it was recommended that cement blocks would be cost-effective and have better precision. The blocks could also be produced on-site with convenience.

3.4 Alternative Sewage Disposal Methods

According to the World Health Organization (WHO) and United Nations Children's Fund (UNICEF), the global average water use per capita is around 50 litres per day for domestic purposes. However, in developing countries where water scarcity is a concern, this figure can be significantly lower. Mkondiwa et al (2013) guides that average water consumption for Malawi is 40 litres per day.[3] During the operation phase, more than 80,000 litres of wastewater will be generated daily. As such, there is a need to consider how to manage and dispose of this volume of wastewater. Mzuzu University is not connected to any sewerage for wastewater treatment. The available stabilization ponds currently in use at MZUNI have limited capacity for any additional facility. As such, the ETIC building will use septic tanks.

3.4.1 Use of Septic Tanks

According to World Bank Environmental, Health, and Safety Guidelines for Water and Sanitation (2007:5), in communities not served by sewerage systems, sanitation may be based on on-site systems, such as pit latrines, bucket latrines or flush toilets connected to septic tanks. MZUNI notes the following recommendations: Promote and facilitate correct septic tank design and improvement of septic tank maintenance; septic tank design should balance effluent quality and maintenance needs; consider provision of systematic, regular collection of fecal sludge and septic waste; use appropriate collection vehicles. A combination of vacuum tanker trucks and smaller hand-pushed vacuum tugs may be needed to service all households; facilitate

[3] https://www.bing.com/ck/a?!&&p=5b15ad6a52ed6da8JmltdHM9MTcxNzk3NzYwMCZpZ3VpZD0zYjc5ODgyZC01MzNhLTYxMzUtMzM3MC05YjlkNTJhOTYwYzAmaW5zaWQ9NTE5Nw&ptn=3&ver=2&hsh=3&fclid=3b79882d-533a-6135-3370-9b9d52a960c0&psq=google+scholarper+capita+water+use+in+Malawi&u=a1aHR0cHM6Ly93d3cucmVzZWFyY2hnYXRlLm5ldC9maWd1cmUvQXZlcmFnZS1wZXItY2FwaXRhLXdhdGVyLWNvbnN1bXB0aW9uLWJ5LWxvY2F0aW9uLWFuZC1kaXN0cmljdF9maWcyXzI1OTY4NjEyMQ&ntb=1

discharge of fecal sludge and septage at storage and treatment facilities so that untreated septage is not discharged to the environment. The use of septic tanks to manage wastewater is therefore the recommended option for the ETIC building. With reference to the foregoing, advantages of using septic tank are as follows:

a) Septic tanks are easier to operate than WSP as such they do not require personnel to manage their operations except when there are blockages;

b) Septic tanks do not generate odour as they are usually under cover;

c) Septic tanks do not require a lot of space as compared to WSP; and

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

The main disadvantage of using septic tanks is that they need periodic emptying, and this could raise the operation cost over time. With the large volume of effluents that will be discharged from the project during operation, the septic tanks will need to be emptied time and again making the alternative not viable for the management of wastewater discharged at the University. Due to capacity challenges at the University's wastewater stabilisation ponds, it is proposed that the wastewater from the proposed new infrastructure will be directed to an on-site septic tank and soak away system.

3.5 Alternative Solid Waste Disposal Methods

3.5.1 Bio-Waste

With the increased number of students at the campus, it is expected that bio-waste will be generated daily and an analysis of alternative disposal methods was made as follows:

3.5.1.1 Use of Rubbish Pits

The use of rubbish pits inside the university campus to dispose of bio-waste was considered as one of the alternatives. However, this option was not favoured because this could lead to the breeding of houseflies and could attract scavengers such as dogs and cats. Despite this, advantages include low cost in terms of operation because there will be no costs related to transportation and handling of the waste.

3.5.1.2 Use of Waste Disposal Site Operated by Mzuzu City Council

This method involves arranging with the Mzuzu City Council to collect bio-waste for disposal at a designated dumping site for the council. However, in the event that the council fails to collect the bio-waste, the bio-waste can produce a bad odour and attract flies, dogs, etc. As such for this arrangement to work properly, the university needs to have a standby vehicle to assist when such a situation arises. In addition, in order to reduce the volume of bio-waste, an arrangement will be made with people/institutions that are in the piggery business to come and collect bio-waste to feed their stock. This alternative was considered to be favourable for the disposal of bio-waste.

3.5.2 Waste Paper

The teaching and learning activities at the university are likely going to generate waste paper that will need to be disposed of. Several disposal alternatives were analysed and these include:

3.5.2.1 Use of Rubbish Pits

This alternative was not favoured because the waste paper could easily be blown off by wind from the rubbish pit and litter the University campus. An advantage to this alternative includes low cost in terms of operation because there will be no charges related to transportation and handling of the waste.

3.5.2.2 Recycling of Waste Paper

The University will either embark on a waste recycling project or arrange with waste paper recycling companies to come to collect waste paper periodically. It was envisaged that this initiative will not only benefit the university but also the whole of Mzuzu City Council as waste paper will be reduced. As such this was the favoured option in the management of waste paper.

CHAPTER 4: LEGAL AND POLICY FRAMEWORK

4.1 Malawi's Environmental Regulatory Framework

Malawi has over the years, developed several policies and legislation to guide implementation of environmentally and socially sustainable development projects in various sectors of the economy. The policies and legislation have assisted in mainstreaming environmental and social issues in different development projects during the planning, construction, operation and maintenance, and decommissioning phases of the projects. Besides, Malawi also uses different international procedures, policies and guidelines where national laws, policies, procedures, guidelines and legislation fall short of guiding the implementation of environmentally and socially sustainable development projects in various sectors of the economy.

This chapter outlines the policies, legislative and administrative frameworks relevant to guide the implementation of various activities of different projects.

4.2 Policy Framework

The different policies that Malawi has developed to guide the implementation of different project activities in the country that are relevant to the project under discussion are discussed below.

4.2.1 National Environmental Policy, 2004

The National Environmental Policy (2004) aims at narrowing the gap between the degradation of the environment and depletion of natural resources on one hand and development on the other. The Policy promotes sustainable social and economic development through sound management of the environment and natural resources.

Activities of the project shall among other things involve clearing, excavation and levelling of soil, extraction of gravel and quarry, transportation of materials, compaction of sub-base material and construction of the undergraduate teaching complex, which will generate negative impacts in the project area and beyond. Some of the impacts will include increased generation of waste; injuries due to construction works; increased dust emission and air pollution; risk of social conflicts; increased risk of illicit behaviour and crime; impacts on community dynamics; increased risk of communicable diseases; increased cases of accidents; possible disruption of public service utilities; increased demand for sanitary facilities; and increased disruption of activities at the university premises. As a requirement under the environmental policy, the developer will, therefore, prepare an environmental and social management plan, which will be implemented during the Project construction and operation phases. The ESMP will put in place measures to reduce adverse impacts arising from the activities of the project and the implementation of the activities of this project will take sustainable environmental and social issues on board. At the same time, the project will enhance all the positive impacts.

4.2.2 Gender Policy, 2015

The Gender policy specifies that the Government has a responsibility to integrate gender issues into the development, design, implementation, and monitoring of different development programmes. As provided in Section 1.3, the National Gender Policy provides guidelines for mainstreaming gender in various sectors of the economy to reduce gender

inequalities and enhance the participation of women, men and youth for sustainable and equitable development; as well as poverty eradication in the country.

Section 3.7 of the Policy recognises that Gender Based Violence (GBV), especially violence against women, girls and vulnerable groups, is a severe impediment to social well-being and poverty reduction.

The proposed project will integrate considerations of the needs of women, men, boys and girls in all project activities. The project will ensure that wherever there are any employment opportunities, women will be given equal chances as men for employment. Deliberate effort will be made to ensure that among the employees, at least 40% should be women.

4.2.3 National Water Policy (2005)

The policy as outlined in Section 1.3, provides an enabling framework for integrated water resources management in Malawi. The Policy covers areas of water resource management and development, water quality and pollution control, and water utilisation. If not properly managed, the activities of the project have the potential to negatively affect the water resources of the Lunyangwa Catchment Area. It is therefore recommended that implementation of the activities of the project should minimise pollution of the public water sources thereby promoting public health and hygiene and environmental sustainability. The University will ensure that solid waste and wastewater from the construction of the site and the university campus during the operation phase do not pollute the water bodies.

4.2.4 Decentralisation Policy (1998)

The Decentralisation Policy devolves administration and political authority to the district level in order to promote popular participation. One of the key responsibilities of the district councils is to assist the government in managing and preserving the environment and natural resources. In the course of their development work, the Councils are required to provide for local people's (communities) participation in the formulation and implementation of the District Development Plans. It is in this respect that the councils have been requested to form action committees at Area, Ward, or Village level. For the City Council these structures are at Block Levels.

In light of this devolution, the District and City Councils will play a very important role in implementing Environmental and Social Management Plans that have been developed for this project.

4.2.5 National Construction Industry Policy (2017)

Construction of the proposed undergraduate teaching complex will trigger the Construction Industry Policy in that the project developer must ensure that the contractor protects the environment, in line with national and international policies for environmental sustainability. Areas of focus include occupational health and welfare; gender; and HIV and AIDS. Section 3.7 part (a) of the policy recognises that the Construction Industry greatly contributes to deforestation, noise, dust and chemical pollution, soil erosion and physical disruption. In addition, there have been several abandoned quarry sites, which have been left without being rehabilitated and bitumen wastes dumped carelessly in roads projects. Some of these result in the pollution of rivers and the annihilation of aquatic life. While the Environmental Impact Assessment is mandatory for certain projects, however, there are no mechanisms for effective reinforcement. To that effect, the Policy ensures that the Construction Industry protects and harnesses the environment in line with national and international policies.

Furthermore, the developer will ensure that only qualified and registered contractors with the National Construction Industry Council (NCIC) will be considered for the works contracts of the project to ensure that standard structures and standard procedures are followed which will ensure that only durable structures are constructed and in an environmentally and socially sustainable manner.

4.2.6 HIV and AIDS Policy, 2012

The Policy highlights that the impacts of HIV and AIDS on the country are quite significant and affect a range of socio-economic activities. HIV and AIDS prevalence in the country varies from one district to another and from rural to urban areas. The highest rate is in the Southern Region and the lowest rate is in the Northern Region. The prevalence rate is high in urban areas as compared to rural areas.

The Policy identifies migrant workers and women as highly vulnerable people to transmission of HIV and AIDS and other sexually transmitted diseases. In addition, increased disposal of income from migrant workers may encourage some workers to indulge in extra-marital affairs within the surrounding villages, which would enhance the spread of HIV and AIDS among workers and local people. The project will have the potential to increase the number of people in the project area due to an increase in the number of temporary workers who will be employed to work on the project. This will likely cause the spread of HIV and AIDS. As a way of implementing the Malawi National HIV and AIDS policy, the developer will implement an HIV and AIDS workplace policy and prevention, treatment, care, support and impact mitigation programmes as one way of effectively preventing, reducing and managing the impact of HIV and AIDS in the workplace. It is also proposed that during the construction and implementation phases of the project, workers as well as surrounding communities, should be sensitised on the prevention of HIV and AIDS. Further, Information, Education and Communication (IEC) materials on HIV and AIDS should be distributed.

4.2.7 Guidelines of Environmental Impact Assessment in Malawi, 1997

The EIA Guidelines of 1997 outline the process for conducting EIAs to ensure compliance with the EIA process, as required in the Environment Management Act and Sections 2.2, 2.3 and 2.4 of the 1997 EIA Guidelines for Malawi. The Guidelines contain a list of prescribed projects for which EIA is mandatory and those that may not require an EIA. The Guidelines further prescribe the requirement for conducting environmental and social screening of different projects to determine, which projects require an EIA and which projects do not require an EIA. The screening was conducted for the project. Screening showed an EIA is not required for this project. An Environmental and Social Management and Monitoring Plan was therefore recommended for this project.

Preparation of this ESMP, therefore, followed closely all the provisions of the requirements of the EMA, 2017 and the EIA guidelines of 1997 as discussed above.

4.2.8 National Sanitation Policy (2006)

The National Sanitation Policy provides a vehicle to transform the hygiene and sanitation situation in Malawi. Section 1.2 of the policy provides both guidelines and an action plan where, by 2020, all the people of Malawi will have access to improved sanitation, safe hygienic behaviour will be the norm and recycling of solid and liquid waste will be widely

practised leading to healthier living conditions, a better environment and a new way for sustainable wealth creation.

One of the policy objectives as highlighted in section 3.1.1 of the Policy is the improvement of hygiene, sanitation and recycling of waste in the country. The proposed project will ensure that liquid and solid waste management encourages the reduction, recycling and reuse of waste before final disposal hence complying with the provisions of the Policy. Furthermore, appropriate waste management facilities will be provided for the Project.

4.2.9 Public Health (Corona Virus Prevention, Containment and Management) Rules (2020)

The objective of these Rules is to enable the Minister to implement measures to prevent, contain and manage the incidence of COVID-19. Section 3 of the regulations provides for prevention measures against the spread of Coronavirus, while Section 13 provides for regulations of workplaces. The Minister may prescribe the following measures on workplaces employers and employees: operation of shifts for employees; the spacing between shifts for employees at a workplace; restrictions on the number of persons at any workplace at any time; prescribe the spacing between employees at a workplace; prevention of persons showing general symptoms of COVID-19 from accessing a workplace; where applicable, provision of isolation facilities at a workplace for employees showing symptoms of COVID-19; provision of personal protective equipment for all persons at a workplace; and observance of sanitary and hygienic practices, including disinfection of the workplace and in between shifts.

These Rules are enforceable whether or not a state of disaster in relation to COVID-19 is in force under the Disaster Preparedness and Relief Act. To prevent, contain and manage COVID–19 at the workplace, the contractor will train the employees on the provisions of these rules.

4.2.10 National Educational Policy (2020)

The National Education Policy (NEP) is the Government of Malawi's document that spells out Government policy on education. It outlines the sector's priorities and defines the country's education policies that will guide the development of the education sector in Malawi. The Government recognises that education is the backbone for socio-economic development, economic growth and a major source of economic empowerment for all people especially women, the youth and persons with disabilities (PWDs). It also has a strong impact on literacy; behaviour in terms of reproductive, maternal and child health; and knowledge of HIV and AIDS. The Policy also subscribes to the Sector Wide Approach (SWAp) to the development, planning, and financing of the education sector in line with the Malawi Development Assistance Strategy and Sector Working Group Guidelines. The NEP is designed to respond to the Malawi Growth and Development Strategy II and various related national, regional and international policies and protocols on education. The Policy recognises that early childhood development and early childhood education, primary and secondary education are critical foundations to further education. It further recognises the importance of the inclusion of special needs education, out-of-school youth education (complementary basic education) and adult literacy in the education sector. The NEP attempts to define the provision of quality education holistically through expanded access and equity, improved quality and relevance, and improved governance and management. Furthermore, the NEP recognises the government's commitment to related international protocols such as the Education for All

Jomtien (1990), Millennium Development Goals (2000) and Sustainable Development Goals (2015) which recognise the importance of making education available to all. It is, therefore, expected that the coming together of all key players in the education sector will make a significant difference in and to Malawi, and thereby respond to the national and international aspirations and expectations. By building an educated and highly skilled population, Malawi will not only achieve accelerated economic growth and development, but it will also aim towards the achievement of the Sustainable Development Goals. The Government is committed to spearheading the implementation of specific strategies and focused actions pursued to ensure that the NEP becomes the centre of the education sector.

The Project is in line with the policy as it aims to increase the annual intake of students and train high-level human resources that can meet the development needs of the country and the international labour market.

4.3 Legal framework

The section provides a review of key national legislation pertinent to the development and operation of the project. The Project proponent intends to develop and operate the project in line with all relevant national laws. Details of the legal frameworks considered are presented in the sections that follow.

4.3.1 The Constitution of the Republic of Malawi (1995)

The Constitution of the Republic of Malawi (1995) is the supreme law of the land. Section 13 of the Constitution sets out a broad framework for sustainable environmental and social management at various levels in Malawi. Section 13 (d) of the Constitution provides that the state shall actively promote the welfare and development of the people of Malawi by progressively adopting and implementing policies and legislation aimed at managing the environment responsibly.

The Constitution further provides a framework for the integration of environmental and social considerations into any development programmes. This provision implies that the Government, its cooperating partners and the private sector have a responsibility to ensure that development programmes and projects are undertaken in an environmentally and socially responsible manner, hence the development of this ESMP for the Project.

4.3.2 Water Resources Act (2013)

The Act makes provision for the control, conservation, apportionment and use of water resources in Malawi. Under the Act, the right to use public water may be limited if the use may cause damage to the natural resources of the area or in the vicinity. The Act defines pollution or fouling of public water to mean the discharge into or in the vicinity of public water or in a place where public water is likely to flow, of any matter or substance likely to cause injury whether directly to public health, livestock, animal life, fish, crops orchards or gardens which such water is used or which occasions, or which is likely to occasion, a nuisance.

Section 39 (1) of the Water Resources Act prohibits the abstraction and use of water unless authorised to do so under this Act. Abstraction and use of water from a water resource would require a licence granted by the Authority. When necessary, this licence could be combined with a permit. Permits would be required for the abstraction of water for the surface water resources and for discharging effluents.

Part VIII, Section 89 (1) of the Act prohibits any person who owns, controls, occupies or uses land on which an activity or process is or was performed to pollute water resources and which, unless authorised under this Part, causes, has caused or is likely to cause pollution of a water resource, shall take all such measures as may be necessary to prevent any such pollution from occurring, continuing or recurring.

The Developer will, therefore, ensure that construction of the undergraduate facility at the university does not pollute the environment. Measures to minimise pollution of the water will include proper disposal of both solid and liquid waste during the construction and operation phases.

4.3.4 Public Health Act (1948)

The Act provides a legal framework for planning and management of a wide range of health-related issues including environmental health, occupational health and solid waste management. Section 79 parts (a) and (b) provide legal powers for the local authority to enforce the provision of sewage works for large-scale development projects. Section 80 stipulates the requirements for the preparation of detailed plans for planned sewage works for implementation. Section 82 outlines some activities which can limit the free flow of wastes into sewage works and which must be avoided as much as possible. These activities include the disposal of solid wastes in oxidation ponds, disposal of chemical refuse, waste streams, and petroleum spirit or carbon calcium. Section 87 of the Public Health Act stipulates the need for proper drainage works for new buildings. Section 88 stipulates the requirements for separate toilets for both female and male persons in public buildings which would be used by both male and female employees.

The implication of the Act on the proposed project is that the developer should ensure that there are appropriate and adequate waste disposal facilities, provision of sanitary toilets and proper storm water drains. The toilets will be demarcated according to sexual category. In addition, the contractors will have in place temporary toilets for both female and male workers during the construction period.

4.3.5 Occupational Safety, Health and Welfare Act (1997)

The Act regulates work conditions concerning the safety, health, and welfare of workers. During the construction phase, there will be several workers working on the site using different types of machinery and facilities. Construction activities in general pose several occupational health and safety risks and probable risks to workers and community members in the surrounding areas. Furthermore, increased movement of vehicles and equipment during construction can pose a risk of accidents to the surrounding communities as well as the construction workers.

The Act, therefore, places a duty of care on contractors throughout the project construction phase and similarly, the workers must take reasonable care for their own safety and health. The duty of ensuring the safety, health, and welfare of workers is on the employer. However, every employee is required to take reasonable care for his/her own safety and that of other workers.

Considering that the construction phase of the Project will require a labour force of about 100 people and the use of heavy machinery, the Occupational Safety, Health and Welfare Act is

important in safeguarding the health and welfare of all workers. The contractor will ensure that there is adequate protection for the workers who will be on-site as required by the Act.

Section 66 of the Act defines the procedure to be followed in case of the occurrence of an accident which either can cause loss of life or disables a person from carrying out the normal duties at which he is employed. Furthermore, it stipulates measures that relate to work in confined spaces (section 55), matters relating to bulk storage of dangerous materials, matters dealing with noise (section 63) and general matters relating to health and safety. To this effect, the proponent will allow the Ministry of Labour to assess the construction activities and make determinations of the adequacy of the mitigation measures towards the occupational safety of the workers.

4.3.6 Gender Equality Act (2013)

The Gender Equality Act of 2013 seeks to promote gender equality, equal integration, influence, empowerment, dignity and opportunities, for men and women in all functions of society, to prohibit and provide redress for sex discrimination, harmful practices, and sexual harassment to provide for public awareness on promotion of gender equality, and to provide for connected matters. Part II of the Act is on Sex Discrimination. Section 4 stipulates that a person shall not treat another person less favourably than he or she would treat a person of his or her own sex. In compliance with this section of the Act, the proponent of the project will ensure that there is no sex discrimination during all phases of the project including the Implementation and Maintenance Phase.

The Mzuzu University Act in Section 6 and Subsection 1 Part C on Principles of the University, advocates for gender responsiveness to ensure equal opportunity and participation of women and men in programmes, governance and other spheres. The Contractor will, therefore, be expected to ensure that wherever there are any employment opportunities, women will be given equal chances as men for employment. Deliberate effort will be made to ensure that among the employees, 40% should be women.

The Project shall support interventions aimed at expanding education opportunities, especially for the poor and disadvantaged students in line with the Government and the University's strategy of increasing access to and equity of tertiary education. The Project will ensure that vulnerable groups are also considered in the project by providing bursaries to vulnerable students.

The Project will further ensure that vulnerable groups also benefit from the different opportunities that the project will bring.

4.3.7 Local Government Act, 1998

The Act, as read with Section 146 of the Constitution, provides the mandate to the local councils in planning, administration, and implementation of various development programmes in their areas. The district council where the project will be implemented was consulted concerning its mandate and how the project will comply with the planning requirements.

As is required by the Act, the proponent of the project briefed and consulted the City Council on the project. The proponent of the project will incorporate all recommendations made by the Local Council during the Planning, Construction and Operation phases of the proposed project.

4.3.8 Environment Management Act (2017)

The Environment Management Act of 2017 makes provision for the protection and management of the environment and the conservation and sustainable utilisation of natural resources. Section 31 __ (1) of the EMA stipulates that the Minister may, on the recommendation of the Authority, specify, by notice published in the *Gazette*, the type and size of a project, which shall not be implemented unless an Environmental and Social Impact Assessment is carried out.

Subsection (2) stipulates that a person shall not undertake any project for which an Environmental and Social Impact Assessment is required without the written approval of the Authority, and except in accordance with any conditions imposed in that approval.

Subsection (3) provides that the licensing authority shall not grant a permit or licence for the execution of a project referred to in subsection (1) unless approval for the project is granted by the Authority, or the grant of the permit or licence is made conditional upon the approval of the Authority being granted.

In this way, the developer for the proposed project will have to demonstrate that he has made sufficient efforts to identify all possible negative impacts and suggest reasonable measures in order to obtain environmental and social clearance for the project first before construction activities of the proposed project are undertaken.

4.3.9 Education Act (2013)

The Education Act of 2013 Part II, Section 5 provides for the promotion of education and the goals of education in Malawi. Among the goals is to promote equality of education opportunities for all Malawians by identifying and removing barriers to accessing education. The development of students' knowledge, understanding and skills needed for Malawians to compete successfully in the modern and ever-changing world is also being emphasised. The project will assist in removing the barriers through the construction of the Entrepreneurship Training Incubation Centre, which will provide for a specialised skill set (fulfilling section 7 of the Mzuzu University Act), increased access to higher education, quality education and improved learned academic performance.

4.3.10 Child Care, Protection and Justice Act (2010)

In addition to the duties and responsibilities imposed by section 23 of the Constitution, a parent or guardian) shall not a) deprive a child of his or her welfare; and b) has responsibilities whether imposed by law or otherwise towards the child which include the responsibility to i) protect the child from neglect, discrimination, violence, abuse, exploitation, oppression and exposure to physical, mental, social and moral hazards; ii) provide proper guidance, care, assistance and maintenance for the child to ensure his or her survival and development, including in particular adequate diet, clothing, shelter and medical attention; iii) ensure that during the temporary absence of the parent or guardian, the child shall be cared for by a competent person; and iv) exercise joint primary responsibility for raising their children, except where the parent or guardian has forfeited or surrendered his or her rights and responsibilities in accordance with the law. In line with the provisions of this Act, the project implementers will ensure that child protection is greatly respected at all levels.

4.3.11 Employment Act (2000)

The Act prohibits forced labour and child labour as well as discrimination against any employee or prospective employee on the grounds of race, colour, sex, language, religion, political or other opinions, nationality, ethnic or social origin, disability, property, birth, marital or other status or family responsibilities in respect of recruitment, training, promotion,

terms and conditions of employment, termination of employment or other matters arising out of the employment relationship. It also encourages equal pay to employees.

A worker is entitled to wages and remuneration due on the termination or completion of his employment contract within 7 days of such termination or completion. In line with the provisions of this Act, the project implementers will make sure that all the relevant provisions mentioned above are adhered to.

4.3.12 National Construction Industry Act (1996)

The Act provides for the establishment of the National Construction Industry Council of Malawi (NCIC) for the promotion and development of the construction industry, registration of persons engaged in the construction industry in Malawi, coordination of training of persons engaged in the construction industry and general matters incidental thereto. The NCIC is responsible for regulating the construction industry in Malawi through among others: registering consultants and construction firms, standardising quality control, codes of practice, procurement process; and legal contractual procedures in liaison with other organisations. Under the Act, the NCIC will be involved in the project to make sure that construction activities adhere to agreed quality standards and registered persons are the ones entrusted with the works to ensure that quality structures are developed.

4.3.13 HIV and AIDS (Prevention and Management) Act (2018)

The HIV and AIDS (Prevention and Management) Act makes provisions for the prevention and management of HIV and AIDS; provisions for the rights and obligations of persons living with HIV or affected by HIV and AIDS; provisions for the establishment of the National AIDS Commission; and provisions for matters incidental thereto or connected therewith. Part 4, Section 6 (1) states that discrimination on a basis related to HIV or AIDS is prohibited. Part 5, Section 9.

(1) states that a person living with HIV has the right to privacy and confidentiality concerning information concerning their status. Part 8 of this Act gives provisions to employers by stipulating requirements in several sections quoted as follows:

a) Section 26 states that an employer shall not require any person to undergo HIV testing as a pre-condition for recruitment;

b) Section 27 (1) states that an employer shall not terminate the employment of an employee solely on the ground that the employee is living with HIV or is perceived to be living with HIV;

c) Section 28 (1) states that an employee shall not be discriminated against or be subjected to unfair treatment solely on the ground that he is perceived to be or is living with HIV; and

d) Section 32 (1) states that the State shall ensure that employers adopt and implement an HIV and AIDS policy at the workplace.

This implies that the Project will implement interventions to manage HIV and AIDS that respond to the requirements of the Act. The project will have an HIV and AIDS workplace policy as a guide to implementing the interventions.

4.3.14 Physical Planning Act (2016)

This provides for orderly planning and development of land in both urban and rural settings to ensure the preservation and improvement of amenities and also for purposes of granting permission to develop. The act allows for the establishment of a Town Planning Committee that receives development plans and must see to it that relevant organisations and people within the planned development are consulted. In this, Mzuzu University will seek planning approval from the Mzuzu Town Planning Committee.

4.3.15 Environment Management (Waste Management & Sanitation) Regulations (2008)

The Regulations apply to the management of general and municipal waste in Malawi. Part III of the regulations has provisions for the management of general or municipal solid waste with Section 7(1) regulating that any person who generates solid waste shall sort out the waste by separating hazardous waste from the general or municipal solid waste. Section 8(1) regulates that every generator of waste shall be responsible for the safe and sanitary storage of all general or municipal solid waste accumulated on his or her property so as not to promote the propagation, attraction of vectors, or the creation of nuisances. Section 10(1) has provisions for the collection of municipal solid waste as being the responsibility of a local authority. Section 11 has provisions that general or municipal solid waste may be disposed of at any waste disposal site or plant identified and maintained by a competent local authority or owned or operated by any person licensed to do so under these regulations. Part V of the regulations has provisions for the management of municipal liquid waste with a general requirement stipulated in Section 23 that no person shall discharge effluent into the environment unless it meets prescribed environmental standards. These regulations have a major implication on the proposed project with regard to waste management regimes that are to be put in place. The proposed project will have to encourage waste separation at the source, provide proper and adequate waste receptacles, and suitable waste storage and treatment facilities. The project will work with Mzuzu City Council to ensure proper waste collection alternatives are put in place as well as waste disposal.

4.3.16 Mines and Minerals Act (2019)

Mining activities in Malawi are governed by the Mines and Minerals Act of 2019 (CAP. 270). The Act stipulates that all potential environmental and social impacts must be included in the application for exploration and mining licences. Considering that the project will use quarry stone and sand as construction materials, the quarry and sand mining operations will require a mining licence and that the mining of the quarry and sand should include plans for addressing environmental and social problems, prevention of pollution, treatment of waste and land rehabilitation. The Act further states that an environmental licence must be submitted to the Minister responsible for Mines when applying for a licence for mining. The Contractor will be required to get the necessary permits before he begins to mine quarry stone and sand for the construction of the teaching complex facility.

4.4 International Guidelines

The international legal and policy framework within which projects operate, and implementation procedures and guidelines, have developed substantially since the adoption of the Universal Declaration of Human Rights in 1948. Instruments supported by member states include those developed by the United Nations and the European Union/Commission. Others have been developed by bodies such as the World Bank Group. The Project under discussion being a World Bank project, World Bank Group Environmental and Social Standards were reviewed.

4.4.1 World Bank Environmental, Health and Safety Guidelines

The Project will be required to apply the relevant requirements of the World Bank Group Environmental, Health and Safety Guidelines (EHSGs). These are technical reference documents, with general and industry-specific examples of Good International Industry Practice (GIIP). These will include the General EHS Guidelines as well as any relevant Industry Sector EHS Guidelines.

4.4.2 World Bank Group Environmental and Social Standards

The World Bank Environmental and Social Framework aims to ensure that environmental and social risks and impacts that the proposed project may generate are incorporated and managed during project implementation. The ESF sets out environmental and social standards, which are key in the identification and assessment of environmental and social risks and impacts associated with projects supported by the Bank. Additionally, the Environmental and Social Standards (ESSs) are used during the implementation of World Bank-funded projects or activities in order to protect the interest of beneficiaries, clients, shareholders and the Bank. The ESSs also provide a comprehensive framework for avoiding negative impacts on the environment and people enhancing social equity and promoting sustainability. The SAVE Project contains a series of sub-projects whose implementation will generate several impacts, which will affect both the biophysical and socio-economic environment in the project area and beyond; this ESMP has therefore been prepared to outline the impacts and the measures that will be used to manage the impacts. The ESMP contains measures and plans to reduce, mitigate and/or offset adverse risks and impacts, provisions for estimating and budgeting the costs of such measures, and information on the agency or agencies responsible for addressing project risks and impacts, including on its capacity to manage environmental and social risks and impacts. During the implementation of the project, the following World Bank ESSs will be triggered:

i. Assessment and Management of Environmental & Social Risks and Impacts;
ii. Labour & Working Conditions;
iii. Resource Efficiency and Pollution Prevention & Management;
iv. Community Health & Safety;
v. Biodiversity Conservation & Sustainable Management of Living Natural Resources
vi. Stakeholder Engagement and Information Disclosure

4.4.1.1 Assessment and Management of Environmental & Social Risks and Impacts (ESS1)

ESS1 sets out the Borrower's responsibilities for assessing, managing and monitoring environmental and social risks and impacts associated with each stage of a project supported by the Bank through investment project financing, in order to achieve environmental and social outcomes consistent with the ESSs. ESS1 therefore requires that an ESMP should be prepared for the project. In line with this requirement, the ESMP has been prepared for the project before the commencement of construction activities to ensure that the project is environmentally and socially sound and sustainable. The environmental and social assessment was proportionate to the risks and impacts of the project. It informed the design of the project and was used to identify mitigation measures and actions and to improve decision-making.

4.4.1.2 Labour and Working Conditions (ESS2)

ESS2 recognises the importance of employment creation and income generation in the pursuit of poverty reduction and inclusive economic growth. Borrowers can promote sound worker management relationships and enhance the development benefits of a project by treating workers in the project fairly and providing safe and healthy working conditions. Considering that the project will attract a huge workforce, then ESS2 applies. The Project will apply skilled, semi-skilled and non-skilled labour. Deliberate effort will be made to ensure that most of the non-skilled labour force will be employed from the surrounding communities. Furthermore, the Project will ensure that 40% of the labour force will be women and that the national laws and conditions of employment will be followed.

4.4.1.3 Resource Efficiency and Pollution Prevention and Management (ESS3)

This ESS3 recognises that economic activity and urbanisation often generate pollution of air, water, and land, and consume finite resources that may threaten people, ecosystem services and the environment at the local, regional, and global levels. The Project under discussion will generate pollution to the air, water bodies and land during both construction and operation levels. During construction, dust will be emitted into the atmosphere polluting the air. Exhaust gas from heavy construction equipment will be emitted into the atmosphere thereby increasing the levels of greenhouse gases. Run-off from the construction site will carry along with it silt and other debris that will pollute the rivers in the project area. Solid and liquid waste that the project activities will generate will pollute the water bodies in the project area. Furthermore, leakage and spillages of oils from heavy construction equipment will also cause pollution of the water bodies in the project area. The University has, therefore, prepared this ESMP with measures to manage the above impacts.

4.4.1.4 Community Health and Safety (ESS4)

This ESS recognises that project activities, equipment, and infrastructure can increase community exposure to risks and impacts. The ESS4 addresses the health, safety, and security risks and impacts on project-affected communities as project activities such as borrow pits may become breeding grounds for mosquitoes, traffic and drowning accidents which can affect surrounding communities.

A moderate influx of labour is expected during the construction of the project. Therefore, the impacts associated with an influx of populations such as disease transmission and spread of HIV, potential for Gender-Based Violence, Sexual Exploitation and Abuse, Child Labour and Violence Against Children have been outlined in the ESMP and their management has been provided.

4.4.1.6 Stakeholder Engagement and Information Disclosure (ESS10)

ESS10 recognises the importance of open and transparent engagement between the Borrower and project stakeholders as an essential element of good international practice. Effective stakeholder engagement can improve the environmental and social sustainability of projects, enhance project acceptance, and make a significant contribution to successful project design and implementation.

Preparation of the ESMP for this project involved engaging institutions within the Project impact area and selected public institutions who expressed their views on the proposed Project. The stakeholder participation process ensured that due consideration was given to stakeholder values, concerns and preferences when decisions regarding the project were made. The purpose of stakeholder involvement was to inform the stakeholders about the project and its likely effects; solicit their inputs, views and concerns about the project; and take into account

the information and views of the public in the environmental and social assessment and decision-making. The study used two methods to ensure adequate input to the environmental and social impact assessment process, which included focus group discussions and key informant interviews.

4.5 Gaps Between World Bank Environmental and Social Standards and National Legislation

Table 4.1 provides details on the gaps that exist between national legal instruments and the World Bank ESS.

Table 4. 1 Gaps between national legal instruments and World Bank Environmental and Social Standards

World Bank ESS provisions	National Legal Instruments provisions	Gap(s) identified	How the gaps have been addressed (if applicable)
ESS 1: Assessment and Management of Environmental & Social Risks and Impacts	Environmental Management Act (2017 EIA Guidelines (1997)	Environmental Management Act (2017) and EIA Guidelines (1997) do not indicate the need to prepare ESMF for projects to guide the preparation of project or ESMP	Preparation of the ESMF the project
ESS 2: Labour and Working Conditions	The Labour Relations Act (1996) Occupational Safety, Health and Welfare Act, (1997) Employment Act (2000)	The national legislation does not mention the need to develop Labour Management Plan or Procedures	The project will follow ESS2 and developed labour management procedures with relevant provisions to bridge the gap
ESS 3: Pollution Prevention and Resource Efficiency	Environment Management Act (2017) Environmental Management (Waste Management and Sanitation) Regulations, (2008)	The national legislation mostly focuses on pollution prevention and less on aspects of resource efficiency	The project will follow provisions of ESS3 on resource efficiency including the development of a waste management plan to mitigate the impacts of pollution from solid and liquid wastes.

ESS 4: Community Health and Safety	Occupational Safety, Health and Welfare Act, (1997)	The Occupational Safety, Health and Welfare Act, (1997) does not focus much on community health and safety	This gap has been addressed through the implementation of ESS4, which addresses potential risks and impacts on communities that may be affected by Project activities.
ESS 10: Stakeholder Engagement & Information Disclosure	EIA guidelines (1997) Local Government Act (1998) National Decentralisation Policy (2000)	No provision for the development of the GRM	The project has developed a stakeholder engagement plan which includes a GRM

4.6 Summary of Approvals and Licences Required for the Project

There are several statutory and regulatory approvals or licences that the developer needs to get in the course of project implementation to ensure that the project is in line with sound environmental management practices and follows other relevant pieces of legislation. These have been summarised in Table 4.2.

Table 4. 2 List of Statutory Approvals and Licences Required for the Project

List of statutory approvals or licences to be obtained	Legal and regulatory framework	Responsible institution for processing approval or licence
ESMP approval	Environment Management Act (2017)	Malawi Environment Protection Authority
Planning Permission	The Physical Planning Act No. 17 of 2016	Mzuzu City Council
Permission to Develop	Physical Planning Act No. 17 of 2016	Mzuzu City Council
Approval to transport, store and dispose of waste	Local Government Act (1998) EMA,2017	Mzuzu City Council and MEPA
Work Place Registration Certificate.	Occupational Health, Safety and Welfare Act (Cap 55:01)	Ministry of Labour, Youth and Manpower Development
Approval for water abstraction from under the ground or stream	Water Resources Act, 2013	National Water Resources Authority,
Sand mining permit	Mines and Minerals Act, 2019	Mzuzu City Council
Quarry mining permit	Mines and Minerals Act, 2019	Department of Mines

CHAPTER 5: BIOPHYSICAL AND SOCIO-ECONOMIC ENVIRONMENT

A baseline study of the existing environment has been carried out on the physical, biological and socio-economic environment in the project area and beyond. The study provides a measure of the existing state of the environment against which future changes imposed by the construction of the access roads and the proposed ETIC will cause. The physical and biological baseline factors considered include climate, air quality, topography, drainage, vegetation, fauna, geology and soils, existing road traffic, and socio-economic factors. The sections that follow provide detailed explanations of these factors.

5.1 Physical environment

5.1.1 Water Resources

Mzuzu City has a network of main rivers with tributaries that form a dendritic drainage pattern. It is endowed with various water resources that cater to the water needs of its residents and surrounding areas. The city has various rivers and streams namely: Lunyangwa, Chamangulu, Lusangazi, Zolozolo, Ching'ambo, Kang'ona, Mganthira, Chiputula, Chasefu, Mchengautuwa, Kaligomba, Katoto, Chingozi, Chipambo, Kanthete, Nkhoswe, Kavuzi and Kajiliro.

Lunyangwa River, which is the main surface water source in the city, rises from the east of Mzuzu City in Kaning'ina Hills to the east of Mzuzu City and it lies approximately 3 km away from the project site Mzuzu also benefits from the presence of wetlands as well as boreholes and wells, which tap into underground aquifers.

Tondu River is a stream close to the Project site. It has an elevation of 1,282 metres and it is situated nearby to the localities Chiputula and Katoto.

5.1.2 Geographical Location and Topography

Mzuzu City is found on the Northern end of the Viphya Plateau situated on the edge of the Rift Valley escarpment at an altitude between 1,200m and 1,370m above sea level. It is bounded by the Viphya Mountains to the North and South and by the Kaning'ina Mountains to the East. The city itself is predominantly situated on relatively flat and sloped terrain. The project area lies at an altitude ranging from 1300 -1320 metres above sea level at an elevation of 1,286 metres.

The Project area is within a gently sloping topography with an altitude ranging from 1300 - 1320 metres above sea level. The site has a gentle slope from the southern side towards the northern side.

5.1.3 Geology

Mzuzu City's geology is mainly made up of alluvial and alluvial deposits with ferruginous soils on the lower grounds while the higher grounds are composed of metamorphic gneiss with feralitic or lithosols soils (Dijkshoorn et al., 2016). The City is dominated by the rocks of the amphibolite facies, gneisses of the pre-Mafingi group. There is also a stretch of sedimentary and volcanic rocks particularly to the north of the city along the Mzuzu – Nkhata Bay road. The other types found include nepheline senate, garnet – mica schist phallometers.

5.1.4 Soils

Mzuzu City has high and low areas with different types of soils. Due to the many different types of sediments and rocks, a wide variety of soils have developed in Mzuzu city that varies from area to area. The soils in the area are classified by the Geological Map of Malawi, 1979, as latosols dominated by leached ferralitic soils and ferrisols. The soils are less exposed to the risk of erosion due to their deep sub layer which encourages infiltration. Figure 3.1 shows the soil type found at the Project site.

5.1.5 Climatic Characteristics

Climate of the City of Mzuzu is a typical tropical climate characteristic. It lies within high-altitude areas that receive high rainfall, hot temperatures and high humidity during the rains. There is a long dry season occurring from May to mid-November, and a short wet season occurring from November and ending mid-April. The dry season is characterised by days with high sunshine hours and very little cloud cover. The main rain-bearing winds for the area are the warm and moist Congo air mass and south–easterly winds which prevail over much of central and northern Malawi through the Inter Tropical Convergence Zone (ITCZ) between November to April. Cool south easterly winds bring light rains in April and early May.

	January	February	March	April	May	June	July	August	September	October	November	December
Avg. Temperature °C (°F)	20.8 °C (69.4) °F	20.7 °C (69.3) °F	20.3 °C (68.5) °F	19.2 °C (66.5) °F	17.6 °C (63.7) °F	15.8 °C (60.4) °F	15.3 °C (59.5) °F	17.1 °C (62.7) °F	19.6 °C (67.3) °F	21.4 °C (70.5) °F	21.9 °C (71.4) °F	21 °C (69.8) °F
Min. Temperature °C (°F)	17.8 °C (64) °F	17.7 °C (63.9) °F	17.6 °C (63.6) °F	16.4 °C (61.4) °F	13.9 °C (57.1) °F	11.7 °C (53.1) °F	11.1 °C (52) °F	12.6 °C (54.6) °F	14.8 °C (58.7) °F	16.7 °C (62.1) °F	17.7 °C (63.9) °F	17.7 °C (63.9) °F
Max. Temperature °C (°F)	24.9 °C (76.9) °F	24.9 °C (76.8) °F	24.1 °C (75.4) °F	22.9 °C (73.2) °F	21.8 °C (71.3) °F	20.3 °C (68.6) °F	20 °C (67.9) °F	21.9 °C (71.4) °F	24.6 °C (76.3) °F	26.4 °C (79.5) °F	26.6 °C (79.8) °F	25.2 °C (77.3) °F
Precipitation / Rainfall mm (in)	303 (11)	256 (10)	228 (8)	151 (5)	58 (2)	26 (1)	22 (0)	19 (0)	15 (0)	47 (1)	110 (4)	252 (9)
Humidity(%)	87%	87%	88%	85%	79%	75%	72%	66%	61%	62%	70%	83%
Rainy days (d)	21	18	21	18	11	6	6	4	3	7	11	18
avg. Sun hours (hours)	7.2	6.8	5.4	5.0	6.1	6.9	7.2	8.3	9.4	9.5	8.7	7.1

Figure 3.2*:* Climate of Mzuzu Source: https://en.climate-data.org

1991 - 2021 Min. Temperature °C (°F), Max. Temperature °C (°F), Precipitation / Rainfall mm (in), Humidity, Rainy days. Data: 1999 - 2019: avg. Sun hours.

The variation in the precipitation between the driest and wettest months is 288 mm. The variation in annual temperature is around 6.6 °C.

The month with the highest relative humidity is March (88%). The month with the lowest relative humidity is September (61%). The months with the rainiest days are January and March (21 days). The month with the fewest rainy days is September (3 days).

5.2 Biological environment

Biological characteristics analysed in this report include flora and fauna.

5.2.1 Terrestrial Flora

Flora Species in Mzuzu City

The natural vegetation of Mzuzu City is dominated by Miombo woodlands and has two large Forest Reserves at Lunyangwa and Kaning'ina. Due to human settlement major parts of the city are now built-up areas or cultivated land and dry grassland. Jacaranda-lined streets are typical in the inner-city area along Orton Chirwa Avenue (Mzuzu Urban Profile, 2013-2018). Other tree species found in Mzuzu City include; Jacaranda (*Jacaranda mimosifolia*), M'bawa (*Khaya nyasica*), Spathodia (*Spathodea campanulata)*

Flora Species in the Project Area

Common trees in the communities around the Project site are in the genera Brachystegia (Msasa), Combretum (*Bush Willows*) and Acacia (Mthethe), making up to 70% of the canopy cover, particularly *Brachystegia manga* (Blue-Leaved Brachystegia), Brachystegia. bussei (Smooth bark Brachystegia), *Julbernardia globiflora* (Mnondo), *Acacia polyacantha* (Mnthethe), *Terminalia stenostachya* (Rosette Cluster Leaf), and *Dichrostachys cinerea*. (Sicklebush). Common fruit trees in the project area include: *Mangifera indica* (Mango) , *Psidium guajava* (Guava) and *Citrus limon* (Lemon). Figure 5.3 following shows the common tree species around the project area.

Fig. 5.2: Common tree species around the project area (Source: MZUNI Household Survey June 2023)

Other flora species observed in the communities around the project area are presented in Table 5.1 below.

Table 5.1: Common flora species in the communities around the project area

Local Name	Scientific Name	National Red-list Status	IUCN Red-list Status
Mthethe	*Acacia polyacantha*	Least Concern/Protected	Least Concern
Msangu	*Faidherbia albida*	Least Concern/Protected	Least Concern
Miombo	*Brachystegia spp*	Least Concern	Least Concern
Pine	*Pinus spp*	Least Concern	Least Concern
Bluegum	*Eucalyptus globulus*	Least Concern	Least Concern
African tulip	*Spathodia campanuata*	Least Concern	Least Concern
Mango	*Mangifera indica*	Least Concern	Least Concern
Lemon	*Citrus limon*	Least Concern	Least Concern
Avocado	*Persea Americana*	Least Concern	Least Concern
Guava	*Psidium guajava*	Least Concern	Least Concern
Reed	*Phragmites muritianus*	Least Concern	Least Concern
Monkey thorn	*Acacia galpinii*	Least Concern	Least Concern
African senna	*didymobotrya*	Least Concern	Least Concern
Bamboo	*Bambusa vulgaris*	Least Concern	Least Concern
Blackjack	*Bidens pilosa*	Least Concern	Least Concern
Rhodes grass	*Chloris gayana*	Least Concern	Least Concern
Banana tree	*Musa paradisiaca*	Least Concern	Least Concern
Hook thorn	*Acacia polyacantha*	Least Concern	Least Concern
Wild poinsettia	*Euphorbia heterophylla*	Least Concern	Least Concern

Flora Species on the Project Site

The land close to the project site has Brachystegia tree species (*Brachystegia spp*), Mango (*Mangifera indica*), *Khaya anthontheca* (East African mahogany), *Syzygium cordatum* (Water berry) and *Parinari curatellifolia* (Hissing tree) that will potentially be cut down or disturbed. About 40 small trees could be potentially affected. The smaller trees will need to be transplanted elsewhere if applicable. Figure 5.4 shows the vegetation found on the project site.

Fig. 5.3: Vegetation found on the Project site (Source: MZUNI Household Survey June 2023)

5.2.2. Terrestrial Fauna

The majority of fauna species in Malawi are declining in numbers, especially in recent years, mainly due to poaching and habitat loss. There are several species that are not considered to be of great conservation concern globally but need to be considered critically endangered in Malawi. These include the Wattled Crane *(Bugeranus carunculatus)* whose population has greatly reduced in the Nyika plateau.

a) Fauna Species in the Project Area

The Consultant used direct visual observation, and indirect evidence such as interviews with local inhabitants to identify fauna species in the communities around the Project area.

Fauna species mentioned in the communities around the project area are presented in Table 5.2. None of the species in the five taxonomic groups presented is classified as threatened by both local and IUCN Red-list and none is endemic to the project area.

The communities of interest are in the peri-urban areas, as such no traces of scat and prints for wild animals were observed except for the domesticated animals. However, this does not rule out the presence of some of the fauna species mentioned by the local inhabitants. The local community pointed out that Nkhututu *(Tilapia rendalli)* are not very common as they are mostly pond-raised.

Table 5.2: Common fauna species in the communities around the project area

Local Name	Scientific Name	National Red-list Status	IUCN Red-list Status
Birds			
Cape turtle Dove	*Streptopelia capicola*	Least Concern	Least Concern
Puffback	*Dryocopus cubula*	Least Concern	Least Concern
Pied Crow	*Corvus albus*	Least Concern	Least Concern
Miombo Rock-Thrush	*Monticola angolensis*	Least Concern	Least Concern
Common Bulbul	*Pycnonotus barbatus*	Least Concern	Least Concern
Gray Tit-Flycatcher	*Fraseria plumbea*	Least Concern	Least Concern
House Sparrow	*Passer domesticus*	Least Concern	Least Concern
Mammals			
Fat mouse	*Steatomys pratensis*	Least Concern	Least Concern
Black rat	*Rattus rattus*	Least Concern	Least Concern
Pouched Mouse	*Saccostomus campestris*	Least Concern	Least Concern
Velvet monkey	*Chlorocebus pygerythrus*	Least Concern	Least Concern
Reptiles			
Common house gecko	*Hemidactylus mabouia*	Least Concern	Least Concern
Striped skink	*Mabuya striata*	Least Concern	Least Concern
Variable skink	*Mabuya varia*	Least Concern	Least Concern
Olive grass snake	*Psammophis mossambicus*	Least Concern	Least Concern
Puff adder	*Bitis arietans*	Least Concern	Least Concern
Nile Monitor	*Varanus niloticus*	Least Concern	Least Concern
Amphibians			
Guttural toad	*Sclerophys gutturalis*	Least Concern	Least Concern
Grey tree frog	*Chiromantis xerampelina*	Least Concern	Least Concern
Lesser Banana Frog	*Afrixalus brachycnemis*	Least Concern	Least Concern
Fish			
Nkhututu	*Tilapia rendalli*	Least Concern	Least Concern
Matemba	*Barbus paludinosus*	Least Concern	Least Concern
Mulamba	*Clarias gariepinus*	Least Concern	Least Concern
Mphuta	*Petrocephalus catostoma*	Least Concern	Least Concern

5.3 Socio-economic Environment

5.3.1. Demographic and Settlement Pattern

The National Statistic Survey report of 2018 revealed that Mzuzu City had a population of 221,272 people in the year 2018, of which 108,848 are male, and 112,424 are female (NSO Report 2018). The Population of the City has continuously grown in the past and was 133,968 in 2008 with an annual growth rate of 4.4%. Population projections of NSO indicate a figure of 195,078 for 2013; up to 306,000 in 2020: up to 405,000 in 2025; and more than 522,000 in

2030. Population density is calculated at 932 inhabitants per sq.km and varies for different parts of Mzuzu City. Population distribution reflects Historical and Socio-economic patterns of development.

Mzuzu City being a regional centre, experiences more immigrants from surrounding areas due to business attractions. The city has a high proportion of young people of school-going age (between age 5 and 24) comprising 49% of the total population (109,126 individuals out of a total population of 221,272); and a low proportion of elderly people (70+ years) comprising only 0.1% of the total population (2,252 individuals out of a total population of 221,272). It is anticipated that the youth will benefit from the MZUNI SAVE project. In addition, the proportions of males and females in the City is nearly balanced highlighting the possibility of achieving gender equity in the flow of benefits from the project. The household survey conducted showed a composition of 47% men and 53% women and 31% of youth between the ages of 15 to 29.

5.3.2. Ethnicity and Culture

Mzuzu City serves as the primary business hub and is home to a wide array of ethnic groups and languages. According to the household survey that was conducted, the dominant ethnic group in the city is Tumbuka, representing 55.07% of the households. Following behind are the Chewa group, accounting for 21.74% of households, and the Ngoni group with 8.70%. The remaining 14.49% of the population comprises various other languages (see Figure 3.5). The presence of various ethnicities will ensure the inclusion of various groups in the project.

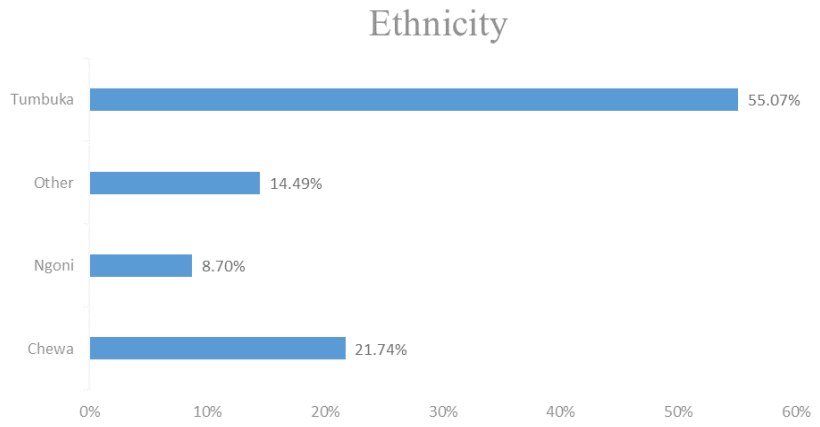


Figure 5.3a: Ethnicity of the Project area

Source: *MZUNI ESIA Household Survey, June 2023*

According to the household survey, Chitumbuka is the most spoken language in the area, followed by Chichewa and Chingoni. Figure 5.6 shows that Chitumbuka is spoken by 60.8% of the households, followed by Chichewa spoken by 24.64% of the households. Chingoni is spoken by 2.90% of the households, while the remaining languages collectively account for 11.59% (see Figure 5.6).

5.3.3. Religion

The most dominant religion is Christianity which is represented by 99% of the sampled population with Islamic religion as the remaining 1% as shown in figure 5.7. The main churches

in the area are the Church of Central Africa Presbyterian, Apostolic Faith, Jehovah's Witness, Anglican Church and Roman Catholic Church. In addition to the provision of religious services, Christian Churches also provide basic education and health services within the City of Mzuzu. The two important cultural resources within the Luwinga area are churches and graveyards. Churches are used for prayers and Sunday school services. Cemeteries are used for the burial of dead people. Cemeteries are organised per village or clan. There are however, no cultural resources within or near the plot for the proposed Entrepreneurs Training and Incubation Center (ETIC). The operation of the ETIC will therefore not directly affect religion.

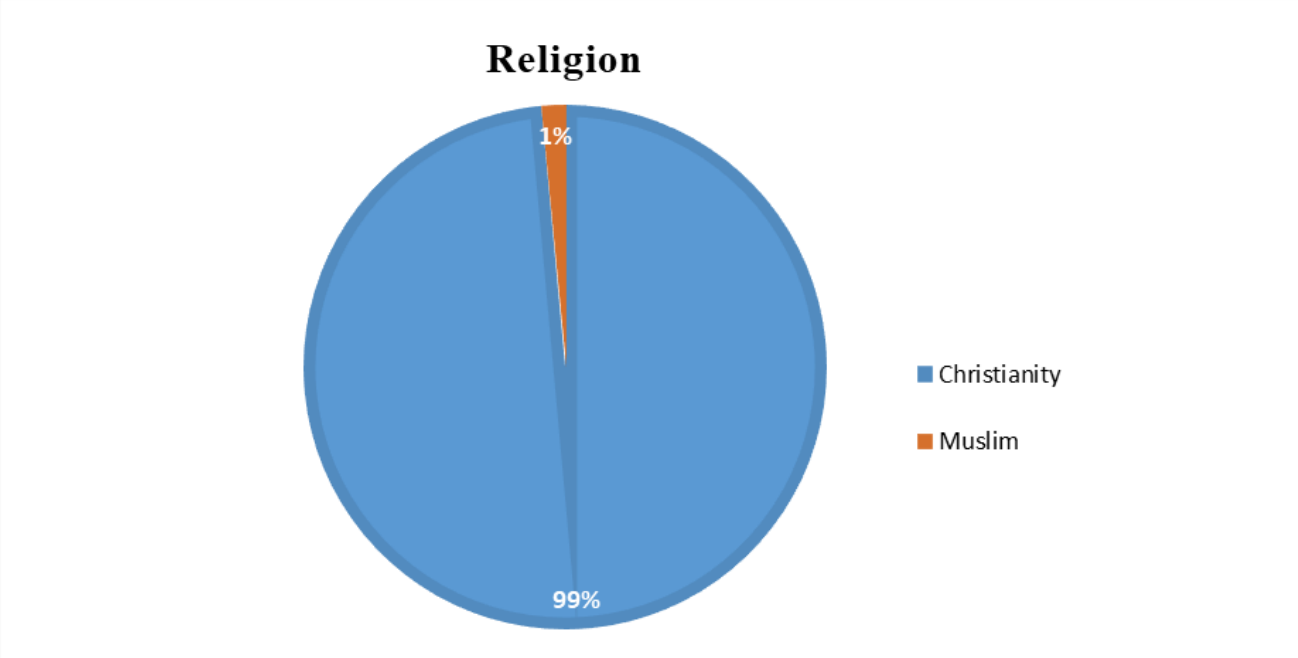


Figure 5.3b: Religion in the project area

Source: *MZUNI ESIA Household Survey, June 2023*

5.3.4. Livelihood and Income

The major sources of livelihood in the Project area are: agriculture, business, formal and informal employment (Mzuzu Urban Profile, 2013-2018). From the household survey conducted, formal employment and businesses (trading), are the major sources of income and livelihood support with 46.38% and 36.23% respectively. 11.59% of the population within the project areas rely on informal employment for income. Figure 3.8 graphically illustrates the income and livelihood support means in the project area. Small to medium-scale agriculture is also undertaken within the city.

According to the Mzuzu Urban Profile (2018), the most commonly produced crops in the Northern Region are maize, vegetables, fruits, groundnuts and sugar cane. Maize is mostly produced for consumption only while the rest of the crops are mostly utilised for commercial purposes. The household survey assessed agricultural challenges faced by community members in the project areas. Lack of agricultural inputs, insufficient rainfall (drought), pests and diseases and floods are the major agricultural challenges experienced.

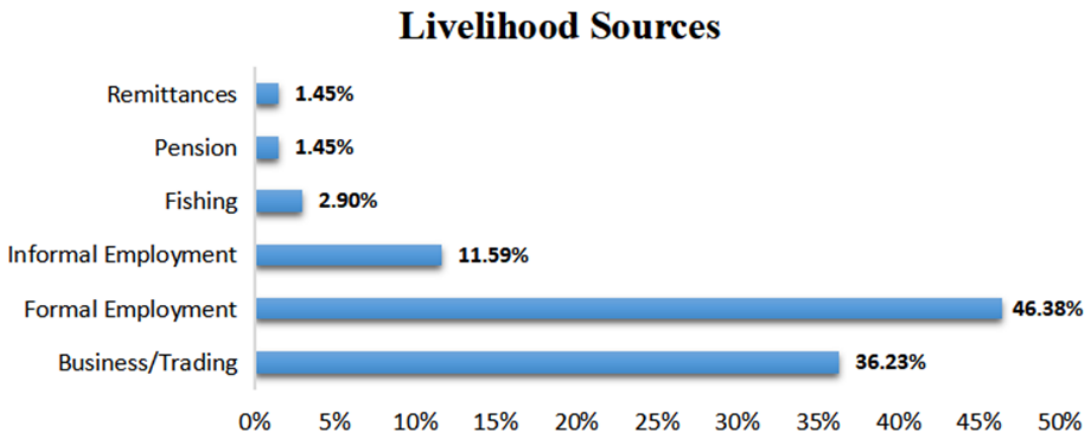


Figure 5.3c: Sources of livelihood in the project area

Source: *MZUNI ESIA Household Survey, June 2023*

5.3.5. Health

a) Health Facilities

The main government health facilities in Mzuzu City are Mzuzu Central Hospital, Mapale/ Mzuzu Health Centre, Moyale CAMP Hospital, Mzuzu Police Clinic and Mzuzu Central Prison Clinic. There are also several privately owned clinics and Christian Health Associations (CHAM) affiliated health centres spread across the city. CHAM-affiliated health centres are; Ekwendeni Mission Hospital, Nkholongo Health Centre, St Johns' Hospital, and Enukweni Mission Health Facility. Privately owned clinics include: Mumbwe Clinic, MASM Katoto Clinic, Kandindindi Clinic, Wezi Clinic, Chibavi Clinic, Mumbwe Medical Centre, Sun Rise Clinic and Care Medical Clinic; among others. Most of these privately owned health centres provide outpatient services and do not offer admissions to patients. In addition to these, Mzuzu City also has two notable NGO Clinics namely; Banja La Mtsogolo and MACRO Clinics.

Mzuzu University Clinic recorded a total of 1,174 cases from October to December 2022. The common cases recorded include Upper Respiratory Tract Infections, Diarrhoea, Musculoskeletal Pains, Conjunctivitis and Malaria.

According to the household survey conducted, people in the project area attain health services at Mzuzu Central Hospital as it is only about 2-3 km away and takes 16 to 30 minutes on foot. Other significant public health facilities where community members in the project area usually go to attain health services are Mapale Health Centre (about 7 km away) and Choma Heath Centre on the outskirts of Mzuzu (about 19 km).

b) Health Situation around the Project Area

According to the Mzuzu Urban Profile (2013 – 2018), the leading cause of illness in Mzuzu City is malaria. However, the household survey conducted revealed that the majority of household members suffer from acute respiratory infections such as colds and coughs, accounting for 39.4%. This was followed by diarrhoea at 11.8%, malaria/fever at 11%, high blood pressure at 9.4%, and eye infections at 9%. Other diseases were present in smaller percentages, as depicted in Figure 5.9. The Mzuzu Urban Profile (2018) also highlights HIV

and AIDS as a significant public health problem in Mzuzu. The prevalence rate in 2015 was 7%, slightly higher than the rate in Mzimba District, which stood at 6%. The most affected age group was individuals in the productive age range of 15 to 49 years. Mzuzu City has a range of public and private clinics that offer healthcare services across different areas. The Mzuzu City Council manages five Outreach Clinics located in five wards of the city.

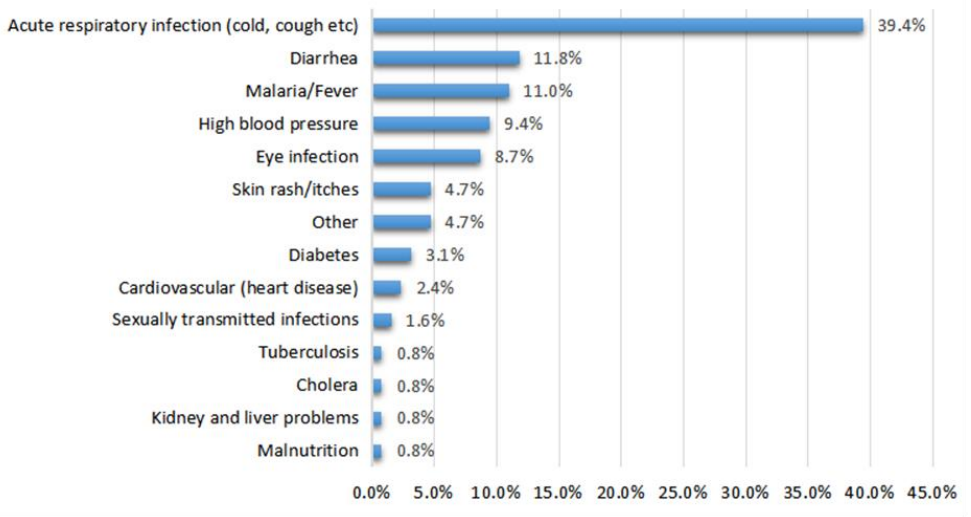


Figure 5.3d: Prevalence of diseases in Mzuzu City

Source: *MZUNI ESIA Household Survey, June 2023*

c) Health Situation at Mzuzu University

Mzuzu University has a clinic which offers the following six services;

i) Antiviral Treatment (ART),
ii) Outpatient Department (OPD),
iii) Family Planning,
iv) Sexual Transmitted Infection (STI) treatment,
v) HIV Testing and Counselling (HTS); and
vi) Short stay (bed rest) for students.

On average, the clinic services approximately 100 patients per day; nevertheless, the clinic used to service over 200 patients per day in 2020 and 2021 during the COVID-19 pandemic. Mzuzu University Clinic's staff consists of 1 Clinician, 5 Nurses, 1 Laboratory Technologist, 1 Laboratory Aid, 1 Clinic Attendant and 1 HIV Testing (HTS) Counsellor.

Common diseases handled at the clinic include; Upper Respiratory Tract Infections (URTI), Diarrhoea, Sexual Transmitted Infections, Soft Tissue Injuries, Hypoglycemia due to alcohol and General Body Pains. Malaria is not a common illness handled by the clinic. Table 5.3 shows the prevalence of sexually transmitted infections and Table 5.4 shows the prevalence of other diseases recorded by the Mzuzu University Clinic.

Table 5.3a: Prevalence of Sexually Transmitted Infections

Month	Number of Males Infected	Number of Females Infected	Total Number of Cases
July	18	16	34
August	22	22	44
September	5	5	10
October	23	34	57
November	28	40	68
December	30	29	59

Source: *Mzuzu University Clinic, June 2023*

Table 5.3b: Cases of other diseases at Mzuzu University Clinic from October to December 2022

Month	Disease	Number of Cases
October	Upper Respiratory Tract Infections	138
	Diarrhoea	52
	Musculoskeletal Pains	90
	Conjunctivitis	33
	Malaria	15
November	Upper Respiratory Tract Infections	255
	Diarrhoea	43
	Musculoskeletal Pains	129
	Conjunctivitis	33
	Malaria	5
December	Upper Respiratory Tract Infections	191
	Diarrhoea	34
	Musculoskeletal Pains	134
	Conjunctivitis	21
	Malaria	1

5.3.6. Education

There are both public and private schools in Mzuzu City. In total there are 47 primary schools in the city; out of which 40 are public primary schools and 7 are registered private primary schools. 44 secondary schools exist in the city; 27 are public secondary schools which include 3 conventional secondary schools and 7 community day secondary schools (CDSS), and 17 are registered private secondary schools. Higher education institutions in Mzuzu City include: Mzuzu University, Mzuzu Technical College, Lilongwe University of Agriculture and Natural Resources LUANAR (Mzuzu campus) and University of Livingstonia (Mzuzu Campus).

Children in the communities around Mzuzu University attain their primary education at Lupaso, St Augustine, Viyele, Mzuzu Demonstration and Habitat Primary schools. The secondary

schools in the area include: Lupaso CDSS and Luwinga Secondary School. Mzuzu Bible College is the only tertiary education institution closer to the project site.

Mzuzu City has education statistics that are higher than national averages. In fact, Mzuzu City has a literacy rate of 87.1%, which is higher than the average literacy rate of Malawi (64%). This literacy rate is also the highest among all the districts/ cities in Malawi (NSO, 2020). Figure 5.10 compares the literacy rate of Mzuzu City to the national literacy rates.

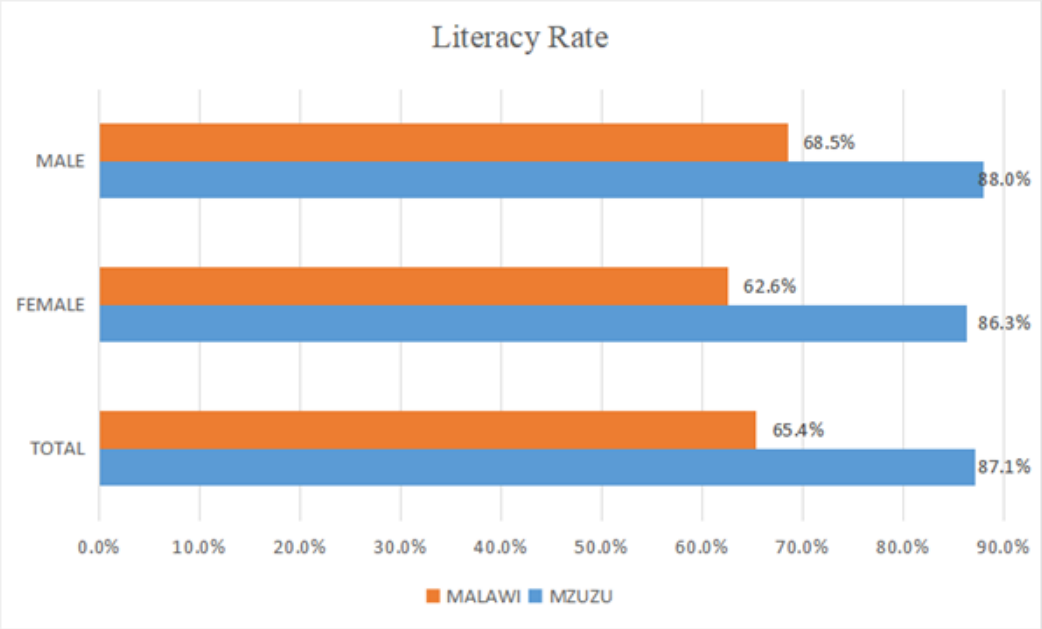


Figure 3.10: Literacy rate for Mzuzu City against Malawi

Source: *National Statistical Office, IHS5 2019-2020*

From the Household survey that was conducted it was found that only a few percent of youths around Luwinga attain higher education (20%). This can be attributed to economic restraints which force young men only to reach up to form 4 and to look for income-generating opportunities instead. The restraints also cause ladies to enter into marriages before attaining higher education. However, the survey found that up to around 45% of the people in the area reach up to secondary education. This corresponds to the Net Secondary School enrolment rate for Mzuzu City (44.8%).

5.4 Water Supply

In Mzuzu City, potable water is mainly supplied by the Northern Region Water Board (NRWB) which provides water through piped connections to approximately 82% of households in the city (Mzuzu Urban Profile, 2013-2018). A study of WASH status for the low-income areas of the city under the Peri-urban Hygiene and Sanitation project in 2014 revealed that 79% of homes in the high-density areas of the city are using piped water from NRWB with 14% of the homes in the high-density areas using NRWB water kiosks as their primary source of potable water. NRWB utilises Lunyangwa Dam as the main source of fresh raw water. The Dam is built on the Lunyangwa River around coordinate locations 36L 615990; 8735597 and 614708; 8734679.

The water supply at Mzuzu University campus is also through NRWB. Even though the water supply is sufficient, the university experiences water shortage in the dry season to the extent that the university may sometimes stay for 1 week without water. During a shortage of water supply, the university usually contacts the Northern Region Water Board who supply water to the campus using bowsers. On average, Mzuzu University has been spending around MWK20 Million on water bills each month for the past 12 months. It is thus anticipated that the Contractor will have his / her own account for water bills as is the case with the currently ongoing library construction at the university campus.

The University has six 10,000 cubic metre water tanks, which can only sustain the university for 2 days. The University applied for a licence to have boreholes in order to supplement water supply at the campus however, NRWB rejected the idea of having boreholes on campus (no boreholes in the City). It is evident that the project will add to the existing problem of insufficient potable water reserves. According to World Bank's Environmental, Health, and Safety Guidelines for Water and Sanitation (2007:15) The water distribution system is a critical component in delivery of safe potable water. Recommended measures to prevent or minimize potential community health risks associated with the water distribution system include: Construct, operate, and manage the water distribution system in accordance with applicable national requirements and internationally accepted standards.With this in mind, it is proposed that additional water tanks be provided specifically to service the ETIC building during periods of water scarcity.

The household survey revealed that there are various sources of water available in the region with Boreholes, water vendors, protected wells and piped water outside dwelling being the most prominent. The choice of the water sources depends on preference as well as challenges faced. Figure 5.14 shows the various sources of water as well as the percentage of households that utilise each water source.

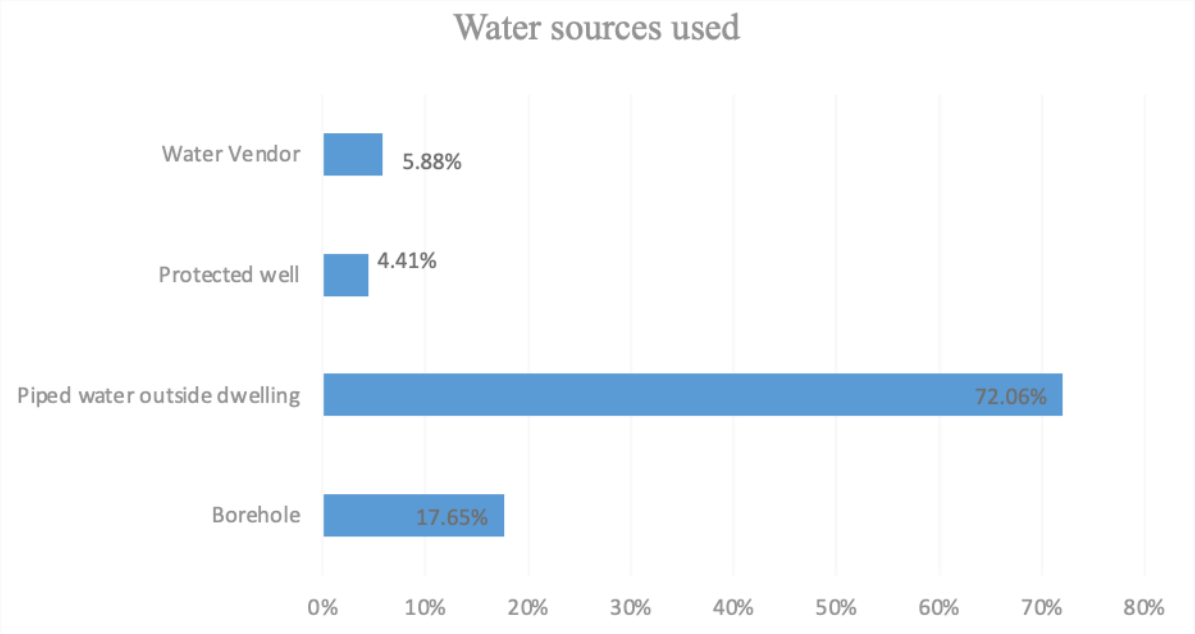


Figure 5.14: Water Sources used in the Project area

Source: MZUNI ESIA Household Survey, June 2023

Access to water is a challenge to some of the households present in the project area. Challenges such as distance, water quality, water shortages and expensive prices, among others, have led to insufficient water supply in the community to meet household's need for drinking and domestic uses such as bathing and cooking. According to the household survey, most people who are not connected to a piped water system are the main victims of such challenges. Households that utilise shallow wells and rivers/ streams as water sources sometimes face the challenge of poor water quality. Expensive water charges are the leading challenge with a percentage of 47.62%, followed by water quality (23.81%) distance (14.29%), water shortages (9.52%) the other sources represented by 4.76%.

5.5. Energy

Malawi's main electricity source is hydropower that is generated by Electricity Generation Company (Malawi) Limited (EGENCO) from Nkula 1 & 2, Tedzani 1 & 2, Kapichira 1 & 2 and Wovwe power stations; and supplied by Electricity Supply Corporation of Malawi (ESCOM). EGENCO has a total installed generation capacity of 441.95MW, with 390.55MW from hydropower plants and 51.4MW from standby diesel power plants.

The Third Integrated Household Survey (IHS3) found that 42% of households in the city had access to electricity with 88% of households accessing electricity within 100 metres of the dwelling.

The household survey revealed that common sources of energy for cooking for households around the project area are charcoal (53.52%), electricity (34.78%) and wood (11.59%). Figure 5.13 shows the percentage of people using various forms of energy for cooking.

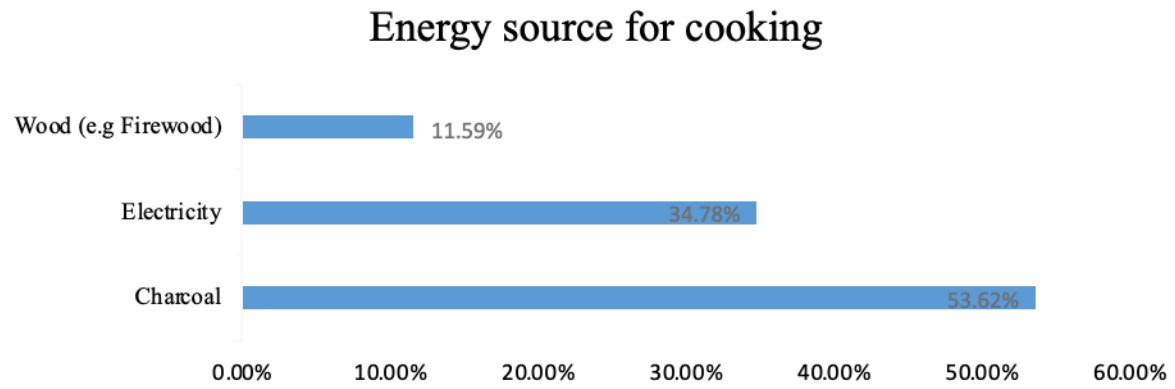


Figure 5.13: Fuel used for cooking around the Project area
Source: MZUNI ESIA Household Survey, June 2023

Main Power supply at Mzuzu University is through the Electricity Supply Corporation of Malawi (ESCOM) and the University also utilises Solar Energy**.** On average, the University has been spending around MWK18 Million on electricity bills each month for the past 12 months**.** The University has 2 Generators (300 KV and 250 KV) for backup power supply**.** It is

anticipated that the Entrepreneurs Training and Incubation Centre will also utilise the backup power supply available at the university. Detailed building designs indicate that roof-top solar panels will be installed to supplement ESCOM power supply.

5.6. Telecommunications

The area is within the coverage of Airtel, MTL and TNM networks hence people can easily communicate (make and receive calls, send and receive messages from friends and relatives using cell phones and landlines). There are also several service providers of the Internet including Skyband, Malawi Net, Globe Internet, MAREN, and Broadband Digital Solutions.

5.7. Solid Waste Management

According to the Mzuzu Urban Profile (2013-2018), the amount of solid waste generated in the city is estimated at about 171 kg per person per year. Services for solid waste collection and disposal in Mzuzu are provided by the Mzuzu City Council (MCC) and some private operators (who include Mr. Clean Malawi). The City Council has a skip carrier which is used for collection of solid waste. It also has only one waste compactor. The council mainly collects solid waste from commercial, health institutions, and some industrial areas. Residential areas (particularly homes in high density and traditional housing areas) in the city are mostly not covered by solid waste collection services.

Collected solid waste from the city is disposed of at the Msilo Waste Management Facility which is located in Mchengautuwa Township (approximately) 15 km northwest of the Mzuzu City Centre. The facility, which was commissioned in 2017, covers an area of 12 Ha and is designed to serve the city for about 50 years.

According to the survey, indiscriminate disposal and collection of waste by companies are used at a minimum and rubbish pits are the most common ways of solid waste disposal with a percentage of 86% as shown in Figure 5.15 below.

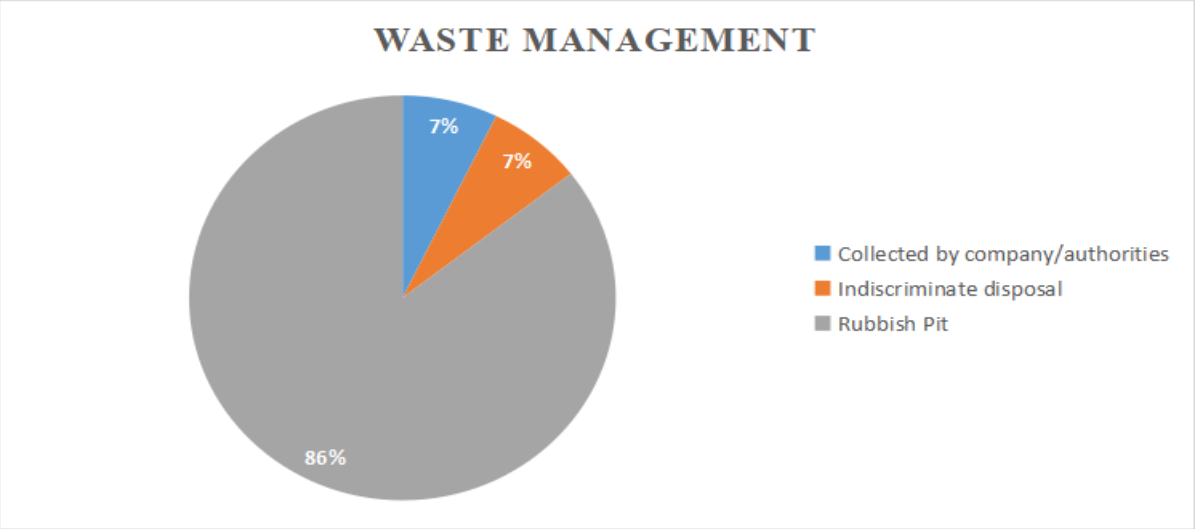


Figure 5.15: Waste Management in the Project Area
Source: MZUNI ESIA Household Survey, June 2023

Main solid wastes from Mzuzu University include waste arising from maintenance works, glassware and non-functional equipment from laboratories and waste paper. However, disposal of solid waste arising from maintenance works at the campus seems to be a challenge. There is a stockpile of solid waste (approximately 2 tonnes) from maintenance works near the Education Sector Support Program (ESSUP) buildings.

Non-functional and/or old equipment from laboratories is sometimes sold on auction by the university; thereby minimising the quantity of solid waste. Solid waste from laboratories is disposed of at designated sites in collaboration with Mzuzu City Council.

5.7.1 e-Waste Management

The kind of e-waste that is currently produced at the University is generally old computers and laptops; waste from networking equipment like cables switches; and old printers and photocopiers. The quantities are not recorded, however they are produced occasionally and in minimal quantities (less than 1000 kg per year).

The e-waste is collected and sorted according to the category and the degree of damage and then handled in the following stages:

1. Refurbishment and reuse after repair;
2. Recycled, where possible (though not to a greater extent);
3. Sold on auction by the procurement department;
4. Those that were donated by donors are collected and disposed of by the owners themselves following environmental health hazards guidelines; and
5. The rest are disposed of at designated sites in collaboration with Mzuzu City Council.

5.7.2 Sanitation and Hygiene

Improved sanitation (toilet) facility is defined as one that hygienically separates human excreta from human contact. They include flush or pour flush (to piped sewer system, septic tank, and pit latrine) ventilated improved pit (VIP) latrine, pit latrine with slab and compost toilet.

Overall, 35.2% of the households in Malawi have access to improved toilet facilities (NSO, 2020). The IHS5 found that 64.0% of households in Mzuzu City had access to improved sanitation with 18.6% having flush toilets, 1.4 having VIP latrines, 44.0% having pit latrines with slab; and 33.8% having pit latrines without slab. Figure 5.16 shows the common latrines found in the area of Group Village Head (GVH) Singini in Luwinga.

Figure 5.16: Common Latrines in GVH Singini, Luwinga
Source: MZUNI ESIA Household Survey, June 2023

Mzuzu University campus has a total of 599 toilets which are used by a population of about 5450 people (5,000 students and 450 members of staff). 39 of these are in the teaching area. It is anticipated that the Contractor will have his/ her own account for water bills as it is the case with the current infrastructure projects at the university. Maintenance of the toilets is done internally by the University's housekeeping staff.

Mzuzu City has no conventional municipal sewerage system. Some institutions like; Moyale Barracks, SOBO (Castel Malawi Ltd), Mzuzu Central Hospital and Mzuzu University have localised sewerage systems with oxidation ponds. Septic tanks as well as pit latrines in the city are emptied when full using sewage vacuum emptying trucks. Services for emptying of septic tanks and pit latrines are currently provided by Moyale Barracks and some private companies (Mr Clean Malawi being majorly the sole private service provider).

Liquid waste at the MZUNI (Luwinga) Campus is treated using a wastewater Stabilisation Pond that is about 100 metres from the southern part of MZUNI fence. The wastewater Stabilisation Ponds are divided into 3 sections with a combined total size of 100m by 50m. The first 2 sections have a depth of 1.5m and the third section has a depth of 1.2m. The estimated volume of the wastewater Stabilisation Pond is 5,000m^3 and supports a population of 5000 people. The ponds are managed by Mzuzu University's Department of Water and Sanitation, and Projects and Estates Department. Currently there are no major challenges associated with the pond except minor blockages that occur occasionally. Figure 5.17 following shows the 5000m^3 Waste Stabilisation Pond used by Mzuzu University.

Figure 5.17: Wastewater Stabilisation Pond at Mzuzu University
Source: MZUNI ESIA Household Survey, June 2023

There is, however, an overgrowing of weeds which are potential breeding grounds for mosquitoes and other parasites. In addition, there is a blanket covering of vegetation on the surface of the wastewater which will lead to poor aeration; causing incomplete treatment and odours.

It is also expected that the Entrepreneurs Training and Incubation Centre (ETIC) will utilise the wastewater Stabilisation Pond for liquid waste management. At the minimum, the operation of the ETIC building will bring at least 2000 additional students which will put pressure on the wastewater stabilisation pond, which was designed to accommodate 5000 people. In the long run, Mzuzu University will eventually need to expand the capacity of its wastewater stabilisation ponds or will require alternative wastewater treatment facilities.

5.7.3 Wastewater Management

A few houses in the city use septic tanks most of which are single-chambered with the potential of groundwater pollution and the majority of households use pit latrines. These take the forms of ventilated/improved pit latrines and traditional pit latrines. Traditional pit latrines are the major form of liquid waste disposal in the communities. However, there are some households without pit latrines and effort has been made to ensure that every household has sanitary facilities. The low access to improved sanitation facilities in Mzuzu City remains a major public health concern.

The Water Works Act (1995) designates Water Boards as the responsible institutions for managing both water supply and sewerage systems in Malawi. Northern Region Water Board is the sole supplier of domestic and industrial water in the City of Mzuzu and surrounding districts in the Northern Region. Mzuzu City has no sewage treatment plant at the moment and liquid waste management systems include oxidation ponds, septic tanks and pit latrines.

The University currently has a WSP, where wastewater is treated. However, because the ETIC will significantly increase student enrolment at the University's Luwinga campus, the existing WSP will not cope with this increase without undergoing substantial expansion. For this reason, it is proposed to install a septic tank and soak away system to the City Engineer's specification to treat wastewater to be generated by the ETIC.

5.8 Economy

5.8.1 Commercial and SMEs

Commercial activities in Mzuzu City are dominated by large-scale businesses, and small and medium enterprise (SMEs) sized businesses. The majority of these businesses have limited access to lending institutions. A good number of people around the university have invested in the construction of students' hostels and are benefiting due to the high demand for accommodation facilities by students in the city. Other economic activities include agriculture.

5.8.2 Industry and Commerce

The enterprise structure for Mzuzu City can be classified into three divisions namely: commerce, light manufacturing and services. The commerce sector is about trade and retail and it comprises markets, formal and informal trade, transport and telecommunications. The services sector consists of transport, utilities, hotel and tourism, financial and professional services and business support while the industry sector is mainly about light manufacturing in agro-processing, forestry products, fisheries, and small-scale mining and quarrying.

5.8.3 Gender Analysis and Mainstreaming

Sections 20 and 41 of the Constitution of Malawi uphold the principle of equal rights for men and women and prohibit any discrimination based on gender or marital status. The Republic of Malawi ratified the Convention on *'The Elimination of All Forms of Discrimination against Women'* in 1987. Malawi signed the Optional Protocol in 2000, but has yet to proceed with ratification. It ratified the Protocol to the African Charter on Human and Peoples' Rights on the Rights of Women in Africa in 2005. Malawi has achieved gender parity with respect to primary school enrolments, which indicates an improvement in attitudes towards girls' education.

The University's Gender Policy advocates for gender responsiveness to ensure equal opportunity and participation of women and men in programmes, governance and other spheres. The Contractor will, therefore, be expected to ensure that wherever there are any employment opportunities, women will be given equal chances as men for employment. Deliberate effort will be made to ensure that among the employees, 40 % should be women.

The Project shall support interventions aimed at expanding educational opportunities, especially for the poor and disadvantaged students in line with the Government and the

University's strategy of increasing access to and equity of tertiary education. The Project will ensure that vulnerable groups are also considered in the Project by providing bursaries to vulnerable students.

5.8.4 Transport and Communication

Minibuses, vehicles, motorbike and bicycle taxis are the common modes of transport in the City of Mzuzu. Motorbike and bicycle taxis are also increasing in popularity in the peri-urban and low-income areas. However, the current road infrastructure is inadequate to support the growing number of vehicles leading to increased traffic congestion and a lot of time wasted in traffic jams.

Many people however, still walk to their various places of work resulting in a high number of pedestrians. However, the absence of footpaths creates conflict between motorists and pedestrians and has resulted in a high increase in road accidents. The local authorities need to provide adequate transport infrastructure such as footpaths, bicycle paths, safe pedestrian crossings and flyovers, and well-protected bus lay-bys. The Road Traffic Directorate in the Ministry of Transport and Public Works provides the legal framework for the transport industry. It administers regulatory provisions governing motor vehicle administration, driver licensing, operator authorization, permit control and other related traffic management controls. The road network in the City comprises main, secondary and minor roads.

5.8.5 Security

In an attempt to promote safety and security in the Project area, the University has engaged traditional leaders and community members around Luwinga and the surrounding areas with the assistance of the Mzuzu Police Station to put in place community policing service. Besides, the University has outsourced the services of a private security company to provide security services at the campus. The University has also enhanced its communication and working relationship with Mzuzu police station who conduct patrols within and around the campus in addition to responding to active elements of criminal acts.

CHAPTER 6: IMPACT IDENTIFICATION AND ANALYSIS

6.1 Impact Identification and Their Measures

Construction and operation of the proposed infrastructure for the undergraduate facility at the University will generate different impacts in the project area and beyond. Some of the impacts will be positive while others will be negative. The negative impacts will mainly be on the biophysical environment of the project area with a few affecting the socio-economic environment of the project area. The majority of the positive impacts will be on the social economic environment of the project area. The purpose of this chapter is to identify potential environmental and social impacts that will be generated by the project and to propose mitigation and enhancement measures to manage the impacts. Specifically, the chapter is aimed at the following:

a) Predicting the potential environmental and social impacts arising from the implementation of the proposed project;

b) Assessing the possible extent /severity of the predicted impacts (both positive and negative);

c) Assessing the significance of the predicted impacts; and

d) Recommending hierarchical measures for mitigating the impacts.

6.1.1 Impact Identification

Impact prediction considered the different environmental and social impacts that the project will generate at various phases. A step-by-step approach was taken to identify the potential impacts as follows:

a) Assessment of Baseline Conditions

The purpose of assessing baseline conditions was to understand the existing situation as this is the basis for determining changes that may occur as a result of the proposed project.

b) Assessment of Project Inputs Associated with the Proposed Project

Project inputs were examined to determine the potential changes and impacts that would be created through the application of project inputs.

c) Assessment of Project Activities that will be undertaken

Project activities were examined to identify the impacts that the activities would bring on the environment.

d) Assessment of Project Outputs Associated with the Proposed Project

Project outputs were examined to determine the potential changes and impacts that would happen as a result of the outputs.

e) Determination of Environmental and Social impacts

Based on the above steps, the environmental and social impacts of the project were identified. A Leopold matrix was used to identify the different environmental and social impacts that the project will generate. Table 6.1 outlines the identified impacts.

Table 6. 1 Impacts Identified

Phase	Impact/ Component	Environmental Impact	Source of Impact
Planning phase	**Social positive impacts**		
		Creation of employment opportunities	Pre-feasibility assessment, topographic surveys, preliminary designs, detailed designs, environmental and social assessments, economic analysis and cost estimates
		Source of Government revenue	Pre-feasibility assessment, topographic surveys, preliminary designs, detailed designs, environmental and social assessments, economic analysis and cost estimates
	Social negative impacts		
		Anxiety about the disruption of teaching and learning activities	News about the planned project at the University will cause anxiety among lecturers and students about disruption of teaching and learning activities at the university
	Social positive impacts		
		Creation of employment opportunities	Construction of different project infrastructure and support facilities
		Increased economic activities in the project area	Increased numbers of people in the project area which will stimulate small-scale businesses

Construction phase		Increased skills transfer to local communities	Construction of different project infrastructure and support facilities
		Creation of a market for local construction materials in the area	Construction of different project infrastructures and support facilities will stimulate demand for different construction materials
	Negative Environmental impacts		
		Increased generation of solid waste	Construction and domestic activities
		Loss of vegetation	Land clearing to pave the way for the construction of different project infrastructures
		Increased noise and dust pollution due to construction works	Operation of different machinery, land clearing, excavation works and movement of construction vehicles and heavy trucks carrying construction materials
		Increased soil erosion resulting in loss of topsoil	Site preparation, vegetation clearance and excavations using heavy construction equipment
		Increased soil and water pollution due to Spillage of hazardous materials	Use of all sorts of motorised equipment, from generators to trucks, requiring fuel, lubrication and maintenance
		Increased demand for extra toilet facilities	Substantial increase in number of vendors, job seekers, people at the construction site
		Increased incidents of vector borne diseases, risk of traffic and drowning accidents.	Exposed borrow pits
	Negative Social impacts		

		Increased labour Impacts	Increased number of people at the construction site
		Increased risk of illicit behaviour and crime	Increased number of people at the construction site
		Anxiety about the safety of staff and students at the university from road accidents	Operation of different machinery, land clearing, excavation works and movement of construction vehicles and heavy trucks carrying construction materials
		Increased disruption of teaching and learning activities at the university	Noise and vibration from heavy machinery and moving trucks especially during excavation of soils delivering construction materials and from workers.
		Increased construction works induced traffic – traffic congestion	Movement of construction vehicles and heavy trucks carrying construction materials
		Increased risk of Gender Based Violence (GBV)	Increased number of women seeking employment, increased number of people with increased disposable income and increased number of people seeking employment
		Increased risk of sexual harassment	Increased number of women seeking employment, increased number of people with increased disposable income and increased number of people seeking employment
		Increased risk of Sexual Exploitation Abuse (SEA)	Increased number of women seeking employment, increased number of people with increased disposable income and increased number of people seeking employment
		Increased risk of domestic violence and marriage breakdown	Increased number of women seeking employment, increased number of people with increased disposable income and increased number of people seeking employment

		Increased risk of Defilement	Increased dominance of the construction workers by men, high level of poverty, lack of awareness of women's rights, drug abuse and lawlessness
		Early marriages	
		Increased risk of Child and forced labour	Some community members in pursuit of benefits sometimes allow sub-contractors to recruit children
		Increased cases of HIV and AIDS and other STIs	Increased number of people at the construction site and increased income capacities due to wages during the construction phase
		Increased susceptibility to pandemic diseases (Cholera and COVID-19) Increased risk of cholera infections	Increased number of students and workers at the university campus
		Increased risk of conflicts between migrant workers and the local community members	Increased number of people in the project area in search of employment
		Increased occupational health risks of workers and community members to accidents and exposure to hazardous materials	Exposure of construction workers to different hazardous materials and moving construction and heavy trucks carrying construction materials
Demobilisation phase	**Positive Social Impact**		

		Reduced noise levels	Completion of construction activities
		Reduced dust emissions	Completion of construction activities
	Positive Environmental impact		
		Increased generation of Various construction activities and demolished solid waste structures at the construction site	
	Negative Environmental impact		
		Increased generation of construction waste	Demolition of some temporary structures
	Negative Social impacts		
		Loss of employment	Completion of construction activities
		Loss of small-scale businesses	Completion of construction activities
Operational and maintenance phase	**Positive Social impacts**		

	Increased students' intake at the University	Availability of additional undergraduate facilities at the university	Completion of construction activities
	Creation of employment opportunities	Availability of additional undergraduate facilities at the university	
	Improved teaching and learning at the university due to the availability of quality and adequate teaching and learning facilities	Availability of additional undergraduate facilities at the university	
	Negative Environmental impacts		
	Increased generation of solid waste at the university	Increased number of students and staff at the university	
	Increased generation of liquid waste at the university	Increased number of students and staff at the university	
	Increased pressure on potable water reserves at the school	Increased number of students and staff at the University.	
	Increased stormwater runoff	Construction activities	
	Negative Social impacts		
	Increased pressure on the use of other infrastructure such as roads etc	Increased number of students, workers and the general public going to and from the university	

	Increased traffic flow – Increased accidents	Increased number of students, workers and the general public going to and from the university	
	Increased cases of HIV and AIDS and other STIs	Increased number of students and workers at the university campus	
	Increased vandalism and theft of the newly constructed facilities and materials	Installation of modern facilities at the newly constructed undergraduate facility	

Methodology for Impact Evaluation

Project impacts are assessed using a simple matrix to determine their overall significance and to decide whether they are acceptable, require mitigation measures, or whether they are completely unacceptable. The significance of the impact is determined by a joint consideration of the impact characteristics and the importance or value attached to it. This is done against the framework criteria specifically set for this purpose. In the case of this project, professional understanding and judgement, environmental and social standards and environmental-specific laws were used to carefully evaluate and interpret each impact.

When evaluating each environmental and social impact, the following factors are considered:

- **Magnitude/extent:** the measure in general degree, extensiveness, or scale of each impact.
- **Significance:** a measure of the importance of a particular action on the environmental and social factor in the specific instance under consideration.
- **Probability of occurrence:** the likelihood of an impact occurring before mitigation measures are applied.
- **Duration:** the period of time over which an impact may occur and remain on site, from once-off to total life.

Each of the four factors considered under the above-stated criteria is graduated into 4 stage scales and assigned a value ranging from the smallest to the highest impact, that is 1 to 3 (Table 6.2). Then each impact is assigned one of the values under the four factors under consideration. The values can be positive or negative depending on whether they are beneficial or detrimental to the biophysical and socio-economic environment. For example, a score of -3 means a negative impact of the highest degree of adversity while a score of +3 means a positive impact with the highest degree of potential benefit. If the impact is believed to be negligible or has no effect at all on a biological and social environment, it was then assigned a value of "0".

Table 6.2: ***Scoring Matrix Used for Evaluating Potential Impacts***

Extent or Magnitude of the impact		**Score**
Site	Impact confined to a small area within the project area	1
Local	Impact is limited within the radius of 3-5 km of the project area	2
Regional	Impact extends beyond the borders of the project area to influence other areas as a whole	3
Significance of the impact		
Low	Where the impact has a relatively small effect on the biophysical and socio-economic environment and is very difficult to detect it	1
Moderate	Where the impact is or can be measured but does not alter biophysical and socio-economic environmental processes	2
High	The impact is very likely to alter biophysical and socio-economic processes and hence needs mitigation to minimise or reduce its impact	3

Probability of occurrence of the impact		
Possible	The impact may occur but is not possible	1
Probable	The impact is very likely to occur at a probability of between 35% and 65%	2
Definite	The impact will occur (unavoidable) at a probability of greater than 65%	3
Duration of impact		
Short	Impact lasts for a period of less than 5 years	1
Long	Impact continues at any point for a period between five to ten years	2
Permanent	Impact never lasts once it occurs	3

The values are then added to make a composite score (impact severity) for each impact using all four factors. The composite score is a proxy value that provides decision-makers and policy-makers a basis for comparing the severity of impacts across different biological and social environments. For this project, severity is defined as follows:

Table 6.3: ***Severity of the impacts***

Positive Impact		**Negative Impacts**	
Score	**Definition**	**Score**	**Definition**
+1 ≤ +4	Low	-1 ≤ -4	Low
+5 ≤ +8	Medium	-5 ≤ -8	Medium
+9 ≤ +12	High	-9 ≤ -12	High

Evaluation of the Anticipated Project Impacts

Table 6.4 presents the scoring of the anticipated impacts of the project on the biophysical and socio-economic environment. Overall, the negative impacts are medium while the positive impacts are medium to high.

Table 6.4: ***A Simple Scoring Matrix Used for Evaluating Potential Impacts***

ID	Assessment Potential impact	Magnitude	Significance	Probability	Duration	TOTAL SCORE	SEVERITY
1.	**EVALUATION OF POSITIVE IMPACTS**						
1.1	**Impacts in the Planning and Design Phase**						
1.1	Increased employment opportunities	+3	+1	+3	+1	+8	Medium
1.2	**Impacts in the Construction Phase**						
1.2	Increased employment opportunities	+3	+3	+3	+1	+10	High
1.2	Promotion of local skills in building	+3	+2	+3	+1	+9	High
1.2	Increased trade opportunities	+3	+3	+3	+1	+10	High
1.2	Generation of revenue for the government from taxes and levies	+3	+3	+3	+1	+10	High
1.3	**Impacts in the Demobilisation Phase**						
1.3	Improved visual appearance	+1	+2	+3	+1	+7	Medium
1.4	**Impacts in the Operation and Maintenance Phase**						
1.4	Increased access to skills	+2	+3	+3	+3	+11	High

	development programmes						
1.4	Increased students' innovative potential	+2	+3	+2	+3	+10	High
1.4	Improved national education standards	+2	+2	+2	+3	+9	High
1.4	Improved innovations in sustainable and clean energy	+2	+2	+2	+3	+9	High
1.4	Security enhancement using ICT	+1	+2	+2	+2	+7	Medium
1.4	Increased employment opportunities	+3	+3	+2	+3	+11	High
1.4	Improved aesthetic beauty of the institution	+2	+3	+2	+2	+9	High
1.4	Enhanced skill Transfer	+3	+3	+3	+3	+12	High
1.4	Enhancement of youth and women empowerment efforts	+3	+3	+3	+3	+12	High
2.	**EVALUATION OF NEGATIVE IMPACTS**						
2.1	**Impacts in the Planning and Design Phase**						
2.1	Increased expectations, frustrations and anxiety	-1	-3	-1	-3	-8	Medium
2.2	**Impacts in the Construction Phase**						
2.2	Loss of trees and vegetation cover	-1	-1	-1	-1	-4	Low

2.2	Increased risk of soil erosion	-1	-1	-1	-1	-4	Low
2.2	Increased risk of land degradation	-1	-1	-1	-1	-4	Low
2.2	Soil contamination	-1	-1	-1	-1	-4	Low
2.2	Increased generation of dust and other particulate matter	-1	-2	-2	-1	-6	Medium
2.2	Increased noise pollution and vibration	-1	-2	-3	-1	-7	Medium
2.2	Increased generation of solid wastes	-1	-3	-3	-1	-8	Medium
2.2	Increased pressure on existing university sanitation facilities	-1	-1	-1	-1	-4	Low
2.2	Increased pressure on power and water resources	-1	-2	-1	-1	-5	Medium
2.2	Increased occupation safety and health risks	-1	-2	-2	-1	-6	Medium
2.2	Increased student and community safety and health risks	-1	-2	-2	-1	-6	Medium
2.2	Increased risk of spread of COVID-19 infections	-1	-2	-1	-1	-5	Medium

2.2	Increased risk of spread of cholera	-1	-2	-1	-1	-5	Medium
2.2	Increased risk of spread of HIV and AIDS and STIs	-2	-2	-2	-1	-7	Medium
2.2	Increased risk of sexual exploitation and abuse and gender-based violence	-1	-2	-2	-1	-6	Medium
2.2	Increased risk of child labour and trafficking in persons	-1	-2	-2	-1	-6	Medium
2.2	Increased risk of theft at MZUNI and surrounding communities	-1	-2	-2	-1	-6	Medium
2.2	Blockage of right of way	-1	-2	-1	-1	-5	Medium
2.2	Disruption of the flow of traffic and public mobility	-1	-2	-1	-1	-5	Medium
2.3	**Impacts in the Demobilisation Phase**						
2.3	Increased dust generation	-1	-1	-2	-1	-5	Medium
2.3	Loss of jobs and businesses	-2	-2	-3	-1	-8	Medium
2.3	Increased risk of abandonment of excavated areas for raw materials	-2	-2	-2	-1	-7	Medium
2.4	**Impacts in the Operation and Maintenance Phase**						
2.4	Increased generation of	-1	-2	-1	-2	-6	Medium

	general solid waste						
2.4	Increased generation of e-waste and hazardous waste	-1	-2	-2	-2	-7	Medium
2.4	Increased energy and water use	-1	-2	-2	-2	-7	Medium
2.4	Increased risk of theft and vandalism of the constructed facility	-2	-2	-1	-2	-7	Medium
2.4	Preferential treatment, harassment and marginalisation of new staff	-1	-2	-2	-1	-6	Medium
2.4	Increased risk of sexual exploitation, abuse and harassment	-1	-1	-1	-2	-5	Medium
2.4	Climate change and natural disaster-related impacts	-1	-1	-1	-2	-5	Medium

CHAPTER 7: ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN

An Environmental and Social Management and Monitoring Plan (ESMMP) is a plan of action that states how a project's environmental and social impacts are going to be managed mainly to minimise, avoid or eliminate adverse impacts while enhancing the positive impacts. The Environmental and Social Management and Monitoring Plan is also an environmental and social management and monitoring tool that is used to monitor the implementation of different environmental and social management measures. It outlines environmental and social impacts that the proposed project will generate, recommended enhancement measures for the positive impacts and mitigation measures for the negative impacts, performance indicators, targets, means of verification, responsibility, time-frame, implementation costs (MWK) for the enhancement measures for the positive impacts and mitigation measures for the negative impacts and monitoring costs (MWK) for implementation of the enhancement measures for the positive impacts and implementation of the mitigation measures for the negative impacts.

The ESMMP will, therefore, be approved and included in the bidding and contract documents before any construction begins for these works. Most of the environmental and social-related work and physical activity for this project will be executed by the contractor. Therefore, the contractor will be required to prepare his own site-specific Construction ESMP (CESMP) and Health and Safety Plan based on this ESMMP before commencing any civil works. The contractor will be obligated to take all reasonable steps to protect the environment (both on and off the site of works) and to limit damage and nuisance to people and property resulting from pollution, noise and other results of his/their project-related activities. Further, the contractor/s is/are obligated to ensure that emissions, surface discharges and effluent from its/their project activities shall not exceed the values stated in the Specification or prescribed by applicable Laws or standards (including Malawi laws or World Bank ESSs and World Bank EHS or other agreed standards). Finally, the contractor will be required to have an Environment and Social Management Expert to implement the CESMP and Health and Safety Plan.

Monitoring activities will consist of visual observation during the site inspection and will be carried out by Mzuzu University. Site inspections will take place with emphasis on early identification of any environmental and social risks and the initiation of suitable remedial action. Where remedial actions have been required on the part of the Contractor, further checks will be made to ensure that these are actually being implemented to the agreed schedule and in the required form. The site where construction will be taking place will be formally inspected from an environmental and social viewpoint on a daily basis. However, in addition to visual observation, there shall be the informal engagement of members of the local communities and their leaders who live near the project site since they may be aware of matters, which are unsatisfactory but may not be readily apparent or recognised during normal site inspection visits.

The monitoring activities will also be integrated with other construction supervision activities to be carried out by the University. The Project Implementation Unit has an Environmental and Social Safeguard specialist and a Project Engineer who are already working with the University to address construction environmental and social safeguards. Additionally, the University has an Environmental and Social Safeguards Focal person who is working closely with the Project Implementation Team.

Table 7.1 presents the Environmental and Social Management and Monitoring plan for the project.

Table 7. 1: Proposed Environmental and Social Management and Monitoring Plan for the Construction of ETIC Building

						Responsibility		Time Frame	Implementation Cost	Monitoring Cost
Item	**Potential Impact**	**Recommended Enhancement/Mitigation Measure**	**Performance Indicator**	**Target**	**Means of Verification**	**Enhancement/Mitigation**	**Monitoring**	**Time frame**	**Implementation Cost (MWK)**	**Monitoring Cost (MWK)**
Impacts from the Planning and Design Phase										
Positive Impact										
Positive Social Impact										
1	Creation of employment opportunities	• Adverts should include statements encouraging women and youth to apply • Adhere to the labour laws for Malawi throughout recruitment.	Number of local consultants employed.	4 contracts given to local Consultants.	Records	Mzuzu University and Consultant	District Labour Office	During all project phases	**300,000**	
Negative Impacts										
Negative Social Impact										
1	Disruption of teaching and learning activities	Sensitise staff and students about the project and assure the concerned parties that the construction site will be screened to avoid disturbing teaching and learning activities through meetings and electronic communications.	Number of complaints recorded	0 number of grievances received	Grievance log book.	Grievance Redress Committee and Project Monitoring Team.	Grievance Redress Committee and Project Monitoring Team	Throughout the project phases		

Impacts During Construction Phase										
Positive Impacts										
Positive Social Impacts										
1	Creation of employment opportunities	• Adverts should include statements encouraging women and youth to apply; adherence to the labour laws for Malawi throughout recruitment.	• % of unskilled labourers from project area; and • % of women employed • % of youth employed	90 % of unskilled labourers from project area; 40% of the labourer force is women At least 50% of the labourers should be youth	Site employment records	Contractor and PMT	Mzuzu Labour Office and PMT	Throughout the construction phase		
2	Skills Transfer to Local community	• Employ more people from the project area; and • Adhere to National requirement of contracting 20% of works to local contractors where the contract is awarded to an international contractor.	• Number of the skilled labour force from the project area; and • % of local subcontractors engaged.	• At least 50% of employed personnel to be from the local community; and • 20% of subcontractors to be locals where the contractor is international.	• Site Employment records; and • Subcontracting records	Contractor and Consultant.	Mzuzu Labour Office, PMT and NCIC	Throughout the construction phase		
3	Business opportunities for construction materials	Give preference to local communities in the project area for procurement of construction materials.	% of construction materials bought from the local communities	60 % of local materials are from the project area.	Purchase Records. of	Contractor	Contractor and PMT	Throughout construction phase		

						Responsibility		Time Frame	Implementation Cost (MWK)	Monitoring Cost (MWK)
Item	**Potential impact**	**Recommended Enhancement/Mitigation Measure**	**Performance Indicator**	**Target**	**Means of Verification**	**Enhancement/ Mitigation**	**Monitoring**	**Time frame**	**Implementation Cost (MWK)**	**Monitoring Cost (MWK)**
Negative Impacts During Construction Phase										
1	Increased soil erosion resulting in loss of topsoil	• Monitor areas of exposed soil during periods of heavy rainfall throughout the construction phase of the project to ensure that any incidents of erosion are quickly controlled; • Level the project site to reduce run-off velocity and increase infiltration of stormwater into the soil; • Build physical barriers to prevent mass movement of soil where necessary; • Properly control and manage stockpiling construction materials. Fine-grained materials (sand,	Limited loss of soil cover.	Absence of loose soils piled on drains and around the site	Record of excavated areas and areas prone to erosion.	Contractor	MZUNI	Throughout the construction stage.	420,000	630,000

		marl, etc.) should be stockpiled away from any surface drainage channels and features; • Secure edges of sand piles with stakes/weights/temporary windbreaks to prevent the sand from blowing away; • Use tarpaulin to cover open piles of fine-grained materials (sand, marl, etc.) to prevent them from being washed away when it rains heavily; • Identify safe storage areas; and • Deliver materials In proximity to time of need • Use excavated topsoil to rehabilitate borrow pits and landscaping.								
2	Increased soil pollution due to	• Not refuel and maintain large vehicles at the	Number of incidents of hazardous	Zero incidents of hazardous material spillage	Incident reports; and spill response records	Contractor	District Environmental Office PMT	Throughout construction period	300,000.	300,000

	Spillage of hazardous materials	construction site; • Store and place all hazardous materials inappropriately bounded containers and on • concrete floor. Maintain spill response kits at the site office; • Prepare and display on-site spill response procedures; and • Train workers on spill response and management	material spillage				Supervising Consultants			
3	Increased water pollution due to spillage of hazardous materials	• Not refuel and maintain large vehicles at the construction site; • Store and place all hazardous materials inappropriately bounded containers and on a concrete floor; and • Train workers on spill response and management.	Number of incidents of hazardous material spillage	Zero spillages into the catchment	Incident reports; and spill response records	Contractor PMT	District Environmental Office PMT	Throughout construction period	Cost covered in 4	Cost covered in 4
4	Construction	• Provide adequate water storage reservoirs at the	% of Construction water to be	100 % of construction water is to be collected from	Records on other sources of water (there will be no	Contractor	District Water Office /PMT	Throughout construction period	600,000	400,000

	works water demand – Increased pressure on existing supply	construction site to meet Project needs during periods of high demand externally and refill the tanks during periods of low demand (e.g., late at night); • Use for construction activities water from the surrounding rivers, Lunyangwa River; • Engage water supply tankers in case of total supply failure; and • Implement appropriate water conservation measures.	collected from rivers	Lunyangwa River	abstraction of groundwater).					
5	Increased generation of solid waste	• Provide waste disposal bins; • Collect and dispose of waste in places designated by the Mzuzu city councils; • Reuse removed rubble for other tasks such as paving and backfilling;	• Number of bins provided; • Volume of waste disposed in approved places; • Volume of removed rubble reused;	100% solid waste managed and collected for disposal	Records of solid waste management collected for disposal	Contractor/PMT	Environmental District Office/ Mzuzu City Council/PMT	Throughout construction period	650,000	500,000

		• Develop a coherent waste management plan; • Sensitize workers in the management of wastes	• Presence of waste management; • Number of sensitisations							
Negative Social Impacts During Construction Phase										
1.	Increase in occupational health and safety accidents	• Engage only those workers who are trained to operate specific machines and equipment; • Install proper signage on site to warn workers of safety requirements as regards machines with moving parts and other equipment at site; • Provide a fire-fighting mechanism at the site. Display emergency call numbers that can be used in case of a site fire; • Provide safe scaffoldings and	Number of accidents and incidents	Zero accidents and incidents	Accident records and incident reports	Contractor	District Labour Office / PIU	Throughout construction phase	0(absorbed in the contract)	

		railings at heights; • Provide washing (enclosed bathroom) and toilet facilities at the site with both drinking and washing water. The number of workers engaged determines the number of toilets and bathrooms provided; • Provide safety helmets, safety masks (welders), safety shoes (loaders), uniforms and hand gloves to the workers; • Develop an emergency response plan and have schedule trainings and refresher courses; • Adhere to OHS guidelines; • Secure/Cordon off the site; and • Using well-maintained								

		equipment by qualified personnel.								
2.	Increased risk of illicit behaviour and crime	• Employ most of the unskilled workforce from the local communities who already have homes within the project area and therefore live with their families; • Integrate migrant workers and local communities to ensure mutual and equal access to existing socio-economic opportunities; • Deploy social security staff and regular engagement of the police in the project areas to ameliorate occurrence of mischief; and • Sensitise the workers and the local community members on	Number of reported incidents of illicit behaviour and crime	Zero incidents of illicit behaviour and crime	Incident reports and feedback from GRC, local authorities and the police	Contractor	Mzuzu Police station, GRC	Throughout construction period	500,000	500,000

		security matters. • Development and operationalisation of an OHS plan.								
3.	Increased risk of HIV and AIDS	• Employ most of the unskilled workforce from the local communities who already have homes within the project area and, therefore, live with their families; • Sensitise all employees and the community at large on the prevention of HIV and AIDS and STI and their prevention measures such as abstinence; and • Ensure the availability of free condoms.	Number of HIV and AIDS cases reported	Zero new cases of HIV and AIDS	Monthly progress reports	Contractor / PMT	District Health Office	Throughout construction period		
4.	Anxiety about the safety of staff and students at the	• Keep staff and students and any unauthorised persons away from	Number of occupational safety and health cases reported	Zero cases of occupational safety and health incidents	Records of occupational safety and health incidents	Contractor	PMT GRC and PIU	Throughout the construction phase period	500,000	

	university during the construction phase	construction sites and dangerous zones; • Put warning signs (written in English and local languages) at strategic sites; • Train all workers on proper use and handling of equipment; and • Put signposts indicating "Danger equipment" • "Pedestrian walking", "No Parking", "Stop" etc. shall be placed in critical areas on the project site.								
5	Increased risk of (SEA)	• Orient workers on the Sexual Exploitation and Abuse issues; • Ensure that all workers sign the code of conduct developed by the project;	Incidences of SEA involving workers	Zero incidence of SEA involving workers	Reports of SEA	Contractor	Malawi Police (Victim Support Unit) and District Social Welfare office	Throughout construction period	500,000	

		• Coordinate with the District Office of Gender, Children, and Social Welfare and the Police Department to carry out sexual exploitation and abuse awareness campaigns around the project site; • Community awareness, especially women on the right to work and GRM; • Coordinate with the District Office of Gender, Children, and Social Welfare and the Police Department to carry out sexual harassment awareness campaigns around the project site.								
6	Increased risk of domestic violence	• Orient workers on the Domestic Violence and	Incidences of domestic violence and marriage breakdown	Zero incidence of domestic violence and marriage breakdown	Reports of domestic violence and	Contractor and Mzuzu University	Malawi Police (Victim Support Unit) and District	Throughout construction period	Covered in 5	

	and marriage breakdown	Marriage Breakdown Management issues; • Ensure that all workers sign the code of conduct developed by the project; and • Coordinate with the District Office of Gender, Children, and Social Welfare and the Police Department to carry out domestic violence and marriage breakdown awareness campaigns around the project site.	involving workers	involving workers	marriage breakdowns		Social Welfare office			
7	Increased risk of defilement and child marriage	• Coordinate with the Ministry of Gender, Children, and Social Welfare and the Police Department to carry out child marriage and early marriage awareness campaigns to	Incidences of defilement and child marriages	Zero incidence of defilement and child marriages	Reports on cases of defilement and early child marriages	Contractor and Consultant	Malawi Police and District Social Welfare office	Throughout construction period	Covered in 5	

		workers and communities around the project site; • Make certain the availability of an effective Grievance Redress Mechanism (GRM); and • Children under 18 years of age should not be allowed to work on-site and market								
8	Increased risk of child labour	• Raise awareness among workers and the communities around the project area on the dangers of child labour, the signs, risks and preventive measures of trafficking in persons • Develop a Child Protection Plan (see Appendix 5)	Number of child labour cases reported	Zero under-age workers employed at the construction site	Records of employees at the construction site	Contractor	District Labour Officer	Throughout construction period		
9	Increased incidents of vector-borne	• Adhere to OHS standards	Incidences of vector-borne diseases and OHS	Zero incidences of vector-borne diseases and	Records from the University	Mzuzu University, Contractor	District Health Office	Throughout the construction period.		

	diseases and traffic and drowning accidents.	• Cordon off construction site • Eliminate vector breeding areas such as long bushes and stagnant water	recorded.	OHS incidences	Clinic and site records.					
						Responsibility	**Time frame**			
Item	**Potential Impact**	**Recommended Enhancement/ Mitigation Measure**	**Performance Indicator**	**Target**	**Means of Verification**	**Enhancement/Mitigation**	**Monitoring**	**Time frame**	**Implementation Cost (MWK)**	**Monitoring Cost (MWK)**
Positive Social Impacts During Demobilisation and Operational Phases										
1	Increased staff recruitment at the University	Employ more academic and support members of staff.	Staff vs students ratio	Number of staff employed-20 new members of staff	Records in Human Resource Information Management system.	Mzuzu University	Mzuzu University and NCHE	Yearly during the operational phase	Embedded in MZUNI operational cost	
2	Increased student enrolment in ICT and Energy Programmes	Provide adequate learning space and staff.	% of increase in students enrolled	32% increase in student enrolment by the end of the project circle.	Records of student enrolment	Mzuzu University	Mzuzu University	Operational phase		
3	Reduced noise pollution	Monitoring noise levels. Ensuring set demobilisation work plan is followed.	Noise levels	Zero noise	Records of incidences of noise levels recorded	Contractor	Environmental District Office	Throughout Demobilization phase		
3	Enhanced aesthetic appeal	Monitoring landscaping plans and maintenance schedules.	Scenic surroundings	Pleasant surroundings	Physical inspections	Contractor & Mzuzu University	Mzuzu University	To be completed on infrastructure handover and to be carried over		

								operational phase		
4	Improved teaching and learning at the university	Monitor maintenance of constructed facilities.	% of new teaching and learning infrastructure and equipment in use.	Availability of new teaching and learning infrastructure and equipment in use. -100 % infrastructure and equipment usage	Records of new infrastructure and equipment.	Mzuzu University	Ministry of Education and NCHE	Throughout the operational and maintenance phase		
						Responsibility	**Time Frame**		**Implementation Cost (MWK)**	**Monitoring Cost (MWK)**
Item	**Potential Impact**	**Recommended Enhancement/ Mitigation Measure**	**Performance indicator**	**Target**	**Means of Verification**	**Enhancement/Mitigation**	**Monitoring**	**Time Frame**	**Implementation Cost (MWK)**	**Monitoring Cost (MWK)**
Negative Social and Environmental Impacts During Demobilisation Phase										
1	Loss of employment for construction workers	• Give workers adequate notice of termination of employment; • Provide appropriate terminal benefits to workers; • Pay workers all their dues to minimize wage disputes after termination of employment; and • Sensitize workers on	• Number of workers laid off; • Notice of termination of employment;and • Number of sensitization	Workers to get notice in good time about end of their contracts; At least one sensitisation meeting to be carried out about worker end of contracts	Record of sensitisation meetings and notices issued to end contracts	Contractor	District Labour Office	Throughout Demobilisation phase		

		prudent investment of their earnings whilst working.								
2	Loss of businesses opportunities	• Inform local traders of the project duration in time; and • Present business exit talk to traders at least 3 months before closure of project.	• Number of businesses lost; • Notice of closure of construction activities; and • Number sensitization of conducted	Business community to get the notice in good time about the end of construction activities; At least one sensitisation meeting to be carried out about end of construction activities	Record of sensitisation meetings and notices issued to end construction activities	Contractor	District Trade Office	Throughout Demobilisation phase		
3	Increased generation of solid waste	• Provide waste disposal bins; • Collect and dispose waste in places designated by the districts and city councils; • Reuse removed rubble for other tasks such as paving and backfilling; • Develop a coherent waste management plan; and • Sensitize workers in the	• Number of waste disposal bins; • Waste disposed in designated places; • Volume of waste disposed in approved places; • Volume of removed rubble reused;	100% solid waste managed and collected for disposal	Records of solid waste management and collected for disposal	Contractor	Environmental District Office	Throughout operational phase	500,000	250,000

		management of waste.	• Presence of a waste management system; and • Number of workers sensitised.							
Negative Social and Environmental Impacts During Operational Phase										
1	Increased generation of liquid waste	Adhere to liquid Waste management plan for the ETIC Building the University.	• Volume of Effluent spillages • Number of trainings conducted to handle the effluents.	Zero effluent spillages and two training sessions for waste handlers	Records of effluent spillages and trainings conducted.	Mzuzu University	Environmental District Office	Throughout operation phase	1,800,000	600,000
2	Increased generation of e-waste	Dispose of e-waste in Line with approved Policies and Procedures Store e-waste in secure containers until a disposal site is Identified.	• Policies, regulations and procedures adhered to; and • All e-waste stored in secure containers	All e-waste is properly managed and disposed of.	Periodic inspections	Mzuzu University	Mzuzu University / PMT	Throughout operation phase	Part of the project cost	Part of the project cost
3	Increased energy and water use	• Sensitization on efficient use of energy and water	Amount of energy and water consumption	Energy and water consumption	Periodic inspections	Mzuzu University	Mzuzu University	Throughout operation phase	Part of the project cost	Part of the project cost

		among students and staff on responsible utility usage; • Use smart energy and water systems such as automatic taps, urinals and lighting systems; and • Use renewable energy - solar-powered systems.								
4	Increased traffic flow disruptions Increased accidents	• Place at the vicinity of the entrance to the site appropriate traffic warning signs instructing occupants and visitors to reduce speed; • Instruct security guards to control traffic along the private road leading to the university and assist vehicles as they enter and exit the university; • Develop an emergency	Number of grievances related to road accidents and traffic disruptions	Zero incidents/accidents and minimal traffic disruptions	Incidents/accident reports and complaints against traffic disruptions	Mzuzu University	Traffic Police	Throughout the operation and maintenance phase	500,000	700,000

		response procedure and develop and display at the entrance to the campus; and • Display contacts of emergency service providers including, breakdown vehicles and traffic police at the main entrance to the university.								
5	Increased exposure to Cholera	• Enforce washing hands with soap at all times and no handshaking on the workers and the community members; • Provide clean and safe water; • Practice good hygiene; • Provide enough toilets at the campus for use for both students, staff and construction workers;	Incidences of Cholera cases recorded	Zero incidences of cholera cases	Records from the University clinic	Mzuzu University	District Health Office	Throughout the operation and maintenance phase		

		• Sensitize workers, students and community members on the dangers of cholera; • Train workers, students, staff and community members on preventive measures of cholera; and • Send workers, students and staff who show signs of cholera into isolation until they are confirmed to be negative.								
Total										**8,400,000**

CHAPTER 8 CONCLUSION AND RECOMMENDATIONS

8.1 Conclusion

The ETIC Project will offer youth, vulnerable groups and female students a platform for the development and implementation of innovations, business strategies by providing mentoring, entrepreneurial training and basic support. The project will also provide a suitable learning environment for innovators as well as support Mzuzu University's vision and mission. The Project thus aligns with the Government's long-term development agenda under Malawi 2063.

The ESMP has identified environmental and social impacts associated with the construction and operation and maintenance phases of the ETIC building at Mzuzu University. The Project is beneficial as it will help address the challenge in higher education by constructing an innovation and training centre targeting ICT and Energy programmes at the University, which will assist in strengthening systems and institutional capacity for skills development.

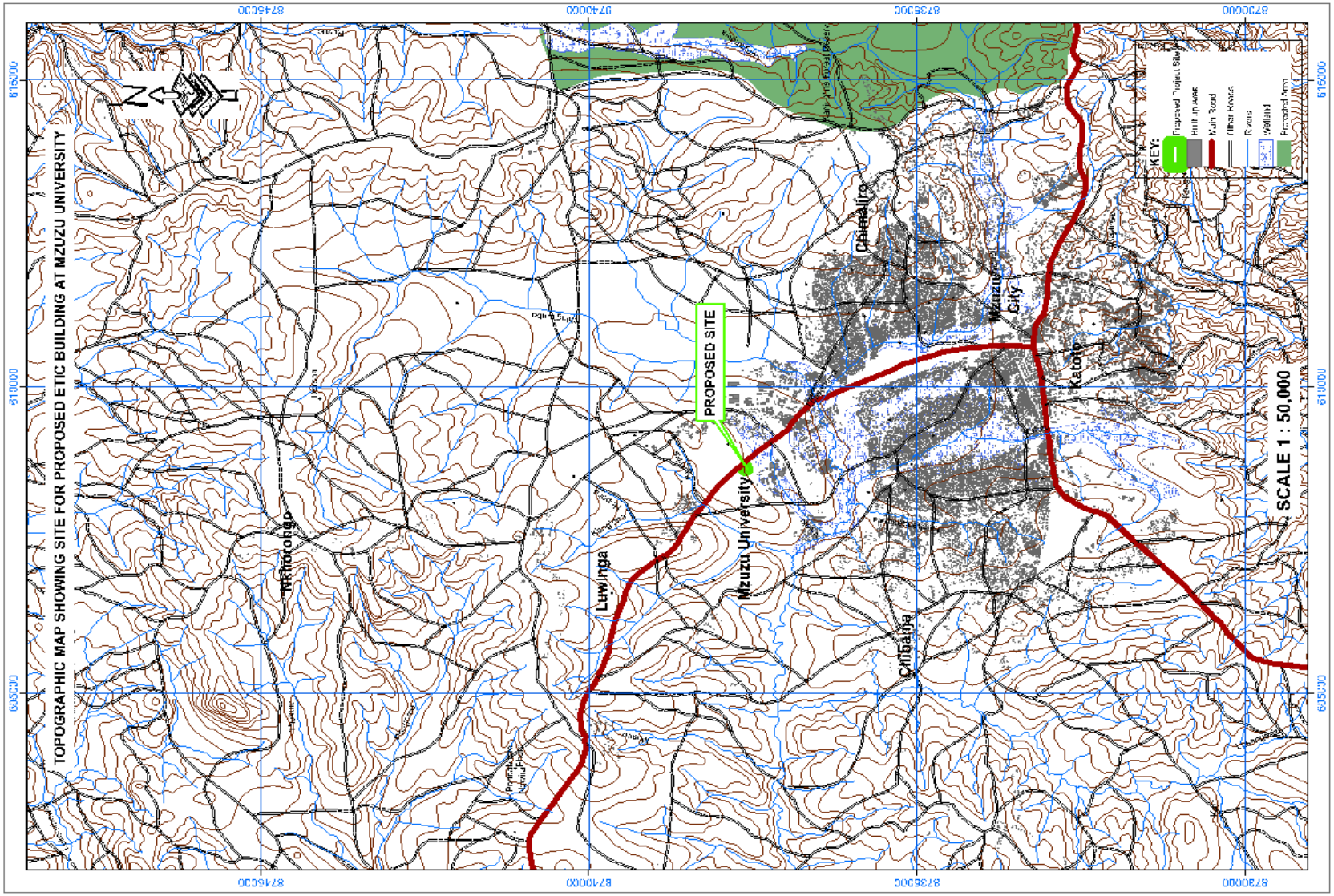
However, the construction of the ETIC building is likely to generate some negative impacts on the biophysical and socio-economic environment. The negative impacts, overall, are assessed to be medium; and mitigation measures for these have been recommended and are compiled into the Environmental and Social Management and Monitoring Plan (ESMMP). The ESMMP will assist MZUNI, the Contractor and other key stakeholders to effectively monitor the implementation of the Environmental and Social Management Plan and ensure that Key Performance Indicators are achieved.

8.2 Recommendation

The Project will bring significant socio-economic benefits to the project area and beyond. To enhance the positive impacts and mitigate the negative impacts, the implementation and operationalisation of the project require strict adherence to the provisions of the ESMMP. In addition, the Contractor is obliged to develop an Environmental and Social Management and Monitoring Plan (CESMMP) to guide the implementation of the mitigation measures contained in this ESMP. The Mzuzu University will monitor the implementation of the CESMP and ensure that the contractor makes environmental and social management an integral part of the construction and operation activities.

APPENDICES

APPENDIX 1: SITE LOCATION



APPENDIX 2: TITLE DEED CONSENT LETTER

Telegrams: MINED LILONGWE
Telephone: +265 1 789422/01788961
Fax: +265 1 788064/164
Communications should be addressed to:
The Secretary for Education, Science and Technology

In reply please quote No.....

MINISTRY OF EDUCATION
PRIVATE BAG 328
CAPITAL CITY
LILONGWE 3
MALAWI

Ref. No. EDU/HE/22/262

15th August, 2022

The Vice Chancellor,
Mzuzu University,
Private Bag 201,
Luwinga,
Mzuzu 2.

Dear Sir,

RE: TITLE DEED CONSENT LETTER FOR MZUZU UNIVERSITY MAIN CAMPUS

I refer to your letter, Ref. No. MU/1/VC/D1, dated 4th March 2020, where you are requesting for a consent letter for the processing of a Title Deed. In your letter you have indicated that the estate which used to be Mzuzu Teachers' Training College and was handed over to Mzuzu University in 1997, does not have any Title Deed, according to your records.

Therefore, I am pleased to convey the Ministry's consent for Mzuzu University to proceed with processing of the needed Title Deed with the Ministry of Lands, in favour of the institution.

I will be glad to know if you will need any other support in the process.

Yours sincerely,

Chikondano C. Mussa
SECRETARY FOR EDUCATION

APPENDIX 3: CONSULTATION SUMMARIES

CONSULTATIONS WITH AUTHORITIES AND OTHER INSTITUTIONS

Date	17 March 2023
Place	Environmental Affairs Department (EAD) / Malawi Environment Protection Authority (MEPA)
Participant	Catherine Musa (Environmental Officer)
Interviewer	Mr. Mussa Kamanula
Consultation Objective	Present the project; to discuss issues and concerns to be considered during the ESIA and project implementation

Issues Discussed

- In conducting the assignment, the consultant should use the current Acts, Guidelines and Regulations governing environment management;
- There is a need to include new regulations from sectors such as Health, Forestry and Lands. The regulations in the health sector include the Covid 19 and Cholera regulations. For the Forestry sector, it is important to include the Forestry Act Amendment (2019). The new Land Acquisition Act should also be referenced for the assignment;
- The most important stakeholders for the project are the Ministry of Labour and the Ministry of Education because they are the ones implementing the SAVE project;
- Regarding the absence of designs, the interviewee mentioned that site plans would be enough to approve the project. The site plans should include the location of structures such as septic tanks.

Interviewer's comments:

- The consultant will access new regulations mentioned by the interviewee for referencing.
- The consultant has already engaged with the Ministry of Labour and the Ministry of Education as main stakeholders.
- The consultant will ask for site plans for the review.

Date	12th June, 2023.
Place	Mzuzu City Council Office- Department of Parks, Leisure and Environment
Participant (s)	Mr. Gerald Mchacha (Assistant Director). *See Appendix 3*
Interviewer	Mr. Samuel B. Phiri and Mr. Kelvin Qongwane
Consultation Objective	Present the project; to discuss issues and concerns to be considered during the ESIA and project implementation

Issues Discussed

- When construction activities are done, serious landscaping should be done at the site (grass and flower lawns).
- Some flowers can be placed on the balconies of each storey.
- Not all the trees on the site should be cut but rather some should remain and be incorporated in the landscape.
- If 1 big tree is removed from the project site, 10 seedlings of the same tree species should be planted within Mzuzu University fences (if possible), or in areas recommended by the City Council.
- The infrastructure can incorporate solar panels into its design.

- There are no sewer lines in Mzuzu City, so the immediate options for Mzuzu University would be using the nearby Luwinga sludge ponds or constructing huge septic tanks.
- Solid Wastes are dumped at Msilo Waste Management Facility

Consultant's Response:

- These have been recommended as some of the action points for the developer to comply with.

Date	12th June, 2023.
Place	Mzuzu Labour Office- Labour Services
Participant(s)	Mrs. Veronica Linyama (District Labour Officer). *See Appendix 3*
Interviewer	Mr. Samuel B. Phiri and Mr. Kelvin Qongwane
Consultation Objective	Present the project; to discuss issues and concerns to be considered during the ESIA and project implementation

Issues Discussed

- The project should strictly follow the labour laws for Malawi when employing people.
- The Contractor must provide contracts to workers, even for those doing piece work. A clear written agreement has to be made before the commencement of works in order to avoid payment-related conflicts.
- The Contract should be written in a language that the workers understand
- Contracts should clearly state:
  - Nature of duties
  - Remuneration
  - Hours of work
  - Probation period
  - Overtime rules and payment
  - Notice period to resign
- The contractor, at all costs, should avoid delays in payments of wages to avoid conflicts with workers; and if there is going to be a delay, for whatsoever reason, the workers should be notified in advance.
- In case of an accident, the Workers' Compensation Act has to be followed.
- The Office conducts Labour Inspection periodically. When there is non-compliance, the office gives the contractor a time frame to address the issues or risk penalties.

Consultant's Response:

- The proposed action points have been included in the ESIA report for the developer to consider.

Date	12th June, 2023.
Place	Mzuzu Labour Office- Occupation Safety and Health (OSH) Department
Participant(s)	Arnold Ben (Regional Occupational Safety and Health Officer). *See Appendix 3*
Interviewer	Mr. Samuel B. Phiri and Mr. Kelvin Qongwane
Consultation Objective	Present the project; to discuss issues and concerns to be considered during the ESIA and project implementation

Issues Discussed

- The project has to be registered with the OSH Department and obtain a Workplace Registration Certificate before commencement of works on site.
- An initial inspection visit is conducted to check whether the project complies with the minimum requirements of the Occupational Safety, Health and Welfare Act. When there is

non-compliance, the office gives the contractor a period to address the contraventions or risk being fined MWK200,000 for each contravention.

- The department, among others, checks the following:
  - Cleanliness at the site
  - Toilets for males and females (segregated)
  - Potable water
  - Change rooms
  - Well-stocked First Aid Box (its size should correspond to the number of workers)
- Those charged with the duty of administering First Aid have to hold a valid certificate (either from the Red Cross, St Johns Ambulance, or any other certified body).
- A medical examination has to be done before and after project works, especially on workers to be involved in heavy work, in order to assess how the project has impacted their health.
- The project should use certified machines and equipment. The Contractor can engage the OSH department or a consultant (accompanied by a witness from OSH department); to conduct an examination assessment of the machines.
- The Contractor, among others, should have the following safeguard documents:
  - Occupational Health and Safety (OHS) Policy
  - Health and Safety Management Plan
  - An Emergency Response and Preparedness Plan (ERPP). The ERPP has to be communicated to the employees in a language that they understand.
- When there is an accident, incident reports must be written and the OSH department must be notified of the accident. Depending on the nature and magnitude of the accident; the OSH department can either let construction works carry on or stop the works until its investigations into the incident are done and necessary compensations stipulated in the Workers' Compensation Act are given.
- Personal Protective Equipment (PPE) should be provided to the workers at no cost.
- The Contractor must include a permanent Health and Safety Person in his team of workers.
- The workers will need to be trained in fire safety (by the City Council or Mzuzu Airport fire-fighting personnel).
- As of June 2023, there are a total of 2 fire-fighting vehicles in the City of Mzuzu. 1 vehicle at the City Council and another vehicle that belongs to Mzuzu Airport.

Consultant's Response:

- The proposed action points have been included in the ESIA report for the developer to consider.

Date	14th June, 2023.
Place	M'mbelwa District Council- Environment Office
Participant(s)	Mr. Euclid Tembo (EDO Representative). *See Appendix 3*
Interviewer	Mr. Mussa Kamanula and Mr. Kelvin Qongwane
Consultation Objective	Present the project; to discuss issues and concerns to be considered during the ESIA and project implementation

Issues Discussed

- We have been to the site and we understand that the ICT lab structure will be removed to create enough room for the ETIC building
- The site is not very sensitive; however, the project is going to have some negative impacts which, among others, will include:
  - Loss of trees and vegetation
  - Creation of borrow pits

- Blockage of footpaths
- Disturbance of rivers in the areas where sand is going to be mined
- Increased incidences of theft

- For the trees that will be cut down the recommendation is to replace them with 10 seedlings of the same species.
- There are small trees on the site and these should be gently removed and transplanted elsewhere (within the university campus or at a place recommended by the Forestry Office)
- The Contractor should buy sand from licensed local suppliers or should ensure that sand mining does not only concentrate at one individual place.
- Waste should be segregated. Hazardous, general waste and those that can be recycled
- Appropriate PPE should be provided depending on the nature of the work
- Toolbox talks should be conducted before the commencement of daily activities.
- Condoms and HIV test kits should be placed in closed spaces at the site (e.g., toilets).
- There should be a committee at the local level to look after the project (community leaders/ members should be included in that committee).

Questions

- **Q1:** What will be the provision for the Contractor's Water Supply?
- **Q2:** What will be the provision when there is a water outage?
- **Q3:** Have you consulted on how you will deal with the negative Social Impacts?

Consultant's Response:

- **A1:** The contractor will arrange with the Northern Region Water Board for his own metre.
- **A2:** He will have water tanks to store water that can be used when there is a water outage.
- **A3:** We have consulted the Consulted various Social Safeguard Stakeholders on social welfare issues, gender issues, HIV and AIDS, sex exploitation and abuse, labour issues; and public health

Date	12th June 2023
Place	OPC Regional Administrator (North)- Social Welfare Office
Participants	Mr Lickson Ng'ambi (Social Welfare Officer) and Mrs Elizabeth Bandawe (Social Welfare Assistant)
Interviewer	Mr. Samuel B. Phiri and Mr. Kelvin Qongwane
Consultation Objective	Present the project; To discuss issues and concerns to be considered during the ESIA and Project Implementation

Issues Discussed

- The city expects that the project will employ people from the surrounding communities and other districts/regions of the country, during all the stages of the project.
- The city expects Improved Education of the people, hence resulting in increased productivity and consequently poverty reduction.
- The city fears that the project will require construction materials including earth, sand and quarry stone. Extraction of these materials may lead to the creation of holes and borrow pits in the ground. These holes and borrow pits as well as trenches opened will be hazardous to people. Therefore, they recommend that contractors should put a barricade face around those areas and have proper sensitisation together with signs around and bury after work everything is done.
- In this project, noise and vibrations are expected from the construction works, use of machinery and movement of materials, and the movement of vehicles. Most of the

construction machinery that will be used, for example, trucks, compactors and concrete mixers. This noise is a health risk only when one is exposed to it over a long time and above the recommended standard, such noise can result in permanent ear damage. The council recommended that the contractor should provide proper PPE to the workers and properly sensitise those within the construction site.

- It is anticipated that the local women will have sexual relationships with the men at the construction site, to earn some money. This could lead to the breaking up of families, where the women or the men are married. Unprotected sex could also lead to unplanned pregnancies and the transmission of STIs, HIV and AIDS where one of the partners is infected. The council recommends a proper code of conduct that highlights all these incidents to protect the vulnerable, the office also recommends health education to minimise the impacts and proper sensitization to all relevant stakeholders like the surrounding community.
- Incidences of sexual abuse and harassment are anticipated at the work sites and in the homes. At the work site, women seeking jobs could voluntarily or involuntarily indulge in sex with the employers in order to get jobs. The social welfare office said that this is a common practice in construction sites. Sexual abuse and harassment occur during the course of employment, mostly affecting women due to the perception that women are a weaker gender (gender inequality). The office recommends that the contractor code of conduct should include a close of abuse of office to minimise these incidents at the same time there should be proper GRM so that the abuse should safely report their concerns.
- The influx of immigrant workers and job seekers may result in increased pressure on community and health services due to the associated significant health and safety impacts on local communities. First and foremost, interactions between workers and female community members increase the risk of sexually transmitted diseases such as HIV/AIDS and other STDs. The interactions could also lead to the spread of communicable diseases such as coughs and Tuberculosis. Construction activities such as sand and cement mixing activities could also lead to respiratory diseases among the workers and the community. On the other hand, poor sanitation at work sites and workers' camps, potential land and water resources degradation as a result of construction activities could lead to the spread of water-related diseases such as malaria among the workers and the communities. The council recommends that the implementer should work hand in hand with the health department in sensitisation and health education to minimise these incidents.
- During informal consultations, it was observed that most of the project activities in the construction phase are considered to be ‘strength-requiring jobs’ and hence “men’s” jobs; for example, digging trenches and laying pipes. As such, the project will tend to employ more men than women. In addition, according to the culture of the area, usually men take key positions while women take supportive roles. Similarly, at the national level, there are more men in the construction industry than women. As such, women may take more supportive roles (for example cooking and ferrying water). The office recommends that the contractor should balance both skilled and unskilled labour in all genders, this is by proper employment procedure, sharing roles equally in line with capabilities, and putting women who are capable in supervisory roles.
- Local labourers will be laid off during the demobilisation phase. This will result in loss of livelihoods. Because of job losses, businesses that were thriving or had opened (mainly food and alcohol businesses) because of the project staff will also be affected negatively. This may in turn, also lead to loss of jobs where employees were running the businesses. The office encouraged that the workers should be sensitised on saving

	culture to be prepared for the phasing out of the project, and the business should be encouraged in marketing to have more customers not only from the construction site.

Date	12th June 2023
Place	OPC Regional Administrator (North)- District Youth Office
Participants	Mrs. Ellen Chisi (District Youth Intern), Mrs. Tiyanjane Chimphonda (District Youth Intern)
Interviewer	Mr. Samuel B. Phiri and Mr. Kelvin Qongwane
Consultation Objective	Present the project; To discuss issues and concerns to be considered during the ESIA and Project Implementation

Issues Discussed

- ✔ The project will create employment opportunities for the youth hence the office recommended that the contractor should consider youth who are capable of the employment process.
- ✔ In its operation stage the project will boast youth education and skills hence more youth will be part of the country's fuel of development.
- ✔ The project has the potential to increase sexually transmitted diseases as the contractors' workers will have money that will influence the youth in sexual activities, so the office recommends proper sensitisation to the youth in preventing such activities at the same time proper ways of protecting themselves like the use of condoms
- ✔ The project has the potential to drive the youth to Alcohol and drug abuse, as the youth will be influenced by the workers who have money in alcohol drinking and drug use, the office recommends advocacies and sensitisation on the dangers of drug and alcohol abuse.

Date	12th -13th June 2023
Places	Mzuzu Plan International Office, Ungweru, St Augustine Primary School, Mzuzu Foundation School, M'mbelwa District Council-NOYD/Gender Office
Participants	Mr. Emmanuel Mkumbwa (Plan International Sponsorship Communications Coordinator), Mrs. Joyce Mphande (Mzuzu Foundation Head Teacher), Mrs. Mercy Chimaliro (Mzuzu Foundation Deputy Head Teacher), Mr. Andie Mtambo
Interviewer	Mr. Samuel B. Phiri and Mr. Kelvin Qongwane
Consultation Objective	Present the project; To discuss issues and concerns to be considered during the ESIA and Project Implementation. (Gender and Social welfare issues)

Issues Discussed

These institutions work to advance children's rights and equality for girls. The organisations are actively involved in promoting gender equality, empowering girls and women, and advocating for social welfare. Some of the key points discussed in the areas of gender and social welfare include:

- ✔ During implementation these institutions urge that there should be a Promotion of Gender Equality: thus, addressing the root causes of gender inequality and promoting equal opportunities for girls and boys. The contractor's code of conduct should

challenge harmful gender norms, stereotypes, and discriminatory practices to create a more inclusive and equitable working environment and society.

- ✔ The institutions say the project should empower Girls and Women in both stages of implementation: thus, the entrepreneurs training and incubation hub should also focus on empowering girls and women by providing them with education, life skills training, and economic opportunities. This is to enhance girls' access to quality education, improve their health and well-being, and enable them to become active participants in decision-making processes.
- ✔ Construction site should promote ending Gender-Based Violence: campaign against all forms of gender-based violence, including child marriage, female genital mutilation/cutting (FGM/C), sexual exploitation, and trafficking. This should be done with communities, governments, and partners to raise awareness, strengthen protection mechanisms, and support survivors of violence. The contractor's code of conduct should include a close of all these to ensure there is safety.
- ✔ Advocating for Girls' Rights: Plan International advocates for the rights of girls at national and international levels. They engage in policy dialogue, research, and lobbying to ensure that laws and policies protect and promote girls' rights, including their rights to education, health, and protection from violence.
- ✔ The project should put measures of strengthening Social Welfare by working with governments and local partners to improve access to essential services, such as healthcare of the workers, clean water, and sanitation, with a specific focus on providing all necessary things like medical check-ups, sanitation facilities.
- ✔ Promoting Child Protection: Construction works should ensure the safety and well-being of children, advocating for their protection from abuse, exploitation, and neglect. This should be done in collaboration with governments, communities, and child protection agencies to establish child-friendly and protective environments. The site should have signs prohibiting violation of child rights like child labour.

✔ Overall, the institutions urged the project to play a crucial role in advocating for gender equality, empowering girls and women, and promoting social welfare through various interventions, partnerships, and advocacy efforts.

Date	27th June 2023
Place	Ministry of Gender, Community Development and Social Welfare (MoGCDSW)
Participant	Mr. Misheck Mdambo (Social Welfare Officer) and Alinafe Gundo (Social Worker)
Interviewer	Mr. Kelvin Qongwane
Consultation Objective	Present the project; to discuss issues and concerns to be considered during the ESIA and project implementation

Issues Discussed

- Gender-related Acts include: Marriage Divorce and Family Relations Act; and Child Care, Protection and Justice Act.
- Issues of concern include; Child labour, unplanned pregnancies, Sexual Exploitation and Abuse and Gender-Based Violence.
- Normally when contractor workers impregnate women or girls in the project area, they leave without providing maintenance to the women or girls.
- The contractor is supposed to have a workplace policy and codes of conduct to ensure that minorities are safeguarded against GBV and SEAH;
- There should be safeguards to ensure that children are protected

- No child labour
- Children should not be allowed to do business at the project site

- The contractor should allocate resources to ensure that an impregnated girl child is maintained.
  - The contractor should take care of the child until safe delivery;
  - The contractor should find a school outside Mzuzu for the child to continue her studies.
  - Maintenance of the child should cover up to first-degree
- Awareness campaigns should be conducted around the project area on the implications of the presence of the project, Child Protection, Gender Based Violence (GBV) and Sexual Exploitation, Abuse and Harassment (SEAH).
  - Training should be conducted on psychological first aid.
  - Psychological first aid training is conducted by the Ministry of Gender and the Ministry of Health
- As a safeguard intervention Mzuzu University can facilitate the creation of safe spaces for women and children where issues concerning them can be freely discussed and then reported to relevant authorities.
- Monitoring of gender and social issues is done by the District Social Welfare Officer and District Gender Officer;
- The building should be disability friendly.
- Employment should also consider people with disabilities who qualify.

CONSULTATIONS WITH UNIVERSITY STAFF AND STUDENTS

Dates	12th and 13th June, 2023
Place	Mzuzu University
Participants (s)	University Management, Staff (Academic and Non-Academic) and Students. *See Appendix 3*
Interviewer	Mr. Mussa Kamanula
Consultation Objective	To discuss issues and concerns to be considered during the ESIA and project implementation

Issues Discussed

- **Thoughts on the proposed project and site for the construction of the Entrepreneurs Training and Incubation Centre**
  - ✔ The proposed site is ideal for the construction of an Entrepreneurs Training and Incubation Centre
  - ✔ The proposed site is Mzuzu University land for infrastructure development
  - ✔ The Entrepreneurs Training and Incubation Centre will help to enhance adequate learning and teaching facilities
  - ✔ The activities to be undertaken at the Entrepreneurs Training and Incubation Centre will benefit the students as well as the communities

- **Concerns about the proposed Project using experiences from previous projects**
  - ✔ Delay in availability of skilled workforce such as carpenters from surrounding communities.

- Carpenters were imported from Blantyre during the ongoing construction of the new library

✔ Waste disposal is expected to be a challenge
- There is no proper direction from Mzuzu City Council on the disposal of waste soils
- There was a dispute between Mzuzu City Council and villagers near Msilo waste disposal site
- Mzuzu University will apply for a permit/licence for the disposal of waste soils
- Mzuzu University will also prioritise the recycling of waste soils

✔ Theft of construction materials
- There have been several cases of theft of construction materials such as cement by construction workers during the ongoing construction of the new library
- Theft of construction materials by construction workers has been witnessed by students, university staff and the surrounding communities
- Mzuzu University security will work hand in hand with the contractor and Luwinga Police Unit during the construction of the Entrepreneurs Training and Incubation Centre to eliminate theft of construction materials

✔ There will be a risk of disturbances from noise and dust during the construction of the Entrepreneurs Training and Incubation Centre
- The ongoing construction of the new library had previously resulted in dust emissions where laboratories at the ESSUP buildings were occasionally affected but not to a larger extent
- The proposed site for the construction of the Entrepreneurs Training and Incubation Centre is closer to male singles hostels and the Information Communication Technology (ICT) Lab which could also be potentially affected by noise and dust

✔ Risk of exclusion of women during employment
- The ongoing construction of the new library has shown that women have been heavily excluded from employment
- Of the 160 workers employed, only 20 are women, representing 12.5 %
- The exclusion of women is possible because construction activities are even carried out at night, making it difficult for the women to participate

✔ There will be a loss of trees at the proposed construction site
- The proposed site has some indigenous trees (Brachystegia species) and one Mango tree
- The majority of the indigenous trees are very small in size
- These trees will be cleared before the commencement of construction works
- The project must ensure that trees are planted as a mitigation measure
- The project must limit vegetation clearance to specific areas to be affected by construction works
- For the small trees, the possibility of uprooting and replanting them elsewhere should be considered

- **Solid waste management at the campus**

✔ Main solid wastes from the campus include waste arising from maintenance works, glassware and non-functional equipment from laboratories and waste paper
- Disposal of solid waste arising from maintenance works seems to be a challenge.
- There is a big heap of solid waste (about 2 tonnes) from maintenance works near the ESSUP buildings
- Non-functional and/or old equipment from laboratories is sometimes sold at auction by the University thereby minimising the quantity of potential solid waste

- ✔ Solid waste from laboratories is usually gathered in waste containers and these are later collected by the Mzuzu City Council for disposal at designated sites. This usually happens once a year
  - In some cases, the University hires a vehicle (2 tonne) to collect the laboratory solid wastes for disposal at designated sites. This estimation is only based on the Chemistry Laboratories
  - Solid waste emanating from laboratories is mostly glassware

- **Liquid waste management at the campus**
  - ✔ The oxidation pond for Mzuzu University is designed to carter for a population of 5000 users and it has now reached its full capacity.
  - ✔ ETIC building will bring an additional user population of 2000. Consequently, it will be connected to an on-site septic tank and soak away for liquid waste management.
  - ✔ The oxidation pond is divided into 3 sections with a combined total size of 100m by 50m
    - The first 2 sections have a depth of 1.5m while the third section has a depth of 1.2m
    - The estimated volume of the oxidation pond is 5000 cubic metres
    - The decision to have an oxidation pond was directed by the Malawi Environment Protection Authority (MEPA)
    - The oxidation pond at Mzuzu University is managed by the Department of Water and Sanitation
    - Currently there are no major challenges associated with the oxidation pond except minor blockages that occur sporadically
  - ✔ Entrepreneurs Training and Incubation Centre will be Liquid waste in the form of chemical products from the laboratories is usually disposed of in pits at the University
    - Normally, a pit that is 3m deep is dug where all used chemicals are disposed
    - On average, 100 L of used chemicals is disposed of in the 3m deep pit per year (Chemistry Laboratories)
    - In most cases, used chemicals are also recycled

- **Health situation at the campus**
  - ✔ Mzuzu University has a clinic that offers 6 main services
    - Anti-Retroviral Treatment (ART)
    - Outpatient Department (OPD)
    - Family Planning
    - Sexual Transmitted Infection (STI) treatment
    - HIV Testing and Counselling (HTS)
    - Short stay for students
  - ✔ Mzuzu University clinic has a total of 10 staff members.
    - 1 Clinician
    - 5 Nurses
    - 1 Laboratory Technologist
    - 1 Laboratory Aid
    - 1 Clinic Attendant
    - 1 HIV Testing (HTS) Counsellor
  - ✔ Common diseases handled at the clinic include;
    - Upper Respiratory Tract Infections (URTI)
    - Diarrhoea
    - Sexual Transmitted Infections
    - Soft Tissue Injuries

- Hypoglycemia due to alcohol
- General Body Pains

✔ Malaria is not a common disease.

✔ On average, the clinic handles about 100 patients per day.

✔ During the Covid-19 pandemic, the clinic used to handle over 200 patients per day.

✔ Challenges faced by the clinic include;

- Shortage of staff such that there is only one clinician who works throughout
- Shortage of essential/basic drugs such as Panadol, buffen
- Delay in procurement of drugs
- The clinic has no incinerator for burning needles/syringes. The needles are combined with other non-metallic clinical wastes when burning them. Consequently, the sharp objects are not fully burnt.
- Lack of equipment such as sterilisation machines and scales
- Shortage of stationery
- There are no computers for storing clinical data/information.

✔ The clinic has so far not recorded injuries from the construction of the new library.

✔ On average, 2 injuries per month were being reported at the clinic from previous construction activities at the University.

✔ Prevalence of sexually transmitted infections at the clinic

Cases of Sexual Transmitted Infections by Gender from July to December 2022 at Mzuzu University Clinic

Month	Number of Males Infected	Number of Females Infected	Total Number of Cases
July	18	16	34
August	22	22	44
September	5	5	10
October	23	34	57
November	28	40	68
December	30	29	59

HIV Testing and Counselling Services from July to December 2022 at MZUNI Clinic

Month	Number of Tests and Counselling Conducted	Number of HIV-Positive Cases
July	89	0
August	88	3
September	Data not available	Data not available
October	122	2
November	139	1
December	142	5

✔ Prevalence of other diseases at Mzuzu University clinic from October to December 2022

- Upper Respiratory Tract Infections (URTI)
- Diarrhoea
- Musculoskeletal Pains (MSP)
- Conjunctivitis
- Malaria

Prevalence of other diseases at Mzuzu University clinic from October to December 2022

Month	Disease	Total Cases for the Month
October	Upper Respiratory Tract Infections	138
	Diarrhoea	52
	Musculoskeletal Pains	90
	Conjunctivitis	33
	Malaria	15
November	Upper Respiratory Tract Infections	255
	Diarrhoea	43
	Musculoskeletal Pains	129
	Conjunctivitis	33
	Malaria	5
December	Upper Respiratory Tract Infections	191
	Diarrhoea	34
	Musculoskeletal Pains	134
	Conjunctivitis	21
	Malaria	1

- **Security at the campus**
  - ✔ Currently, Mzuzu University has two security personnel who manage all issues regarding security at the campus.
    - Senior Security Liaison Officer
    - Security Officer
  - ✔ The University security usually works hand in hand with Luwinga Police Unit and Community Police. Luwinga Police Unit is less than 1km from the University campus.
    - Some members from Luwinga Police Unit are part of Grievance Redress Committee for the SAVE Project
    - Mzuzu University supports community policing through;
      - procurement of reflectors
      - procurement of torch lights
      - provision of transport (vehicle) to carry out operations / follow up on cases
    - The University will also be supporting the Luwinga Police Unit with fuel to carry out operations aimed at providing security services to off-campus students
  - ✔ The University also collaborates with the Malawi Defence Force (MDF) and the National Intelligence Bureau on sensitive issues regarding the security of students/employees at the campus and beyond.
  - ✔ The University security further collaborates with students from the Department of Security Studies at the campus.
    - Students in the Department of Security Studies are usually from the Malawi Police, Department of Immigration, Malawi Defence Force and Malawi Prison

- The students also help in providing further security information to the Mzuzu University

✔ Security challenges at Mzuzu University

- There are few security guards; in total there are 119 security guards; 45 day shift guards and 74 night shift guards.
- There are not enough CCTV cameras covering all areas of the campus.
- The University has already identified specific areas to mount additional CCTV cameras to improve security.
- Security lights at the campus are not enough such that 40 % of the areas in the campus have no security lights.

Overall Guards Deployment for Mzuzu University

S/N	SITE NAME	No. OF GUARDS DEPLOYED	DAY SHIFT	NIGHT SHIFT
1	Mzuzu University Main Campus	47	22	25
2	Supervisor	5	2	3
3	Vice Chancellor's residence	3	1	2
4	Deputy Vice Chancellors residence	3	1	2
5	ODL Main Campus	12	4	8
6	Nkhatabay Fisheries Laboratory	3	1	2
7	ODL Centre Mulanje	7	2	5
8	ODL Centre in Balaka	7	2	5
9	ODL Centre in Lilongwe	7	2	5
10	ODL Centre in Karonga	8	2	6
11	Tourism and Hospitality Skills Development Centre	17	6	11
	TOTAL	**119**	**45**	**74**

✔ It is anticipated that the contractor responsible for the Entrepreneurs Training and Incubation Centre will have his / her security which will be working hand in hand with the University Security.

✔ Anticipated security challenges from the SAVE Project

- Theft of construction materials by contractor's workers
- Breaking of Mzuzu University fence during theft of construction materials
- Construction of the Entrepreneurs Training and Incubation Centre will increase theft at the campus in such a way that thieves targeting items at the construction site may also steal other items on campus.

- **Vandalism on campus**

✔ Vandalism at the campus is mainly from students.

✔ Usually vandalism occurs during football matches (excitement)

✔ A total of 400 chairs were previously broken.

✔ Students involved were suspended.

- **Water supply at the campus and alternative sources**

- ✔ The University has a total of about 8500 students of which 800 are boarders.
- ✔ Water supply at the campus is through the Northern Region Water Board
- ✔ Water supply at the campus is currently enough.
- ✔ Shortage of water supply is mainly in the dry season such that the University may sometimes stay for 1 week without water.
- ✔ During a shortage of water supply, the University usually contacts the Northern Region Water Board who supply water to the campus using bowsers.
- ✔ On average, the University has spent K20, 268, 039 on water bills per month, for the past 12 months.
- ✔ The University has 6 water tanks each with a capacity of 10,000 cubic metres.
- ✔ These 6 water tanks can only be utilised for 2 days.
- ✔ The University applied for a licence to have boreholes in order to supplement the water supply at the campus.
- ✔ Northern Region Water Board rejected Mzuzu University's idea to have boreholes on campus (boreholes cannot be dug in the city)
- ✔ However, the idea to have boreholes at the campus was agreed by the Water Resources Authority
- ✔ For the SAVE Project, it is anticipated that the contractor will have his / her own account for water bills as is currently done by the contractor responsible for the construction of the new library.

- **Energy use and alternative sources at the campus**
  - ✔ Power supply at the campus is through the Electricity Supply Corporation of Malawi (ESCOM)
  - ✔ On average, the University has spent around K18,000,000 per month for the past 12 months.
  - ✔ The University has 2 Generators (300 KV and 250 KV) for backup power supply.
  - ✔ It is anticipated that the Entrepreneurs Training and Incubation Centre will also utilise the backup power supply available at the university.
  - ✔ Alternative sources of energy for the new infrastructure will also be considered.

- **Toilets at the campus**
  - ✔ The campus has 599 toilets which students use.
  - ✔ Maintenance of the toilets is done internally by employees responsible for maintenance of facilities at the University.
  - ✔ It is anticipated that the contractor for the SAVE Project will construct his / her own sanitation facilities including toilets, as is currently done by the contractor handling the new library.

- **Roles and responsibilities of Mzuzu University in implementation and monitoring of the SAVE Project**
  - ✔ For the SAVE Project, Mzuzu University will have the following responsibilities.
    - Facilitation of payments
    - Facilitation of approvals required for the project.
    - Facilitation in the selection of consultants
    - Facilitation of quality assurance/monitoring

- **Estimation of the number of people to be employed by the project.**
  - ✔ It is estimated that not less than 160 people will be employed by the project as is currently the case with the construction of the new library.
  - ✔ It is anticipated that women and men will constitute 40 and 60 % of the labour force, respectively

- **Construction materials to be used.**
  - ✔ The project will use approved construction materials such as cement blocks, steel, glass, sand, rock aggregate, quarry dust, reinforced steel bars, metal and polymer fittings, solar panels, batteries, inverters, electric conductors, and cables and associated electrical fittings among others.

- **General comments and recommendations on the proposed project**
  - ✔ The project must ensure that surrounding communities are involved especially in terms of employment.
  - ✔ Security must be improved to ensure that theft of construction materials is completely eliminated.
  - ✔ The project should ensure that the rights of workers at the construction site are protected.
  - ✔ Students should have access to the Environmental and Social Impact Assessment (ESIA) report.
  - ✔ Students should thoroughly be notified/consulted on the specific activities that will be happening in the proposed Entrepreneurs Training and Incubation Centre

Date	13th June 2023.
Place	Luwinga Secondary School- Deputy Head Teacher's Office
Participant(s)	Mr. Stanley Skewes (Deputy Head Teacher). *See Appendix 3*
Interviewer	Mr. Kelvin Qongwane
Consultation Objective	Present the project; to discuss issues and concerns to be considered during the ESIA and project implementation

Issues Discussed

- As an institution that is close to the project site, Luwinga Secondary School will undoubtedly be impacted by the project.
- The school has 514 female students and 612 male students.
- Contractor workers may engage in illicit relationships with Luwinga secondary school students which may lead to unplanned pregnancies and a rise in school dropouts.
- We would love and expect that Luwinga Secondary students and staff should also benefit from the project.
- We would expect that the knowledge and skills that are going to be acquired should also be imparted to their students and the surrounding communities. This can be done by organising outreach activities.

Consultant's Response:

- The developer should include a clause, in the workers' contracts, preventing sexual relationships with pupils, students, abuse and harassment.
- The expectation has been highlighted as an area where the developer needs to make serious considerations.

Date	13th June 2023.

Place	Mzuzu Foundation LEA Primary School- Head Teacher's Office
Participant(s)	Mrs. Joyce Mphande (Head Teacher) and Mrs. Mercy S. Chimaliro (Second Deputy Head Teacher). *See Appendix 3*
Interviewer	Mr. Samuel B. Phiri and Mr. Kelvin Qongwane
Consultation Objective	Present the project; to discuss issues and concerns to be considered during the ESIA and project implementation

Remarks

- The project is a welcomed development, and the school is ready to be engaged where necessary.
- The school currently has 308 girls and 318 boys.
- Both in 2021 and 2022 the dropout rate was 1%. In 2023 however, the dropout rate has risen to 4% and this may be attributed to fear instilled by Cyclone Freddy and unplanned pregnancies (there were 2 cases of unplanned pregnancies recorded at the school).
- The school collaborates and partners with Mzuzu University in various areas, including but not limited to:
  - Science fairs
  - Tree planting excises
  - The pupils are allowed to use the MZUNI Library on Tuesdays.

Benefits

- The infrastructure will be used as an example to instil hard work in Mzuzu Foundation LEA Primary School pupils.
- The project may present employment opportunities to some of our students and pupils who are constantly asking us for piece work.

Concerns

- Some workers may sexually interact with Mzuzu Foundation LEA Primary School pupils which may lead to unplanned pregnancies (already 2 pupils from the school were impregnated when the ODL infrastructure was being built in the area).
- The risk of theft will increase in the area. There are already high cases of theft in the area even during daytime.

Mitigation Measures

- Workers should be sensitised against engaging in illicit affairs with minors and the community (through local leaders, schools and churches) should be sensitised so that they should not be enticed by Contractor workers.
- Security guards should be employed to mitigate the risk of theft. The community can also be engaged to give them a sense of ownership and safeguard against theft.

Consultant's Response:

- The Consultant has deduced that there is a high risk of child labour in the area, as even individuals from the school management are in support of employment for their underage pupils. The Consultant has therefore recommended that the developer should include a clause against employing children in the construction works contract; and enforce it.
- The mitigation measures proposed by the school management have been included in the ESIA report.

Date	13th June 2023.

Place	Luwinga- St Augustine Market
Participant(s)	Mr. Juma Issa, Mrs. Violet Munkhonde, Mrs. Kisa Mwenitete, Mrs. Iness Kamowa and Mr. Adamson Mkandawire. *See Appendix 3*
Interviewer	Mr. Mussa Kamanula and Mr. Kelvin Qongwane
Consultation Objective	Present the project; to discuss issues and concerns to be considered during the ESIA and project implementation

Remark

- The market committee is responsible for overseeing the affairs of traders in the market and ensuring a clean and safe marketplace.

Benefits

- Increased business opportunities
- Increased employment opportunities.

Concerns

- Projects like these employ foreign people even when the required expertise is available locally. From our previous experience, a certain project right there at MZUNI employed carpenters who are not from around here. There are well-qualified Artisans in the area that can be employed by this SAVE project.
- The risk of theft may increase around the Project area.
- The market's traders may not benefit as much as expected as construction workers may just buy from unregistered vendors who have encroached the roadside close to MZUNI.

Mitigation Measures

- Locals should also be given employment opportunities.
- Employment opportunities should be advertised locally through posters as well.
- Security guards should be employed to mitigate the risk of theft.

Consultant's Response:

- The proposed action points have been included in the ESIA report for the developer to consider.

Date	13th June 2023
Place	Mzuzu St Augustine Catholic Church
Participant	Mr. Sam Hara (Catechist)
Interviewer	Mr. Samuel B. Phiri (WWEC)
Consultation Objective	Present the project; To discuss issues and concerns to be considered during the ESIA and Project Implementation

Issues Discussed

- ✔ The church says the coming of this Project will give its members employment opportunities hence contributing to church activities
- ✔ The Project will also boast education hence contributing economic empowerment to society
- ✔ The church advised the Project to properly sensitise the communities on activities to be conducted on the site to minimise disturbances.

- ✔ The church says the coming of the Project partly will also reduce the participation rate of its members, mainly those who will be employed as most of the construction activities are being done day and night, hence members will not have much time to attend church services.
- ✔ The church recommends that the contractor should be providing normal off days so that the workers are not overworked.

Date	13th June, 2023.
Place	Lupaso Village, GVH Wayinga Singini; Mzuzu
Participant(s)	Mr. David Singini, Mrs. Tarness Ngwira, Mrs. Gertrude Chathira, Mr. Kondwani Shaba and Mrs. Ella Singini). *See Appendix 3*
Interviewer	Mr. Samuel B. Phiri, Mr. Mussa Kamanula and Mr. Kelvin Qongwane
Consultation Objective	Present the project, discuss the impacts of the project; and have an overview of the baseline conditions of the area

Issues Discussed

A. THE PROJECT

It was the first time that the participants heard about the project. The Project is a welcomed development and the school is ready to be engaged where necessary. The Project will have the following impacts on the community.

POSITIVE IMPACTS

- Increased employment opportunities.
- Scenery beauty- the infrastructure will beautify and give more aesthetic value to Luwinga.
- More students in the community will be doing their tertiary education right there in Mzuzu, which means less expenditure on transportation.

NEGATIVE IMPACTS

- Change in culture.
- Increased incidences of strikes by the students
- Conflicts between the Contractor and community members due to lack of transparency and accountability- the communities should be well-sensitised about the project.

B. ROLES OF WOMEN/ MEN

- Women are involved in cooking, cleaning the house, drawing water and small businesses (selling farm produce).
- Men do not usually involve themselves with house chores. They are involved in piece works and some businesses.
- Men and women do not have equal opportunities in the community as women are usually looked down upon.
- Women do not really have significant control over assets, as they use a patrilineal system where land and other assets are controlled solely by the husband.
- Women face various forms of abuse (physical abuse, economic abuse, restriction from piece works and various other opportunities). This is the case because the lobola (bride price) paid gives men a sense of ownership over their wives.

B. EDUCATION

- Children in the community attain their primary education at Lupaso, St Augustine, Vyele, Mzuzu Demonstration and Habitat Primary schools.
- Key secondary schools in the area include: Lupaso CDSS and Luwinga Secondary School.
- About 50% of the boys and girls in the area acquire secondary education and only a few per cent attain higher education. This is because of lack of finances as a result ladies are forced into early marriages and boys engage in income-generating activities.
- Mzuzu University, Mzuzu Technical College, LUANAR Mzuzu campus, and University of Livingstonia (Mzuzu Campus) are the higher education institutions in Mzuzu City.

C. HEALTH

- There is no hospital or health centre in the area. People in the area attain health services at Mzuzu Central Hospital, Mapale, or Choma Heath Centre, which are 4 km, 7 km and 19 km respectively.
- Family planning services are readily available in the area.
- Common diseases in the areas are Malaria, Measles and HIV and AIDS.

D. LIVELIHOOD

- Common crops grown in the area are maize, rice and pigeon peas.
- People get their income through farming (selling farm produce and livestock) and small businesses.
- People in the area mostly spend on food and farm inputs.

E. ACCESS TO WATER

- For potable water, Lupaso has 1 borehole that is used for all their water needs. The borehole was installed in 1998 and is managed by a local water committee.
- Women and girls are responsible for collecting water for household use.
- There is a challenge in accessing potable water as there are insufficient sources in the community.

F. SANITATION AND HYGIENE

- Common sanitation facilities in the area are pit latrines.
- Households use pits for disposal of solid wastes.

G. ACCESS TO POWER

- The community is connected to the ESCOM power grid. Most community members use ESCOM electricity and solar for lighting, they use firewood for cooking and electricity for charging their phones.

H. TRANSPORT AND COMMUNICATION

- Common mode of transport is the use of Taxis and Bicycles.
- Telecommunication services are available in the area.

I. SECURITY

- There is a Community Police forum in the area.

J. CULTURAL HERITAGE

- Most of the people are Tumbukas and Ngonis.
- There is no significant cultural practice that is observed by the people in the community.
- Places of cultural significance in the area are just graveyards.

APPENDIX 4 EVIDENCE OF CONSULTATIONS

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED CONSTRUCTION OF AN ENTREPRENEURS TRAINING AND INCUBATION CENTRE (ETIC) AT MZUZU UNIVERSITY: UNDER SAVE PROJECT

STAKEHOLDER CONSUTATION REGISTER

PLACE: Mzuzu city council

DATE	Name	Position	Contacts	Signature
12/06/23	Gerald Mchacha	Assistant Director Parks, Leisure & Env	Cell: 0888 390826 Email: mchachagerald@gmail	
12/06/23	Bumisani Mbekeani	Land Survey Services Officer	Cell: 0888856275 Email: bmbekeani@yahoo.com	
12/06/23	Lickson Nyirenda	Social Welfare Officer	Cell: 0999375038 Email: licksonnyirenda@gmail.com	
12/06/2023	Elizabeth Bandawe	Social Welfare Assistant	Cell: 0884120602 Email: bandaweeliza@gmail.com	
12/06/2023	Ellen Chisi	District Youth Intern	Cell: 0882119076 Email: ellenchisic@gmail.com	
12/06/2023	Tuyenge Chimphonda	District Youth Intern	Cell: 0997015826 Email: chimphondatuyenge@gmail.com	

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED CONSTRUCTION OF AN ENTREPRENEURS TRAINING AND INCUBATION CENTRE (ETIC) AT MZUZU UNIVERSITY; UNDER SAVE PROJECT

STAKEHOLDER CONSUTATION REGISTER

PLACE: Mzuzu city Council / Luwinga See school

DATE	Name	Position	Contacts	Signature
12/06/23	Veronica Linyama	District Labour officer	Cell: 0999 391 224 Email: Verondovi@gmail.com	VML
12/06/23	Precious Mandala	AG Director of Engineering Services	Cell: 0998717779 Email: Premandala@gmail.com	
12/06/23	Lobbo P.C. Tembo	PRINCIPAL EDUCATION ADVISOR (PQAO)	Cell: 0885910938/0994310938 Email: tembolac@gmail.com	
12/06/23	Arnold Ben	Regional occupational safety & health officer	Cell: 0995622674 Email: arnold.ben@labour.gov.mw	
13/06/23	Madalitso Kanyangwa	Deputy H/Teacher St Augustine Sch	Cell: 0885512752/0996431363 Email:	
13/06/23	STANLEY SILAWESE	D/Head teacher II Luwinga Sec Sch	Cell: 0888310317/0991010583 Email: chisasikwesa@yahoo.com	

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED CONSTRUCTION OF AN ENTREPRENEURS TRAINING AND INCUBATION CENTRE (ETIC) AT MZUZU UNIVERSITY; UNDER SAVE PROJECT

STAKEHODER CONSUTATION REGISTER

PLACE: Northern Region water board, Plan Malawi, UNIVERSITY, St Augustin catholic church, Mzuzu Foundation

	DATE	Name	Position	Contacts	Signature
	13/06/2023	HOUDINI LIPANDE	NORTHERN REGION WATER BOARD Customer Service Ass.	Cell: 0999788370 Email: HLIPANDE@NRWB.ORG.MW	
Plan Malawi	13/6/2023	Emmanuel Mkumba	Sponsorship Communication Coordinator	Cell: 0999626862 Email: Emmanuel.mkumba@planinternational.org	
Unguwevu	13/06/23	Andie Mtambo	Finance & Administration Officer	Cell: 0881621105 Email: andiemambo.mt@gmail.com	
Unguwevu	13/06/23	Anna Maluda	finance and administration officer	Cell: 0888173295 Email: annamaluda66@gmail.com	
St Augustine	13/06/23	Sam Hara	Catechist	Cell: 0884983944 Email: Samuelhara99@gmail.com	
MZ foundation	13/06/23	JOYCE MPHANDE	Head teacher	Cell: 0886267030 Email:	
MZ foundation	13/06/23	Mercy S. Chimaliro	Second Deputy Head Teacher	0993232042 Chimaliromercy1985@gmail.com	

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED CONSTRUCTION OF AN ENTREPRENEURS TRAINING AND INCUBATION CENTRE (ETIC) AT MZUZU UNIVERSITY; UNDER SAVE PROJECT

STAKEHODER CONSUTATION REGISTER

PLACE: MMBELWA DC

DATE	Name	Position /INSTITUTION	Contacts	Signature
14/06/23	Angella Daka	NOYD Field officer	Cell: 0992646996 Email: angelladaka29@gmail.com	
14/06/23	LUSUNGU CHUMBIA	NOYD FIELD OFFICER	Cell: 0991955955 Email: lusunguchumia@gmail.com	
14/06/23	Duncan Chapenda	MMBELWA DC ADLO	Cell: 0882934593 Email: duncanchapenda@gmail.com	
14/06/23	Euclid Tembo	MBELWA DC EDO Intern	Cell: 0995474997 Email: tembeuclid@gmail.com	
			Cell: Email:	
			Cell: Email:	

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED CONSTRUCTION OF AN ENTREPRENEURS TRAINING AND INCUBATION CENTRE (ETIC) AT MZUZU UNIVERSITY; UNDER SAVE PROJECT

STAKEHOLDER CONSUTATION REGISTER

PLACE: MZUZU UNIVERSITY

DATE	Name	Position	Contacts	Signature
12/06/2023	Samba Kambalame	Projects & Estates Manager	Cell: 0999786368 Email: Kambalame.s@mzuni.ac.mw	
12/06/2023	FRANCIS KAMANGADAZI	HOD – FORESTRY	Cell: 0999679115 Email: fkamangadazi@gmail.com	
12/06/23	Twalibu Tandwe	Lecturer Biological Sciences	Cell: 0881787119 Email: ttandwe@yahoo.co.uk	
12/06/23	Eric Gowero	Staff Biological Sciences	Cell: 0882925154 Email: Ericgowero@gmail.com	
12/06/23	Paelalo Moyo	Lab. Technician, Biological sciences	Cell: 0999732944 Email: paelalomoyo96@gmail.com	
12/6/23	TWALIBU TANDWE JAR	Biological Sciences	Cell: 0881506036 / 0996755000 Email: twalibutandwe@gmail.com	
12/06/23	Christopher Mwenegambi	Senior Chief Technician	cmwenegambi1908@gmail.com	
12/6/23	Elvis N. Manda	Senior Lab. Asst	mandaelvis87@gmail.com 0995480037.	

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED CONSTRUCTION OF AN ENTREPRENEURS TRAINING AND INCUBATION CENTRE (ETIC) AT MZUZU UNIVERSITY; UNDER SAVE PROJECT

STAKEHODER CONSUTATION REGISTER

PLACE: Mzuzu University

DATE	Name	Position	Contacts	Signature
12/06/23	Rhoda Msosa	Lab technician Biological Sciences	Cell: 0992674882 Email: rhomsosa3@gmail.com	
12/06/23	Christina Mzumara	Lab technician Biological Sciences	Cell: 0884242501 Email: mzumarachristina@gmail.com	
12/06/23	RASHID CHIPOSA	chemeta Chief Technician	Cell: 0997783036 Email: crashid69@yahoo.com	
12/06/23	Faith M. Kachale	~~faithkachale~~ Student	Cell: 0881159509 Email: faithkachale@gmail.com	
12/06/23	cathy MSUSKA	Student	Cell: 0994409825 Email: cathymsuska10.gmail	C.M
12/06/23	Shackierah Duncan	student	Cell: 0990234792 Email: Shackierahduncan@gmail.com	
12/6/23	Tione Siyame	Nurse Midwife Technician / Psychosocial Counselor	teotiky@gmail.com	

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED CONSTRUCTION OF AN ENTREPRENEURS TRAINING AND INCUBATION CENTRE (ETIC) AT MZUZU UNIVERSITY; UNDER SAVE PROJECT

STAKEHOLDER CONSULTATION REGISTER

PLACE: Mzuzu University

DATE	Name	Position	Contacts	Signature
12/06/23	Tamandani Tovamu	Student	Cell: 0999998759 Email: akuakejovamu@gmail.com	
12/06/23	COSMAS DESOUZA	Student	Cell: 0883455623 Email: Cosmasdesouza5@gmail.com	
12/06/23	Daniel C.M. Msosa-Ta	Student	Cell: +265888928994 Email: dannydstranger@gmail.com	
11	MPhatso Kaluwi	Student	Cell: 0882712802 Email: kaluwi2153@gmail.com	
11	Aubrey Gondwe	Student	Cell: 0886556601 Email: aubreygondwe63@gmail	
11	Andrew Chimuzga	Student	Cell: 0822 42178 Email: Chimuzgaandrew45@gmail.com	
11	GRUNO MYOLA	CHIEF TECHNICIAN PHYSICS	myola.g@mzuni.ac.mw	

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED CONSTRUCTION OF AN ENTREPRENEURS TRAINING AND INCUBATION CENTRE (ETIC) AT MZUZU UNIVERSITY; UNDER SAVE PROJECT

STAKEHODER CONSUTATION REGISTER

PLACE: MZUZU UNIVERSITY

DATE	Name	Position	Contacts	Signature
12/06/23	Mayamiko Mbewe	Student	Cell: 0994387852 Email: mayo26mbewe@gmail.com	
12/06/2023	Stella Kenani	Student	Cell: 0991723004 Email: Kenanistella433@gmail.com	
12/06/23	Emmanuel Kazembe	Student	Cell: 0994277623 Email: manuelkazembe1229@gmail.com	
12/06/23	Jimmy Kanyiks	Student	Cell: 0888079120 Email: jimmykanyiks@gmail.com	
12/06/23	LAPIKEN S. NJOWE	STUDENT	Cell: 0881255611 Email: lapikennjowe@gmail	
12/06/23	George Mwanachaung	Student	Cell: 0999 023 487 Email: georgethomsanmwana@gmail.com	
12/6/23	Almafe Odala Chilinda	DMT	afeodala@live.com	

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED CONSTRUCTION OF AN ENTREPRENEURS TRAINING AND INCUBATION CENTRE (ETIC) AT MZUZU UNIVERSITY; UNDER SAVE PROJECT

STAKEHODER CONSUTATION REGISTER

PLACE: Mzuzu University

DATE	Name	Position	Contacts	Signature
12/06/2023	ALFRED BALUWA	STUDENT	Cell: 0883276284 Email: baluwaalfred@gmail.com	
12/06/203	Yoby Maliano	STUDENT	Cell: 0889635461 Email: YobyMaliano@gmail.com	
12/66/23	Thokozani Mwamphamba	Student	Cell: 0884836721 Email: Mwamphambakani kan@gmail.com	
12/06/23	Yoram Mapheya	Student	Cell: 0887914007 Email: yoramumapheya@gmail.com	
12/06/23	Henrich Mbalati	Student	Cell: 0889569336 Email: henrymbalati@gmail	
12/06/23	Howard Nkhoma	Student	Cell: 0888099247 Email: howardnkhoma24@gmail	
12/06/22	MPHATSO MAONGA	STUDENT	0994625805 mphatsomaonga9@gmail.com	

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED CONSTRUCTION OF AN ENTREPRENEURS TRAINING AND INCUBATION CENTRE (ETIC) AT MZUZU UNIVERSITY; UNDER SAVE PROJECT

STAKEHODER CONSUTATION REGISTER

PLACE: MZUZU UNIVERSITY

DATE	Name	Position	Contacts	Signature
13/06/23	T.K. CHIMPHAKO	Security Officer	Cell: 0992917972	
			Email: chimphakot@gmail.com	
13/04/23	T. MPHANDE	SENIOR SECURITY LIAISON OFFICER	Cell: 0999 335 155	
			Email: thomasmphande@gmail.com	
			Cell:	
			Email:	
			Cell:	
			Email:	
			Cell:	
			Email:	
			Cell:	
			Email:	

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED CONSTRUCTION OF AN ENTREPRENEURS TRAINING AND INCUBATION CENTRE (ETIC) AT MZUZU UNIVERSITY; UNDER SAVE PROJECT

COMMUNITY CONSULTATION REGISTER

District: Mzimba **Date:** 13 June 2022

Place of Meeting: _____ **GVH:** Mwangasinsi **T/A** Mtwalo

No.	Name LEONARD SINGINI	Position	Phone Number	Signature
1.	LEONARD SINGINI	GVH	0888566355	
2.				
3.				
4.				
5.				
6.				
7.				
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11.				
12.				
13.				

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED CONSTRUCTION OF AN ENTREPRENEURS TRAINING AND INCUBATION CENTRE (ETIC) AT MZUZU UNIVERSITY; UNDER SAVE PROJECT

COMMUNITY CONSULTATION REGISTER

Date: 13/06/2023

District: MZIMBA

Place of Meeting: W KUPASO **GVH:** KWAYIHEB SIHGANI **T/A** MTWALO

No.	Name	Position	Phone Number	Signature
1.	David Singini	VDC Chair	0980785359/0882031335	
2.	Tamess Ngwira	Member	0992451155/0981801319	
3.	Getrude Chathura	Member	0995993660/0888610122	G. Chathura
4.	Kondwani Sheba	Secretary	0999200496	K. Sheba
5.	Ella Singini	Member	—	E. Singini
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				

APPENDIX 5: ESS SCREENING FORM

Environmental and Social Screening Form for Screening of Potential Environmental and Social Impacts of SAVE activities

Government of the Republic of Malawi

Ministry of Education, Science and Technology

Skills for a Vibrant Economy (SAVE) Project

Environmental & Social Screening Form

Guidelines: Site inspection of project site. The evaluation results to be a consensus of at least three officials.

Project Name: Entrepreneurs Training & Incubation Centre (ETIC)	
Project Location: MUZU University	District.: Mzimba
Name & Signature of Evaluator: L. Mabumba, S. Kamkwalame, M. Theu, Dennis Phiri	Nature/Size Flat
	Date of Field Evaluation 15th Aug 2022

		Appraisal	Stage of EHS potential impact/risk/issue		Significance	Potential Mitigation Measures
		Yes / No	Construction	Operation	Low, medium, high	
1.0	Environmental Screening					
	Will the project generate the following impacts					
1.1	Loss of trees/ vegetation/ biodiversity	Yes	Yes	NO	Low	Plant trees (100) relocate trees
1.2	Soil erosion/siltation in the area	Yes	Yes	NO	Low	Landscaping
1.3	Pollution to land- diesel ,oils	Yes	Yes	No	Low	Solar and hydro-energy sensitization
1.4	Dust emissions and increased particulate matter	Yes	Yes	No	Low	Water spraying
1.5	Solid waste generation	Yes	Yes	Yes	Low	PPE, sensitization PPE waste disposal e.g Dustbin
1.6	Liquid wastes and waste water generation	Yes	Yes	Yes	Low	waste water facilities PPE
1.7	Introduction of hazardous chemicals and wastes	Yes	Yes	NO	Low	PPE for cement, sensitization

Project location Northings 8737309 N (UTM)
Easting 608695 E

11.42196° S
33.9954° E

ZONE 36L

Screening participants

1.	James	Pelani	Environment Officer	0999768395
2.	MATNESS	THEU	Environment intern	0995128085
3.	Dennis	Phiri	Gender Officer	0884447539
4.	LUSAYO	MWABUMBA	Assoc Prof.	0880809035
5.	Elisha	Ngulube	Senior Lecturer	0882950183
6.	Dalo	Njera	Senior Lecturer	0999266612
7.	Samba	Kambalame	Projects & Estates Manager	0999286368
8	Jeremiah	Kafakoma	ICT	0999623334

1.8	Borrow pits and pools of stagnant water	NO	No	No	N/A	
1.9	Rubble/heaps of excavated soils	Yes	Yes	NO	Low	PPE, Landscaping (reuse of rubbles/heaps
1.10	Invasive tree species	NO	NO	NO	NO	
1.11	Long term depletion of water	NO	NO	NO	NO	
1.12	Reduced flow of water sources	NO	NO	NO	NO	
1.13	Nuisance from noise and vibrations	Yes	Yes	NO	Low	PPE
1.14	Loss of soil fertility	Yes	Yes	NO	Low	Landscaping, Plant trees
1.15	Incidence of flooding	NO	NO	NO	NO	
1.16	Increased Energy use	Yes	Yes	Yes	Medium	Solar + hydro energy
1.17	Increased demand and/or portable water use	Yes	Yes	Yes	Low	Efficient use of water, Sensitization
1.18	Increase emergence of man-made and natural disasters e.g. fires etc.	Yes	Yes	Yes	Low	Sensitization Meeting PPEs
2.0	Cultural, Social and Economic Screening					
	Will the project generate the following negative social and economic impacts?					
2.1	Loss of land to households	NO	NO	NO	NO	
2.2	Loss of properties – houses, structures	NO	NO	NO	NO	
2.3	Loss trees, fruit trees by households	NO	NO	NO	NO	
2.4	Loss of crops by people	NO	NO	NO	NO	
2.5	Loss of access to river/forests/grazing area	NO	NO	NO	NO	
2.6	Impact cultural site, graveyard land	NO	NO	NO	NO	
2.7	Conflicts over use of local water resources	NO	NO	NO	NO	
2.8	Disruption of important pathways, roads	NO	NO	NO	NO	
2.9	Loss communal facilities –churches	NO	NO	NO	NO	
2.10	Loss of livelihood system	NO	NO	NO	NO	
2.11	Blockages to footpath/roads	NO	NO	NO	NO	

2.12	Bring resettlement issues	No	No	No	No	
2.13	Spread of HIV/AIDS and other STIs	Yes	Yes	Yes	Low	Sensitization, Condoms, Sexual reproductive health
2.14	Spread of Covid-19	Yes	Yes	Yes	Low	PPE & Covid measures
2.15	Occupational safety and health issues	Yes	Yes	Yes	Low	PPEs, employ qualified personel
2.16	Increase exposure of Hazardous chemicals and wastes	Yes	Yes	No	Low	PPE, Sensitization, qualified personel
2.17	Safety issues with respect to poor building designs	Yes	Yes	No	Low	Employ qualified Engineers
2.18	Exclude other users especially disabled and vulnerable with respect to poor building designs	Yes	Yes	No	Low	Include facilities for the disabled & vulnerable persons
2.19	Increased GBV and SEA	Yes	Yes	Yes	Low	Sensitization, General & Redress Mechanism
2.20	Increased violence against children	Yes	Yes	No	Low	Sensitization, avoid employing underaged (below) 18yrs

Overall evaluation of Screening Exercises.

The results of the screening process would be either the proposed sub - projects would be exempted or subjected to further environmental and resettlement assessments. The basis of these options is listed in the table below:

Review of Environmental Screening	Tick	Review of Social and Economic Screening	Tick
1. The project is cleared. No serious impacts. (When all scores are "No" in form)), though the bids/contracts still would have standard EHS clauses		1.The project is cleared. No serious social and economic impacts, (Where scores are all "No", "few" in form) though the bids/contracts still would have standard clauses on addressing emerging social and economic issues	✓
2. There is need for further assessment -ESMP or ESIA (when some score are "Yes, High" in form), as determined by MEPA	✓	2.There is need for resettlement/ compensation. (When some score are "Yes, High" in form) including need for ESMP or ESIA as determined by MEPA	
Approval by Environmental officer/		**Approval by Director of Planning and Development**	
Name: James Pelani		Name:	
Signature Date 15th Aug 2022		Signature Walter Chilewe Date 15 AUG 2022	

NOTES:

1. The DPD shall ensure that a completed form is filed within project file immediately after endorsement. Environmental Officer may keep a duplicate.
2. Project Management Committee will maintain a copy of completed form
3. It is the duty of Director of Planning and Development and Environmental Officer to ensure mitigation measures outlined in form are implemented.
4. An Environmental Officer shall prepare a monthly monitoring report on implementation of mitigation measures.
5. The mitigation measures shall be sourced from expert knowledge, stakeholder consultations, EHS guidelines etc.
6. The bids/contracts still would have standard EHS clauses
7. The screening form will be updated prior to use, to reflect a more final set of EHS potential impacts/risks/issues

APPENDIX 6: ESIA EXPERT

Name	Proposed Position and Qualification	Key Role	Experience
Kent Kafatia, Snr R. Eng.	● MSc. in Water and Waste Engineering ● BSc. in Chemical Engineering (Environmental) ● BSc. in Environmental Science & Forestry ● BSc. in Forestry ● PGD. in Integrated Environment and Water Management.	Senior ESIA Expert	36 years ESIA Experience

APPENDIX 7: CHILD PROTECTION PLAN

The safety of the children in the surrounding community is paramount. The objective of this procedure is thus to ensure that all construction works are done safely, safeguarding the lives of the children. This Plan provides simple steps for safeguarding children for the duration of the project. It is the responsibility of all construction personnel to ensure that the guidelines stipulated in this plan are adhered to during the construction phase:

a) The Contractor will ensure that no persons under the age of 18 are employed on the project (child labour in any form will not be condoned, be it at the work site or campsite).
b) All employees will have a current clean criminal background check for offences against children to the extent permitted by law, and this will be extended to sub-contractors.
c) Child trafficking safeguarding obligations will be clearly communicated to, and acknowledged by all employees and will be extended in identical form to any subcontractors.
d) It is strictly forbidden for Employees of this project to engage in sexual relations with a minor. According to the laws of Malawi, a minor is classified as 18 years and below. Such an act will entail immediate dismissal as well as reporting to the Malawi Police Service.
e) Child trafficking warning signs and messages will be posted to raise awareness among the employees, children and the community on the dangers of child trafficking.
f) No construction employees will be engaged in deceiving, coercing and manipulating the locals into child trafficking, where they are found, they shall be dismissed immediately and reported to the police.
g) The contractor will work with law enforcement officers and service providers to identify and report child trafficking and child sexual exploitation in the community.
h) The contractors will ensure that the rights of the children will be protected from any acts or environment, which abuse their rights through the GRM and codes of conduct.
i) The contractor shall ensure that no trafficked persons will be employed in connection with the project.
j) All construction team members will go through safety induction prior to the commencement of works. Child safety is of paramount importance and this will be part of the initial induction.
k) Traffic control plans highlighting specific routes to be used by construction and delivery vehicles and equipment will be prepared; which will take into consideration the safest routes to each site.
l) The basic principle used to determine these routes will be to ensure, wherever possible, that access routes are set out to minimise driving in areas where children frequently play such as soccer fields and schools.
m) All equipment operators will be informed to always be aware that there may be children in the vicinity of their operations and to exercise caution when driving and operating equipment.
n) Flag persons will be posted on areas where delivery and construction vehicles and construction equipment cross or enter public roads used by the general public and children. These flag persons will not only direct delivery and construction vehicles and construction equipment; they will also alert drivers and operators of children crossing or moving along the roads.
o) Construction warning signs will be posted to notify children of the construction activities.
p) Any pedestrian routes, which are used by children that pass through the construction sites will also be barricaded off for the children's safety. The barricades around the construction sites will always be maintained in a good state so that they will always be visible any time.

q) The construction area will be strictly off-limits to all children so that they will not be exposed to any construction hazards.

APPENDIX 8: WASTE MANAGEMENT PLAN

1. INTRODUCTION

The Waste Management Plan (WMP) addresses management of all solid and wastewater, including hazardous and non-hazardous waste, produced as a result of project activities within Mzuzu University Campus.

The WMP covers the construction and operational phases. This plan constitutes the draft which will require amendment and updating during construction and operation phases of the Project.

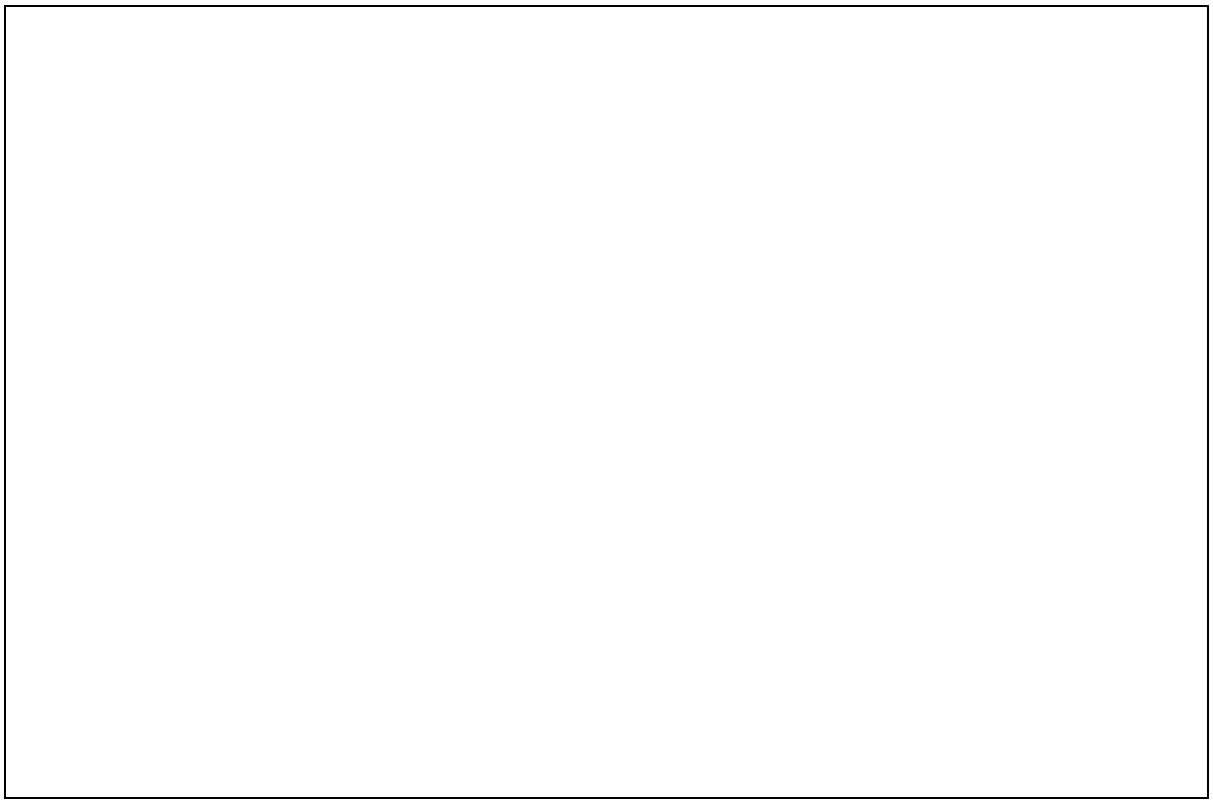
2. PURPOSE

The WMP aims to provide guidelines on waste reduction, segregation, collection and disposal practices in accordance with international best practices, to avoid deterioration of the natural environment and negative impacts on the health and safety of communities in the Project Area.

The Project is committed to apply the waste hierarchy and will seek to be a zero-waste discharge facility. This plan is the primary tool to guide employees towards waste management.

3. WASTE MANAGEMENT OPTIONS - WASTE HIERARCHY

The waste hierarchy presents waste management stages commencing with the most preferable option to the least preferable option. Waste prevention is the most preferred option of prevention, followed by reuse, recycling, recovery and is safe disposal as the last option (Figure 1).



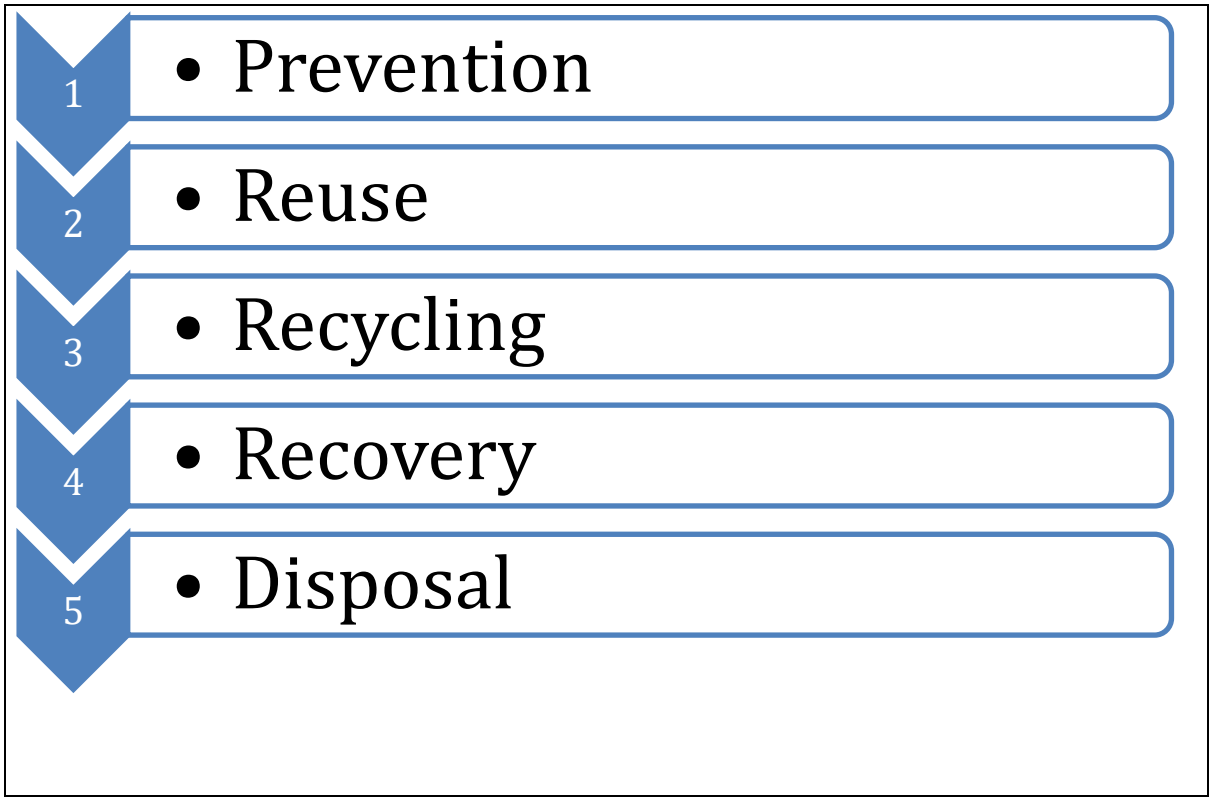


Figure 1: ***Waste Management Hierarchy***

These stages are described in more detail below:

A. Prevention

Waste Generators should ensure there is minimal wastage. This could be achieved through reduction of construction mistakes, ordering the right quantities of materials, getting the right-size materials for the job, proper storage of materials, trying out new building methods and choosing building products with minimal packaging.

Waste Generators should be committed to avoiding the generation of waste and not using hazardous materials. Where the use of hazardous materials is unavoidable, efforts should be made to identify replacement materials that are non-hazardous.

B. Re-use

Waste Generators should be required to prepare a maintenance management plan which seeks to ensure that all equipment is regularly checked and maintained and refurbished or repaired. In addition, Waste Generators should seek to sell and buy used items, donating them for free or exchanging them.

C. Recycling

Waste Generators should seek to turn waste into a new substance or product, such as composting of organic wastes to a standard that meets quality controls. This compost could be sold or given to farming communities around the construction and operations sites to facilitate improvements in soil conditions and hence their production levels.

D. Recovery

Recovery of waste is usually most successful when done in bulk. Therefore, a centralised recovery facility is preferable. The common forms of recovery include composting, anaerobic digestion, incineration with energy recovery, gasification and pyrolysis which produce energy (fuels, heat and power) and materials from waste. It is recommended that composting should be considered for organic solid waste and sludge that will be generated at Mzuzu University.

E. Disposal

Disposal is deemed the last resort and must occur in an environmentally responsible manner. Disposal results in waste going to landfill or to incineration without energy recovery and is the least preferred environmental option. However, when wastes must go for disposal, this must occur at a suitably designed sanitary waste disposal site.

4. WASTE CATEGORIES GENERATED IN THE PROJECT

Solid waste generation in the at Mzuzu University during project life cycle will generally include domestic waste, commercial waste, construction and demolition debris, sanitation residue and waste water. These wastes will be in solid or semi-solid form and will potentially include very low quantities of industrial hazardous wastes and bio-medical waste. All industrial hazardous waste and biomedical waste must be disposed of properly by the respective industries and cannot be included in the general waste management system. The main waste categories anticipated are:

- ✓ Biodegradable waste (food and kitchen waste, green waste such as vegetables, leaves and fruits; and sludge)
- ✓ Recyclable material (paper, glass, bottles, cans, metals, certain plastics, etc.); and
- ✓ Inert waste (construction and demolition waste, dirt, rocks, street sweeping, drain silt, debris, etc.)

The sources of waste and waste generators and the anticipated content of the solid waste generated are presented in table 1 below.

Table 1: Sources of waste, waste generators and content

Source	**Typical waste generators**	**Solid waste content**
Domestic	Dwelling units	Food wastes, paper, cardboard, plastics, textiles, leather, yard wastes, wood, glass, metals, consumer electronics, batteries, limited household hazardous wastes and sewage waste.

Source	Typical waste generators	Solid waste content
Commercial and Institutional	Stores, lecture rooms, cafeteria, market, office buildings	Paper, cardboard, plastics, wood, food wastes, glass, metals, special wastes, hazardous wastes
Construction and demolition	New construction sites, road repair, renovation sites, demolition of building structures	Wood, steel, concrete, rubble, dirt etc.
Waste water	Water and waste water treatment plants	Drain silt, landscape and tree trimmings, general wastes and sludge.

5. WASTE TREATMENT OPTIONS

The primary options for the treatment of solid waste include, in order of environmental benefit:

- ✓ Anaerobic Digestion;
- ✓ Composting (windrow, aerated static pile, in-vessel and vermi-composting);
- ✓ Incineration with or without energy recovery;
- ✓ Pyrolysis and gasification;
- ✓ Plasma pyrolysis and palletisation; and
- ✓ Reuse Derived Fuel (RDF) for mixture waste.

Since the nature of waste envisaged is mainly organic, bioconversion methodologies are considered the preferred technology.

6. EXISTING AND PROPOSED WASTE MANAGEMENT INFRASTRUCTURE IN AT MZUNI

There are organized waste management systems such as collection, transport and disposal. The university has both solid and wastewater collection and disposal facilities. Solid waste disposed is stored in Waste Collection Bin that are placed in strategic places at the campus and then legally dumped at Msilo Dumpsite. Waste collected services is provided by Mzuzu City Council. The sewage for ETIC will be channelled to a dedicated Septic Tank.

7. SOLID WASTE MANAGEMENT IN THE PROJECT AREAS

All Waste Generators within Project Areas will be required to segregate waste at source to ensure the value of the wastes are optimised through recovery, reuse and recycling. By providing an enabling environment the success rate of correct waste practices being implemented are increased. Segregation should be by generators and into three main waste streams:

- ✓ Wet (biodegradable);
- ✓ Dry (plastic, paper, metal and wood); and
- ✓ Domestic hazardous wastes (diapers, napkins, empty containers of cleaning agents, mosquito repellents etc.).

Collection of the segregated waste is to be undertaken by an authorised waste collector. As a minimum wet and dry wastes should be segregated (2-bin system) by the waste generators

Construction and demolition waste should be stored separately. Opportunities to repurpose this waste as secondary aggregate to the construction industry should be investigated to ensure this waste is either utilised in the Project Sites or is sold as a product to the construction industry. No construction or demolition waste should be disposed of to landfill. No hazardous wastes shall be permitted to be disposed of outside the boundary of the Project Sites unless being transported to a sanitary landfill. The District Council must place the responsibility of safe disposal of hazardous waste on the generator. It will be the generators responsibility to ensure that the waste collector which will be transporting the waste for disposal is licenced to do so. In addition, the Generator will need to provide evidence in writing from the receiving disposal site of its capacity to recycle or dispose of the waste in an environmentally sound manner. Proof of safe disposal should be provided to the Mzuzu City Council, such as a waste disposal ticket issued and date stamped by the sanitary landfill. This waste stream is anticipated to be small, limited to cleaning materials and small quantities of bio-medical waste since most of the processing to be undertaken on site is for the water supply and waste management and therefore hazardous process materials should be limited.

During the operation phase, this waste will be taken directly to the treatment sites. Primary collection of solid waste will occur using segregated bins or containers which will be placed on the streets for collection. This waste will be taken to a solid waste intermediate storage facility. The use of an intermediate site allows for the optimisation of transport devices and manpower which in addition allows for timely collection of waste from source and onward treatment. Secondary transportation occurs from the storage area to the landfill site. The dry waste such as paper and plastic and cardboard and glass are to be recycled.

Waste collection from generators within the university campus will need to occur on a daily basis in order to prevent garbage containers overflowing and waste littering the streets. To maintain a hygienic environment regular waste clearance is required.

8. PERFORMANCE MONITORING

Site inspections must be performed on regular basis by a qualified personnel from the University. Inspections will ensure that all commitments in this Waste Management Plans are being enforced and that specific waste management elements are verified.

8.1. Data Collection

Implementation of the waste hierarchy principles requires that destinations and quantities of residual matter are monitored. A register of waste material should be maintained to ensure the measurement of eliminated waste and of residual matter sent for reuse, recycling and reclamation.

8.2. Waste Audit

After a year of operation, a waste audit should be performed, on all waste data collected, to identify waste streams and fate and develop ways to reduce waste production.

9. PERFORMANCE INDICATORS

Measurement is an important tool in improving performance, and performance indicators will help Mzuzu University define and measure progress towards its goals. The results reflect current conditions and allow orientation and coordination of further actions towards sustainability.

9.1. Environmental Audit Results

Environmental auditing is a key process in the implementation of the Environmental and Social Management Plan (ESMP), of which the WMP forms a part. The findings of each audit should be registered in a database, where corrective and/or preventive actions are prescribed, responsibilities assigned to people, deadlines established and necessary resources mobilised. In compliance with the procedure, audit reports should categorise findings as being either "major", "minor" or "observation". The number of findings shall be decreasing every year until the ultimate goal of zero major findings is achieved.

9.2. Percentage Waste Generated

During the operational phase, the quantities and types of waste produced should be tracked for each waste generators categories, and activities examined to identify waste reduction opportunities. Specific reduction target ratios should be determined and the rate of waste production is required to reduce annually relative to production volumes.

10. RESPONSIBILITIES

The roles and responsibilities inherent to the Waste Management Plan are presented in Table 2.

Table 2: Roles and Responsibilities

Entity	Responsibilities
Mzuzu University	- Enforce the Waste Management Plan. - Contractually obligate the Waste Generators to meet the requirements of the Waste Management Plan. - Manage the Solid Waste Management Area or appoint an appropriate contractor. - Manage the Solid Waste Treatment plant or appoint an appropriate contractor. - Manage the Wastewater Treatment plant or appoint an appropriate contractor.
Contractors	- Provide a minimum of two garbage receptacles to allow for wet and dry waste segregation. An additional bin for hazardous waste is highly recommended. - Develop a site-specific Waste Management Plan for the activities the Contractor is undertaking. - Site-specific Waste Management Plan must be aligned with the full site waste management plan and must be approved by Mzuzu University prior to work commencing. - Educate all members of staff on the waste hierarchy. - Educate all members of staff on site-specific Waste Management Plan - Education is to be provided to each staff member prior to commencement of work, and regular refresher sessions are to be undertaken in the form of toolbox talks or training sessions throughout the contract period.

11. RECORD KEEPING

Data on waste production and disposal should be gathered continually via logbooks and registers. Records should be maintained on site and made available to the authorities and any other party contracted to audit or assess the waste management practices on site. The data should include the final destination of each waste stream and where disposal has occurred proof of safe disposal will be required, such as a date stamped waste disposal ticket issued by a sanitary landfill. A cost should be paid for safe disposal of wastes. Evidence of waste disposal should also be maintained.

APPENDIX 9: OCCUPATIONAL SAFETY AND HEALTH PLAN

The contractor shall prepare a Health and Safety management plan including a Health and Safety Manual and Policy.

1. Conduct risk assessment for all construction activities and train workers accordingly.
2. All workers shall be regularly sensitised on safety regulations on the site.
3. The Contractor shall ensure the employment of skilled workers and endeavour to train all employees in health and safety management.
4. The contractor shall provide all necessary protective clothing for workers exposed to hazardous and risky work activities.
5. The contractor shall be guided by and shall adhere to the relevant national occupational health and safety regulations on the site.
6. The contractor will enable the facilitation of the Grievance Redress Mechanism (GRM) to be freely used and accessed by contractor workers and managed by the Employer.
7. The contractor shall maintain on-the-site first aid kits for male and female workers.
8. Workers shall be provided with clean potable water whilst on the site.
9. Workers shall be provided with washrooms.

Before implementation of the project, the contractor will develop an Occupation Safety and Health Plan that will comprise of the following at minimum:

Table of Content

1. **Introduction**
   Overview and purpose of the HSP; Identification of contractor team who develop the HSP; Structure and content of the HSP; and Staff identification and responsibilities.
2. **Sub-project Description**
   Description of construction works and other activities; Potential constraints on site, whether physical or natural, existing infrastructures; potential climate events, etc.; Description of the main risks by activity. Please consider summarising them in a table; and Identification of construction materials that pose safety risks to the workers and classify the risk.
3. **Legal Requirements**
   Occupational health and safety (OHS) policy and/or strategy of the Firm; Health and safety principles to adhere to in all activities; Applicable health and safety regulations and standards/guidelines; and legally required documentation and assistance for workers.
4. **Measures and Actions for Risk Prevention**
   Working procedures and instructions; Procedures for access to work sites; Procedures and personal protective equipment according to the potential risk classification; Collective protection procedures and equipment (this should include, among others, alcohol control procedures and equipment, etc.); Procedures and signalling of work sites, (including procedures and measures in case of temporary restriction of access to homes and services); Training plan for workers including procedures for induction; and Procedures for reporting and recording accidents and non-compliance.
5. **Emergency and Contingency Plan**
   Means of intervention, including equipment and human resources; Emergency communication process; Response procedures in case of fall of materials and equipment, spill of toxic substances, road accident; Fire-fighting procedures; and Procedures to assist victims.
6. **Monitoring Programmes**
   Design procedures for monitoring and inspection of compliance with health and safety

procedures.

7. **Annexes**

   The annexes shall include at least the following: PPE delivery record form; Access control form to the construction site; Workers' medical record form; Training record form; Equipment maintenance record form; Non-compliance record form; Accident record form; and Drawings showing typical images of signalling on site.

APPENDIX 10: HIV AND AIDS WORKPLACE POLICY

The contractor will prepare an HIV and AIDS Policy that will consist of the following elements;

a) Recognition of HIV and AIDS as a workplace issue: HIV and AIDS is a workplace issue and should be treated like any other serious illness/condition in the workplace.
b) Non-discrimination; workers will respect the human rights and dignity of persons infected or affected by HIV and AIDS. There should be no discrimination against workers based on real or perceived HIV status.
c) Gender equality: The gender dimensions of HIV and AIDS should be recognised. Women are more likely to become infected and are more often adversely affected by HIV and AIDS
d) Healthy work environment: The work environment should be healthy and safe, so far as is practicable, for all concerned parties, in order to prevent transmission of HIV.
e) Social dialogue: The successful implementation of an HIV and AIDS policy and programme requires cooperation and trust between employers, workers and their representatives and the government, where appropriate, with the active involvement of workers infected and affected by HIV and AIDS.
f) HIV and AIDS Screening, for purposes of exclusion from employment or work processes; and HIV and AIDS screening should not be required of job applicants or persons in employment.
g) Confidentiality: no job applicants or workers will be forced to disclose HIV-related personal information; nor should co-workers be obliged to reveal such personal information about fellow workers.
h) Continuation of employment relationship: HIV infection is not a cause for termination of employment. As with many other conditions, persons with HIV-related illnesses should be able to work for as long as they are medically fit in available and appropriate work.
i) Care, support and counselling: Solidarity, care and support should guide the response to HIV and AIDS in the world of work. All workers, including workers with HIV, are entitled to affordable health services.
j) The Contractor needs to involve government authorities in issues of HIV and AIDS.
k) Prevention through information and education: Workplace information and education programmes are essential to combat the spread of the epidemic and to foster greater tolerance for workers with HIV and AIDS.
l) Information and awareness-raising campaigns: Information programmes should, where possible, be linked to broader HIV and AIDS campaigns within the local community, sector, region or country. The programmes should be based on correct and up-to-date information about how HIV is and is not transmitted, dispel the myths surrounding HIV and AIDS, how HIV can be prevented, medical aspects of the disease, the impact of AIDS on individuals, and the possibilities for care, support and treatment.
m) Educational programmes: educational strategies should be based on consultation between employers and workers, and their representatives and, where appropriate, government and other relevant stakeholders with expertise in HIV and AIDS education, counselling and care. The methods should be as interactive and participatory as possible.
n) Gender-specific programmes: All programmes should be gender-sensitive, as well as sensitive to race and sexual orientation. This includes targeting both women and men explicitly, or addressing either women or men in separate programmes, in recognition of the different types and degrees of risk for men and women workers.
o) Linkage to health promotion programmes: educational programmes should be linked, where feasible, to health promotion programmes dealing with issues such as substance

abuse, stress and reproductive health at the workplace. Existing work councils or health and safety committees provide an entry point to HIV and AIDS awareness campaigns and educational programmes. This linkage should highlight the increased risk of infection in the use of contaminated needles in intravenous drug-injection. It should also highlight that intoxication due to alcohol and drugs could lead to behaviour that increases the risk of HIV infection.

p) Practical measures to support behavioural change: Workers should be provided with sensitive, accurate and up-to-date education about risk reduction strategies, and, where appropriate, male and female condoms should be made available.
q) Training: Training should be targeted at, and adapted to, the different groups being trained: managers, supervisors and personnel officers; workers and their representatives; trainers of trainers (both male and female); peer educators; occupational health and safety officers; and factory/labour inspectors. Innovative approaches should be sought to defray costs.
r) Testing: Testing for HIV should not be carried out at the workplace except as specified in this code. It is unnecessary and imperils the human rights and dignity of workers: test results may be revealed and misused, and the informed consent of workers may not always be fully free or based on an appreciation of all the facts and implications of testing.

Prohibition in recruitment and employment: HIV testing should not be required at the time of recruitment or as a condition of continued employment. Any routine medical testing, such as testing for fitness carried out prior to the commencement of employment or regularly for workers, should not include mandatory HIV testing.

APPENDIX 11: GENDER MANAGEMENT PLAN

Gender equality refers to the equal rights, responsibilities and opportunities of women and men and is recognised as an important component in the development work of which this project is one. Projects if not considerate of gender disparities have the potential to affect employment opportunities, safety and general benefits of one gender over the other. This project will have to include issues of inequality, prevention of gender-based violence (GBV), identify gender needs and constraints, availability and appropriateness of resources, gender capacity gaps and non-discrimination based on gender in the company's Gender Policy and Code of Conduct.
To mitigate and manage the risks of gender inequalities and gender-based violence in the project, the following general mitigation measures will have to be applied before and during the implementation of sub-components:

- Develop, implement and communicate a Gender Policy.
- Ensure the Code of conduct includes stipulations against GBV on fellow workers and government employees and the public.
- Ensure equal opportunity for men and women employed in the project.
- Develop and institute an effective Grievance Redress Mechanism for gender-related issues and sensitise the project workers as well as government employees on the same before implementation of the project.
- Increase access to well-coordinated GBV response services including medical services and counselling to GBV survivors.
- The GBV response should ensure a survivor-centred approach focusing on safety, confidentiality and respect.
- Provide separate facilities for men and women.
- Report to the Police as early as possible on serious GBV cases such as rape, sexual assault, physical violence and GBV cyber-bullying as they are criminal in nature.
- Identify gender capacity gaps and consequently build the capacity of the employees to ensure equal opportunities.
- Provide work resources that do not discriminate against one gender.

APPENDIX 12: COVID-19 RESPONSE AND MANAGEMENT PLAN

The COVID-19 pandemic has warranted projects to undertake extra measures to ensure the protection of work sites and project employees and the surrounding communities. In addition to mitigation measures provided in this document, further guidance is provided in this section to assist contractors and their employees to manage and respond to COVID-19.

COVID-19 Information

Information dissemination and training are an effective way to reduce the risk for both the company and the general public.

- The Contractor is advised to develop and provide information on good practices for preventing COVID-19 transmission, particularly observing recommendations on social distancing, and training staff to recognise the symptoms of COVID-19 and understand their required response, following suggestions provided within this document.
- There should be no discrimination against or stigmatisation of persons affected by COVID-19 or their families.
- The Contractor should identify communication channels (for example, SMS, WhatsApp and email) within the company to address workers' concerns on an ongoing basis.

Management of Sick or Potentially Sick Employees

- To prevent potentially infected staff from entering the workplace and infecting co-workers, the company should ask workers to stay away from work in cases where they exhibit any COVID-19 symptoms or have been in close contact with a confirmed COVID-19 patient during the previous 14 days.
- The company should review its human resources policies related to sick leave and consider changes, which may be temporary, to ensure that potentially sick staff do not feel pressured to attend work, thereby risking transmitting the virus to the rest of the workforce.

A short questionnaire could be used. Workers should only report to work if they answer "no" to all the questions.

The following is an example:

• Have you, in the last two weeks, been in close contact with a person who has COVID-19?

• Have you, in the last two weeks, been in a country/region with a high number of cases of COVID-19?

• Do you have a fever?

• Have you used medications such as paracetamol or aspirin to suppress fever in the last 24 hours?

• Are you coughing (even mildly)?

• Do you currently experience shortness of breath?

COVID-19 Preventive measures

i. Cough hygiene

Workers should be instructed to follow the cough etiquette outlined below to reduce these risks: Cover the mouth and nose with a tissue when coughing or sneezing and dispose of the used tissue in a waste-basket.

When no tissue is available, cough or sneeze into the upper sleeve or elbow, not into the hands. Clean hands after coughing or sneezing, preferably by thorough water-soap hand washing or using a hand sanitising gel.

ii. Social distancing

To prevent person-to-person infection, it is important to minimise direct contact as much as possible. Where people are regularly working or meeting, a safe distance of 2 metres (six feet)

between people should be observed.
The Contractor should adjust workplace design and work processes to improve social distancing.
Inform people about the hazards of close contact, including with direct co-workers, and promote alternative behaviours, such as maintaining safe distances and using alternatives for handshakes.
Consider establishing alternating workdays or adding extra shifts to reduce the total number of employees in a facility at a given time, allowing them to maintain the recommended distance from each other, while maintaining a full on-site work week.

iii. Hand sanitation

Frequent water-soap hand washing is critical in preventing infection in the workforce. WHO recommends rinsing and washing hands with soap for at least 20 seconds, rinsing again, and then using paper, such as a paper towel, when turning off the faucet.
The company should promote frequent and thorough water-soap hand washing and provide enough places for employees to wash their hands. If soap and running water are not immediately available, provide alcohol-based hand rubs containing at least 60% alcohol.

iv. Cleaning and disinfecting

To prevent the spread of the virus, the Contractors' employees should frequently – and at least daily - clean touched surfaces, instruments and equipment used in the project.

v. Health care in remote areas

Ensure, where possible, that staff have adequate access to medical consultation.
Primary health care should always be provided by qualified medical professionals in accordance with local regulations.

APPENDIX 13: DISASTER RISK MANAGEMENT PLAN

1. INTRODUCTION

Natural disasters are increasingly becoming common in Malawi, affecting education and lives. The main causes of natural disasters are attributed to climate change, environmental degradation as well as weak infrastructure. Common climate change-related disasters are floods, prolonged and heavy rainfall and cyclones. Recently in March 2023, Tropical Cyclone Freddy, which was characterised by heavy winds, prolonged and heavy rainfall and floods, affected the project area. The cyclone damaged school infrastructure; walls for several school blocks and latrines in Malawi collapsed, developed cracks and roofs were blown.

To increase the sustainability of the project, a Disaster Risk Management Plan (DRMP), has been prepared focussing on natural disasters. The plan outlines measures that should be implemented to prevent, minimise and mitigate the impacts of disasters.

2. ANTICIPATED NATURAL DISASTERS

The following are the natural disasters in the project area:

1. Tropical cyclones and storms: these are increasingly becoming common in the project area. Due to the presence of high mountains and big rivers in the area, they often create floods in areas near these geographical features.
2. Prolonged and heavy rains and floods: prolonged rains over several days, intense rainfall over a short period are becoming common, and they result in widespread and flash floods.
3. Landslides: this is the movement of rock, earth, or debris down a slope. They often occur when there are heavy and prolonged rains, tropical cyclones and storms.
4. Strong winds: They often accompany tropical cyclones and storms.
5. Earthquakes: The area is not prone to earthquakes; however, they are a possibility of occurrence.

3. THE DISASTER RISK MANAGEMENT PLAN FOR ETIC

Table A11.1 below is the proposed Disaster Risk Management Plan for Mzuzu University. It identifies the risks and impacts and outlines measures for prevention and mitigation of the risks of natural disasters.

To complement the plans, the schools with support from the Department of Disaster Management Affairs (DoDMA) should develop disaster preparedness plans, outlining actions and procedures that will be taken to prepare for, respond to, and recover from a disaster. The plan aims to minimise the loss of life and property and to ensure that education continues as much as possible during and after the disaster.

Table A11.1: Natural Disaster Risk Management Plan

SN	Disaster Risks for MZUNI	Impacts	Mitigation Measures	Schedule	Responsibility for implementation
1.	Tropical cyclones and storms	• Damage to university building and infrastructure • School closure • Injuries and fatalities • Increased cost of maintenance	• Construct structurally strong buildings. • Safe sitting - do not build a classroom under a tree, as it may collapse in case of strong winds. Build a classroom at a proper distance. • Incorporate storm engineering measures in the ETIC building e.g., reinforced roofs and walls, installation of gutters and down spouts for roof and use of reinforced concrete. • Use proper building materials	During construction phase	Ministry of Education (MoE), U Management Committee (UMC)
			• Regularly clear the school property of any debris that could become flying objects during a storm. • Plant and maintain trees around the schools. • Conduct regular awareness and sensitisation.	Throughout the operation and maintenance phase	Mzuzu University, UMC
	Prolonged rains, heavy rains and floods	• Damage to University building and infrastructure • School closure • Injuries and deaths • Increased cost of maintenance • Damage to access roads • Loss of property and equipment • Risk of contamination from bacteria and viruses • Risk of mould and mildew growth	• Construct an effective drainage system around the ETIC building and in waterways around the university. • Use waterproof paint and sealants to prevent water from seeping into the building through walls and other openings.	During construction phase	MoE, UMC
			• Install temporary flood barriers, such as sandbags or permanent barriers, to prevent flood waters from entering the buildings. • Develop and implement emergency response plans that include procedures for evacuating students and staff during floods or other disasters. • Engage the M'mbelwa District and Mzuzu City councils to support the implementation of the following: - Developing and enforcing acceptable land use;	Throughout the operation and maintenance phase	Mzuzu University, UMC

SN	Disaster Risks for MZUNI	Impacts	Mitigation Measures	Schedule	Responsibility for implementation
			- Afforestation projects in the high areas and around the schools; - Developing flood plains, dykes and other structures to control floods; - Applying soil stabilisation measures, such as planting soil-stabilising vegetation on steep slopes around the schools. ● Conduct regular awareness and sensitisation.		
2.	Landslides (mudslides)	● Structural damage to buildings, including cracking or even collapsing of walls and foundations. ● Injuries and fatalities ● Damage to access roads ● Environmental impacts such as soil erosion, loss of vegetation, and changes in water quality	● Design and construct the ETIC facilities to be landslide-resistant, with reinforced concrete walls and foundations, and other structural elements to resist landslide forces.	During construction phase	Ministry of Education (MoE), University Management Committee (UMC)
			● Conduct regular inspections and maintenance of building components and systems. ● Properly manage vegetation, including tree trimming and removal of dead or dying trees to stabilise slopes and prevent landslides. ● Implement erosion control measures, such as stormwater management systems and the installation of retaining walls and erosion control blankets. ● Develop and implement emergency response plans that include procedures for evacuating students and staff during landslides, and for accounting for all students and staff after the landslide. ● Conduct regular awareness and sensitisation.	Throughout the operation and maintenance phase	Mzuzu University, UMC
3.	Strong winds	● Roof damage including the roof being blown away. ● Weakening the structural integrity of	● Regularly carry out inspections and maintenance of buildings to identify potential issues before they become major problems. ● Implement wind engineering measures and techniques that include ring beams, installing extra	During construction phase	MoE, UMC

SN	Disaster Risks for MZUNI	Impacts	Mitigation Measures	Schedule	Responsibility for implementation
		buildings, leading to cracks, leaning, and other forms of damage ● Falling trees and debris damaging school properties ● Disruption of university activities	nails, using reinforced joints, using more binding wires for the roof frame, etc. ● Install wind shutters in the windows to reduce roof damage from high winds.		
			● Remove dead or damaged trees and debris from the grounds to reduce the risk of falling objects during high winds. ● Plant trees and other vegetation around the university to act as barriers against severe winds. ● Regularly inspect and conduct maintenance of the buildings. ● Conduct regular awareness and sensitisation.	Throughout the operation and maintenance phase	Mzuzu University, UMC
4.	Earthquakes	● Structural damage to buildings, including cracks in walls, beams, and foundations. ● Non-structural damage, such as damage to fixtures, furnishings and equipment ● School closures or disruptions	● Design and construct the ETIC building to be earthquake-resistant, with for example reinforced concrete walls and foundations. ● Regularly carry out inspections and maintenance of the building.	During construction phase	MoE, UMC
			● Secure any fixtures, furnishings and equipment to prevent them from becoming projectiles during earthquakes. ● Develop and implement emergency response plans that include procedures for evacuating students and staff during earthquakes, and for accounting for all students and staff after the earthquake. ● Conduct regular awareness and sensitisation.	Throughout the operation and maintenance phase	Mzuzu University, UMC

APPENDIX 14: EMERGENCY PREPAREDNESS PROCEDURES

An Emergency Preparedness Plan outlines measures, which should be implemented to prepare for, respond to, and recover from a disaster. These measures can help to minimise the impact of a disaster and protect lives and property. Importantly, they can help education to continue quickly after a disaster. The schools must carry out the following:

1. Create an emergency plan: This is a plan that outlines the actions to be taken in the event of a disaster. Students, staff, UMCs and other stakeholders must:
    - Identify potential hazards;
    - Create emergency contact phone numbers and put them on signage around the school and in the offices, classrooms and offices;
    - Describe how the students and staff must leave the classrooms;
    - Identify a place to meet when there are disasters;
    - Identify safe places for evacuation;
    - Procedures for evacuating the school; and
    - Conduct drills to practise the plan.

2. Create an emergency supply kit: An emergency supply kit should include basic items like food, water, a first aid kit, flash lights, and batteries. Make sure everyone at the school knows where the kit is placed and that it is easily accessible.

3. Stay informed: By keeping an eye on the local news and weather forecasts, schools can be informed about potential disasters. Importantly, the schools must familiarise themselves with and keep watch of the local early warning systems.

4. Exercise evacuation drills: The school must practise evacuation procedures to ensure that everyone is prepared for an emergency. Ensure that everyone is aware of the meeting spots and evacuation routes.

5. Create a communication strategy: Create a plan for contacting members of the families of the students at the school and the community to inform them about the disasters and emergency measures under implementation. Make sure everyone is aware of how to get in touch with one another in case of an emergency.

6. Implement the Disaster Risk Management Plan: The DRMP is essential for minimising the impact of disasters and securing the school infrastructure and property. The disaster risk management measures include reinforcing structures, securing loose objects, and trimming trees and shrubs.

The schools and stakeholders can lessen the effects of disasters and safeguard themselves and school property by implementing these emergency preparedness strategies.

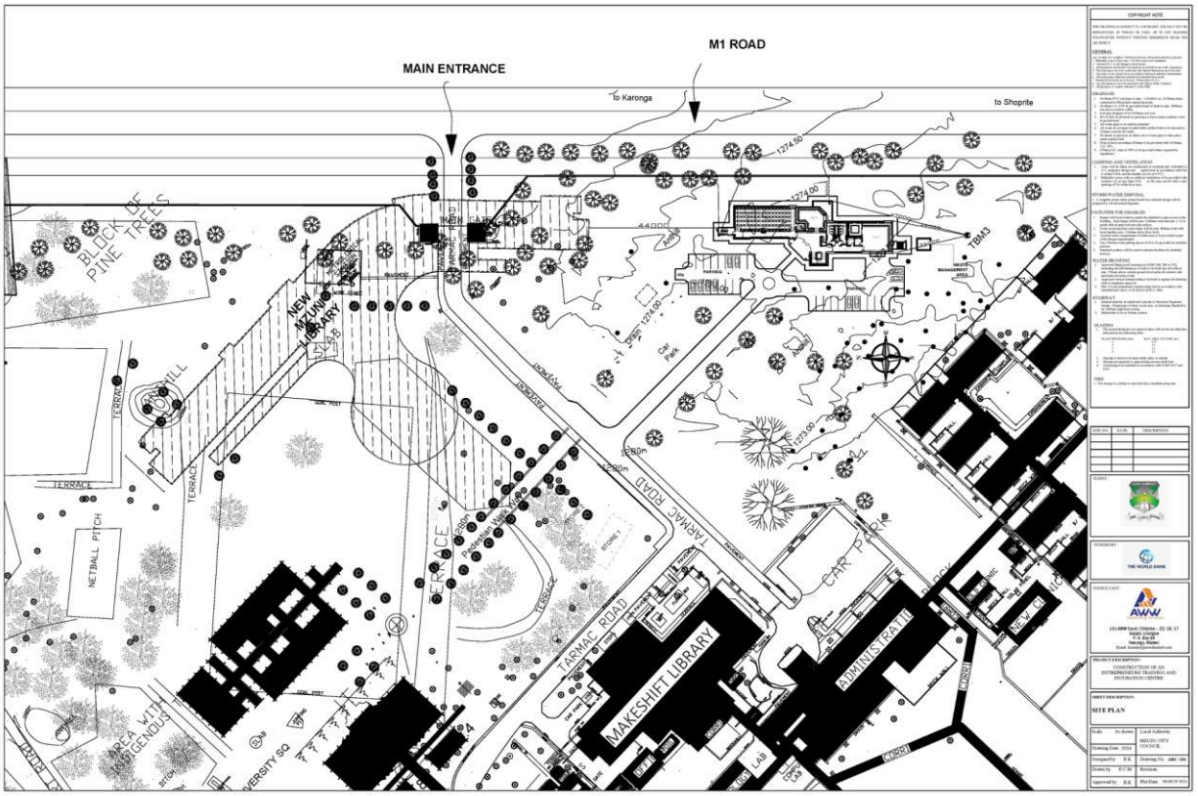
APPENDIX 15: CHANCE FINDING PROCEDURES

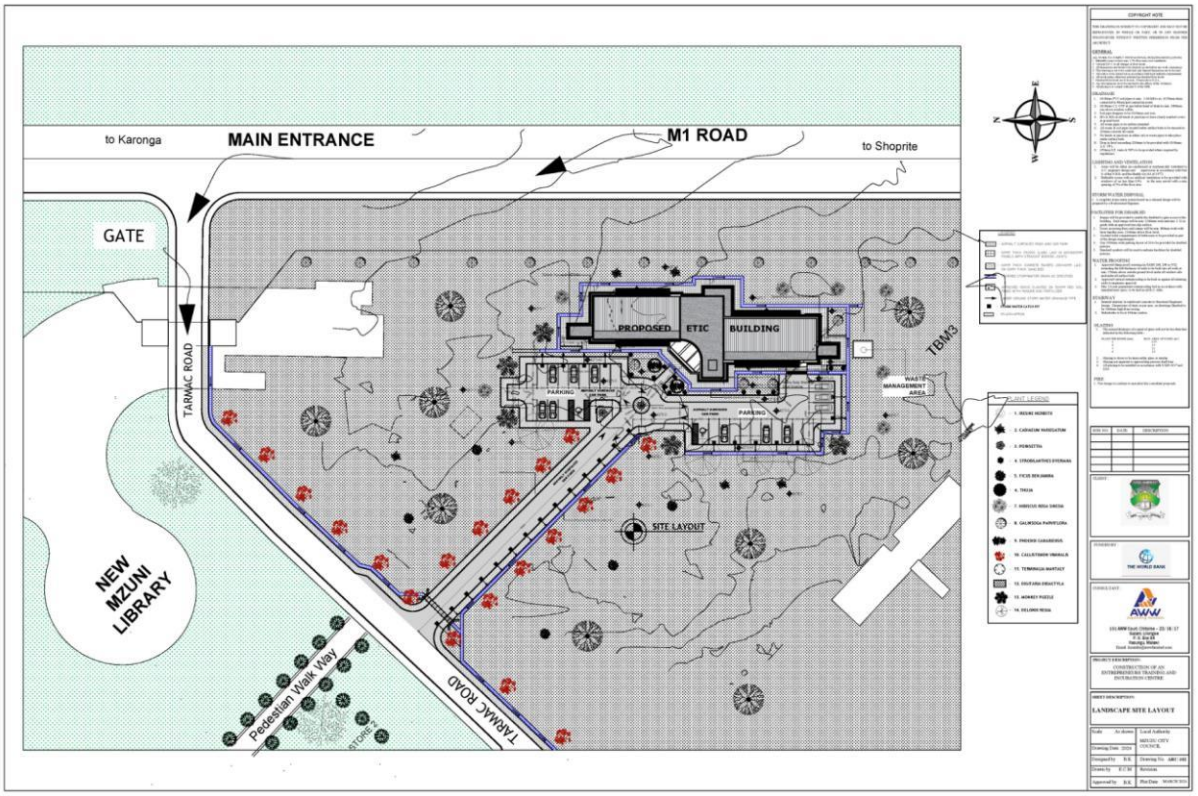
If the Contractor discovers archaeological sites, historical sites, remains and objects, including graveyards and/or individual graves during excavation or construction, the Contractor shall do the following:	
Step 1	Stop the construction activities in the area of the chance find;
Step 2	Delineate the discovered site or area;
Step 3	Secure the site to prevent any damage or loss of removable objects. In cases of removable antiquities or sensitive remains, a night guard shall be arranged until the responsible local authorities or the Department of Antiquities take over;
Step 4	Notify the Clerks of works who in turn will notify the Project Implementation Unit (PIU). The PIU will notify the Director of the Department of Culture immediately (within 24 hours or less);
Step 5	Responsible local authorities and the Malawi Department of Culture would then be in charge of protecting and preserving the site before deciding on subsequent appropriate procedures. This would require a preliminary evaluation of the findings to be performed by the archaeologists of the Department of Culture. The significance and importance of the findings should be assessed according to the various criteria relevant to cultural heritage, namely the aesthetic, historical, scientific or research, social and economic values
Step 6	Decisions on how to handle the finding shall be taken by the Director of the Department of Culture. This could include changes in the layout (such as when finding irremovable remains of cultural or archaeological importance) conservation, preservation, restoration and salvage.
Step 7	Implementation of the authority decision concerning the management of the finding shall be communicated in writing by relevant local authorities.
Step 8	Construction work may resume only after the Director of the Department of Culture concerning the safeguarding of the heritage gives permission.

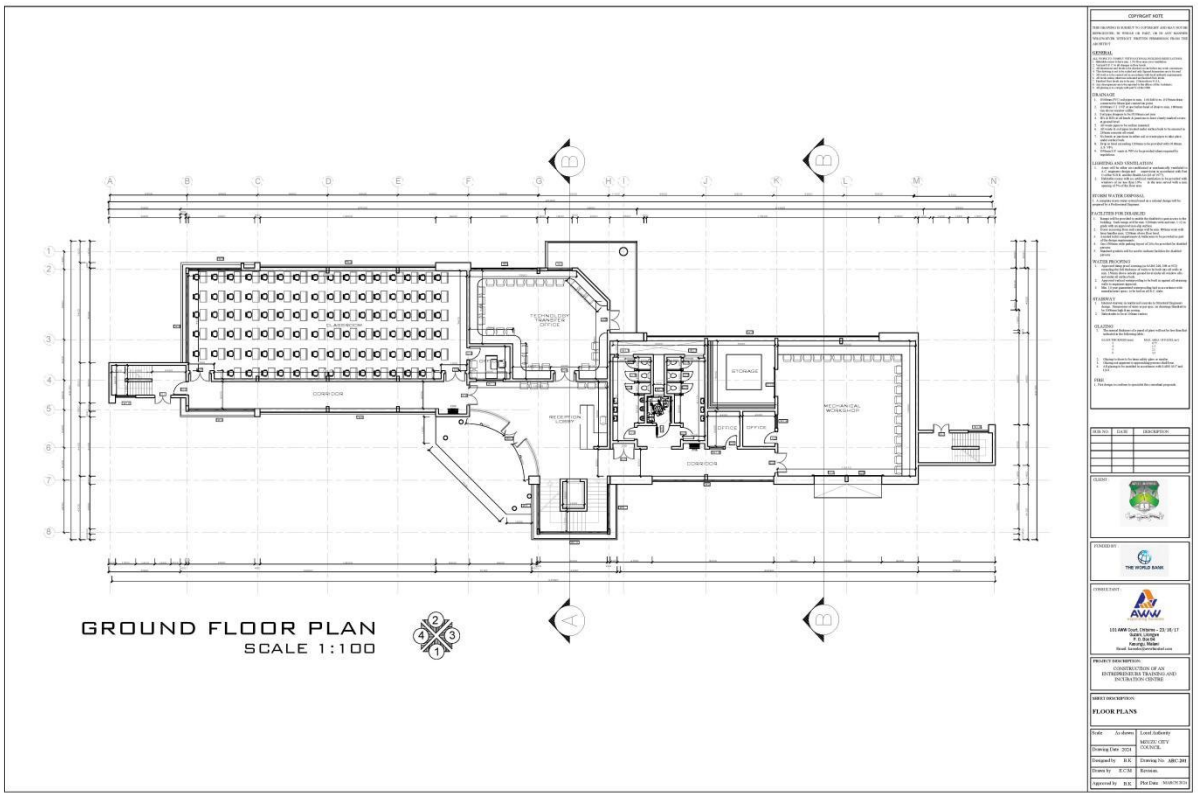
APPENDIX 16: ARCHITECTURAL DESIGNS OF THE PROPOSED ETIC BUILDING

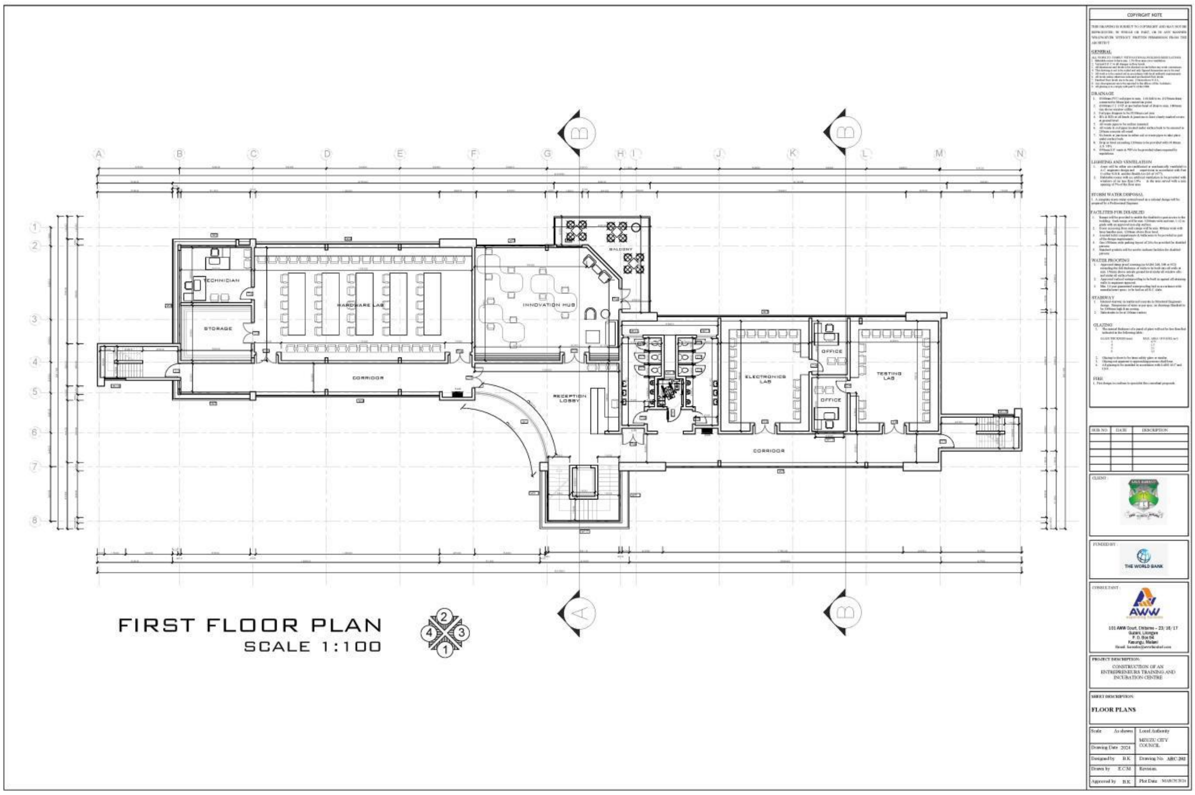
Architectural Drawing List	
Drawing Number	**Drawing Title**
A00	DRAWING LIST
A101	SITE PLAN
A102	LANDSCAPE SITE LAYOUT
A201	GROUND FLOOR PLAN
A202	FIRST FLOOR PLAN
A203	SECOND FLOOR PLAN
A204	THIRD FLOOR PLAN
A205	THIRD FLOOR PLAN
A301	ROOF PLAN
A401	ELEVATIONS
A401	ELEVATIONS
A501	SECTION A-A
A502	SECTION B-B
A601	WINDOW AND DOOR SCHEDULES
A701 - 704	3DS

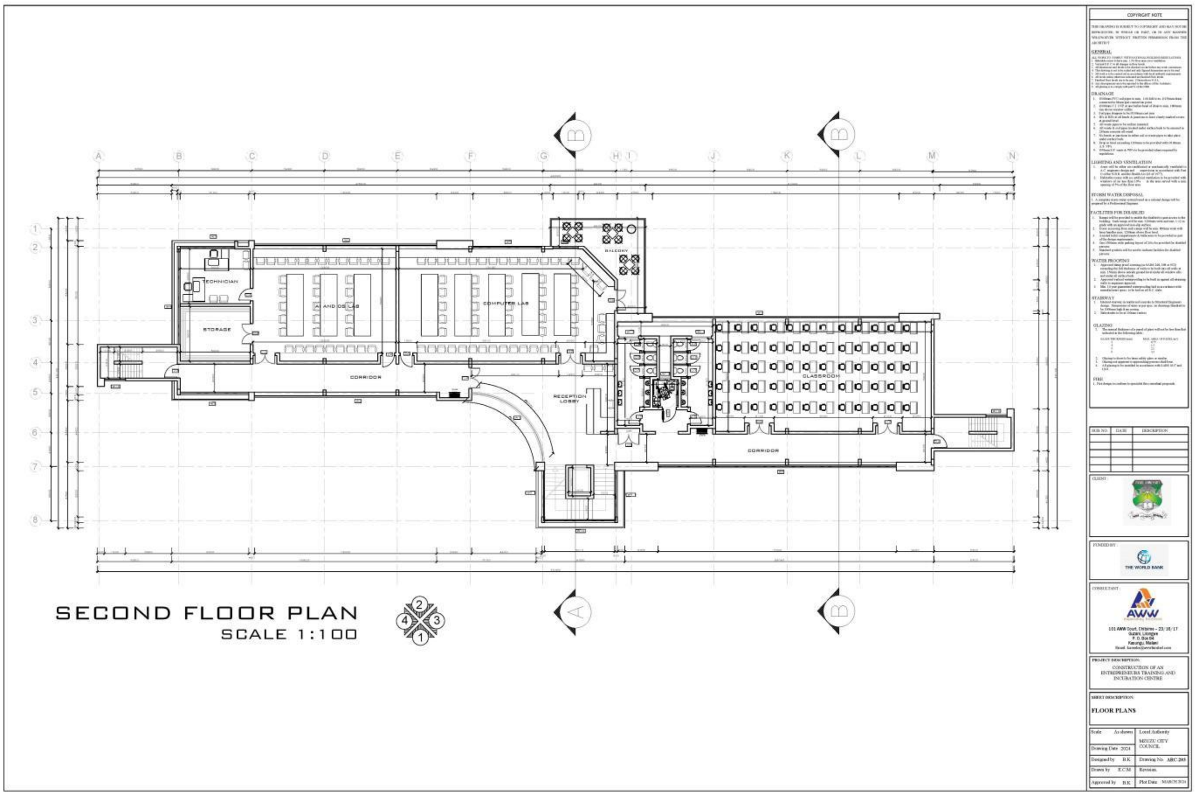

PROPOSED
ETIC BUILDING
New Library construction
ESSAP Building Mzuni
Lubinga Rd
Mzuzu University
Warthogsl

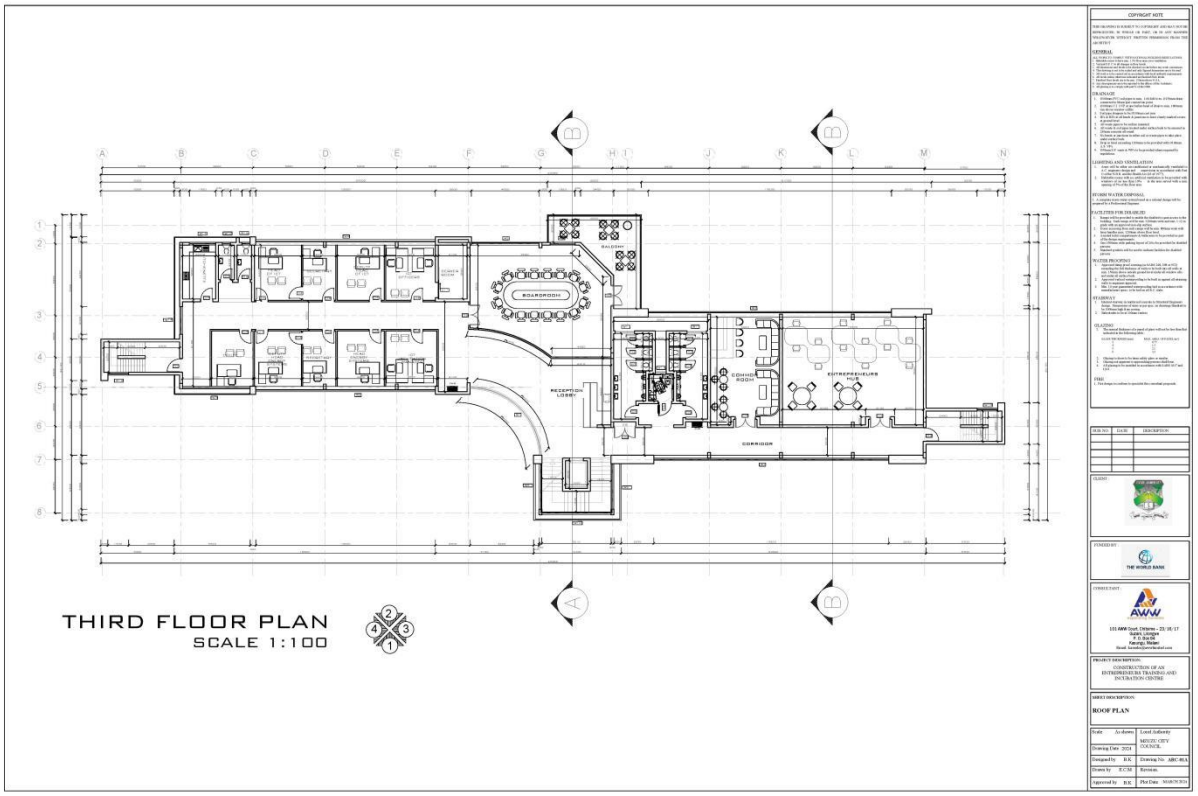

MAIN ENTRANCE
M1 ROAD
to Karonga
to Shoprite
BLOCK OF PINE TREES
NEW MZUNI LIBRARY
NETBALL PITCH
TERRACE
TARMAC ROAD
MAKESHIFT LIBRARY
ADMINISTRATION
CAR PARK
AREA WITH LEGENDS


to Karonga
MAIN ENTRANCE
M1 ROAD
to Shoprite
GATE
TARMAC ROAD
PROPOSED ETIC BUILDING
PARKING
PARKING
WASTE MANAGEMENT AREA
TBM3
SITE LAYOUT
NEW MZUNI LIBRARY
Pedestrian Walk Way
TARMAC ROAD
ENTRANCE
PLANT LEGEND
COPYRIGHT NOTE
LANDSCAPE SITE LAYOUT


GROUND FLOOR PLAN
SCALE 1:100
COPYRIGHT NOTE
FLOOR PLANS


FIRST FLOOR PLAN
SCALE 1:100
TECHNICIAN
STORAGE
HARDWARE LAB
INNOVATION HUB
BALCONY
CORRIDOR
RECEPTION LOBBY
ELECTRONICS LAB
OFFICE
TESTING LAB
COPYRIGHT NOTE
THE WORLD BANK
FLOOR PLANS


SECOND FLOOR PLAN
SCALE 1:100
TECHNICIAN
STORAGE
COMPUTER LAB
BALCONY
CORRIDOR
RECEPTION LOBBY
CLASSROOM
COPYRIGHT NOTE
THE WORLD BANK
FLOOR PLANS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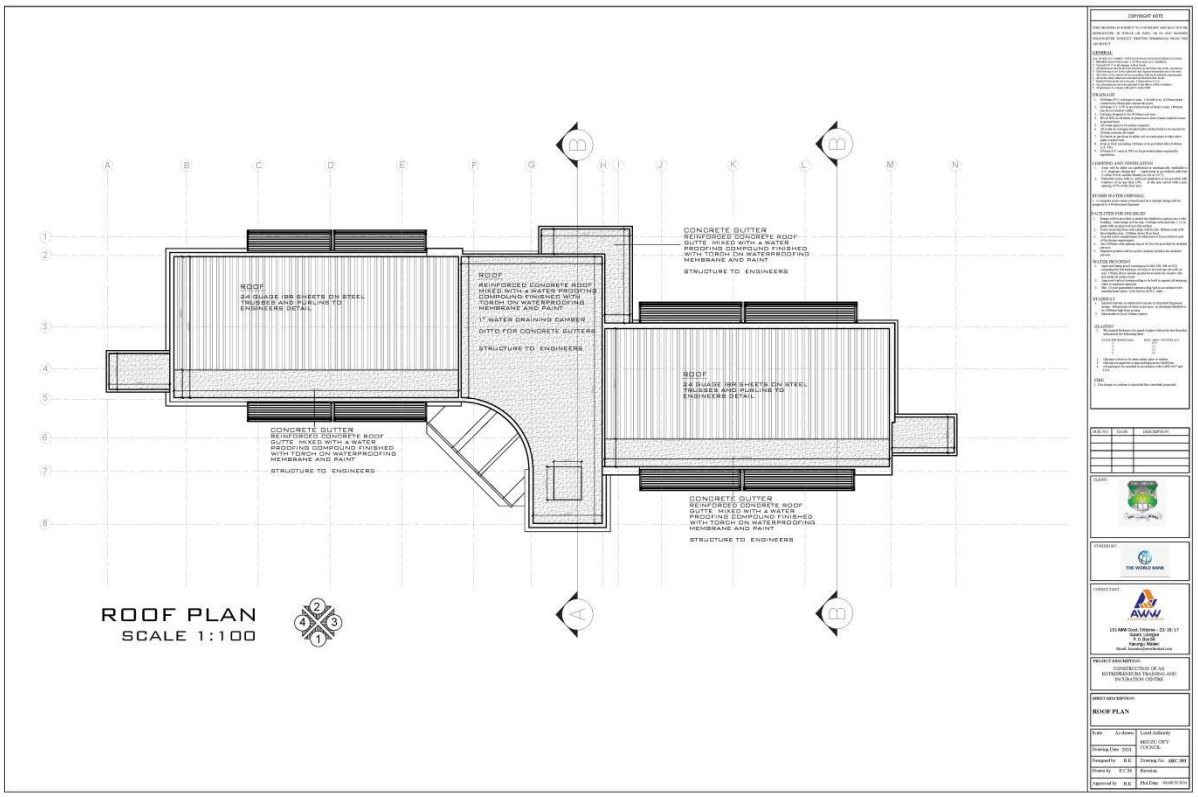
RECEPTION LOBBY
CORRIDOR
ENTREPRENEURS HUB
THIRD FLOOR PLAN
SCALE 1:100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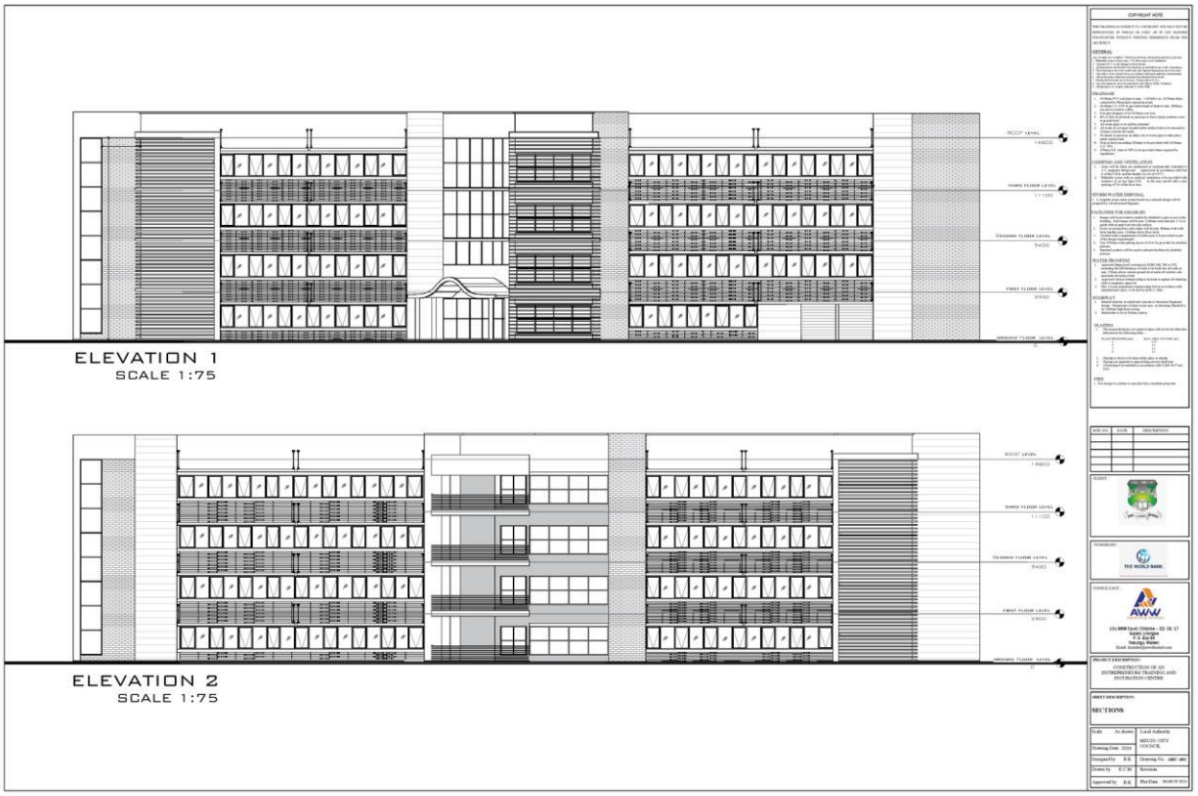
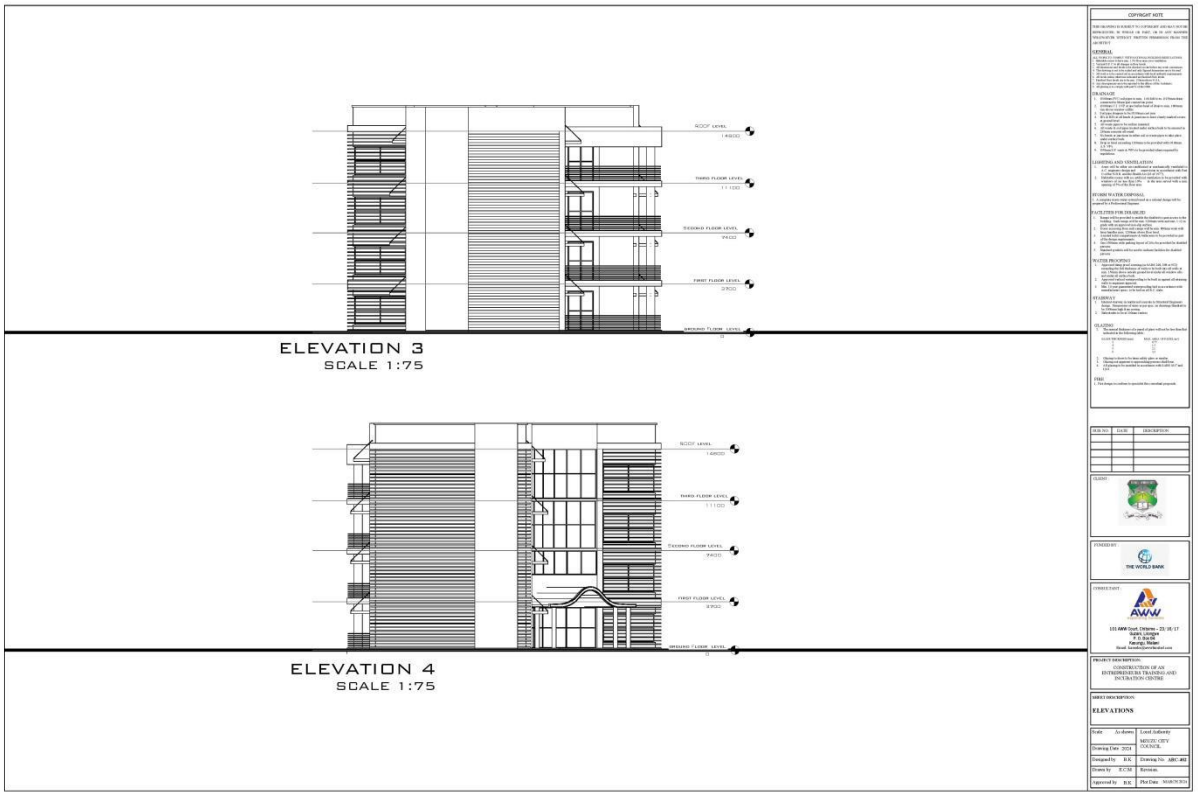
24 GUAGE (BR SHEETS ON STEEL TRUSSES AND PURLINS TO ENGINEERS DETAIL
ROOF
REINFORCED CONCRETE ROOF MIXED WITH A WATER PROOFING COMPOUND FINISHED WITH TORCH ON WATERPROOFING MEMBRANE AND PAINT
1" WATER DRAINING CAMBER
DITTO FOR CONCRETE GUTTERS
STRUCTURE TO ENGINEERS
CONCRETE GUTTER REINFORCED CONCRETE ROOF GUTTE MIXED WITH A WATER PROOFING COMPOUND FINISHED WITH TORCH ON WATERPROOFING MEMBRANE AND PAINT
STRUCTURE TO ENGINEERS
ROOF
24 GUAGE (BR SHEETS ON STEEL TRUSSES AND PURLINS TO ENGINEERS DETAIL
CONCRETE GUTTER REINFORCED CONCRETE ROOF GUTTE MIXED WITH A WATER PROOFING COMPOUND FINISHED WITH TORCH ON WATERPROOFING MEMBRANE AND PAINT
STRUCTURE TO ENGINEERS
CONCRETE GUTTER REINFORCED CONCRETE ROOF GUTTE MIXED WITH A WATER PROOFING COMPOUND FINISHED WITH TORCH ON WATERPROOFING MEMBRANE AND PAINT
STRUCTURE TO ENGINEERS
ROOF PLAN
SCALE 1:100


ELEVATION 1
SCALE 1:75
ELEVATION 2
SCALE 1:75
SECTIONS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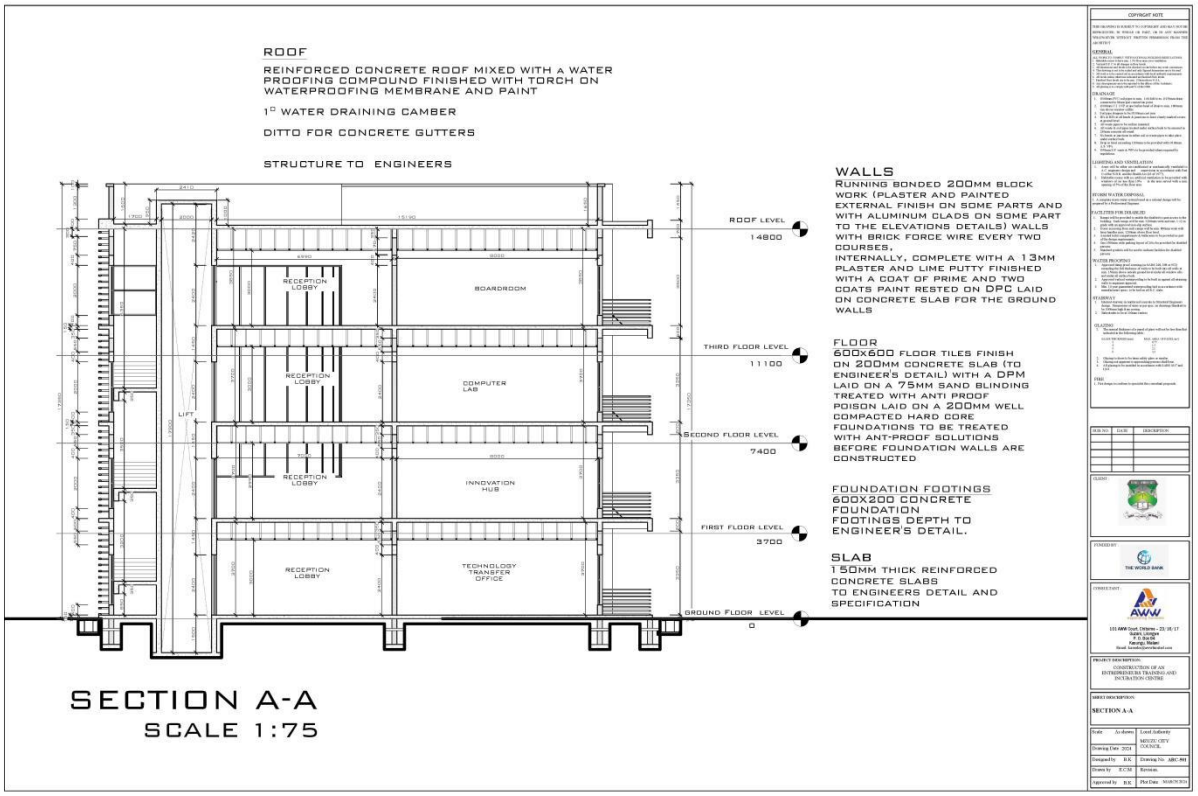
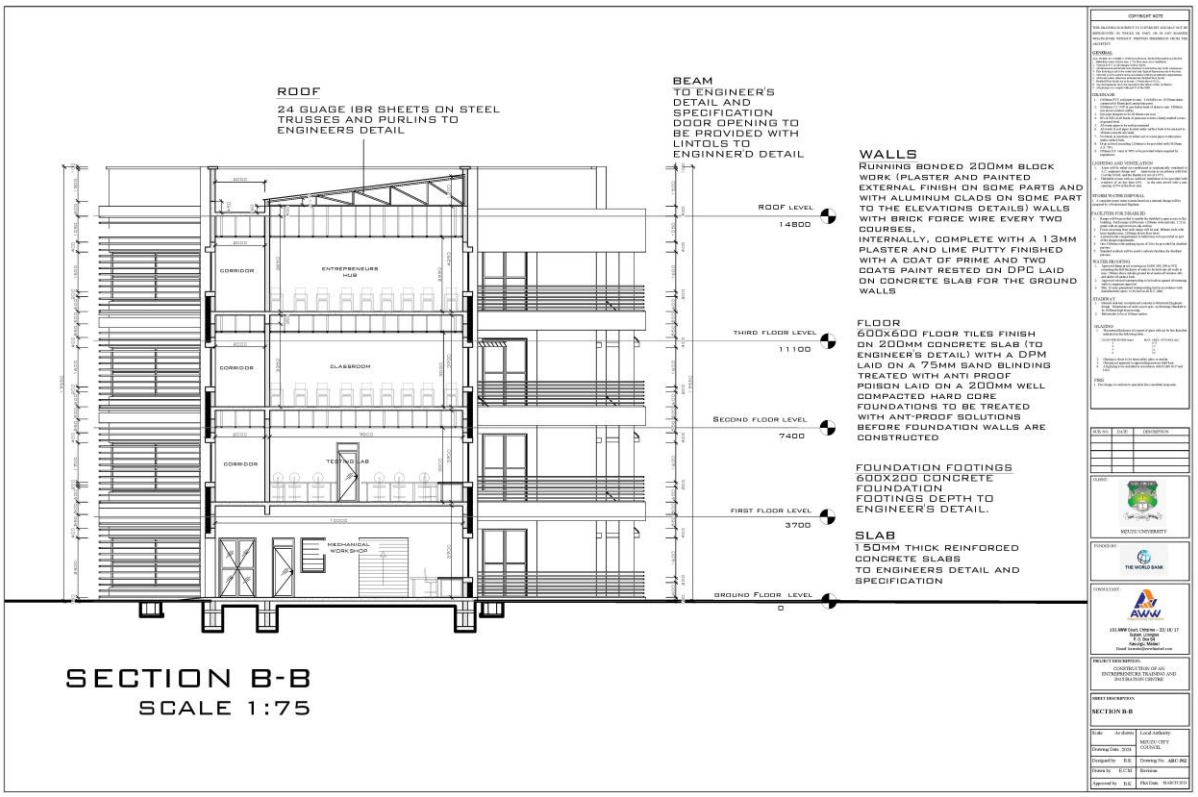
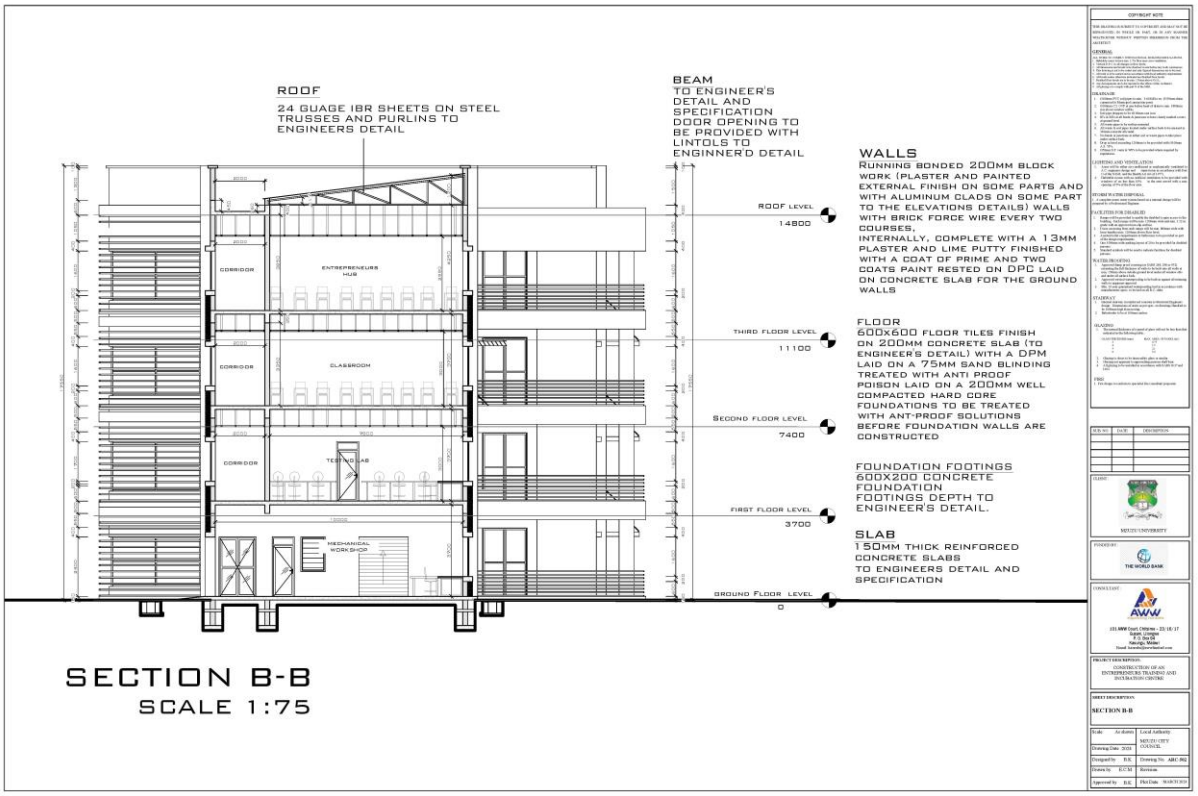
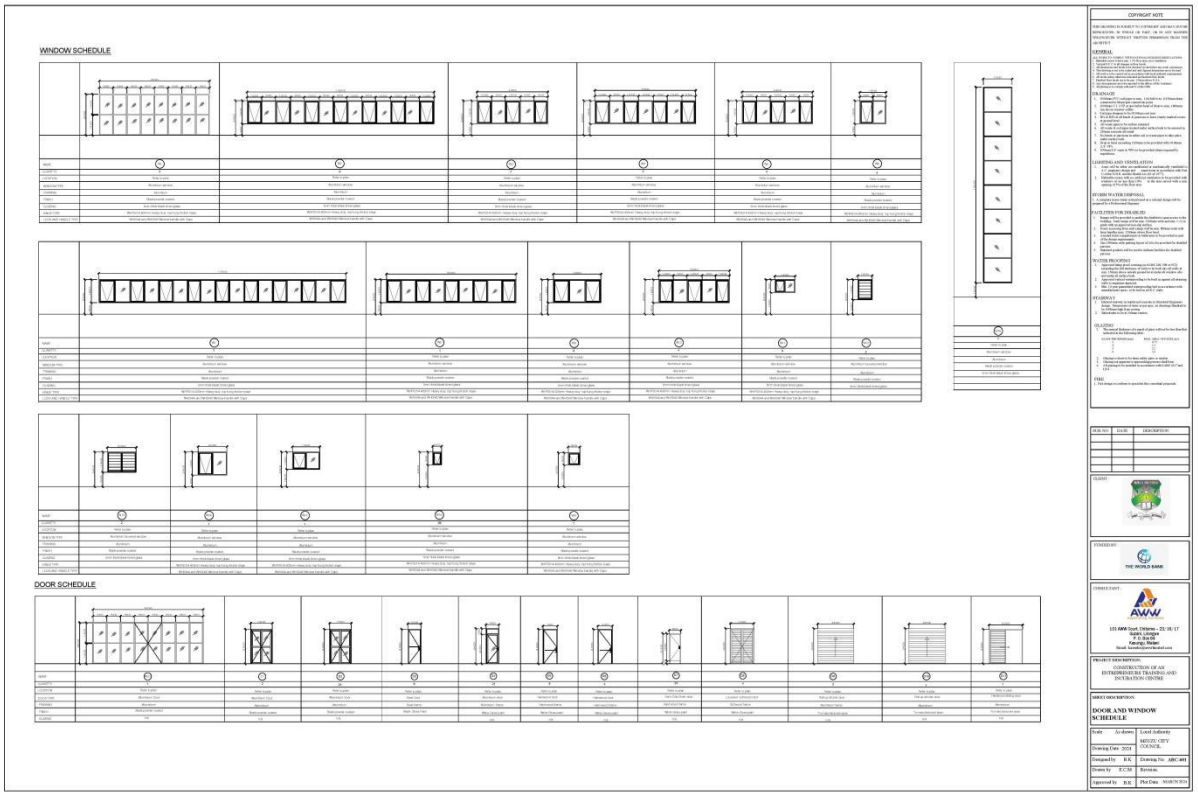
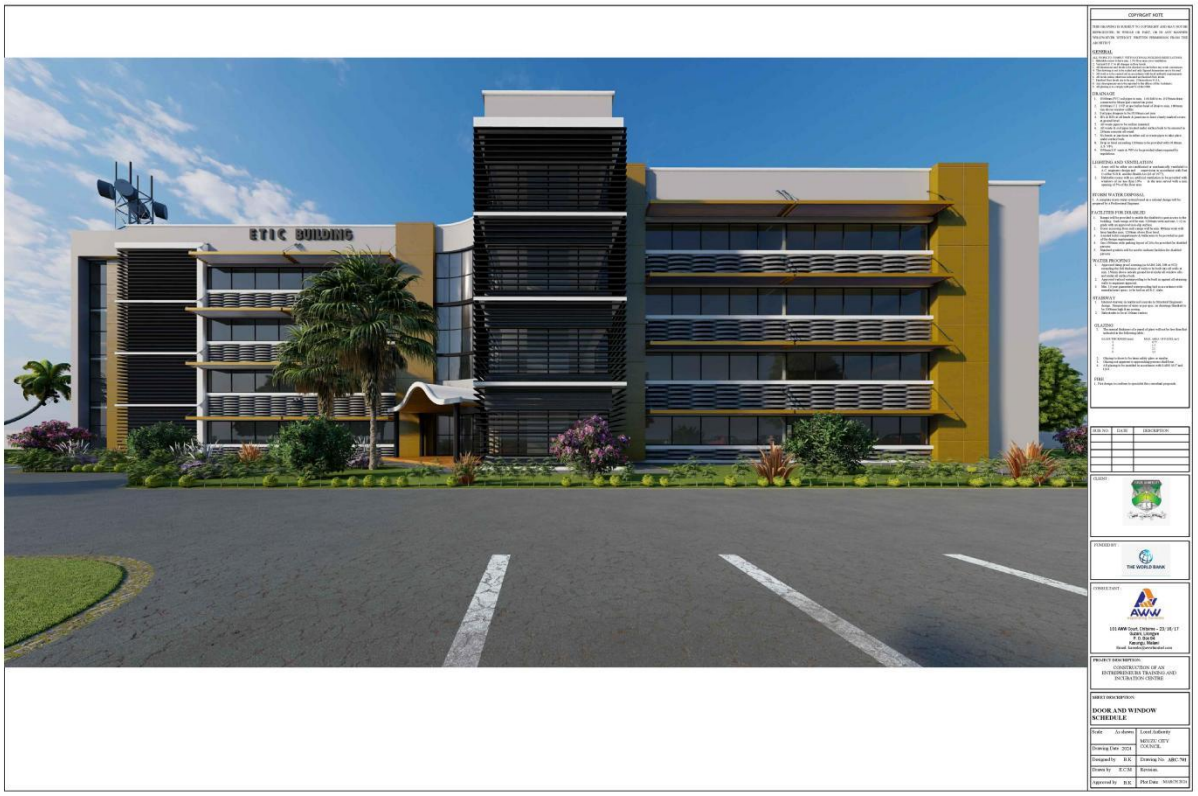
SCALE 1:75
ELEVATION 4
SCALE 1:75
ELEVATIONS


ROOF
REINFORCED CONCRETE ROOF MIXED WITH A WATER PROOFING COMPOUND FINISHED WITH TORCH ON WATERPROOFING MEMBRANE AND PAINT
1° WATER DRAINING CAMBER
DITTO FOR CONCRETE GUTTERS
STRUCTURE TO ENGINEERS
WALLS
RUNNING BONDED 200MM BLOCK WORK (PLASTER AND PAINTED EXTERNAL FINISH ON SOME PARTS AND WITH ALUMINUM CLADS ON SOME PART TO THE ELEVATIONS DETAILS) WALLS WITH BRICK FORCE WIRE EVERY TWO COURSES, INTERNALLY, COMPLETE WITH A 13MM PLASTER AND LIME PUTTY FINISHED WITH A COAT OF PRIME AND TWO COATS PAINT RESTED ON DPC LAID ON CONCRETE SLAB FOR THE GROUND WALLS
FLOOR
600X600 FLOOR TILES FINISH ON 200MM CONCRETE SLAB (TO ENGINEER'S DETAIL) WITH A DPM LAID ON A 75MM SAND BLINDING TREATED WITH ANTI PROOF POISON LAID ON A 200MM WELL COMPACTED HARD CORE FOUNDATIONS TO BE TREATED WITH ANT-PROOF SOLUTIONS BEFORE FOUNDATION WALLS ARE CONSTRUCTED
FOUNDATION FOOTINGS
600X200 CONCRETE FOUNDATION FOOTINGS DEPTH TO ENGINEER'S DETAIL.
SLAB
150MM THICK REINFORCED CONCRETE SLABS TO ENGINEERS DETAIL AND SPECIFICATION
ROOF LEVEL 14800
THIRD FLOOR LEVEL 11100
SECOND FLOOR LEVEL 7400
FIRST FLOOR LEVEL 3700
GROUND FLOOR LEVEL 0
RECEPTION LOBBY
BOARDROOM
COMPUTER LAB
INNOVATION HUB
TECHNOLOGY TRANSFER OFFICE
LIFT
SECTION A-A
SCALE 1:75


ROOF
24 GUAGE IBR SHEETS ON STEEL TRUSSES AND PURLINS TO ENGINEERS DETAIL
BEAM
TO ENGINEER'S DETAIL AND SPECIFICATION DOOR OPENING TO BE PROVIDED WITH LINTOLS TO ENGINNER'D DETAIL
WALLS
RUNNING BONDED 200MM BLOCK WORK (PLASTER AND PAINTED EXTERNAL FINISH ON SOME PARTS AND WITH ALUMINUM CLADS ON SOME PART TO THE ELEVATIONS DETAILS) WALLS WITH BRICK FORCE WIRE EVERY TWO COURSES, INTERNALLY, COMPLETE WITH A 13MM PLASTER AND LIME PUTTY FINISHED WITH A COAT OF PRIME AND TWO COATS PAINT RESTED ON DPC LAID ON CONCRETE SLAB FOR THE GROUND WALLS
FLOOR
600X600 FLOOR TILES FINISH ON 200MM CONCRETE SLAB (TO ENGINEER'S DETAIL) WITH A DPM LAID ON A 75MM SAND BLINDING TREATED WITH ANTI PROOF POISON LAID ON A 200MM WELL COMPACTED HARD CORE FOUNDATIONS TO BE TREATED WITH ANT-PROOF SOLUTIONS BEFORE FOUNDATION WALLS ARE CONSTRUCTED
FOUNDATION FOOTINGS
600X200 CONCRETE FOUNDATION FOOTINGS DEPTH TO ENGINEER'S DETAIL.
SLAB
150MM THICK REINFORCED CONCRETE SLABS TO ENGINEERS DETAIL AND SPECIFICATION
ROOF LEVEL 14800
THIRD FLOOR LEVEL 11100
SECOND FLOOR LEVEL 7400
FIRST FLOOR LEVEL 3700
GROUND FLOOR LEVEL 0
CORRIDOR
ENTREPRENEURS HUB
CLASSROOM
TESTING LAB
MECHANICAL WORK SHOP
SECTION B-B
SCALE 1:75


ROOF
24 GUAGE IBR SHEETS ON STEEL TRUSSES AND PURLINS TO ENGINEERS DETAIL
BEAM
TO ENGINEER'S DETAIL AND SPECIFICATION
DOOR OPENING TO BE PROVIDED WITH LINTOLS TO ENGINNER'D DETAIL
WALLS
RUNNING BONDED 200MM BLOCK WORK (PLASTER AND PAINTED EXTERNAL FINISH ON SOME PARTS AND WITH ALUMINUM CLADS ON SOME PART TO THE ELEVATIONS DETAILS) WALLS WITH BRICK FORCE WIRE EVERY TWO COURSES, INTERNALLY, COMPLETE WITH A 13MM PLASTER AND LIME PUTTY FINISHED WITH A COAT OF PRIME AND TWO COATS PAINT RESTED ON DPC LAID ON CONCRETE SLAB FOR THE GROUND WALLS
FLOOR
600X600 FLOOR TILES FINISH ON 200MM CONCRETE SLAB (TO ENGINEER'S DETAIL) WITH A DPM LAID ON A 75MM SAND BLINDING TREATED WITH ANTI PROOF POISON LAID ON A 200MM WELL COMPACTED HARD CORE FOUNDATIONS TO BE TREATED WITH ANT-PROOF SOLUTIONS BEFORE FOUNDATION WALLS ARE CONSTRUCTED
FOUNDATION FOOTINGS
600X200 CONCRETE FOUNDATION FOOTINGS DEPTH TO ENGINEER'S DETAIL.
SLAB
150MM THICK REINFORCED CONCRETE SLABS TO ENGINEERS DETAIL AND SPECIFICATION
ROOF LEVEL
14800
THIRD FLOOR LEVEL
11100
SECOND FLOOR LEVEL
7400
FIRST FLOOR LEVEL
3700
GROUND FLOOR LEVEL
0
CORRIDOR
ENTREPRENEURS HUB
CLASSROOM
TOILETS
MECHANICAL WORKSHOP
SECTION B-B
SCALE 1:75


WINDOW SCHEDULE
DOOR SCHEDULE


ETIC BUILDING


ETIC BUILDING