ENVIRONMENTAL IMPACTS STATEMENT (EIS) FOR THE PROPOSED CONSTRUCTION OF ADMINISTRATION BLOCK, LIBRARY AND COMPUTER LABORATORY BUILDING ON PLOT NO.259 &260 BLOCK ‘‘CC’’AT IAA-BABATI CAMPUS, BABATI TOWN, MANYARA REGION

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EXECUTIVE SUMMARY
INTRODUCTION

The Institute of Accountancy Arusha (IAA) is a parastatal Educational Institution operating as a campus under the established Institute of Accountancy Arusha Act of 1990 under the Ministry of finance (MoF). IAA is located about 8Km Northern side of Tanzania, on observation hill along Njiro Road adjacent to Tawiri Offices. The Institute is highly accessible from all parts of Arusha City and it is within the proximity of other academic Institutions such as ESAMI. The overall control and supervision of the Institute is vested in its Governing Council. Institute of Accountancy Arusha of P.O. Box 2798, Arusha www.iaa.ac.tz is a main proponent of the expected project. The objectives and functions are teaching, conduct research and offer consultancies to business organizations, government, and non-governmental organizations and arrange for publication and general dissemination of study materials in connection with the work activities of the institute

The Institute of Accountancy Arusha operates in five campuses including IAA-Babati campus being a parastatal Educational Institution established by the Institute of Accountancy Arusha Act of 1990 on 17-September-2014. The overall control and supervision of the Institute is vested in its Governing Council.

Currently, IAA- Babati campus is among of the public academic institution, which offers unique business and technological courses that goes with labour market/demands of the community scarcity of skilled manpower in the fields of Accountancy with Information Technology, Accountancy with Microfinance (Apprenticeship), Information Security, Business management and Agribusiness, Accountancy and Taxation credit Management, Cyber Security, Information Technology, Natural Resource Economics, Insurance and Risk Management with Apprenticeship, Peace and Security Studies, Tourism and Hospitality with Apprenticeship, Multimedia technologies and Computer Networking. Being one of the famous institutes offering business and technological courses in the country, the Institute of Accountancy Arusha-Babati campus attracts largest number of students in Tanzania. This is partly due to the diversity and potential of its programmes but also to account for the urgently human development needs and transformation processes in Tanzania. In recent years, however, IAA-Babati campus capacity to admit students and offer quality education in areas of Science, Technology and Business has been hampered by inadequate infrastructures in terms of buildings, ICT and human resources as well as teaching, learning and research facilities.

The IAA is one of the higher learning institutions which have benefited from the Higher Education for Economic Transformation (HEET) project. HEET is a five-year project, which is financed by the World Bank through the Ministry of Education, Science and Technology (MoEST). HEET project aims at promoting higher education as a catalytic force for the new industrial based economy of Tanzania. Thus, the project is designed to revitalize and expand the capacity of higher learning institutions to contribute to key areas for innovation, economic development, and labour market relevance, by investing in requisite infrastructure for modern and effective teaching and research (**POM, 2021**).

The IAA-Babati campus, through the Government of the United Republic of Tanzania (URT) has received financing loan from the World Bank to implement higher education for economic transformation project (HEET). HEET project is a five-year project through the World Bank support, to promote higher education as a catalytic force in the new Tanzanian economy. The project is designed to revitalize and expand the capacity of higher learning institutions to contribute to key areas for innovation, economic development, and labor market relevance, by investing in requisite infrastructure for modern and effective teaching and research, and by training to the highest standard the teachers, researchers and administrators needed by higher learning institutions to achieve to their full potential. The Government of Tanzania intends to increase access and improve the quality of Technical and Vocational Education and Training (TVET) programs in the country. Therefore, the project is part of many ongoing projects under HEET in the country being implemented by various higher learning and monitored by the government. This project (HEET) will enhance IAA-Babati campus to become the centre of excellence in Informatics and Allied Technologies which will meet these needs. In conjunction with the above strategies the IAA-Babati campus will also facilitate the implementation of other government policies including The Technical Education Training Policy, The National Higher Education Policy, The National Sustainable Industrial Development Policy, The National Science and Technology Policy, National Skills Development Policy and The Small and Medium Enterprise Policy (SME Policy 2003.

The IAA-Babati campus through the HEET project loan of the World Bank intends to construct one administration block, library and computer laboratory for classes with four storeys for students with capacity of 7000, and staff offices carrying about 150 staffs. It is to be located within IAA-Babati campus premises babati town council in Manyara Region. It will comprise of Offices for staff Floor, Seminar Rooms, Lecture Halls, ICT-Laboratories, conference theatre hall. The proposed buildings will be equipped with online distance learning facilities for wider reachability and addressing emerging communicable disease challenges such as COVID-19. Thus, through HEET project, IAA-Babati campus will improve teaching environment and equity in education and training, and enhance quality of education and training, hence contributing to the Tanzania economy through generation of quality graduates that are relevant to the labor market requirements. In addition, the proposed project at IAA-Babati campus shall create many employment opportunities throughout the project life time. This is in line with The Second Five Year Development Plan 2015/16 – 2020/21 (FYDP II) of the Country that focuses on building an industry-centered economy and reducing unemployment through a multi-sector transformative framework. Upon completion, IAA-Babati campus is expected to accommodate a total of 7,150 students and staff. The project life span is expected to be 99 years, with total investment costs estimated at Tanzania Shillings USD 6,000,000 equivalent to TSh Billion 12,769,498,550

The construction of an administration block, library and computer laboratory like many other facilities must abide to the World Bank Environmental and Social Framework (ESF) and Environmental Management Act of 2004 of Tanzania which require the project developers to carry out Environmental and Social Impact Assessment prior to project implementation as a prerequisite to the construction of new buildings, the project will involve various site excavation activities, hence building construction and associated activities will inevitably have environmental, social and economic impacts, which need to

be identified and mitigation measures put in place for ensuring sustainability of the project. The Environmental Management Act of 2004 of Tanzania requires project developers to carry out an Environmental and Social Impact assessment (ESIA) prior to project implementation. In accordance with the categories identified in the Third Schedule to Environmental Management Act, Cap 191 and First Schedule to Environmental Impact Assessment and Audit (Amendment) Regulations, 2018, the nature of this project is subject to full ESIA study. Similarly, the World Bank **(PAD, 2021**) provides Environmental and Social Framework (ESF) and relevant Environmental and Social Standards (ESSs), which aim to offset the anticipated social and environmental risks and impacts. The ESS1 for example, sets out the requirements for Borrowers relating to the identification and assessment of environmental and social risks and impacts and development of mitigation measures. Therefore, Environmental Management Act, Cap 191, the Environmental Impact Assessment and Audit (Amendment) Regulations, 2018, and World Bank Environment and Social Framework (ESF) as well as the project's Environmental and Social Management Framework (ESMF) were observed in the study.

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PROJECT DESCRIPTION

The proposed project upon completion will enable the realization of the increased capacity of approximately 7,150 students and staff offer quality education in areas of Science, Technology, and business. The project advances in phases starting from the planning phase to the pre-construction phase, followed by construction then the operation phase and finally the decommissioning phase.

IAA-Babati campus will construct one administration block, library and computer laboratory building within the campus to address the immediate and long-term needs. The buildings will be climate smart and friendly to gender including considerations to persons with special needs (e.g. physical, learning impairment, emotional and behavioural). It is expected to have various structures. The design will ensure low energy use and integration of solar power supply; low footprint to increase green spaces; and accommodation of rainwater harvesting, storm water and waste management systems. The proposed project constructions are planned to be implemented concurrently within first two years for various logical reasons. One is to optimize scale of economies in project management. Two is to minimize cumulative environmental and social impacts of the construction projects. Three is to achieve to the earliest increase in quality and enrolment of students within the specified project period of five years. Specifically, the following buildings are envisaged to be in place after the completion of HEET project.

Project location

IAA-Babati campus is located eight point nine kilometres from Babati town. It lies in the North side of Tanzania, on observation hill along Mamile Road adjacent. The Institute is highly accessible from all parts of Babati town. The general area is characterized by hills with sparsely gentle hills with lower flat lands and plateau-like features in some areas.

Main Project Activities

The development of the proposed project will involve various phases, including the design (planning) phase, construction phase, operation phase and decommissioning phase. The

planning phase will involve surveying the proposed sites for construction of the facilities at IAA-Babati campus in waang'waray mtaa, waang'waray ward of Babati in Manyara Region. A survey, in this case, refers to land investigations, drilling, measurements, and pre-works examination of the site. The 18 months of the actual construction phase of the project will involve standard construction activities such as construction management, site preparation and levelling, excavation, compaction, setting the foundation, installation of electrical, water and wastewater infrastructure, erection of superstructures.

POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

Tanzania is committed to attaining sustainable development goal. Some of the policies and legislation that have a close bearing to this project are listed hereunder:

i The Environmental Management Act No. 20 of (2004);
ii The Occupation Health Safety Act, No. 5 of 2003;
iii The Water Supply and Sanitation Act No. 12 of 2009;
iv The Land Act no 4 (1999), Cap. 113 R.E., 2019;
v The Urban Planning Act (2007);
vi The Employment and Labour Relations Act No. 6 of 2004;
vii The Engineers Registration (Amendments) Act of 2007;
Viii The Contractors Registration Act (1997);
ix The Architects and Quantity Surveyors Act (1997);
x The HIV and AIDS (Prevention and Control) Act of 2008;
xi The Local Government Laws (Miscellaneous Amendments) Act (1999);
xii The National Environmental Policy of 2021;
xiii The National Health Policy of 2008;
xiv The Tanzania 2025 Development Vision; and
xv Environmental Impact Assessment & Auditing (Amendment) Regulations (2018).

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

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

This ESIA has applied 5 relevant standards out of 10 ESSs, which are:

(i) ESS1-Assessment and Management of Environmental and Social Risks and Impacts;
(ii) ESS2-Labor and Working Conditions;
(iii)ESS3-Resource Efficiency and Pollution Prevention and Management;
(iv) ESS4-Community Health and Safety; and
(V) ESS8-Cultural heritage
(v) ESS10-Stakeholder Engagement and Information Disclosure

BASELINE ENVIRONMENTAL AND SOCIAL CONDITIONS

The area is dominated by natural trees which account for 61% of the vegetation types found in the proposed construction area, followed by trees (19%) and others which account for less than ten percent (10%). The trees are scattered throughout the proposed construction areas. The presence of many tree species indicates that the community is less disturbed by human activities such as poles cutting and fuel wood collection besides being surrounded by human settlements. However, these species are allocated near the construction site and not within the construction site. The soils of the area comprised of loam silty mixtures with

minor clay deposits. The underlying geology is predominantly granitic basement complex with no observed. Groundwater or flooding issues with Seismic activity being low but built structures will adhere to earthquake standards. The Information on the bio-physical, socio-economic environment, institutional and legal regimes were collected from a variety of sources, namely project documents and general literature review, visual and inspection, expert opinion, consultations with selected stakeholders and discussions with proponent representatives. The proposed site has Electrical, water supply and telecommunication system.

The proposed site covering the proposed project is flat land, no important conserved area. The vegetation of the area gives the indication for habitat for fauna and based on the vegetation condition of the area there was no indication for presence of large wild animal. Few species of birds were observed in the area while some small reptiles and insects are expected to be present in some parts of the general area. Thus, there was no identified specie with significance conservation status (i.e. threated or endangered as per IUCN guidelines/CITES List) in the area. The shrubs are scattered throughout the proposed construction areas. The presence of many shrubs and tree species indicates that the community is less disturbed by human activities such as poles cutting and fuel wood collection besides being surrounded by human settlements. The vulnerable species identified are Dalbergia vacciniifolia and Thevetia peruviana while the endangered is Opuntia sp. However, these species are allocated near the construction site and not within the construction site.

STAKEHOLDER CONSULTATIONS AND PUBLIC INVOLVEMENT

Stakeholders' identification and engagement process was conducted based on EIA and Audit Regulations, 2005 and its amendment of 2018 and being guided by the World Bank Environmental and Social Standards (ESS10) and the project's Stakeholders Engagement Plan (SEP). Public consultation entailed sharing information and knowledge about the project, seeking to understand key stakeholders' concerns and building relationships with the community. Stakeholders' identification considered all aspects of stakeholders that may be affected or have interest to project activities whether positively or negatively and/or based on their roles in implementation of the project.

Stakeholder consultations were carried out, including interviews and meetings with officials from Government departments and Town authorities, officials from public and private organizations, local leaders, general public and student's representatives. Stakeholders consulted included Babati town Council, OSHA, Fire, students, staff, service providers, Ward and Mtaa Leaders, as well as neighbours and students' representative. Other key stakeholders at the national level were also consulted. Stakeholders' identification and engagement process was conducted based on ESIA and Audit Regulations, 2005 and its amendment of 2018 and World Bank Environmental and Social Standards (ESS10) and Stakeholders Engagement Plan (SEP). The project involved various stakeholders considering gender, vulnerable people as well as people with special needs. They were consulted to get their views throughout the project life. In addition, a mechanism was put in place to address grievances; Gender based Violence (GBV), Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH).

The main stakeholders include, Ministry of Education Science and Technology; National council of technical education and vocational education training (NACTEVET, Institute

of accountancy Arusha Management-Developer; Institute of accountancy Arusha Academic and Administrative staff members, Institute of accountancy Arusha students; Tanzania Buildings Agency (TBA), Institute of accountancy Arusha Students' Organisation; Non state actors working in Babati, Waang'waray, Babati town Council (Health officer, Municipal urban planning and environment, Trade officer, Land officer); Babati Water Supply and Sewerage Authority (BAUWASA); Occupational Safety and Health Authority (OSHA); Tanzania Electrical Supply Company (TANESCO), Fire and Rescue Force, Babati ward leaders, Waang'waray Street leaders.

Major issues raised are:

i. Increased dust and noise during construction;
ii. Waste Management problems;
iii. Local communities should be given priority in terms of employment and service provision during the implementation of the project;
iv. Sexual harassment/abuse
v. Security matters should be strengthened by the institute by constructing a police post;
vi. Fire protection plan
vii. There are scarcity of play ground to accommodate the needs of the institution local communities
viii. The proposed project shall put pressure on Sewerage systems; and there should be an adequate storm water management system to avoid social conflicts (difficulties during cleanliness) which may arise due to solid wastes from the institution.

Stakeholders' consultation revealed that the proposed project will have positive impacts that might stimulate economic and social development through the expected employment opportunities. Nevertheless, stakeholders also raised several issues and concerns on waste management, impaired air quality (dust and pollutant gases), noise, oil spills and efficiency of water utilization.

Assessment of Environmental/Social Issues of Concern for the Proposed Project

The construction project at IAA-Babati campus is viewed as a positive aspect in the development of Babati Township Council and country as a whole. However, the project will constitute a wide range of Environmental and Social risks and Impacts on a number of receptors. Impacts will be of both positive and negative nature. Identified potential environmental and social impacts associated with specific activities include;

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

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

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

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

Impacts associated with preparatory and demolition phase:

Positive social impacts

i. Job Creation and employment opportunities
ii. Increased market opportunities and sources of income
iii. Changes in lifestyle and quality of life
iv. Increased Revenues to local authorities

Negative social Impacts

i. Re-allocation of power lines and pedestrians' routes passages passing through the site.
ii. Increased pressure on social services;
iii. Increased risks of road accidents;
iv. Increase in level of crimes;
v. Price inflation of goods and services;
vi. Occupation health, safety and security risks;
vii. Child labour
viii. Increased risks of communicable diseases such as STDs, COVID etc.;

Negative Environmental Impacts

i. Exploitation of borrow pits/quarries and other natural resources
ii. Contamination and /impaired quality of receiving body – land and water
iii. Disadvantages related to the management of solid wastes from demolition activities

Impacts associated with construction phase:

Potential Positive social impacts

i. Jobs creation
ii. Income to local suppliers and service providers
iii. Increased skills and impart knowledge to local communities
iv. Improved quality of life and living standard

Potential negative social impacts

i. Occupational Safety and Health impacts
ii. Community Health, Safety and Security
iii. Increased level of crimes
iv. HIV / AIDS and STD'S among workers
v. Eruption of COVID-19 disease
vi. Occupation health, safety and security risks;
vii. Community health and safety risks;
viii. Child labour
ix. Increased incidence of GBV/SEA/SH;
x. Increased risks of communicable diseases such as STDs, COVID etc.;

Negative Impacts on physical environment

i. Impairment of air quality due to dust (air pollution)
ii. Contribution to Climate Changes due to emission of GHGs
iii. Noise Impacts
iv. Impacts of vibration
v. Wastewater Management problems (Water pollution)
vi. Solid waste management problems (Land pollution)
vii. Erosion of Exposed Surfaces

viii. Landscape and visual impacts
ix. Loss of flora and fauna

Impacts associated with Operation Phase

Potential Positive Social Impacts

i. Increase of admission of students to IAA-Babati campus
ii. Increase of revenue to IAA-Babati campus
iii. Job creation
iv. Increased commercial and social activities around project locations
v. Growth of Trade and Increased Investment – growth of retail businesses
vi. Production of skilled labour force for implementing various development policies, plans and goals for sustainable social and economic growth of the Nation
vii. Rise in house rents in babati ward
viii. Increased social services provision like health issues, electricity.

Negative Social Impacts

i. Increased incidences of diseases and ill health
ii. Increased pressure on social services and utilities
iii. Increased Risk to Safety and Health
iv. Community health risk due to improper waste management

Negative Impacts on physical environment

i. Water pollution
ii. Increased storm water generation and overflow
iii. Health and safety risks due to fire hazards
iv. Increased hazardous wastes generation from laboratory
v. Contribution to Climate Change
vi. Increased solid waste generation
vii. Fire risk.
viii. Increased solid and liquid waste

Impacts associated with Decommissioning Phase:

Negative Social impacts

i. Loss of employment and
ii. Decrease in local government revenues
iii. Livelihoods and Economic Loss
iv. Displacement of patients, tenants &workers

Negative Environmental Impacts

i. Loss of aesthetic value due to haphazard disposal of demolished waste
ii. Dust and noise pollution from demolishing works
iii. Solid Waste Generation
iv. Excessive Noise and Vibration pollution

MITIGATION MEASURES

The design of the mitigation measures for the identified Environmental and Social impacts applied the mitigation hierarchy suggested in the ESF (i.e. ESS1) which are:

a) Anticipate and avoid risks and impacts;

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

Many of the mitigation measures put forward are essentially good engineering practice that shall be adhered to during all the project phases.

Potential mitigation measures during construction phase

Negative Social Impacts

i. Institute good site practices including prevent public access to the construction site by securing equipment and demarcate excavate, using warning signs with appropriate text (local language) and graphic displays;
ii. Institute traffic management and safety programme including, training and testing of heavy vehicles operators and drivers, enforcement of speed limits, maximum loading restrictions and compliance with all Tanzania transportation law and standards;
iii. Provide more avenues for service providers e.g. cafeteria and restaurants
iv. Constructions of temporal police station at the site and the surrounding communities like in order to strengthen security services
v. Awareness campaigns /Education on HIV, COVID-19 and STDs shall be provided to workers;
vi. The project will prepare a GBV Action Plan that ensures project awareness raising strategy (for workers and community members), a list of GBV service Providers to which GBV survivors will be referred, revisions to the GRM to ensure it can address GBV complaints, and information on GBV allegation procedures in the workplace.
vii. IAA-Babati campus will conduct regular monitoring of project workers in relation to health, working conditions, hours of work, minimum age, and the other requirement of national law.

Negative Environmental Impacts

i. Equipment shall be maintained in good running condition and equipment, which generate excessive black smoke shall not be used;
ii. Enforce vehicle road restrictions to avoid excessive emissions from engine overloading, where practical switching off engines will be done when machines are not in use;
iii. Protect stockpiles of friable material subject to wind through wetting;
iv. Cover loads with friable material during transportation;
v. Green spaces shall be maximized in project areas
vi. Vehicles carrying construction materials shall be restricted to work during night time only;
vii. Impact pile driving shall be avoided where possible in vibration sensitive areas;
viii. Wastewater shall be properly treated in the Septic Tank Before disposal into the Soak Away Pit within the site;
ix. The contractor shall have adequate facilities for handling the construction waste;

x. Construction will be done as per engineering design and procedure of which a maximum requirement of compaction strength is achieved during the construction. That is maximum dry density (MDD) specified in the design manual by consultant;
xi. Locating parts of the development further away from the general public;
xii. Clearance of patches of native forest remaining in the neighbourhood of the proposed project shall be avoided;

Potential mitigation measures during the operation phase:

Negative Social Impacts

i. A safety, health and environment induction course shall be conducted to all surrounding communities and workers, putting more emphasis on HIV/AIDS, which has become a national disaster as well as other emerging pandemics such as COVID 19
ii. Use of water conservatively by instituting technologies (e.g. self-lock water taps) and awareness raising notices to users, etc.;
iii. The project will prepare a GBV Action Plan that ensures project awareness raising strategy (for workers and community members), a list of GBV service Providers to which GBV survivors will be referred, revisions to the GRM to ensure it can address GBV complaints, and information on GBV allegation procedures in the workplace.
iv. IAA will conduct regular monitoring of project workers in relation to health, working conditions, hours of work, minimum age, and the other requirement of national law.
v. Provide more avenues for service providers e.g. cafeteria and restaurants
vi. Constructions of temporal local police stations at IAA-Babati campus and the surrounding communities in order to strengthen security service;
vii. The cooperation of local people together will help to lessen criminal incidents and maintain security of people and their properties.
viii. Cooperate with relevant authorities like Ministry of Labour to control child labour.
ix. The contractor shall establish his own security to protect his properties and should establish community policing to support insufficient police force.

Impacts on physical environment

i. Septic tank and soak away shall be designed in such a way waste treatment is achieved by 100% before disposal to the authorised disposal sites(construct treatment wetland);
ii. The design of storm water drainage will be given a high priority;
iii. Adequate number of portable fire extinguishers shall be placed at strategic locations;
iv. Good housekeeping shall be maintained at all the time;
v. The design of buildings shall strictly adhere to the Fire Safety Standards;
vi. To change the consumption behaviour in terms of energy and water
vii. All liquid wastes shall be properly directed to the public sewerage system;

Mitigation Measures during Decommissioning Phase:

Social impacts

i. Seminars shall be conducted on alternative means of livelihood after termination of job

Environmental Impacts

i. The debris resulting from the demolition will either be transported by a licensed waste transporter for dumping at an approved site or used as base material for new construction work;
ii. All the necessary health and safety measures will be implemented including provision of personal protective equipment such as, safety harnesses, helmets, gloves, respirators, safety shoes, coveralls, goggles and ear protectors; and

ENVIRONMENTAL AND SOCIAL IMPACT MANAGEMENT PLAN

The Environmental and Social Management Plan is presented in Table 8.1. The ESMP is an important tool that enables concerned parties to measure successes or failures of implementation of mitigation measures on identified impacts. The contractor shall implement components relevant to the actual construction and operation phases. The mentioned proponent shall be responsible for overall implementation of the ESMP with the collaboration with their contractor. ESMP is an estimate cost of the measures so that the project proponent can budget the necessary funds. Appropriate bills of quantities should clearly give the actual figures. In any case, the consultant used informed judgment to come up with these figures.

The options to minimize or prevent the identified adverse social and environmental impacts as well as a monitoring plan have been suggested in this report and are contained in the ESMP. Many of them are based on good engineering and social practices. The ESMP defines roles and responsibility of different actors of the plan. However, the key actors during construction phase is contractor and IAA-babati campus while during the operation phase, IAA-babati campus will be the key actor in the implementation of mitigation measures. The associated environmental costs amount to **Tsh 143,000,000**.

The project shall ensure that the activities which are causing impacts to the environment are managed in a comprehensive, systematic, planned and documented manner. Proponent shall communicate the environmental and social management plan and environmental and social monitoring plan to its employees and its contractors to ensure that implementation is done accordingly. Furthermore, proponent shall ensure availability of resources which are required for implementation of its environmental management plan. The plan shall also be monitored to ensure that environmental objectives are well met. Project proponent shall carry out routine auditing to ensure continued sustainability of the environmental management system.

ENVIRONMENTAL AND SOCIAL MONITORING PROGRAMME

Environmental and Social Monitoring Plan will be implemented in all project phases. The monitoring of environmental and social parameters during the construction phase shall be carried out by the Contractor's Environmental and Social Safeguard team, under the supervision of the UPIU's Environmental and Social Safeguard team. The estimated annual costs for carrying out the proposed environmental monitoring programme amount to TSH **116,100,000.** There will be four types of monitoring activities; (i) baseline monitoring, (ii) impact monitoring, compliance monitoring, and mitigation monitoring. The monitoring of environmental and social parameters during the construction phase shall be carried out by the Contractor's safeguard team (i.e. Environmental, social and safety experts); under the

supervision of the Consultant's safeguard team. The responsibility for mitigation and monitoring during the operation phase will lie with the IAA-babati campus Estate Department. Depending on the implementation status and sensitivity of any emerging issues, OSHA and /or NEMC will perform annual EHS reviews in which environmental concerns raised will be reviewed alongside project implementation. The estimated annual costs for carrying out the proposed environmental motoring programme amounts to Tshs **116,100,000**.

DECOMMISSIONING

A preliminary decommissioning plan has been developed. Should the decommissioning become inevitable the plan provides general description of decommissioning methods considered feasible for the proposed project. The plan is intended to demonstrate that the methods considered are practical and that they protect the health and safety of the public and decommissioning personnel. A decommissioning plan that considers environmental issues shall be prepared by the developer prior to the decommissioning works. Should it be done, decommissioning may entail change of use (functional changes) or demolition triggered by change of land use. Project decommissioning has five phases:

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

PROJECT COST BENEFIT ANALYSIS

The Project Proponents might consider renovating or demolishing his building as the case may be depending on the condition of the building at that time let say after about 99 years projected life of the structure. In case the demolition is considered, specific conditions for mitigation are generally inherently uncertain. The conditions include methods of demolition, material handling, proposed sequences, protective measures, traffic management, occupational health and safety and environmental management as well as the estimated cost of conducting the decommissioning. The implementation of the proposed new buildings project at IAA-Babati campus shall have costs to community, government and the environment. For instance, community shall have inherent costs associated with noise, impairment of air quality, and Safety and health risks.

However, the introduction of mitigation measures will reduce the anticipated impacts. The government has secured the loan for this project; and there will be costs for mitigating environmental impacts. On the other hand, the proposed new buildings project has both direct and indirect benefits to IAA-babati campus, neighbour and the government as well. The benefits of the project are experienced in all phases from mobilization, construction, operation to decommissioning phase. Several benefits are associated with the proposed development both at local and national level in terms of revenue generation and the multiplier effects associated with linkages with local and national economy. However, building construction projects may generate negative benefits though; they are usually minimal compared to the positive benefits. Some of those benefits are non-quantifiable thus cannot be used in the cost- benefit analysis estimations.

SUMMARY AND CONCLUSION

The project has gained overall acceptance within the community, district, regional, and national levels, primarily due to its potential socio-economic benefits. The projected long-term environmental and socioeconomic advantages outweigh any potential negative impacts, which can be effectively managed to acceptable levels. It is, therefore, the study concludes that, the proposed project is in appropriate location as far as land use and interactions with human social and economic setting is concerned. Most of the environmental and social impacts have been identified and assessed and none of these are considered to be that severe after mitigation to prevent the further planning, design, and development of the proposed construction. The proposed project will entail no significant impacts provided that the recommended mitigation measures are adequately and timely implemented. The identified impacts will be managed through the proposed mitigation measures and implementation regime laid down in this ESIA. IAA-Babati campus is committed in implementing all the recommendations given in this ESIA and further carrying out the environmental auditing and monitoring schedules. IAA will hold the responsibility for ensuring the overall implementation of the Environmental and Social Management Plan (ESMP) and Environmental and Social Monitoring Plan (ESMP) outlined in this report. This Environmental and Social Impact Assessment (ESIA) report recommends that the proposed project can proceed, provided that the proponent adheres to the ESMP as specified in the report, along with any additional conditions imposed by regulatory bodies such as the National Environment Management Council (NEMC), World Bank ESF and ESSs, and other relevant authorities.

STUDY TEAM

NAMES	EXPERT	POSITION IN THE PROJECT	SIGNATURES
Mr. Obadia .K. Kibona	Environmental Studies Environmental science in planning and Management	Environmental consultant and Team leader	
Dr.Henry.G.Mung'ong'o	Geography and Environemtnal Management Climate Change and Sustainable Development	Environment Expert-Focal person	
Eng. Izack Somoka	Civil engineering Project planning and management	Infrastructures-Focal Person	
Ms. Anthropia Mlingo	Community Development	Social Safeguards – Focal Person	
Mr. Godwin Urio	Education psychology Applied Social psychology	Inclusivity–Focal Person	
Mr. Moses Shimba	Botany Wildlife Management	Botanist	
Mr. Fred Magesa	Education Development studies	Gender issues – focal person	

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ABBREVIATIONS AND ACRONYMS

AIDS	Acquired Immune Deficiency Syndrome
ABR	Anaerobic Biogas Reactor
BATNEEC	Best Available Technology Not Entailing Excess Cost
CITES	Convention on International Trade an Endangered Species
CRB	Contractors Registration Board
CNG	Compressed natural gas
DoE	Division of Environment
EIA	Environmental Impact Assessment
EMA	Environmental Management Act
EMP	Environmental management Plan
ESAMI	Eastern and Southern Africa management institute
ESF	Environmental and Social Framework
ESMP	Environmental and Social Standards
ESS	Environmental and Social Management Plan
ERB	Engineers Registration Board
GOT	Government of Tanzania
GBV	Gender-Based Violence
HEET	Higher education for economic transformation
HIV	Human Immune Deficiency Virus
IAASO	Institute of Accountancy Arusha students' organization
ICT	Information Communication Technology
IUCN	International Union for Conservation of Nature
LGA	Local Government Authority
MoEST	Ministry of Education, Science and Technology
NACP	National HIV/AIDS Control Programme
NACTEVET	National Council for Technical and vocational Education and Training
NAFORMA	National Forest Resources Monitoring and. Assessment
NEMC	National Environment Management Council
NEP	National Environmental Policy
NGO	Non-Governmental Organisation
OHS	Occupational Health and Safety
OSHA	Occupational Safety and Health Authority
STD	Sexually Transmitted Diseases
TBA	Tanzania Building Agency
TANESCO	Tanzania Electric Supply Company limited
TCU	Tanzania Commission for Universities
THTU	Tanzania Higher learning institutions Trade Union
ToR	Terms of Reference
URT	United Republic of Tanzania
WB	World Bank
UN	United Nation

VAT	Value Added Tax
WHO-GPA	World Health Organization Global Programme on AIDS

CHAPTER ONE
1.0 INTRODUCTION

1.1 Background and justification

The Institute of Accountancy Arusha (IAA) is a parastatal Educational Institution operating as a campus under the established Institute of Accountancy Arusha Act of 1990 under the Ministry of finance (MoF). IAA is located about 8Km Northern side of Tanzania, on observation hill along Njiro Road adjacent to Tawiri Offices. The Institute is highly accessible from all parts of Arusha City and it is within the proximity of other academic Institutions such as ESAMI. The overall control and supervision of the Institute is vested in its Governing Council. Institute of Accountancy Arusha of P.O. Box 2798, Arusha www.iaa.ac.tz is a main proponent of the expected project. The objectives and functions are teaching, conduct research and offer consultancies to business organizations, government, and non-governmental organizations and arrange for publication and general dissemination of study materials in connection with the work activities of the institute

The Institute of Accountancy Arusha operates in five campuses including IAA-Babati campus being a parastatal Educational Institution established by the Institute of Accountancy Arusha Act of 1990 on 17-September-2014. The overall control and supervision of the Institute is vested in its Governing Council. Currently, IAA- Babati campus is among of the public academic institution, which offers unique business and technological courses that goes with labour market/demands of the community scarcity of skilled manpower in the fields of Accountancy with Information Technology, Accountancy with Microfinance (Apprenticeship), Information Security, Business management and Agribusiness, Accountancy and Taxation credit Management, Cyber Security, Information Technology, Natural Resource Economics, Insurance and Risk Management with Apprenticeship, Peace and Security Studies, Tourism and Hospitality with Apprenticeship, Multimedia technologies and Computer Networking.

Being one of the famous institutes offering business and technological courses in the country, the IAA- Babati campus attracts largest number of students in Tanzania. This is partly due to the diversity and potential of its programmes but also to account for the urgently human development needs and transformation processes in Tanzania. In recent years, however, IAA- Babati campus capacity to admit students and offer quality education in areas of Science, Technology and Business has been hampered by inadequate infrastructures in terms of buildings, ICT and human resources as well as teaching, learning and research facilities.

The IAA- Babati campus is one of the higher learning institutions which have benefited from the Higher Education for Economic Transformation (HEET) project. HEET is a five-year project, which is financed by the World Bank through the Ministry of Education, Science and Technology (MoEST). HEET project aims at promoting higher education as a catalytic force for the new industrial based economy of Tanzania. Thus, the project is designed to revitalize and expand the capacity of higher learning institutions to contribute to key areas for innovation, economic development, and labour market relevance, by investing in requisite infrastructure for modern and effective teaching and research (**POM, 2021**).

The IAA-Babati campus, through the Government of the United Republic of Tanzania (URT) has received financing loan from the World Bank to implement higher education for economic transformation project (HEET). HEET project is a five-year project through the World Bank support, to promote higher education as a catalytic force in the new Tanzanian economy. The project is designed to revitalize and expand the capacity of higher learning institutions to contribute to key areas for innovation, economic development, and labor market relevance, by investing in requisite infrastructure for modern and effective teaching and research, and by training to the highest standard the teachers, researchers and administrators needed by higher learning institutions to achieve to their full potential. The Government of Tanzania intends to increase access and improve the quality of Technical and Vocational Education and Training (TVET) programs in the country. Therefore, the project is part of many ongoing projects under HEET in the country being implemented by various higher learning and monitored by the government. This project (HEET) will enhance IAA- Babati campus to become the centre of excellence in Informatics and Allied Technologies which will meet these needs. In conjunction with the above strategies the IAA-Babati campus will also facilitate the implementation of other government policies including The Technical Education Training Policy, The National Higher Education Policy, The National Sustainable Industrial Development Policy, The National Science and Technology Policy, National Skills Development Policy and The Small and Medium Enterprise Policy (SME Policy 2003.

The IAA-Babati campus, through the Government of the United Republic of Tanzania (URT) has received financing loan from the World Bank of **USD 6,000,000** equivalent to **TSh Billion 12,769,498,550** to implement higher education for economic transformation project (HEET). HEET project is a five-year project through the World Bank support, to promote higher education as a catalytic force in the new Tanzanian economy. The project is designed to revitalize and expand the capacity of higher learning institutions to contribute to key areas for innovation, economic development, and labor market relevance, by investing in requisite infrastructure for modern and effective teaching and research, and by training to the highest standard the teachers, researchers and administrators needed by higher learning institutions to achieve to their full potential. The Government of Tanzania intends to increase access and improve the quality of Technical and Vocational Education and Training (TVET) programs in the country. Therefore, the project is part of many ongoing projects under HEET in the country being implemented by various higher learning and monitored by the government. This project (HEET) will enhance IAA-Babati campus to become the centre of excellence in Informatics and Allied Technologies which will meet these needs. In conjunction with the above strategies the IAA-Babati campus will also facilitate the implementation of other government policies including. The Technical Education Training Policy, The National Higher Education Policy, The National Sustainable Industrial Development Policy, The National Science and Technology Policy, National Skills Development Policy and The Small and Medium Enterprise Policy (SME Policy 2003.

The IAA-Babati campus through the HEET project loan of the World Bank intends to construct one Administration Block, Library and Computer Laboratory for classes with four storeys for students with capacity of 7000, and staff offices carrying about 150 staffs. It is to be located within IAA-Babati campus premises babati town council in Manyara Region. It will comprise of Offices for staff Floor, Seminar Rooms, Lecture Halls, ICT-Laboratories, conference theaters hall. The proposed building will be equipped with online distance learning facilities for wider reachability and addressing emerging communicable disease challenges such as COVID-19. Thus, through HEET project, IAA-Babati campus will improve teaching environment and equity in education and training, and enhance quality of education and training, hence contributing to the Tanzania economy through generation of quality graduates that are relevant to the labor market requirements. In addition, the proposed project at IAA-Babati campus shall create many employment opportunities throughout the project life time. This is in line with The Second Five Year Development Plan 2015/16 – 2020/21 (FYDP II) of the Country that focuses on building an industry-centered economy and reducing unemployment through a multi-sector transformative framework. Upon completion, IAA- Babati campus is expected to accommodate a total of 7,150 students and staff. The project life span is expected to be 99 years, with total investment costs estimated at Tanzania Shillings USD 6,000,000 equivalent to TSh Billion 12,769,498,550

As a prerequisite to the construction of new building, the project will involve various site excavation activities, hence building construction and associated activities will inevitably have environmental, social and economic impacts, which need to be identified and mitigation measures put in place for ensuring sustainability of the project. The Environmental Management Act of 2004 of Tanzania requires project developers to carry out an Environmental and Social Impact assessment (ESIA) prior to project implementation. In accordance with the categories identified in the Third Schedule to Environmental Management Act, Cap 191 and First Schedule to Environmental Impact Assessment and Audit (Amendment) Regulations, 2018, the nature of this project is subject to full EIA study. Similarly, the World Bank provides Environmental and Social Framework (ESF), Environmental and Social Safeguarding Policies and relevant Environmental and Social Standards (ESSs), which aim to offset the anticipated social and environmental risks and impacts. The ESS1 for example, sets out the requirements for Borrowers relating to the identification and assessment of environmental and social risks and impacts and development of mitigation measures. Therefore, Environmental Management Act, Cap 191, the Environmental Impact Assessment and Audit (Amendment) Regulations, 2018, and World Bank Environment and Social Framework (ESF) as well as the project's Environmental and Social Management Framework (ESMF) were observed in the study.

Thus, the ESIA study was conducted in accordance with the Environmental Impact Assessment and Audit (Amendment) regulations 2018, formulated after the Environmental Management Act (EMA) No. 20 of 2004. The Regulations give mandate to NEMC to oversee the ESIA process, which culminates with an award of the Environmental certificate by the Ministry responsible for Environment. The certificate is among the prerequisite approvals required before the project takes off. This project will need this approval before it is implemented. Also, the study has adhered to World Bank Environmental and Social

Standards especially ESS1 which needs an identification of types of E&S risk and impacts that should be considered in the environmental and social assessment.

1.2 Nature of the Project

The proposed project is construction in nature that involves the Construction administration block, library and computer laboratory comprising lecture and seminar rooms, staff office, Library, Students hostels and cafeteria (Table 2.1). All the proposed buildings will be accommodated on a land of about 25.65ha owned by the proponent IAA- Babati campus at waang'waray Mtaa, waang'waray ward, babati town, Manyara region with the title deed Plot NO.269&260 Block "CC" (Appendix 4). The overall objective of the project is the realization of the increased capacity to admit students and offer quality education in areas of Science, Technology, and business. The ESIA study addresses all environmental and social aspects of the proposed project. As already stated above, this ESIA study has been conducted in accordance with World Bank Environmental and Social Standards and the National Environmental Impact Assessment and Audit (amendment) regulations 2018, formulated for the purpose of implementing the Environmental Management Act No. 20 of 2004. This Act specifically requires mandatory carrying out of ESIA for development projects implemented in Tanzania. Under these Regulations, multi- storeys buildings projects require an ESIA study. The project is therefore qualified for ESIA study

1.3 Project Rationale and Objectives

Tanzania has achieved remarkable progress in expanding access to basic education since 2015 being commendable gains in basic education in recent years. For example, enrolment at the primary level has shown an increase of 24.5% from 8,116,488 in 2015 to 10,111,671 pupils in 2018 (10,601,616 in 2019). Similarly, the enrolment trend in secondary education in the year 2013/14 showed a positive increase in the number of students transitioning to post-primary education. Student demand for higher education is expected to surge by 2030, so the tertiary education system (public and private) must expand and be of better quality to accommodate these additional students **(PAD, 2021**).

While the country has recorded expansion in basic education, there is widespread acknowledgement among policy makers that the overall outcome of the successful performance in basic education is the demand for subsequent levels of education and especially higher education. In this regard, the main challenges are inability of the system to absorb the expanding number of graduates in basic education inspired and capable of joining the higher education subsector, mismatch between university skills and industry needs, inadequate infrastructure, weak academia-private sector linkages, and limited research capacity. Of immediate need is the expansion of investment in infrastructure, facilities and quality assurance system in Innovative and technological courses, Business courses, Forestry and Natural Resource Management. Another concern is on the addressing gender issues, as women and girls encounter barriers to access and complete higher education.

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

(i) Gender inequality in lower levels of education (especially upper secondary) that persists up to the university level, although the gender parity index in higher education has improved from 56.5 percent in 2013 to 67.4 percent in 2018;

(ii) University graduates struggle to find jobs, at least in part due to skills mismatches;
(iii) Demand-side considerations underscore the need for greater numbers of students in disciplines and programs sought after by employers, such as engineering, agribusiness, tourism, and climate change. The overall quality of post-secondary academic programs is low and does not prepare university graduates adequately for current and future formal jobs or self-employment;
(iv) Shortage of well-trained lecturers, and the majority of academic staff use traditional teaching methodologies;
(v) Most of higher education institutions are not currently able to access or use modern technologies to deliver training; and
(vi) The global pandemic has reinforced the need for higher education institutions to develop thoughtful resiliency plans.

A more strategic mix of education, skills and technology will help Tanzania develop its productive sector and create jobs for the growing number of youths entering the labour market (**PAD, 2021**). It supports the development of academic programs, research centres, and partnerships in priority areas. It also provides scholarships, grants, and loans to students and institutions. The project is expected to benefit over 100,000 students and 3,000 faculty members by 2028. The Higher Education for Economic Transformation (HEET) Project will finance the development of infrastructures, faculties, and quality assurance systems in higher education to facilitate rapid economic transformation in the country. Through HEET project, the Government of the United Republic of Tanzania seeks to build requisite operational capacity for public universities to empower them to be dependable drivers for economic transformation by building on their respective institutional visions, missions, objectives and core values

Ultimately, the HEET project aims to ensure that higher education institutions in Tanzania are responsive to the changing economic needs of the country and continue to fuel sustainable economic growth. IAA- Babati campus being a public higher learning institution with the objective of assisting the government in producing competent human resource, finds it is necessary to embark on the proposed construction project so that the enrolment of students who will be pursuing innovative technology and business related programmes will increase from the current 16,000 students to at least 20,000 students. Such service requires facilities including class rooms, laboratories for hands-on practical learning as well as theatre for teaching and learning purposes.

1.4 Projective Objectives

According to the HEET Project Appraisal Document (**PAD**) of 2021, the main objective of the project is to strengthen the learning environment and labour market alignment of priority programs at beneficiary higher education institutions and improve the management of the higher education system. The stipulated objective is in line with IAA- Babati campus Strategic Plan which focuses on expanding infrastructures to match with increase in the student's enrolment. The strategic plan of the IAA- Babati campus is to enrol 20,000 students by year 2024-2027. This calls for the need to expand its facilities including infrastructures to create supportive environment towards achieving its goal. Prior to the construction of the proposed project, Environmental and Social Impact Assessment is required by World Bank and Tanzanian laws and governing in order to protect the

environment and lives of people. The ESIA study shall be conducted in accordance with World Bank Environmental and Social Framework as well as Tanzania's National Environmental Management Act, Cap 191 and its subsequent Environmental Management (Environmental Impact Assessment and Audit) (Amendment) Regulation of 2018.

In complying with World Bank's ESF instruments (Environmental and Social Management Framework (ESMF), Environmental and Social Commitment Plan (ESCP) , Resettlement Policy Framework(RPF), Stakeholder Engagement Plan(SEP), Labour management plan (LMP) and Standards as well as the provisions of the Environment Impact Assessment and Audit Regulations, (GN) No.474 of 2018, the project beneficiary IAA- Babati campus has prepared this ESIA report which address: the nature of the project; its location; main processes; materials use, by products and their disposal; environmental impacts; and their mitigation measures. It also analyses the economical and socio-cultural impact of the project to the local community and the nation at large.

1.4.2 Specific Objectives

In addressing the overall objective of the project, IAA-Babati campus as a beneficiary of the project have the following specific objectives:

i. To construct and equip one Administration Block, Library and Computer Laboratory (with classrooms, lecture halls and laboratories),
ii. To upgrade learning resources and equipment including capacity building in development of online and ODL learning and pedagogy;
iii. To update curriculum and introduce innovative pedagogical methodologies;
iv. To promote applied research and innovation capacity;
v. To building functional linkages with private sector/industry; improving incubator capacity for training.
vi. To develop online learning platforms and digital technology applications (including selecting and customizing Moodle based learning platforms);
vii. To promote self-generated income; and
viii. To building capacity of academic staff and university leadership.

1.5 Objectives of the ESIA Study

The overall objective of carrying out this ESIA was to identify, predict and assess both positive and negative environmental and social impacts associated with the project and propose mitigation measures to minimise the negative impacts and enhance the positive ones. The assessment used data and information on the physical, biological, and socio-economic environment to predict both negative and positive impacts of the project. The Environmental Management (EIA and Audit) (Amendment) Regulations of 2018 and World Bank Environmental and Social Standards (ESS1) provides the general objectives for carrying ESIA, among others a list comprises the following; -

- To ensure that environmental considerations are explicitly addressed and incorporated into the development decision making process;
- To anticipate and avoid, minimise or offset the adverse significant biophysical, social and relevant effects of developmental proposal;
- To protect the productivity and capacity of natural systems and ecological processes which maintain their functions;

- To promote development that is sustainable and optimizes resources use and management opportunities;
- To establish and assess impacts that are likely to affect the environment before a decision is made to authorise the project;
- Propose mitigation and socio-management procedures aimed at managing the proposed mitigation of the identified potential impacts and that will form part of the overall Environmental and Social Management Plan(ESMP) for the project operations; and
- To enable information exchange, notification and consultations between stakeholders.

IAA-Babati campus undertook this Environmental and Social Impact Assessment to address the above objectives.

1.6. Scope of Work

This study entailed the following: -

i. To provide description of the relevant parts of the project including project location, design, components and activities;
ii. To review of policies, legislation, standards and regulations governing Environment at International, Regional and Local levels;
iii. To assemble, evaluate, and present baseline data on the relevant environmental and social characteristics of the project area;
iv. To make consultation with Government agencies, local communities and the private sector operating near the project area;
v. To assess and quantify the potential environmental impacts resulting from the building development, especially within the zone of influence of the project;
vi. Describe alternatives that were examined in the course of developing the proposed project and identify other alternatives, which would achieve the same objectives;
vii. To develop an Environmental Management Plan (EMP) detailing actions and responsibilities for impacts mitigation and monitoring.

1.7 Methodology of the ESIA Study

The ESIA being a multidisciplinary field involved a team of experts while applied different participatory methods to involve all the concerned stakeholders. The methodology used in this study is commensurate with the Environmental Management Act, Cap 191 and the Environment Impact Assessment and Audit (Amendment) Regulations, 2018). The study was undertaken based on checklists complimented by the Consultants' experience and through discussion with IAA- Babati campus staff, local government officials and communities in the vicinity of the project site. ESIA study was done both as a desktop study and field work. It involved the review of literature/documents including Environmental and Social Management Framework (ESMF) report, IAA- Babati campus project background reports, socio-economic profiles and field studies at the project site to gather information and data on various aspects of the project. The environmental assessment required consultations with a number of stakeholders, including responsible government agencies, Local Government Authorities), etc. The study adopted the following approach:

1.7.1 Desk study

Desk study involved: identification and review of the country policies and laws which are relevant to the project; collection and review of previous study reports (including design reports) pertaining to the project; collection and review of information and data on the physical, social, economic, cultural as well as archaeological (if present); preliminary identification of key issues to be included in scoping report and the main ESIA study; and preparation for fieldwork, including notification of all stakeholders on the intention to conduct ESIA study as well as seek their co-operation. This was done by making phone calls, writing e-mails, and distribution of letters seeking appointment to the stakeholder.

1.6.2 Fieldwork

The field visits were essential to fully realizing the scope of the project. Several visits were made to the project site, where by the ESIA team collected specialised data. The visits were made during scoping stage and during detailed ESIA study. All visits were made in March 2022 to July 2023. Fieldwork intended to facilitate acquisition of information and data on physical, biological and social-economic aspects of the project site and neighbouring area. The collection of baseline data was conducted by defining the scope of the ESIA. Data collected during scoping allowed the study team to determine whether more detailed information on environmental conditions at the development site and its surroundings are needed and where such information can be obtained. Sampling locations during the study, samples were collected at the corners and in the middle of the farm (project site). Samples at the corner were named POINT A, POINT B, POINT C, POINT D, and POINT E and at the middle of the farm based on the marker block found at the farm. At each sample point three readings were recorded and the average value was used to represent the suspended particulate matters, ambient gases emission, noise level and Vibration level at that particular point for each of the project site.

1.6.2.1 Suspended Particulate Matter (Dust) Measurement in terms of PM10 and PM2.5.

Ambient air quality study was conducted with a view to establish the baseline status with respect to dust as particulate matter in terms of PM10 and PM2.5 for the proposed project area. Micro dust pro Casella (type 712) was used to detect the levels of PM10 and PM2.5. With exception of PM2.5, the measured PM10 levels were found are less than 150µg/m^3 and 50µg/m^3 limits prescribed by both TBS limits and WHO guidelines for all areas of proposed site as table shown per each site.

1.6.2.2 Ambient Gaseous Assessment

Air quality study was conducted with a view to establish the baseline status with respect to ambient gases for all four proposed project area. Multi-gas monitor type “MX6 IBrid” was used to detect the levels of ambient gases. All the measured parameters were found to be below their respective TBS and/or WHO limits. The gas detectors established the air composition characteristics by recording the proportions of oxygen (O_2) [%], carbon monoxide (CO) [mg/nm^3], hydrogen sulphide (H_2S) [mg/m^3], mono nitrogen oxide (NO) [mg/nm3], nitrogen oxides (NOx) [mg/nm3], sulphur dioxide (SO_2) [mg/nm^3], and carbon dioxide (CO2) [%].

1.6.2.3 Ambient Noise Levels.

Noise study was also conducted with a view to establish the baseline status with respect to noise levels for the proposed project area. The measurements were undertaking using a digital sound level meter Sper Scientific type 850069, which was placed at 1.5 meters above the ground. The noise qualities in all measured stations were found to be within the TBS and WHO limits specified for institutional areas.

1.6.2.4 Vibration Levels

Ground vibrations were monitored by using vibrometer branded PCE- HAV 100" data logger, which is designed to measure ground vibrations according to European standard EN14253:2003. The recorded levels were compared with both British Standard of 0.3mm/s PPV, TBS limit of 5mm/s PPV and 0.15 mm/s PPV (Peak Particle Velocity), the levels that human beings and/or animals can detect or may experience stress resulted to vibrations. The highest recorded average ground vibration level was 0.001 mm/s PPV. However, the anticipated impact resulting from the measured vibrations is considered less-than significant as the levels did not exceed the 0.15 mm/sec PPV criteria established to evaluate the extent that can easily be detected by human.

1.6.2.5 Data Analysis

The data collected under each measurement was compiled and analyzed with MS Excel. Interpretation of the data utilized various standards and norms and was compared to the specific threshold limits from the Tanzania standards or the alternative international standards.

Measurement of Ambient gaseous pollutants

Baseline levels of ambient gaseous pollutants were measured using a FD-4S Portable Multi-Gas Detector (pictured in Figure 2.2). The instrument operates using a heated metal oxide semiconductor. The gas molecules adsorb onto the heated surface where an oxidation-reduction reaction occurs causing a change in the electrical conductivity of the metal oxide. This change is proportional to the concentration of the gas of interest. Parameters measured included: Carbon monoxide (CO) in Parts per Million (PPM), Oxygen (O_2) in %, and Hydrogen sulphide (H_2S) in PPM. At the sites, the equipment was mounted at 1.5m above the ground. Three reading were collected at each sampling point, and the mean value was used as a representative value of that particular point. Results were compared with local and international standards.

Meteorological conditions

Temperature and relative humidity were measured at the same sampling points used for ambient air quality, using the same device (i.e. Temtop M2000C) (see Figure 2.1). Four readings were recorded for each parameter and the average value was used.

Collection of biological information

The survey was based on qualitative method where by field observation through transect walk within the entire proposed project was conducted. The vegetation types were classified basing on their physiognomic characterization. Identification of plant species was conducted directly in the field by botanist aided by various plant identification books includes Flora of Tropical East Africa series and various reports for the coastal forest vegetation especially Frontier Tanzania expeditions. Existing two documents of **CITES** list (Convention on

International Trade an Endangered Species of Wild Fauna and Flora) and the **IUCN** (International Union for Conservation of Nature) Red List of Threatened plant species, have been used to identify those plant species which falls in any of its categories and appendices respectively. Digital Camera was used to take photographs for further illustrations as well as GPS used for marking various important points.

Collection of socio-economic data

Both primary and secondary data were collected. Primary data were collected by direct measurement, observations and using semi-structured interviews with respective and targeted parties (as explained in the previous section). Secondary data were obtained from various relevant sources of information such as education and many other official and non-official documents.

1.6.3 Public participation

Consultations were done to members of the surrounding communities of the IAA-babati campus which includes local government authorities and community meetings in three streets of waang'waray, and all street of Babati ward. This study has taken on board, the World Bank Social Standards which include, assessment and Management of Social Risks and Impacts, Labor and Working Conditions, Community Health and Safety, Land Acquisition, Restrictions on Land Use and Involuntary Resettlement, Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities and Cultural Heritage.

The data for this study was obtained through organized public meetings at IAA-babati campus and community level, face-to-face meetings, community meetings, site visits, group discussions, meetings with mtaa/street councils, presentations and workshops. At the institutional level interviews with IAA Rector, Deputy Rector for Academic and Administrative affairs and service providers within IAA -babati campus addition to that, the study conducted focus group discussion with Public Institutions and Agencies relevant for service provisions at IAA -babati campus responsible authorities and surrounding communities which include but not limited to NACTEVET, TANESCO, BAUWASA, CCM-region, OSHA-northern zone, RC-office Manyara region and Fire Rescue Army. The study further conducted face-to-face meetings with vulnerable communities' e.g. public meetings with people whom live near or adjacent to IAA -babati campus and Non-Government organisations. The concerns of each group have been addressed in this ESIA report.

1.7 Project impact assessment

The environmental assessment has been undertaken in close interaction with the design team. In this process environmental impacts have been evaluated for various alternatives. Several project alternatives were considered including that of not implementing the project. The fundamental environmental protection strategy and environmental considerations influencing engineering design were incorporated. However, reasonable regard to technological feasibility and economic capability were taken into account. Inter alia, the assessment entailed the following:

1.7.1 Project impacts identification

Superimposing project elements onto the existing social and environmental natural conditions made it possible to identify the potential impacts of the proposed project. The checklist method was used to identify the impacts in which the contender list of key impacts such as noise pollution, waste management was developed etc.; Further, environmental impact matrix method was adopted in identifying impacts of major concerns. A key guiding assumption in this study is that the project will be designed, constructed and operated with due care for safety and environmental matters using current and practical engineering practices and/or Best Available Technology Not Entailing Excess Cost (BATNEEC). The implementation schedule of the mitigation measures is summarized in the ESMP.

1.7.2 Impact Assessment

The actions undertaken to determine the significance of potential project impacts involved the following three key steps:

i. **Prediction**: What will happen to the status of specific receptors as a consequence of this project activities (primarily; what is the magnitude of the impact?);
ii. **Evaluation of significance**: How significant is the impact to the identified receptors namely, affected communities and the wider environment – land, air and water? What is its relative significance when compared to other impacts?
iii. **Residual Impacts**: After mitigation, are the impacts still of concern and/or significant? If yes, the process needs to be repeated at least once before the 'final' determination of residual impact significance occurs.

Potential impacts arising from planned activities, cumulative impacts with other developments and unplanned events (e.g. accidents, natural disasters, etc.) were also assessed. Stakeholder engagement is undertaken throughout the implementation of the proposed project to ensure that Affected and Interested Parties are aware and informed of the proposed project and have an opportunity to provide input regarding potential proposed project impacts and mitigation measures.

1.7.3 Development of Mitigation Measures

As part of the ESIA process, when impacts (adverse and/or significant) were identified and could not be managed via design controls, mitigation measures were developed in line with the Mitigation Hierarchy. First, efforts were made develop measures to avoid, or prevent, then minimize or reduce adverse impacts or to enhance potential beneficial impacts. For remaining significant and moderate residual impacts, mitigation measures were developed.

1.8 Report Structure

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

- Executive Summary
- Table of Contents
- Acknowledgement
- List of Acronyms
- Introduction
- Project description

- Policy, administrative and legal framework
- Environmental and Social Baseline/ Existing conditions
- Stakeholders Analysis
- Assessment of Impacts and Identification of Alternatives
- Environmental and Social Mitigation Measures
- Environmental and Social Management Plan
- Environmental and Social Monitoring Plan
- Resource Evaluation / Cost Benefit Analysis
- Decommissioning and Closure
- Summary and Conclusions
- References
- Appendices

CHAPTER TWO

2.0 PROJECT DESCRIPTION

2.1 Location and Accessibility

2.1.1 Location

The proposed projects shall be located at Institute of accountancy IAA-Babati campus, Babati mjini ward, Babati, Manyara Region. Institute of accountancy Arusha is bordered by Mamile road to the South – East side, Residential area to the west side, and Residential

area to the North – East side. The sites for the project are located within the Institute campus.

2.1.2 Accessibility

IAA is located eight point nine kilometres from Babati town. It lies in the North side of Tanzania, on observation hill along Mamile Road adjacent. The Institute is highly accessible from all parts of Babati town.

2.1.2 Sites description

IAA-Babati campus landscape is divided into low, medium and high zones. The proposed construction of new buildings under HEET project will be done at the least developed area. The buildings will be constructed at the low and medium zone.

2.2 Project Components and Design

The site is almost irregular in shape and allows a high-rise development in accordance with Manyara region redevelopment plan. The site is located in a prime area whereby it links closely with the local public and private transport facilities, which reinforce its sustainable credentials.

2.2.1 Project Components

IAA-Babati campus will construct one new building within the campus to address the immediate and long-term needs. The project components are number of toilets to each floor and each gender since we have one project academic buildings the design proposed having female 8 toilets for non – disable person and 2 disable toilets and Male 6 toilets for non-disable person and 2 for disable person per each floor since toilets are typical for all floors Table 2.1. There will be parking at project area and we estimate capacity of 50 vehicles. The number of toilets to each floor and each gender female 8 toilets for non – disable person and 2 disable toilets and Male 6 toilets for non-disable person and 2 for disable person per each floor since toilets are typical for all floors.

Table 2. 1: Typical project components to be built at IAA-Babati campus

Component	Functional space	3D view	Total floors area (m^2)	Area coverage (m^2)	Number of People to be accommodated
Administration Block, Library and Computer Laboratory building	Academic building is a 4 storey building comprising of conference ground, Offices, library, board room, classrooms and other supporting facilities such as, Lift, stair toilets and ramps.		8,672	10,900	7000 students; 150 staff

Source: IAA, 2025

2.2.2 Project Design

The buildings shall be developed within a campus setting and requires a number of design provisions to be made to ensure its functionality. The buildings will be climate smart and friendly to gender including considerations to persons with special needs (e.g. physical, learning impairment, emotional and behavioural). The design will ensure low energy use and integration of solar power supply; low footprint to increase green spaces; and accommodation of rainwater harvesting, storm water and waste management systems. The following are the design criteria that have been followed during the design of the buildings.

- Ensure easy flow of clean air
- Presence of fire escape routes in each floor
- Aesthetic values added
- Proper orientation to reduce indoor discomfort and capture natural air as much as possible and minimization of the sun effects
- Easy accessibility of common facilities

The designs of toilets facilities have been prepared following standard and specification for both able-bodied and disabled persons which take into account the size of toilets, fittings, Ducts for wastage collection and accessibility. The size of storage rooms is well design to accommodate all equipment's needed in our design the storage room we call utility room which have dimension of 3m x 3.5m with a total square meter of 10.5. Before commencing the project consultant will have to register the project to OSHA and follow all OSHA regulation which includes putting sign board as OSHA instructs and approve. In the design consideration of renewable energy has been putting in solar streetlight. In designing of rainwater harvesting system is proposed to construct underground storage water tank of capacity 10000 litters whereby by all rainwater drain from gutter will be stored and be utilized in gardening and toilets. waste collection point will be constructed but also to in the site will put dust collector and for waste to be recycle will give to the dealers who deals with recycling waste such as plastics and papers. The designs provide accessibility of person with disabilities such facilities are Entrance Ramps with dimension of 2.5m x 3m, also due to our building having 5 storey and budgeted fund does not allow to construct ramp up 5 storey will put lift for easy access and will have accessible toilets for disable person with dimension of 1.5m x 2m.The interior design is the state of art and the size of corridor have width of 2.5m and stairs having width of 2m. The designed building follow standard and specification so if there is possible changes we will see the magnitude of that variation changes if can relate to our design. The walls constructed for those rooms will have sound proof materials to avoid noises raised. Technological solution that could aid disabled individuals such as devices for communication in the buildings will depend on the nature of disability such as Ramps, Lift, Wheel chair, Hearing aids, Tape recorder and Blair, Sign language, Sound proof Studying table should be cycle.

2.2.2. Climate Change Risks Mitigation and Adaptation in the Project Design

In order to mitigate and adapt the climate change risks (e.g., heat, drought, water scarcity, etc), the design of the IAA-Babati campus shall accommodate the infrastructures to enhance low energy use, rainwater harvesting, storm water management systems, adequate natural ventilation and lighting, and maintaining a significant green space, as described hereunder;

(i) **Park and open space:** Trees will be planted in the park and public open spaces to maximize the tree canopy cover and shade provided by trees in the area for more

provision of ecosystem services. In doing so native trees will be given first priority to maintain the natural ecosystem.

(ii) **Greenery walkways:** The design maximizes pedestrian movement and minimizes motorized transport within the site in order to reduce air emissions (greenhouse gasses (GHGs)) and maximizing Carbon sequestration. Walkways are provided to restrict free movement that causes vegetation destruction in the site, and reducing land cover important for carbon sequestration. Trees are proposed to be planted along the vehicular access road and footpaths to improve landscape and reduce effects of sun radiation during the day.

(iii) **Green areas:** Green areas are distributed in every zone/ block to allow cross fresh air into the buildings. Due to the topographical nature and nature vegetation cover, green belt and conservation zone intend to preserve the ecosystem and control land degradation. Trees and grasses will reduce soil erosion in sloping plains and all areas prone to soil erosion.

(iv) **The building with low energy use;** Provisions for adequate openings for cross ventilation, that will ensure easy flow of clean air and reduce energy use (thus reducing emissions); provisions for motion sensors in public areas, to enable auto switch ON/OFF of lights; installation of presence sensors in offices, class rooms, laboratories and workshop areas; proper orientation to reduce indoor discomfort and capture natural air as much as possible and minimization of the sun effects (installation of fans; and provisions for solar lights along the pathways for sun shading); maximizing the potential of utilization of renewable energy options such as solar and wind; Utilization of biogas from the wastewater treatment plant for cooking; buildings to be oriented and constructed to take advantage of natural lighting and cross ventilation as a means of minimizing energy consumption during operation;

(v) **The buildings with low footprint**. This increases green spaces; and accommodation of rainwater harvesting, storm water and waste management systems and embracing water-efficient processes.

2.2.3. Disaster Risk Management

The proposed project shall have provisions for fire prevention and firefighting facilities. Also, the buildings shall have provisions for solid waste and liquid waste management for diseases prevention. In addition, possible access roads shall be used to ensure easy walkability and vehicular access to and from the building to avoid car accidents. The roads shall be safely connected to the parking area huge enough to accommodate cars. IAA-Babati campus shall have an emergency management plan that assigns the responsibilities for various emergency tasks, specifically to WHO does, WHAT, WHEN AND HOW.

2.2.4. Gender Inclusivity

The IAA-Babati campus structures shall be designed to be intelligent and inclusive to all genders, with special attention to accommodating individuals with special needs (e.g. physical, learning impairment, emotional and behavioural). These include provisions of lamps, toilets, etc.

2.2.5. Occupational Health and Safety (OHS)

OHS During pre-construction phase

The structural elements of a project will be designed and constructed by competent professionals, and certified or approved by competent authorities or professionals. Where the project includes new buildings and structures that will be accessed by members of the public, the IAA-Babati campus will consider the incremental risks of the public's potential exposure to operational accidents or natural hazards, including extreme weather events. Where technically and financially feasible, IAA-Babati campus will also apply the concept of universal access to the design and construction of such new buildings and structures.

OHS During construction phase

IAA-Arusha campus with support from the supervision consultant will ensure regular training to permanent and temporary workers (including community workers) on occupational health and safety to workers and information relevant to health risk including cholera, HIV/AIDS, COVID-19, and impacts of dust to workers health will be provided to workers. During the construction period the contractor shall provide, equip and maintain adequate personal protective equipment, first-aid stations and sign boards directing where these services are situated and transport in case of emergency. Appropriate protective gear including, but not limited to helmets, heavy duty gloves, safety vests and boots, shall be provided to site workers and visitors. Training related to hazards and hazard management will be provided to workers and particularly as stipulated in the general IFC general EHS guidelines during construction the contractor will be required to put emphasize on training related to specific hazards such as working at height, ergonomic, slips and falls, dust and moving machinery and any other relevant hazard that will be identified during construction.

OHS During operation phase

All the emergency situations associated with building operations will be included as part of the design aspects including allocation of emergency assembly point. Emergency plans procedures will be developed to prevent and mitigate likely consequences associated with each incident. The document that details potential emergencies and response to such situations and how to prevent and mitigate the environmental aspects will be in place. Occupational Health and Safety hazards related to the daily operations of the like exposure to eruption disease, risks of fire explosion and security will be given due considerations. Fire extinguishers of powder foam type and fire hose reel will be placed in several strategic areas at the site and serviced on time.

OHS during decommissioning phase

If decommissioning has to happen, it is anticipated that the project will have hazards resulting from noise and vibration that may be caused by the operation of pile drivers, earth moving and excavation equipment, concrete mixers, cranes and the transportation of equipment, materials and people. According to IFC Guidelines specifically the general Environmental Health and Safety guidelines, slips and falls on higher elevation associated with poor housekeeping, such as excessive waste debris, loose decommissioning materials, liquid spills, and uncontrolled use of electrical cords and ropes on the ground, are also among the most frequent cause of lost time accidents at

decommissioning site. To control these challenges during decommissioning phase, the contractor shall be required to have a clear understanding on the historical use of the land with regard to the potential presence of hazardous materials or oil prior to initiation of decommissioning activities, preparing plans and procedures to respond to the discovery of contaminated media to minimize or reduce the risk to health, safety, and the environment but equally important to provide adequate and the right PPEs for the anticipated hazards during decommissioning.

2.2.6. Project Design Criteria

The building shall be used for educational purpose only. The building rules and regulations will be in accordance with Tanzania government specifications and the planning regulations of Arusha City Council and specific conditions as provided a certificate of occupancy from Ministry of Lands, Housing and Human Settlements Development. The following are the design criteria that have been followed during the design of the building;

(i). Easy vehicular access to and from the building,
(ii). Short internal walking distances
(iii). Ensure easy flow of clean air
(iv). Aesthetic values added
(v). Proper orientation to reduce indoor discomfort and minimize the effect of the sun
(vi). Ensure coherence, diversity compatible uses and scale in the context
(vii). Wastewater disposal facilities are part of the design whereby storm water is directed into the highway storm drains.

2.2.3 Development Conditions

The proposed project is in line with the priority of the fifth phase government on industrialization and Vision 2025 in general, requires higher learning institutions to produce high quality, ready to use skilled labour. IAA-Babati campus ought to expand its physical infrastructure to accommodate this need. Furthermore, the buildings rules and regulations will be in accordance with Tanzania government specifications and the planning regulations of Arusha City Council and specific conditions as provided in certificate of occupancy from Ministry of Lands, Housing and Human Settlements Development. The project is in line with city plan for the IAA-Arusha campus. The expansion of IAA-Babati campus facilities was characterized by two main factors, one of which being to fulfil the objectives and requirements of the HEET project. HEET is coordinated by the Ministry of Education, Science and Technology (MoEST) and will be implemented in almost all public higher learning institutions located in regions. The second factor was the stipulated objectives that are in line with 2018 - 2038 IAA Master Plan. The number of storeys and plot ratio of the buildings are within the specified range provided by Arusha city council. Therefore, the development complies with the proposed number of floors and the proposed land use.

2.2.4 Land ownership and Requirement

The plot number **259 &260** block **"CC"** Babati town is currently owned by IAA-babati campus. The title deed and transfer document has been attached with this report (Appendix II). The area is planned for educational purposes and ancillary purposes thereto, use group C use classes (a) and use group K use classes (b). The land has a total area of 67m^2. The proposed new buildings are expected to utilize a maximum of cover **10,900m^2** for major one building composed of

administration block and academic block for classes with four storeys for students with capacity of 70000, staff offices carrying about 150 staffs.

2.3 Manpower and Utility Requirements

2.3.1 Manpower Requirements

The proposed project is expected to be temporarily (contract) deploying about 150 to 200 people gender (male and female) being sensitive aspect having equal opportunity during construction phase. Employment during construction phase will be under contractor and will be in the form of managers, skilled as well as unskilled laborers considering all gender types and ages. Working hours will be under labour law controls which are 8 hours.

2.3.4 Electricity

The total connected load will be 33 KV supplied through three phase 220kVA distribution transformer from national electricity grid. However, due to recurrent power cuts from the national grid the proponent might install a 110 kVA generator set for backup. Status of the generator room currently is not known until the contractor will be procured who will set the standards of construction.

2.3.5 Water Requirement

The major water source is from BAUWASA; water will be used for construction activities and for domestic purpose (flushing of toilets) and cleaning activities during construction and operation phase. The water consumption using construction is estimated to be 3.2 m^3/day

2.3.6 Access and Service Roads

The project site will be accessed through Mamile roads from babati town. The project will not require additional onsite access roads to connect existing roads. As there already exist of access roads of which the proposed project will make use of these. Delivery of construction materials will be scheduled during off peak hours to control traffic and congestion along the mentioned roads.

2.3.7 Hazardous materials/waste management

The main type of hazardous waste to be involved at site during construction includes hydrocarbons such as used oil and diesel for running diesel powered machines at site. Also, there will be remaining paint containers. A proper temporary storage room will be constructed with bund wall to contain leakage or spillage in case of incident. After accumulation of large amount of used oil or at the end of construction during demobilization the oils and other type of hazardous wastes will be handled over to the authorised agent to handle such kind of wastes.

During operation there is potential for generation of hazardous wastes to include expired chemicals if due care is not taken. Chemicals in liquid or solid form might expire and require proper handling and disposal to avoid human health risks and environmental pollution. IAA-babati campus laboratory team will establish a system for management of chemicals to include ordering only the amount required for a short period of time to avoid accumulation and expiring. The system will also include First in First Out (FIFO) to ensure old chemicals is consumed first and hence to reduces chances for expire of chemical before usage. In case there will be expiring of chemicals, they will be stockpiled properly as per its nature and shall engage certified agent for disposal.

2.4 Project activities in general

The undertaking involves various phases from the planning phase all the way to the construction and operation phase. Each specific phase has its own activities which are elaborated in the following sections;

2.4.1 Pre -Construction Phase

Activities

This phase entails

i. **Topographical Survey**- The topographical survey was done by Surveyors to establish the boundaries and the ground levels;
ii. **Geotechnical investigations**- Geotechnical investigation involved drilling the ground to study the soil profile the underling geological formations.
iii. **Architectural and Services Designs**- Preparation of Architectural drawings is done by architects to provide drawings which fits the proposed plan;
iv. **Environmental and Social Impact Assessment** (ESIA)- This ESIA has been conducted by following the ESIA and Audit (Amendment) regulations of 2018 and the World Bank's ESF;
v. **Acquisition of various permits/ certificates**-This include getting building permit from relevant authorities.

Duration

The duration of this phase will be Four (4) months.

2.4.2 Construction Phase

Activities

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

- **Earthworks (site clearance)** - This shall be done by means of motor grader. The proponent shall ensure as many indigenous and artificial trees as possible are left intact. This will also ensure that the drainage pattern of the site is not interfered with.
- **Demolition Works**- The existing site has no any building for demolition.
- **Foundations excavation**- Most part of the site is covered with vegetation. The same will be removed and disposed off by a licenced waste handler to pave way for the construction.

- **Material transportation**- Materials shall be extracted to ensure efficient use of resources as stipulated in ESS3.Materials (fine and course aggregates) from quarries will be transported by trucks to the construction site. Water will be brought to the site directly from tank within the site area. Other materials like cement, timber and reinforcement bars will be transported by trucks to the construction site.

- **Material Storage-** Materials like aggregates and sand will be stored at the site ready for use. Cement and reinforcement bars will be stored in special storage rooms. Timber will directly be used at the required areas and consequently there will be no stockpiling of timber at the camp sites. Fuel will be stored in drums in secluded areas.

- **Masonry, Concrete works and related activities**- The construction of the building walls, foundations, floors, pavements, drainage systems, perimeter fence and parking area among other components of the project will involve a lot of masonry work and related activities. General masonry and related activities will include stone shaping, concrete mixing, plastering, slab construction, construction of foundations, and erection of building walls and curing of fresh concrete surfaces. These activities are known to be labour intensive and will be supplemented by machinery such as concrete mixers.

- **Steel Structure works-** The buildings will be reinforced with structural steel for stability. Structural steel works will involve steel cutting, welding and erection.

- **Roofing and Sheet metal works**- Roofing activities will include sheet metal cutting, raising the roofing sheets and structural timber to the roof and fastening the roofing materials to the roof.

- **Electrical Work**- Electrical work during construction of the premises will include installation of electrical gadgets and appliances including electrical cables, lighting apparatus, sockets etc. In addition, there will be other activities involving the use of electricity such as welding and metal cutting.

- **Plumbing-** Installation of pipe-work for water supply and distribution will be carried out within all units and associated facilities. In addition, pipe-work will be done to connect sewage from the premises to the effluent treatment plant.

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

Duration

The duration of this phase will be Two (2) years.

Types, Amounts and Sources of Project requirements

Types, amounts and sources of project requirements during the construction phase are shown in Table 2.2.

Table 2. 2: Types, amounts and sources of project requirements during the construction phase

Requirements	Type	Source	Quantity (Estimates)	Mode of Transport
Raw Materials	Aggregates	Mlete	1,700-2,000m^3	Trucks
	Sand	Tanga	5,000-10,000m^3	Trucks
	Cement	Babati town	2,500-3,000Tons	Trucks
	Water	BAUWASA	60 m^3	Trucks
	Reinforcement bars	Babati town	2,100Tons	Trucks
	Timber	Mafinga	32Tons	Trucks

Requirements	Type	Source	Quantity (Estimates)	Mode of Transport
Manpower	Skilled	Contractor	25	Communal buses
	Unskilled	Pambazuko area	150	Communal buses
Equipments	Excavator	Contractor	1	Trucks
	Bulldozer	Contractor	1	Trucks
	Motor grader	Contractor	1	Trucks
	Plate compactor	Contractor	1	Trucks
	Trucks	Contractor	5	
	Construction Crane	Contractor	2	Trucks

Source: Consultant Analysis, 2025

Types, Amounts and treatment/disposal of Wastes

Types, amounts and treatment/disposal of wastes during the construction phase are shown in Table 2.3: The project shall be implemented in a manner that pollution does not occur as stipulated in ESS3.

Table 2. 3: Types, amounts and treatment/disposal of wastes during the construction phase

Waste	Types	Amount	Treatment/ Disposal
Solid Waste (Degradable)	Vegetation	Approximately 2,500m^3 The estimate is based on the total area to be built (62,756.91 m^2)	The logs shall be sold to people to be used as fire wood
	Remnants of timber.	Estimated to be 2500m^3 The estimate is based on activities expected to generate remnants of timber such as formworks	Shall be sold to recyclers
	Food remains, cardboards and papers	52.5 kg/day (based on generation rate of 0.3kg/day/ person and 175 people)	To be collected in the large skip bucket at site ready to be disposed at the designated dumpsite which will be known letter
Solid Waste (Non-Degradable)	Demolition waste Spoil Soil	1000 m^3. The estimate is based on the area to be excavated	This soil shall be stock piled along the foundation trenches. The soils shall be used to reinstate site at the end of construction activities
	Scrap metals, drums	5-10 kg	To be Sold to Recyclers
	Tins, glasses and plastics	5-10 kg	To be Sold to Recyclers

Waste	Types	Amount	Treatment/ Disposal
Liquid waste	Sewage	3.2 m^3/day (Based on 175 people, water consumption rate of 40L/capita/day and wastewater discharge factor of 80%, 50% of the workers shall use the Site Toilet)	To be directed to the Septic Tank-Soak away System that is present at the site
	Oils and greases	None	Service and maintenance of vehicles will be done at designated garages

Source: Consultant Analysis, 2025

2.4.3 Demobilization phase

Activities

Demobilization of temporary structures will be done for proper restoration of the site. Clearance of all sorts of wastes including sewage and solid wastes (plastics, wood, metal, papers). All wastes will be deposited at the designated dumpsite and temporary employment will be terminated.

Duration

Demobilization stage will last for a period of six months.

Types, Amounts and Sources of Project requirements

Types, amounts and sources of project requirements during the demobilization phase are shown in Table 2.4:

Table 2. 4: Types, amounts and sources of project requirements during the demobilization phase

Requirements	Type	Source	Amount
Manpower	Skilled	Contractor	5
	Unskilled	Local area (Mletele area)	50
Equipment	Bull dozer	Contractor	2
	Motor grader	Contractor	1
	Plate compactor	Contractor	1
	Tippers	Contractor	1

Source: Consultant Analysis, 2025

Types, Amounts and treatment/disposal of Wastes

The demobilization of the temporary structures will result mainly into solid wastes such as timber, iron sheets and rubbles from demolitions. Timber and metal sheets will be sold to people in the nearby communities for reuse while rubbles will be used for levelling.

2.4.4 Operation phase

Activities

The activities that are expected to be executed during operational phase include

i. Tenancy/ Occupancy;
ii. Imparting Knowledge;
iii. Occupational health and safety management;
iv. Good housekeeping of the area;
v. Project Maintenance.

Duration

The duration of this phase will be more than thirty (50) years

Types, Amounts and Sources of Project requirements

Types, amounts and sources of project requirements during the operational phase are shown in Table 2.5:

Table 2. 5: Types, amounts and sources of project requirements during the operational phase

Requirements	Type	Source	Quantity	
Water		Main supply	320m^3/day estimated based on the number of occupants for all buildings (7,609 *60l/c/d*70%). Assuming that 70% of the population will use the structure full time	
Energy	Electricity	• TANESCO (National Grid) • Standby generator at the Site	• 1050kwhr per day • 1500kVA	•

Source: Consultant Analysis, 2025

Types, Amounts and treatment/disposal of Wastes

Types, amounts and treatment/disposal of wastes during the operation phase are shown in Table 2.6:

Table 2. 6: Types, amounts and treatment/disposal of wastes during the operation phase

Waste	Types	Amount	Treatment/ Disposal
Solid Waste (Degradable)	Food remains, cardboards and papers	2.8tons/day (based on generation rate of 0.35kg/day/ person, campus intended to accommodate 8000 people, worst case scenario)	Collected in waste collection points ready for disposal at the designated dumpsite

Solid Waste (Non-Degradable)	Scrap metals, drums	5-10 kg/day	Sold to Recyclers
	Tins, glass and plastics	5-8 kg/day	Collected in waste collection points ready for disposal at the designated dumpsite
Liquid waste	Sewage	256m^3/day (The campus intended to accommodate people, water consumption rate of 60L/capita/day and wastewater discharge factor of 80%) and 50% will use facilities Q= 0.8*(60*15000)*0.5 =360,000 l/day	All the liquid wastes from toilets, kitchen, bathrooms etc. will be collected and directed to the Treatment plants – Septic tanks and soak away pit and Up flow Anaerobic Sluge Blanket (UASB) present at the campus
Storm water	Runoff	Based on an average of 40% paved project area and 60% unpaved project area; the estimated runoff (m^3/year)= K×I×A Where by K =Runoff coefficient (0.85 for paved surface and 0.7 for unpaved surface) I= Rainfall Intensity (1100mm) A = Area of the catchment (m^2) (0.85*0.11*0.4*62,756.91) +(0.7*0.11*0.6*62756.91) Thus, the estimated runoff will be 5,246.5 m^3/year	To be directed to storm water drainage system present to be constructed Rainwater harvesting

Source: Consultant Analysis, 2025

2.5 Occupational health and safety (OHS)

2.5.1 OHS During construction phase

IAA-Babati campus with support from the supervision consultant will ensure regular training to permanent and temporary workers (including community workers) on occupational health and safety to workers and information relevant to health risk including Chorela, HIV/AIDS, COVID-19, and impacts of dust to workers health will be provided to workers. During the construction period the contractor shall provide, equip and maintain adequate personal protective equipment, first-aid stations and sign boards directing where these services are situated and transport in case of emergency. Appropriate protective gear including, but not limited to helmets, heavy duty gloves, safety vests and boots, shall be provided to site workers and visitors.

Training related to traffic hazard management will be provided to communities especially through their Leaders so that each citizen will not be affected with traffics during construction. The speed limits for vehicles shall not exceed the default speed limit (not exceeding 50 km/h), except within a speed zone in which a higher speed is permitted. The speed limit in the shared zone that should not exceed 10 km/h. Signals that a driver shall not turn right or left, or stop or suddenly decrease speed, without giving warning of his or her intentions. Contractors shall make sure that all of these issues are well known to their employed drivers to prevent unnecessary complications and accidents during project execution. However, the entrance and exit points have been provided. The entry points at IAA-Babati campus there will a main gate to be used during the night hours only starting from 10:00pm to 11:00 am to avoid interference with normal routine.

2.5.2 OHS During operation phase

All the emergency situations associated with building operations will be included as part of the design aspects including allocation of emergency assembly point. Emergency plans procedures will be developed to prevent and mitigate likely consequences associated with each incident. The document that details potential emergencies and response to such situations and how to prevent and mitigate the environmental aspects will be in place. Occupational Health and Safety hazards related to the daily operations of the like exposure to eruption disease, risks of fire explosion and security will be given due considerations. Fire extinguishers of powder foam type and fire hose reel will be placed in several strategic areas at the site and serviced on time.

2.6 PROJECT BOUNDARIES

Identification of boundaries within which the ESIA study is undertaken is an important component of the environmental and social assessment study. There are three types of boundaries that are considered in this ESIA study: Institutional, Temporal and Spatial boundaries.

2.6.1 Institutional boundaries

Institutional boundaries refer to those institutions and sectorial boundaries in which the project lies or mandated. These can be determined from political boundaries, Acts, regulations and institutional mandates and administrative structures. The proposed development is about the construction of new IAA-Babati campus buildings. Many institutions and administrative units in Tanzania are of interest;

- Ministry of Education Science and Technology
- Babati town
- Tanzania Commission of Universities (TCU)
- National Council for Technical and Vocational Educational Training(NACTEVET)
- Fire and Rescue Force
- Occupational Safety and Health Authority (OSHA)
- BAUWASA
- TANESCO
- Tanzania building agency (TBA)
- Babati ward

These institutions were consulted in this ESIA process, as they are key stakeholders with vested interest in the development at IAA-Babati campus for environment and economic prosperity of the local people and Tanzanians in general.

2.6.2 Temporal boundaries

Temporal boundaries refer to the lifespan and reversibility of impacts. For example, the impact of construction work for the affordable housing project may be short-lived, but the presence of these buildings in the selected site may have implications that stretch far into the future until when decommissioning is undertaken. Also, consideration needs to be given to what happens when the project ends, where there is a need for site restoration and decommissioning of the water supply system. Therefore, some of the impacts that may occur during construction, e.g. noise caused by bulldozers will disappear as soon as the construction phase will be completed. The construction period will last for not more than sixty months while the operational phase is designed for more than 99 years unless unforeseen event occurs.

2.6.3 Spatial boundary

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

1. The core Impact zone- The core impact zone includes the area immediately bordering the project (0-500m radial distance). In the case of this project, local impacts will include the site of the construction and the immediate surrounding areas.
2. The influence impact zone- includes the area beyond 500m from the proposed site. Most of impacts are expected to be within this boundary.

CHAPTER THREE
3.0 POLICY, LEGAL AND INSTITUTIONAL REQUIREMENTS

3.1 Environmental Management Regulation in Tanzania

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

3.2 Policies Relevant to the Project

The following are relevant sectoral and cross–sectoral policies which provide directives on how the project should be operated in relation to concerned environmental and socio-economic settings. IAA-Babati campus will need to observe these policies in the course of designing and implementing the proposed project activities

3.2.1 National Environmental Policy (NEP) of 2021

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

The National Environmental Policy, 2021 serves as a national framework for planning and sustainable management of the environment in a coordinated, holistic and adaptive approach taking into consideration the prevailing and emerging environmental challenges as well as national and international development issues. It is worth noting that, effective implementation of this policy requires mainstreaming of environmental issues at all levels, strengthening institutional governance and public participation in the environmental management regime. The long-term vision of this policy is geared towards the realization of environmental integrity, assurance of food security, poverty alleviation and increased contribution of the environmental resources to the national economy. The National Environmental Policy, 2008 stresses that for a framework law to be effective, environmental standards and procedures have to be in place. For example, Chapter 4 of the policy (Instruments for Environmental; Policy), Section 61, states that *"As part of the (National Environmental Policy) strategy in the implementation of the National Environmental Guidelines, specific criteria for EIA conduct will be formulated".*

The National Environmental Policy of 2021 replaces the NEP of 1997 whose objective was to provide for the implementation of a range of strategic interventions to address the identified priority areas of environmental concerns by involving Government sectors and other stakeholders. This approach was preferred on the understanding that all stakeholders would take priority actions to address the environmental challenges based on the fact that the environment is a cross-cutting issue

and as such environmental challenges affect all sectors. To implement the Policy, the Government enacted the Environmental Management Act (2004) to provide for a legal and institutional framework for sustainable management of the environment. In addition to this, the Government in collaboration with other stakeholders implemented several strategies, programmes, plans and projects through which the policy objectives were implemented.

The specific objectives of the National Environmental Policy of 2021 are:

i) To strengthen coordination of environmental management in sectors at all levels;
ii) To enhance environmentally sound management of land resources for socio-economic development;
iii) To promote environmental management of water sources;
iv) To strengthen conservation of wildlife habitats and biodiversity;
v) To enhance conservation of forest ecosystems for sustainable provision of environmental goods and services;
vi) To manage pollution for the safe and healthy environment;
vii) To strengthen the national capacity for addressing climate change impacts;
viii) To enhance conservation of aquatic system for the sustained natural ecosystem;
ix) To ensure safety at all levels of application of modern biotechnology;
x) To promote gender consideration in environmental management;
xi) To promote good governance in environmental management at all levels; and
xii) To ensure predictable, accessible, adequate and sustainable financial resources for environmental management.

Commitments: The NEP advocates the adoption of Environmental Impact Assessment (EIA) as a tool for screening development projects which are likely to cause adverse environmental impacts. The proponent has initiated a process in view of the policy objectives.

3.2.2 The National Land Policy (1995)

The National Land Policy states that, "the overall aim of a National Land Policy is to promote and ensure a secure land tenure system, to encourage the optimal use of land resources, and to facilitate broad - based social and economic development without upsetting or endangering the ecological balance of the environment". The National land Policy is relevant to this project because the project will be required to ensure protection of existing cultural heritage and conservation of ecological and socially sensitive areas. The proposed building project is located within the area planned for institutions and as such it is compatible with the land use in the project area as required by the National Land Policy. IAA-Babati campus has developed environmental management plan to curb the likely environmental hazards out of project implementation. Important sections of the policy relevant to the Proponent are 2.4 (on use of land to promote social economic development), section 2.8 (on protection of land resources) and section 4 (on land tenure). Section 4.1.20 provides guidance on compensation for land acquired, and section 4.2.0 provides guidance on land administration.

Commitment: Proponent shall observe these provisions and ensure no land conflict to his neighbours and adhere to approved land use.

3.2.3 The Construction Industry Policy (2003)

Among the major objectives of the policy, which supports a sustainable block development sector, include the promotion and application of cost effective and innovative technologies and practices

to support socio-economic development activities such as blocks, road-works, water supply, sanitation, shelter delivery and income generating activities and to ensure application of practices, technologies and products which are not harmful to either the environment or human health. This project is in-line with this policy as ultra-modern technology shall be used during construction and its operation. Implementations of the proposed project will as much as possible make use of cost effective and environmentally friendly technologies to minimise wastage of resources especially building materials, water and energy.

Commitments: This project is in-line with this policy as ultra-modern technology shall be used during construction and its operation.

3.2.4 The National Gender Policy (2002)

The key objective of this policy is to provide guidelines that will ensure that gender sensitive plans and strategies are developed in all sectors and institutions. While the policy aims at establishing strategies to eradicate poverty, it is relevant to the project as it puts emphasis on gender quality and equal opportunity of both men and women to participate in development undertakings and to value the role-played by each member of society. It also requires that women and men are given equal employment opportunities in the project, whenever possible. This project shall ensure that women will be adequately involved at all levels of project planning to implementation.

Commitment: The proponent shall adopt the policy through the provision of equal opportunities to both men and women in construction and related activities.

3.2.5 The Energy Policy (2015)

The policy outlines measures to adopt clean technology and minimize energy losses. The policy states that energy is a prerequisite for the proper function of nearly all sectors of the economy. It is an essential service whose availability and quality can determine the success or failure of development endeavours. The policy seeks to promote energy efficiency in all economic sectors.
Commitment: IAA-Babati campus will promote the objectives of this policy from design perspective of the building to minimize energy uses. Further shall explore the use of clean energy during the project implementation.

3.2.6 The National Water Policy (URT, 2002)

The overall objective of the policy is to develop a comprehensive framework for sustainable management of the national water resources. Policy directs concerted efforts in the protection of water sources and catchments. The policy also advocates the conservation, wise-use and minimization of water uses. The proposed project shall be designed in such a way that water use is kept to the minimum by, for example, installation plumbing fixtures such as faucets and flushing cisterns, which minimises use of water. It will also ensure that pollution of water sources is avoided or minimized during the construction and operation phases.
Commitment: Thus, the execution of the proposed project will abide to the provision under this policy and its associated regulations to avoid in any way the deterioration of water quality for both surface and underground resources for the benefit of the community by putting in place good sanitary facility.

3.2.7 The National Health Policy (URT, 2007)

The policy emphasizes on the need for increasing community involvement in health development and improved access and equity in health and health services. One of the main objective of this policy is to ensure that health services are available and accessible to all people wherever they are in the country, whether in urban and rural areas. The policy encourages safe basic hygienic practices in workplaces, promote sound use of water, promotes construction of latrines and their use, encourage maintenance of clean environment; working environment which are conducive to satisfactory work performance. The policy is relevant to the project responsible to provide safe environment during project implementation as well as to implement safety measures, regulations and precautions.

Commitment: The proponent will ensure that his operations adhere to the National Healthy Policy as the student population increases.

3.2.9 The Urban Planning Regulations (Space Standards), 2018

The Urban Planning Space Standards provides guidance on space utilization in order to achieve harmony and sustainable development. In construction of buildings under HEET project at IAA-Babati campus, this document informed design of the buildings and selection of construction sites. Space standards provide suitable heights for buildings according to their use, guide space to be reserved between one building and another (setbacks), plot coverage and plot ratio. It also guides provision of space to accommodate both motorized and non-motorized transport systems such as roads, parking and footpaths / pedestrian walkways. The HEET project at IAA-Babati campus has taken into consideration the requirements of urban planning space standards in inception and design of buildings to be constructed, and will continue taking proper utilization of project area during its implementation.

Commitment: IAA-Babati campus will plan for proper utilization of project area during its implementation

3.2.10 Education Training Policy (2014)

Science, technology and innovation provides a good foundation for the envisaged economic transformation as implied in the National Science and Technology Policy, 1996. The National Education and Training Policy, 2014 highlight the need for quality education at all levels of the education supply chain. As part of the need to strengthen use of science and technology in national development and upon taking into account that the expansion of the middle level and higher education sectors of education supply chain has mainly involved non-science programmes, the government has, of recent, renewed the call for strengthening science teaching and learning education. This project is in-line with this policy as will modernize education training and put in place the state of the art equipment for training. In addition, the university fees will be affordable to all people. IAA-Babati campus through HEET will increase teaching and learning infrastructure which at the end will to increase enrolment of the students.

Commitments: Through establishment of the project, the proponent is in-line with this policy as it will improve the university capacity in providing quality education

3.2.11 National Mineral Policy (2009)

The National Mineral Policy also addresses that the mining activities should be undertaken in a sustainable manner. Reclamation of lands after mining activities is recommended. As far as this project is concerned, mining activities is directed to quarrying activities for obtaining stones and

aggregates. Fine and course aggregates for the proposed project will be strictly purchased from authorised vendors.

Commitment: The proponent will use minerals classified as building materials which include stone aggregates and sand. This will promote economic growth but will also ensure that the extraction of construction materials secured in a manner that do not environmentally contravene the policy provisions.

3.2.12 The National Policy on HIV/AIDS (2001)

National policy providing guidelines for effective prevention, care and support for those affected by HIV/AIDS. The overall goal of the National Policy on HIV/AIDS is to provide a framework for leadership and coordination of the National multisector response to the HIV/AIDS epidemic. This includes formulation, by all sectors, of appropriate interventions which will be effective in preventing transmission of HIV/AIDS and other sexually transmitted infections, protecting and supporting vulnerable groups, and mitigating the social and economic impact of HIV/AIDS. It also provides the framework for strengthening the capacity of institutions, communities, and individuals in all sectors to arrest the spread of the epidemic. Being a social, cultural, and economic problem, prevention and control of the HIV/AIDS epidemic will very much depend on effective community-based prevention, care and support interventions. The local government councils will be the focal points for involving and coordinating public and private sectors, NGOs and faith groups in planning and implementing HIV/AIDS interventions, particularly community-based interventions. Best experiences in community-based approaches in some districts in the country will be shared with the local councils. The proponent will comply with this policy by ensuring that;

- Pieces of training are provided to workers, students and surrounding community members on HIV/AIDS
- HIV/AIDS policy is in the workplace

3.2.13: The National Health Policy, 2017

The National Health Policy is aimed at providing guidance regarding improvement and sustainability of the health status of all people by reducing disability, mobility and morbidity, improving nutritional status and raising life expectancy. The objectives of the policy among others include reduction of the burden of disease, maternal and infant mortality, and increase life expectancy through the provisions of adequate and equitable services. Furthermore, the policy aims at facilitating the promotion of environmental health and sanitation, adequate nutrition, control of communicable diseases and treatment of common conditions. The policy also emphasises environmental cleanliness, monitoring of food and water quality, and safety achieved through collaboration with other stakeholders. The proponent will comply with this policy by ensuring.

- Ensure Safety and health at the workplace and that of the surrounding environment and people.

Commitment: The proponent will ensure that his operations adhere to the National Healthy Policy as the student population increases.

3.2.14: The National Employment Policy, 2008

The major aim of this policy is to promote employment mainly of Tanzania Nationals. Relevant sections of this policy are (i) 10, which lays down strategies for promoting employment and section 10.1 is particularly focusing on industry and trade sectors (ii) 10.6 which deals with employment of special groups i.e. women, youth, persons with disabilities and (iii) 10.8 which deals with the tendencies of private sectors to employ expatriates even where there are equally competent nationals. The overall vision of this National Employment Policy is to have society engaged in decent gainful employment capable of generating adequate income to sustain it, and reduce poverty as envisaged by the Tanzania Development Vision 2025, the National Strategy for Growth and the Reduction of Poverty (MKUKUTA), as well as facing the challenges of labour market gaps in the globalized economy. The proponent will comply with this policy by ensuring that;

- ❖ legal procedures of employment are followed

Commitment: The proponent and contractor shall promote this policy by employing many Tanzania of relevant qualifications with priority to the community around and special groups as stated by the policy especially during development phase.

3.2.15: The National Occupational Health and Safety Policy, 2009

National policy promoting safe and healthy working conditions and safeguarding the physical, mental and social wellbeing of workers and employees across all sectors and workplaces. The proponent will comply with this policy by ensuring that;

- ❖ Occupational Health and Safety Procedures are being adhered to in every stage of the project cycle legal

Commitment: The proponent and contractor shall promote this policy by ensuring health issues in the working site are implemented as per policy for safetness of the workers.

3.2.16: Environmental Management (Prohibition of Plastic Carrier Bags and Plastic Bottle Cap Seals) 2022.

These Regulations may be cited as the Environmental Management (Prohibition of Plastic Carrier Bags and Plastic Bottle Cap Seals) Regulations, 2022. These Regulations shall apply to-

(a) The import, export, manufacturing, sale, supply, storage and use of plastic carrier bags within Mainland Tanzania; and

(b) The import, export, manufacturing, sale and use beverages with plastic bottle cap seal

The objectives of these Regulations are to-

(a) Impose a total ban on the import, export, manufacturing, sell or offer for sale and use of plastic carrier bags regardless of their thickness;

(b) Impose a total ban on the import, export, manufacturing, sale and use beverages with plastic bottle cap seal;

(c) Protect human and animal health as well as the environment from likely adverse effects of utilization of plastic carrier bags, or plastic bottle cap seals; and

(d) Provide economic and financial incentives for the production and importation of alternative carrier bags.

3.2.16. The National Research and Development Policy (2010)

Tanzania recognizes the power of science and technology in national development. The policies echo the need to embrace science and technology in development. Thus, in aspiring to achieve the objectives of these policy frameworks, government take cognizance of the weak links between research and development and continued low transition of youths into science and technology disciplines. Low transition into science and technology disciplines is partly as a result of weaknesses of science teaching foundation, which is partly attributed to inadequate numbers of qualified science teachers. The university will also addressee research issues and thus in line with the policy requirements.

Commitments: Proponent shall address research issues and thus in line with the policy requirements.

3.3 Legal Framework

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

3.3.1 Environmental Management Act (EMA), 2004 Act, Cap. 191.

The Environmental Management Act (EMA) No. 20 of 2004 is the principle legislation governing environmental management in the country. The Act provides a legal framework for managing environment in the country. The EMA requires an Environmental and Social Impact Assessment (ESIA) to be carried out for the development of any project which is likely to have a significant impact on the environment. The Act makes it mandatory for any person to comply with the environmental and social impact assessment requirement of the Project which includes environmental screening, scoping, preparation of the Environmental Impact Statement and its review before the decision on environmental clearance is made. The HEET project has to conform to all requirements of environmental clearance and safeguards and they include ESIA, Auditing, Monitoring, and implementation of the environmental and social management plans for the project. The Act is relevant to the project because it is expected to have some negative impacts to the environment during its implementation. The act requires the ESIA report to be submitted to NEMC for review and subsequently issuance of Environmental Impact Assessment Certificate.

Commitment: By conducting this study, the proponent complies with the requirement of the Act and will further comply to various sections noted above through this report and eventual its implementation

3.3.3 The Land Act, 1999, CAP 113 R.E. 2019

These laws declare all land in Tanzania to be "Public land" to be held by the state for public purposes. The Acts empower the President of the United Republic of Tanzania, to revoke the "Right of Occupancy" of any landholder for the "public/national interest" should the need arise. The laws also declare the value attached to land. The Act seeks to control the land use and clarify issues pertaining to ownership of land and land-based resources, transactions on land and land administration. The law provides for technical procedures for preparing land use plans, detailed schemes and urban development conditions in conformity with land use plan and schemes. The LGA has the power to impose conditions on the development of any area according to the land-use planning approved by the Minister. The proposed site for the execution of HEET projects at IAA has been planned for institutional purpose.

Commitment: This project conforms to this law because it has followed all development conditions provided.

3.3.4 The Urban Planning Act (2007)

The law provides for the orderly and sustainable development of land in urban areas, to preserve and improve amenities; to provide for the grant of consent to develop land and powers of control over the use of land and to provide for other related matters. The project will seek planning consent and building permits from relevant authorities.

Commitment: This project is in line with this law as the proponent buildings shall be constructed at the area where no relocation of people is needed and also there are no buildings of special architectural or historic interest.

3.3.5 The Occupational Health and Safety Act No.5 of 2003

The occupation health and safety Act no.5, 2003 section 73-76, is an act for health and safety different from the regulations provided This Act provide for the protection of human health from occupational hazards. It requires the employer to ensure the safety of workers by providing gear at workplace. It specifically demands: the provision of regular medical examination of employees, safe means of access and safe working place; prevention of fire; supply of clean and safe water to workers; sanitary convenience; washing facilities; and first aid facility. The law requires employers to adhere to legally acceptable working environment to workers in order to safeguard their health. The Act is relevant to the project because it will involve construction of buildings. Therefore, project is responsible to provide to workers /constructor/ students with a safe environment during project implementation. In addition, the project construction sites are required to implement safety measures, regulations and precautions and ensure health and welfare of workers and proper handling of hazardous materials and chemicals.

Commitments: Proponent shall observe the provision of this Act for the proposed project whereby protective gears during all times of working will be available and ensure protection of human health and safety against any associated risks while working.

3.3.6 Engineers Registration Act and its Amendments 1997 and 2007

The Acts regulate the engineering practice in Tanzania by registering engineers and monitoring their conduct. Laws require any foreigner engineer to register with ERB before practicing in the country. Foreign engineers who will be involved in this IAA-Babati campus project shall abide to the law requirements.

Commitments: Proponent shall ensure that all projects are registered by ERB and practicing professional own practicing license.

3.3.7 The Contractors Registration (Amendment) Act, 2008

The Contractors Registration Act requires contractors to be registered by the Contractors Board (CRB) before engaging in practice. It requires foreign contractors to be registered by the Board before gaining contracts in Tanzania. Also, the legislation provides powers to the Board to inspect any site for construction works, for the purpose of ensuring that the construction activities are being undertaken by registered contractors and the works comply with the governing regulation of the nation. In case a firm, company, organization, partnership or individual person undertakes construction activation legal action is taken against such acts. In addition to these, the Board ensures that all action is taken against such acts. In addition to these, the Board ensures that all constructions sites hoarded so as to adhere to occupational health and safety regulations.
Commitments: In compliance with the Act, the Proponent will hire a registered consultant firm.

3.3.8 The Architects and Quantity Surveyors Act (1997)

Similarly require architects and quantity surveyors (QS) to be registered with the Board before practicing. Only registered architects and quantity surveyors shall be involved in the implementation of the proposed project.

3.3.9 Public Health Act 2009

An Act provide for the promotion, preservation and maintenance of public health with the view to ensuring the provision of comprehensive, functional and sustainable public health services to the general public and to provide for other related matters. This Act is relevant to the project especial through Section 66 of the Act state that: *(1) A block or premises shall not be erected without first submitting the plans, sections and specifications of the block site for scrutiny on compliance with public health requirements and approval from the Authority.* The proposed project will comply with the articles of this Act.
Commitment: Proponent shall observe the provisions of this Act in the execution of the proposed project by ensuring that the public shall not be affected

3.3.10 Fire and Rescue Act (2007)

The Act obliges the owners and managers of the structures to set aside places with free means of escape, and install fire alarm and detection systems, or such other escape and rescue modalities in the event of fire. Design and construction of all buildings shall take into strict considerations requirements specified in this Act.

Commitment: Proponent shall observe the provisions of this Act in the execution of the project by applying and obtaining a valid fire certificate. Also, proponent will ensure fire extinguishers are present in every section and other firefighting equipment like baskets full of dry sand are available for use in the event of firefighting. These plants and equipment will be serviced every 6 months for their proper functioning

3.3.12 Employment and Labour Relations Act (No.6), 2004

The Act prohibits forced labour and discrimination of any kind in the workplace. It provides employment standards such as contracts with employees, hours of work, remuneration, leave,

unfair termination of employment and other incidents of termination. The Act makes provision for core labour rights, to establish basic employment standards, framework for collective bargaining, prevention and settlement of disputes and other related matters. The Act strictly prohibits child labour and discrimination. IAA-Babati campus will ensure that it operates within the requirements of this legislation and will comply with stipulated conditions of the Employment and Labour Relations Act, 2004.

Commitments: Proponent shall see to it that the Contractor adheres to employment standards as provided for by the law.

3.3.13 Workers Compensation Act (No.20), 2008

The Act provides for compensation to employees for disablement of death caused by or resulting from injuries or diseases sustained or contracted in the cause of employment. It provides for adequate and equitable compensation for employees who suffer occupational injuries or contact occupational disease arising out of and in the course of their employment and in the case of death, for their dependents; rehabilitation of employees who have suffered occupational injuries or contracted occupational; framework for the effective, prompt and empathetic consideration, settlement and payment of compensation benefits to employees and their dependents; establishment, control and administration of the workers compensation fund and the legal framework for contribution and payment from the fund; give effect to international obligations with respect to workers compensation; and Promote prevention of accidents and occupational diseases.. This Act provides the right for compensation to workers for occupational injury in sections 19(1) - (5) or accidents in sections 20 and 21. Also in sections 22(1) - (5), an employee has the right to compensation for occupational diseases. The proposed project will operate within the requirements of this legislation and abide by all relevant sections provided by this Act.
Commitments: The relevance of this Act to the proposed project is to put emphasis on workers compensation in case of injuries, death, diseases while working. It is therefore a responsibility.

3.3.14 Prevention and Control of HIV/AIDS Act (No.28), 2008

The act among others provides details to promote public awareness on the cause, mode of transmission, consequences, prevention and controls of HIV and AIDS. Further, Sections 6(1) and (2) describe the necessity for private sectors, in collaboration with government, to implement programs and plans geared towards prevention, care of patients and control of HIV and AIDS in their respective area. Section 19(2) describes the provision of community based HIV and AIDS prevention, support and care services. The project may involve construction of a workers' camp site, this may lead to the possible interaction between the workers and the local community members, which may lead to the increased transmission of HIV / AIDS to both the workforce and the local communities. In this case ARU project will have to operate within the requirements of this legislation in adherence to the requirements of its respective regulations in addition to HIV/AIDS Policy.

Commitments: The proponent will observe the provision of this Act by introducing awareness creation programme and sensitization to protect workers and communities around the project area against infection of HIV/AID

3.3.15 Standard Act of 2009

The Standards Act has established National Environmental Standards Compendium (NESC) which is a collection of various standards prepared at different times and recognized by EMA 2004. NESC comprises of standards that require compulsory compliance. Compulsory standards are categorized as generic or specific. Specific standards cover those industries with peculiar effects to the environment while other industries without a specific standard for Tolerance Limits of Emissions discharge including water quality, discharge of effluent into water, air quality, control of noise and vibration pollution, sub-sonic vibrations, soil quality, control of noxious smells, light pollution, and electromagnetic waves and microwaves. It also has the requisite test methods that should be followed when testing for compliance. The test methods included are referred to in at least one of the specification standards appearing under Part 1. The proposed IAA project will be adhered to this Act requirement, during the implementation.

3.3.16 Universities Act No. 7 of 2005

Universities Act No. 7 of 2005 provides for establishment of the Tanzania Commission for Universities (TCU) to provide the procedure for accreditation of institutions of higher learning and other related matters. The proposed IAA-Babati campus will be regulated by the Tanzania Commission for Universities (TCU) and NACTEVET for ensuring that quality education is offered, which meets the needs of all the stakeholders in line with this Act.

3.3.17: The Environment Impact Assessment and Audit Regulation, G.N No. 349, 2005 as Amended in 2018.

The Environmental Management (Environmental Impact Assessment and Audit) Amendment Regulations, 2018 are read as one with the EIA and Audit regulations, 2005 are made under Environmental Management Act No. 20 of 2004. The regulations provide the basis for undertaking Environmental Impact Assessment (EIA) and Environmental Audits for various development projects with significant environmental impacts in the country. These regulations set procedures for conducting EIA and environmental audits in the country. The regulations also require the registration of EIA experts. Under the Tanzania Environment Impact Assessment and Audit Regulation of 2005 and revised in 2018, project activities to be funded will be categorized according to the extent of environmental and social impacts of the sub-projects. That is whether impacts are low impact, site-specific and that can be prevented and mitigated if all responsible parties apply the prevention and mitigation measures.

The First Schedule gives a list of projects requiring and not requiring EIA and it categorizes projects into four categories:

- Type A – Category for the mandatory project
- Type B1 – Category for the borderline project
- Type B2 – Category for Non-Mandatory and
- Special Category – a project where potential risks are uncertain and require detailed specialized study before EIA

According to the schedule, Type B2 Projects are small-scale activities and not enterprises and shall require registration but shall not require ESIA. Further the project shall not require screening and

scoping, rather the project brief shall be examined and issued with the Environmental Impacts Assessment Certificate. Regulation 6(1), 8(1) and 10(1) provide procedures for application for EIA certificate for B2, B1 and A categories respectively. The Regulations also, specify issues to be covered by the proponent in the project brief and scoping reports. Section 6 (2) requires a project brief to be prepared by an environmental expert registered as such under the environmental (Registration of Environmental Experts) Registrations. Part IV Regulation 13(1) requires the Project Proponent to conduct EIA in accordance with the general environmental impact assessment guidelines and in accordance with the steps outlined in the Fourth Schedule of the regulations. Regulations 16 specifies EIA study should cover environmental, social, cultural, economic and legal issues. Part X Regulations 49 and 50 outline the objectives of carrying out annual self-auditing and control audits to check and verify the adequacy of the environmental management plan in mitigating the negative impacts of the project. Part XII Regulation 60(1) stipulated that "notwithstanding any license, permit or approval granted under any written law, any person who commences, proceeds with, executes or conducts any project or undertaking without approval granted under these Regulations commits an offence and on conviction shall be liable to the punishment prescribed under the Act. The regulation is relevant to the proposed project as sub-projects may fall under Type A, B1 or B2 categories and therefore project registration or ESIA study is mandatory and should be carried out in accordance with the guidelines stipulated in the Fourth Schedule to the Regulations.

3.3.18: Environmental Management (solid waste management) Regulations of 2009

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

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

(i) Eliminating the use of toxic construction materials within such times as may be prescribed by the Minister; and

(ii) Reducing toxic emissions and wastes to a level prescribed in the applicable national environmental quality standards.

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

(i) Identifying and eliminating potential negative impacts of the product,

(ii) Enabling the recovery and re-use of the product where possible; and

(iii) Reclamation and recycling.

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

3.3.19 Environmental Management Act (Air Quality Standards) Regulations of 2007

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

3.3.20 Environmental management (Standards for Control of Noise and Vibrations pollution) Regulations of 2015

The objectives of these Regulations shall be to;

(a)Ensure the maintenance of a healthy environment for all the people in Mainland Tanzania by regulating noise and vibration levels,

(b)Prescribe the maximum permissible noise and vibration levels from a facility or activity to which a person may be exposed,

(c)Ensure protection of human health and the environment from various sources of noise and vibration pollution Also, section 7 (1) of the Act says; no person shall be made or cause to make any loud, unreasonable, unnecessary or unusual noise that annoys, disturbs, injures or endangers the comfort, repose, health or safety of others and that of the environment.

3.3.21 Environmental Management (Solid Waste Management) Regulations 2016

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

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

(i) Eliminating the use of toxic raw materials within such times as may be prescribed by the Minister; and

(ii) Reducing toxic emissions and wastes to a level prescribed in the applicable national environmental quality standards.

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

(i) Identifying and eliminating potential negative impacts of the product,

(ii) Enabling the recovery and re-use of the product where possible; and

(iii) Reclamation and recycling.

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

The project proponent shall comply with this regulation by ensuring proper environmental management especially proper solid waste management where a temporary solid waste collection chamber will be constructed, and sorting of solid waste will be done at the site.

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

The Regulations apply to the registration, categorization, practicing and conduct of environmental experts and firms of environmental experts registered and certified under these Regulations to conduct- (a) environmental impact assessment; (b) environmental audit; or (c) any other environmental study that may be required to be undertaken under the Act or its Regulations. The objectives of these Regulations are to- (a) establish a system of registration, categorization and

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

3.3.23: Institute of Accountancy Arusha Act.CAP.240 of 1990

The objectives and functions are conducting training programmes leading to professional qualifications in accountancy and the related programmes, to arrange research and consultancy and dissemination of information and to provide and arrange facilities for conferences, seminars for discussion related to the institute.

3.3.24. The Roads Act No. 13 of 2007

The Roads Act governs the deviation, widening, construction or realignment of a road or access road, as well as describing the compensation details for people that need to be resettled as a result of these. Section 15 provides details on the power of the Minister for provision of consent for the new construction of such infrastructure. Section 16 provides details on the compensation for land and cut vegetation during road construction. Section 35 describes owner to be given power concerning the decision of creating an access road in line with laid conditions. Section 39 and regulation 42 detail the prohibition of certain classes of traffic, and sets out maximum weight, speed and dimensions of vehicles. Section 40 provides the chance for appeal to the proponent if not given consent for the proposed access road construction. Furthermore, the Act provides for road safety through creating road signs and bumps to avoid any occurrence of accidents, and the authority that has jurisdiction for carrying out road undertakings.

Commitment: The proposed project will utilise the current public roads and therefore obliged to observe the requirement of this Act.

3.3.25. The Electricity Act No 10 of 2008

This Act provides for facilitation and regulation of generation, transmission, transformation, distribution, supply and use of electric energy, cross border trade in electricity and the planning and regulation of rural electrification. Section 25 details the relevant Power Purchase Agreements concluded subsequent to the entry into force of this Act. Section 25 (2) A licensee may by rules made by the Authority conclude agreements for the purchase or sale of electricity. This section provides for (among others) agreements relating to electricity purchase and sale in the market determined by the authority, to be competitive Standardized Power Purchase Agreement and Tariff for small power projects. The primary power supply for the project will be the Tanzania Electricity Supply Businessman (TANESCO).

Commitment: Therefore, proponent shall adhere to the requirement of this Act in the process of the Electricity purchase from TANESCO.

3.3.26. The Persons with Disability Act, 2010

The basic principles of this Act are to respect for human dignity, individual's freedom to make their own choices and independence of persons with disabilities, non-discrimination, full and effective participation and inclusion of persons with disabilities in all aspects of society, equality of opportunity, accessibility, equality between men and women with disabilities and recognition of their rights and needs, and provide a basic standard of living and social protection.

Commitment: The project proponent will fulfil this legal requirement in all project phases, from design, construction and operation.

3.3.27. The Child Act, 2010

The legal framework for child labour in Tanzania is contained in the Law of the Child Act (Act No. 21, 2009). The Act sets the minimum age for admission of a child to employment at 14 (Sec. 77.2). It also contains a provision permitting light work for children who are at least 12, where light work is defined as work that is not likely to be harmful to the health or development of the child and does not affect the child's attendance at school or the capacity of the child to benefit from schoolwork (Sec.77.3). The Act prohibits the engagement of children and children below 18 in hazardous work, posing a danger to health, safety or morals and in "night work" taking place between 8 pm and 6 am (Sec. 82.2). The Law of the Child (Child Employment) Regulations (G.N. No. 196, 2012), which is used to implement the Law of the Child Act (Act No. 21, 2009), contains list of all hazardous activities in which a child shall not be allowed to work, even on a voluntary basis. Section 82 of the Act also protects children from sexual exploitation. A child shall be protected from sexual exploitation and use in prostitution, inducement or coercion to engage in sexual activity and exposure to obscene materials.

Commitment: This project will protect against child labour, especially during the construction period.

3.4 Relevant Plans, Regulations and Guidelines

3.4.1 The Tanzania Development Vision 2025

The Tanzania Vision 2025 aims at achieving a high quality livelihood for its people attain good governance through the rule of law and develop a strong and competitive economy. Specific targets include: A high quality livelihood characterized by sustainable and shared growth (equity), and freedom from abject poverty in a democratic environment. Specifically, the Vision aims at: food self-sufficiency and security, universal primary education and extension of tertiary education, gender equality, universal access to primary health care, 75% reduction in infant and maternal mortality rates, universal access to safe water, increased life expectancy, and absence of abject poverty, a well-educated and learning society. IAA-Babati campus is one of the important projects to enable Tanzania achieve its Development Vision objectives notably eradicating poverty. IAA-Babati campus project will contribute to the attainment of the 2025 Vision through provision of adequate skilled labour force for implementing various development plans.

Commitment: IAA-Babati campus is one of the important projects to enable Tanzania achieve its Development Vision objectives notably eradicating poverty. IAA-Babati campus project will contribute to the attainment of the 2025 Vision through provision of adequate skilled labor force for implementing various development plans

3.4.2 Environmental Impact Assessment and Audit (Amendment) Regulations (2018)

The Environmental Management (Environmental Impact Assessment and Audit) Amendment Regulations, 2018 are read as one with the ESIA and Audit regulations, 2005 are made under Environmental Management Act No. 20 of 2004. The regulations provide the basis for undertaking Environmental Impact Assessment (ESIA) and Environmental Audits for various development projects with significant environmental impacts in the country. These regulations set procedures for conducting ESIA and environmental audit in the country. The regulations also require registration of ESIA experts. The regulation is relevant to the IAA-Babati campus project and

therefore project registration or ESIA study is mandatory and should be carried out in accordance with the guidelines stipulated in the Fourth Schedule to the Regulations.
Commitment: The proponent shall be bound by the above principles, other environmental and sustainable development principles and provisions of the Environmental Management Act 2004 at whole.

3.4.3 Environmental Management (Air Quality Standards) Regulations, 2007

The objective of this standard is to set baseline parameters for air quality and emissions within acceptable standards. It enforces minimum air quality standards prescribed by NEMC to industrialists for the purpose of adopting environmental friendly technologies to ensure protection of human health and environment pollution sources. The proposed project will have to abide to Environmental Management (Air Quality Standards) Regulations 2007, and the current assessment is within the required standards. During project implementation the regulations will be complied with to ensure dust emissions from the project are within the acceptable limits. Reg.5 (d) lists specific standards that regulate industrial activities, as prescribed by the NESC with consent on the minister responsible for environment reg. 7(1) calls upon any person in Tanzania to comply with air quality standards, furthermore, reg.8 (1) prohibits any person to emit/release any hazardous substance, chemical, gas or mixture containing gaseous and hazardous substance into the environment unless permitted under these regulations or other written law. Reg, 21 highlights on the need of taking and analysing samples by the council and laboratories accredited or designated in accordance with the Act; and reg. 22(3) empowers the municipal environment management officer to issue compliance order to air quality standards. However, reg 25 Cleary confers environmental inspectors appointed or designated to exercise powers, thus, to comply with this regulation,

Commitment: Proponent shall have to undertake air quality monitoring so that incinerator operations do not produce pollutants beyond the given Tanzania limits.

3.4.4 Environmental Management (Soil Quality Standards) Regulations, 2007

The objective of this standard was to set limits for soil contaminants in agriculture and habitat. It enforces minimum soil quality standards prescribed by NEMC to maintain, restore and enhance the sustainable productivity of the soil. Elevated levels of heavy metals may occur naturally within the soils surrounding. However, any proposed expansion projects will be designed to avoid the release of contaminants, with elevated levels of heavy metals, to the environment. The proposed project will have to abide to this regulation by discouraging haphazard disposal of wastes to the environment.

Commitment: Proponent shall observe the provisions of this regulation in the execution of the proposed project by protecting the soil against any pollution.

3.4.5 Environmental Management (Water Quality Standards) Regulations, 2007

The regulation (regulations 16) requires any person undertaking any activity near water sources to consider safe distances of water supply systems from pollution sources. The8th schedule provides a list of those safe distances, regulation 19(1); empowers NEMC to issue permits for discharge of water polluting substances and designate such pollutants. Sub-regulation 3, empowers LGAs environmental management officers to recommend to the council categories of human activities

which they deem to be main polluting activities, regulation 34 directs local government authority to issue guidelines and standards on collection, transportation and disposal of sewage and sludge.

Commitment: Proponent shall observe these regulations by ensuring that waste is properly treated before disposal and that none of the hazardous wastes will be disposed into the environment to contaminate underground/surface water resources.

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

The regulation prohibits a person to make any loud, unreasonable, and unnecessary on unusual noise that annoys, disturbs, injures or endangers the comfort, repose, health or safety of others and of the environment describes the permissible noise levels from different facilities. The provisions of these regulations will guide in ensuring that noise and vibration levels do not exceed the maximum thresholds specified.

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

The Act describes Classification of hazardous wastes in section 8. (1) Hazardous waste shall be classified in accordance with the criteria set out in the Third First Schedule on the basis of listed waste streams, constituents and other wastes to be controlled which are hazardous under Part I of the First Schedule, read with or combined with hazardous characteristics listed under Part II of the First Schedule. Labelling of wastes is important as stated in section 10 (1) that No person shall sell, offer for sale, use, pack or store wastes in a container or package, unless the container or packaging has label written in English or Swahili affixed onto it. Regulations made under sections 110.128,133,135 and 230 of EMA to control all categories of hazardous waste and to the generation, stage, transportation, treatment and disposal and their movement into and out of mainland Tanzania. Any person generating handling or transporting hazardous waste or exercising jurisdiction under the regulation should be guided by principles of environmental and sustainable development; the precautionary principle; polluter pays principle and the producer extended responsibility (R.4). also, the owner or controller of a facility or premises which generates hazardous and toxic wastes are required to minimize the waste generation by through the cleaner's production principle, i.e. improvements of production process through conserving raw materials principle and energy, and monitoring the product cycle from beginning to end (R.5)**.** On hazardous waste management, every person living in Tanzania has a duty to safeguard the environment from adverse effects of hazardous waste and inform a relevant authority on any activity and phenomenon resulting from hazardous waste that is likely to adversely affect environment human health (R.6)

Commitments: During project implementation hazardous wastes container will be provided and labelled, also it is the duty of the proponent to make sure the ongoing activities shall abide to these regulations.

3.4.8 The Environmental (Registration of Environmental Experts and Practicing certificate) Regulations of 2021

Regulations formulated under Section (Section 83) of EMA on undertaking of environmental assessments by individuals and firms registered /certified by Registrar (NEMC). Regulations 14-15 prohibit any person to conduct an environmental impact assessment, audit or related studies

unless the person is certified /registered; otherwise, the Council shall not deliberate on such study, statement or audit or project brief. Qualifications of experts are stipulated and R. 24(2) allow registered person to use in any communication the title "Certified Environmental Assessor" or "Certified Environmental Auditor". Rs. 24-26 allow Firms registered under other laws to apply as consulting Firm of Environmental Experts comprised of a multi-disciplinary team. R. 22– 23 establish a Registrar of Environmental Experts at NEMC to maintain a Register.

Commitment: Therefore, this ESIA has been undertaken by MR.OBADIA KIBONA as an Environmental registered expert by NEMC.

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

These Regulations may be cited as the Environmental Management (Fee and Charges) (Amendment) Regulations, 2021, and shall be read as one with the Environmental Management (Fee and Charges) Regulations, 2008 regarded as the Principal Regulations. These regulations were made under section 230 (2) (b) of the Environmental Management Act, 2004 (CAP) 191. The regulations apply in relation to an act or omission to which fees and charges are payable under the Act. It requires that any person who wishes to perform any function related to the prevention, protection, promotion or conservation of environment or to carry on business related to – Environmental impact Assessment, Environmental audit or Environmental monitoring;

i. Registration as environmental expert
ii. Environmental quality standards; or
iii. Ozone depleting substances

Hence shall be required to pay the fees prescribed in the Schedule to these Regulations. The fees of which will be collected by the council shall neither be refundable nor transferable.

Commitment: Proponent is aware of the regulations and will be answerable for the charges prescribed in these regulations.

3.5 Relevant International Agreements, Conventions and Treaties

Tanzania is party or acceded to several international agreements and conventions relating to the environment. Agreements of potential relevance for the proposed development are mentioned below

- The Convention on Biological Diversity (CBD) (1992)
- The United Nations Framework Convention on Climate Change (1992)
- The Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal, 1989
- ILO Convention: C182 Worst Forms of Child Labour Convention, 1999
- ILO Convention: C148 Working Environment (Air Pollution, Noise and Vibration) Convention, 1977

3.5.1 United Nations Framework Convention on Climate Change (1992)

The objective of the United Nations Framework Convention on Climatic Change (UNFCCC) is to stabilise the concentration of greenhouse gas (GHG) in the atmosphere, at a level that allows

ecosystems to adapt naturally and protects food production and economic development. Article 4 commits parties to develop, periodically update, publish and make available national inventories of anthropogenic emissions of all GHGs not controlled by the Montreal Protocol (by source) and inventories of their removal by sinks, using agreed methodologies. It commits parties to mitigate GHG as far as practicable. Since Tanzania is a Party to the Convention, she will have to account for all sources of GHG in her future National Communications. Undertaking of this ESIA study will enable the country to identify some of the GHG that will be emitted by the project activities.
Commitment: IAA-Babati campus project will abide with the requirements on control and prevention of greenhouse gases by emphasizing use of electronic materials copies during teaching and learning.

3.6 Institutional Framework for the Management of Environment

Tanzania is among countries in East Africa with an Act for environmental management legislation. The legislation, Environmental Management Act (EMA) (2004), provides a legal and institution framework that guides the implementation of the environmental management activities. The framework provides a pre-requisite for effective implementation of Environment Policy at all levels (National, Region, Council, and Village/Mtaa/Hamlet). According to the Environmental Management Act (EMA) (2004), there is the Environmental Management Committee established at the Hamlet/Village/Mtaa, Ward, and Council and at National level with the responsibility for the proper management of the environment in respect of the area in which they are established. The functions and responsibility of these committees are well explained in the Act. The proposed project will include all governance levels in the management of environment during HEET execution as shown in Table 3.1 below;

Table 3. 1: Key Institutions to the ESIA Process

Level	Institution	Role and Responsibility
National level	Vice President's Office (Division of Environment,)	• Coordinate various environment management activities in Tanzania • Advise the Government on legislative and other measures for the management of the environment • Advise the Government on international environmental agreements • Monitor and assess activities, being carried out by relevant agencies in order to ensure that the environment is not degraded

	Vice President's Office - NEMC	• Carry on environmental audit and environmental monitoring • Carry out surveys which will assist in the proper management and conservation of the environment • Undertake and co-ordinate research, investigation and surveys in conservation and management • Review and recommend for approval of environment impact statements • Enforce and ensure compliance of the national environmental quality standards
	Ministry of Education Science and Technology	• Issuing policy guidance • Providing legal frameworks • Issuing licenses, provisions of certificates of compliances • Enforcement of laws and regulations • Project monitoring.
	National Council for Technical and Vocational Education and Training (NACTVET	• Mandate to recognise, approve, register and accredit Universities • Conduct regular and impromptu periodic evaluation of universities, their systems and programme
	Occupation Safety and Health Authority OSHA	• Approval of building plans for the proposed project • Monitoring Health and Safety of workers in working premises
Municipal/township level	Babati town	• Oversee and advice on implementation of national policies at Municipal level • Oversee enforcement of laws & regulations
Ward Level	Babati Ward	• Oversee general development plans for the Ward. • Provide information on local situation and Extension services
Street (*mtaa*) level	waang'waray office	• Information on local social, economic and environnemental situation • View on socio-economic and cultural value of the sites and on proposed plant operations

Table 3. 2: Institutional arrangement for Environmental and Social management at IAA-Babati campus

Institution	**Roles and responsibility**

World Bank	• The funding organization will have an overarching responsibility to ensure that the project is carried out to the highest environmental standards strictly in accordance with the ESMF and ESIA project report and the mitigation measures set out therein. • Additionally, the funding Institution requires that environmental and social impacts are managed in accordance with the World Bank ESF and its ESS.
PS-MoEST	• E&S monitoring and surveillance of all project components investments that will be undertaken by project. • The ministry will report results of this monitoring to the World Bank
NPIU Environmental and Social Team	Coordinate different activities to ensure that, the project meets the country legal and World Bank requirements in regard to Environment and Social Framework
Implementing institutions (IAA PIU) Environmental and Social Team	• Coordinate specialist/consultants for any support missions or attend different meetings and provide any guidance in the bid to ascertain that the different challenges identified for each sub-project/activity are duly covered from risk. • Support the procurement officer at MUST in making sure that the bidding documents clearly cover the health, safety and environmental component with appropriate provisions of the same for the contractors to bid. • Coordinate preparation of ESIA and environmental and social management plans (ESMPs) done by consultant and site-specific ESMPs (SSESMP). Ensure that contractors have an Environmental Health and Safety Officer (EHS), who are familiar with the compliance requirements, including WB EHS guidelines
Consultant (Environmental and Social Team)	• Work with the NPIU/APIU/IPIU to understand the requirements of the environmental and social assessment; • Conduct initial site visits with the NPIU/APIU/UPIU to understand the sub-project setting and site-specific requirements; • Prepare the ESIAs and ESMPs based on the procedures described in the ESMF including carrying out an alignment walk, alternatives analysis and baselines studies, identifying the E&S risks and impacts, developing mitigation measures and monitoring plans incorporating EHS requirements; • Cost all the mitigation and management measures proposed in the ESMPs and SSEMPs • Propose a capacity building plan for the implementation of the sub-projects for all actors involved with cost estimates and schedule; • Carry out public consultations; • Conduct trainings as needed; • Assist the APIU/IPIU in preparing documentation to obtain certification from NEMC for the ESIAs and ESMPs.

Contractors (Environmental and Social Team)	• Compliance with relevant environmental and social legislative requirements (project-specific, district- and national level), including allocating adequate budget for implementation of these requirements; • Work within the scope of contractual requirements and other tender conditions; • Prepare CESMPs based on the ESMP in the bidding documents and contracts; • Train workers about EHS (including relevant WBG EHS Guidelines) and the site specific environmental and social measures to be followed; • The EHS officer of the contractor will participate in the joint site inspections with the APIU/IPIU and Environmental Supervision Engineer/consultant; • Immediate notification of the NPIU and supervision engineer of any significant social or environmental health and safety incident linked with the project, and indication about the measures taken or that are planned to be taken to address the incident as well as propose any measures to prevent its recurrence.

3.7 ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK

The World Bank Environmental and Social Framework for Investment Project Financing sets out the requirements that the Bank must follow regarding projects it supports through Investment Project Financing. The Environmental and Social Standards set out the requirements for Borrowers relating to the identification and assessment of environmental and social risks and impacts and mitigation measures associated with projects supported by the Bank through Investment Project Financing. In that context, the World Bank has set out the Environmental and Social Standards that must complied with in the implementation of any project. These standards among others aim to support borrowers in achieving good international practice relating to environmental and social sustainability, assist borrowers in fulfilling their national and international environmental and social obligations, enhance non-discrimination, transparency, participation, accountability and governance; and (d) enhance the sustainable development outcomes of projects through ongoing stakeholder engagement. This section (Table 3.3) shows how the 10 ESS of the World Bank are taken on board on ensuring that all HEET projects to be implemented at IAA-Babati campus are environmentally and socially sensitive.

Table 3. 3: Applicable Environmental and Social Standards

Environmental and Social Standards (ESS)	Applicability	Requirements
ESS1: Assessment and Management of Environmental and Social Risks and Impacts	YES	The standard focuses in helping project beneficiaries to manage and reduce both environmental and social risks and enhance project positive impacts. The project at IAA-Babati campus will use this requirement in order to strengthen the environmental and social framework for the assessment, development and implementation of World Bank financed projects where appropriate.

ESS2: Labor and Working Conditions	YES	The standard focuses on the adoption of standard labour practices that take into account the acceptable working conditions for the people to be employed in the execution of the project activities. It requires the Borrower to prepare and adopt labour management procedures. Among others the standard call for provisions on the treatment of direct, contracted, community, primary supply workers, and government civil servants. It further calls for fair terms and conditions of work, non-discrimination and equal opportunity and workers organizations. Provisions on child labour and forced labour. Requirements on occupational health and safety, in keeping with the World Bank Group's Environmental, Health, and Safety Guidelines (EHSG).
ESS3: Resource Efficiency and Pollution Prevention and Management	YES	The standard aims at enhancing effective use of resources and control of pollution. It further requires an estimate of gross greenhouse gas emissions resulting from project (unless minor), where technically and financially feasible. Requirements on management of wastes, chemical and hazardous materials, and contains provisions to address historical pollution. ESS3 refers to national law and Good International Industry Practice, in the first instance the World Bank Groups' EHSGs.
ESS4:Community Health and Safety	YES	The standard aims at protecting local communities against any health risks and ensures their safety against project activities. It requires infrastructure to take into account taking safety and climate change, and applying the concept of universal access which are technically and financially feasible. It require further on traffic and road safety, including road safety assessments and monitoring. It calls for addressing risks arising from impacts on provisioning and regulating ecosystem service. Measures to avoid or minimize the risk of water related, communicable, and non-communicable diseases. Requirements to assess risks associated with security personnel, and review and report unlawful and abusive acts to relevant authorities.
ESS5:Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	NO	This ESS is not relevant to the proposed IAA-Babati campus project.
ESS6:Biodiversity Conservation and Sustainable Management of Living Natural Resources	NO	The project is not located inside or near protected areas and sensitive habitats

ESS7:Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	NO	This standard is not considered relevant as the project will mainly be implemented in areas where communities that meet the requirements of ESS7 are generally not available in the area.
ESS8:Cultural Heritage	YES	This ESS is relevant by chance find as the project area has already being developed.
ESS9:Financial Intermediaries (FIs)	NO	This ESS is not relevant to the project.
ESS10: Stakeholder's Engagement and Information Disclosure	YES	The proponent will provide stakeholders with timely, relevant, understandable and accessible information, and consult with them in a culturally appropriate manner, which is free of manipulation, interference, coercion, discrimination and intimidation. As part of ESIA study stakeholders' engagement has been done in line with the requirement of the ESS10.

CHAPTER FOUR

4.0: BASELINE ENVIRONMENTAL AND SOCIAL CONDITIONS

4.1 Introduction

This chapter provides a description of relevant environmental characteristics of the proposed project. This chapter provides a description of relevant environmental, economic and social characteristics of the project core area.

The major purposes of describing the environmental settings of the study area were:

- To assess the existing environmental quality, as well as the environmental impacts of the future developments being studied;
- To identify environmentally significant factors or geographical areas that could preclude any future development; and
- Additional purposes of the baseline studies were to provide sufficient information so that decision makers unfamiliar with the general location can develop an understanding of the project need.

The environmental impacts were assessed for a project at a specific location to establish baseline status and monitor the environmental quality prevailing in the study area prior to implementation of the project. The environmental status within the study area was used for identification of significant environmental issues that were addressed for assessment of the project impacts (positive and negative) and suggest remedial measures.

4.2 The physical environment

4.2.1 Climate

Generally, the area experiences a tropical type of climate which is characterized by two seasons. The rain season having two peak seasons, the one starts in that starts in March and ends in May of the same year, and the other one starts in November and ends in December. The dry season has one peak season that starts in Mid-January and ends in February of the same year.

Rainfall

Manyara region has a tropical wet and dry climate. Average ~~a~~nnual rainfall is approximately 2000 mm, of which the lowest rainfall 800m while the maximum reaches 2,500mm. In normal years the region experiences two rainy seasons, the long rains which start in March through May and the short rains beginning in October to December. However, due to global climate change, the rain pattern in the region is not consistent. Poor distribution and unpredictability of these rains acts as an obstacle for construction activities. In this regard, construction activities are envisaged to be done during dry season.

Temperature and Relative humidity

Temperature fluctuates between day and night as well as from one season to another. The extreme low temperatures for Manyara region are observed during the cool dry season particularly between May and August where temperatures may fall to 11^0C. On the other hand, high temperatures (22^0C) can be recorded during the early afternoon hours in October to March. Relative humidity is constant during the wet seasons where it generally remains 86%. During the hot dry season, it may drop as low as 70% in the early afternoon hours. Specifically for the project area temperature and relative humidity recorded during field visit in August 2023 was found to be between 16^0C to 18^0C and 52% to 62% respectively therefore poor design of ventilation system in the buildings may result into discomfort to students in the rooms.

Wind speed and direction

The local wind patterns help to guide building designs and orientation on the site to allow cross ventilation and minimize the effects of temperature. The climatic condition of Babati \town and specifically IAA-Babati campus is influenced by southwest winds from April to October and Northwest monsoon winds between November and March. The average wind speed is 10mph (World weather Online.com). Together with good vegetation cover at IAA-Babati campus contains good modified (micro) climate, which is relatively cooler. Nevertheless, due to the global climate

change, there is significant variation in wind directions, speed and rain patterns which are often not following the regular patterns.

Sun Hours and Potential for Solar Energy

The hot climatic condition as well as availability of sunlight in almost 9 hours per day makes Babati town a potential zone for harvesting of solar power which of which if properly harnessed could provide reliable alternative source of energy at the institute. Solar energy may be taped to reduce the running cost of the institute through connecting it to class rooms, lecture theatres, offices, staff houses and a health centre. Photovoltaic generation of electricity through the use of solar panels can be adopted by the institute to tap the sun's energy. With solar energy, the institute will have reliable and affordable alternative source of energy to cover the gap of power breakdown in Babati and other parts of the country, which has been widely affecting the functions of the institute. Solar energy is very possible renewable source of energy at IAA-Babati campus, because the campus is situated in the area where the number of sunny days and the direct radiation of the sun (supported by topography) are sufficient to harvest adequate solar energy potentials.

4.2.2 Existing land use

The proposed land use plan generally makes provisions for various land use components. The proposed project will be implemented as per land use planning stipulated in IAA-Babati campus master plan 2018-2038.

4.2.3 Existing land cover

Data from satellite image indicate that green spaces at IAA-Babati campus, occupy a total of 265849 Square meters whereby trees space constitutes large area following small open spaces. This implies that the big portion (87.2%) of the IAA-Babati campus is covered by green spaces. The grey space occupies about 12.8% of the total area at IAA-Babati campus, implying that IAA-Babati campus, community is surrounded by high evapo-transpiring surfaces. This makes the landscape attractive and cool hence altering the surrounding air temperature, the situation that will favour students to use outdoor environment during day time. Figure 4.3 show the existing land cover at IAA-Babati campus, and the use of outdoor environment during day time respectively. The proposed buildings will occupy 7% of the total area at the campus; hence will reduce the green space coverage.

4.2.4 Topography

IAA-Babati campus is characterized by gently and undulating surface with hills, relatively flat areas and sloppy areas as indicated on the digital elevation model. The current built up area is situated on a flat area.

4.2.5 Soil type(s)

Manyara region consists of two major geological deposits namely red soils, which is a well-drained and heavy clay waterlogged soils in one hand. Nonetheless, there are finer scale variations when it comes to specific areas. Taking into account the geologic specificity issue at local scales, there is a need of detailed geotechnical surveys prior to construction of any of the proposed buildings. Identification of soil types, soil bearing capacity, coefficient of linear extensibility (COLE) and level of erosion should be critically analysed in order to construct appropriate types foundations in specific proposed building structures.

4.2.6 Soil erosion potential

Physical observation revealed that there is no soil erosion as observed in to the campus. Therefore, the establishment of buildings under HEET project may cause soil erosion if effective conservation measures and proper storm water management methods are not adopted. It is probable that the slightly slopes may turn into erosion through development activities at the campus.

4.2.7 Hydrologic characteristics of IAA-Babati campus

IAA-Babati campus is the subset hydrological setups which reside in a bigger hydrology setup. There is no river flowing nearby building site. IAA-Babati campus contains impervious surfaces (18,909.7m^2 (roads, roofs, concrete slabs and pavement areas)) and pervious surface (763,959.3 m^2) from compacted and smoothened soil.

4.2.8 Air Quality

During the study, samples were collected at the corners and in the middle of the farm (project site). Samples at the corner were named POINT A, POINT B, POINT C, POINT D, and POINT E and at the middle of the farm based on the marker block found at the farm. At each sample point three readings were recorded and the average value was used to represent the suspended particulate matters, ambient gases emission, noise level and Vibration level at that particular point for each of the project site.

Ambient Dust Levels

All the measured parameters were found to be below their respective TBS and/or WHO limits. The summary of ambient gases baseline data (i.e., O2, CO_2, CO, NO_2, SO2, O_3, CH_4 and H_2S), are presented in Appendix VI:. With reference to Tanzania's Environmental Management (Air Quality Standards) Regulations (2007) the observed air quality at the proposed project site is within acceptable level. The proposed project may cause the increase in concentration of these gases through its fuel combustion engines for power generators or heavy equipment. Hence a proponent is emphasized to put more efforts to mitigate the impact.

Ambient Gaseous Pollutants levels

The measured PM_{10} levels were found be less than 150µg/m^3 and 50µg/m^3 limits prescribed by both TBS limits and WHO guidelines, respectively (Appendix VII). All the measured parameters were found to be within stipulated local (TBS) and international guidelines i.e. WHO Ambient Air Quality Guidelines. The observed low pollutants levels reflect the campus environment, where there are no significant sources of air pollution. Existing sources are vehicle exhaust emissions, kitchen stoves, standby generators and office appliances such as printers. In general, the baseline air quality study has established that the IAA-Babati campus has relatively clean air. Most of measured pollutants were found below respective standards stipulated by International (WHO) and Tanzanian Emission standards.

4.2.9 Noise Levels

Measured noise levels are presented in Appendix viii. Noise level at the site ranged from 53.4-61.1 dBA implying that noise level is within the standard (i.e. 85 dBA).

4.2.10 Vibration Levels

The recorded levels were compared with both British Standard of 0.3mm/s PPV, TBS limit of 5mm/s PPV and 0.15 mm/s PPV (Peak Particle Velocity), the levels that human beings and/or animals can detect or may experience stress resulted to vibrations. However, the anticipated impact resulting from the measured vibrations is considered less-than significant as the levels did not exceed the 0.15 mm/sec PPV criteria established to evaluate the extent that can easily be detected by human.

4.2.10 Potential natural disasters risks

The IAA-Babati campus faces natural and technological disaster risks like climate change and climate variability risks, earthquake, environmental degradation. They may occur at the campus in one way or another as the result of the institution location, technological failure and the associated factors. The location of institution is approximately 8 km from Babati town. Earthquake, IAA-Babati campus is located at the area, which is not prone to large earthquake, but there is occurrence of small-scale earthquake.

4.7 Biological Features

4.7.1 Fauna

The project areas and their vicinity are poorly endowed with wildlife resources. In this campus, the proposed project areas currently have no wildlife resources of conservation interest. Currently, small animals such as reptiles, monkeys, birds, mongooses, and possibly small antelopes are occasionally sighted. During the consultation, various parties reported that there were no significant wildlife populations in the study area. Invertebrates in the area include common types such as butterflies, millipedes, grasshoppers, etc. The expected or known wildlife in the area includes birds, but none of them are listed as rare, threatened, or endangered

4.7.2 The Flora

The botanical survey found that, the vegetation of the project site are composed with high diversity natural and planted plant species of different life forms including parasite fern, climber, herb, grass, shrubs and trees. The life forms of trees, shrubs and grasses are represented with high number of species. The presence of many tree species indicates that the community is less disturbed by human activities such as poles cutting and fuel wood collection besides being surrounded by human settlements.

4.7.2.2 List of IUCN Threatened Plant species Categories identified in the area

The IUCN Redlist of Threatened Species is recognized as the most comprehensive, objective global approach for evaluating the conservation status of plant and animal species. In the proposed construction sites, only few species were recognized to be identified in IUCN Redlist as endangered (1%) and vulnerable (2%) species, the rest are of least concern (25%), or lack data (2%) and non-evaluated (66%).

4.7.3 Ecosystem and Ecosystem services

IAA-Babati campus ecosystem provides services (benefits important to human) which have environmental, ecological, social and economic value). IAA-babati campus ecosystem provides a total of 14 ecosystem services. The ecosystem services provided by IAA-Babati campus as per approach developed by Millennium Ecosystem Assessment. From Table 4.6, it can be realized that IAA ecosystem provides useful products (provisioning services), regulation services, Non-material benefits (cultural services) and supporting services (services necessary for the production of all other ecosystem services. The benefits provided by the IAA-Babati campus extend from local to regional and global level. The proposed project will be localized to prevent excessive site clearance.

4.8 Socio-economic profile at IAA-Babati campus and surrounding communities

4.8.1 Structures/Buildings

The Administration and academic building is characterised by single to four-floor buildings. Single storey (low-rise) buildings account for 90% of the housing stock. The available spaces show enough spaces which will allow future expansion of the campus enrolment should take into consideration expansion of these facilities.

4.8.2 Students statistics

The Institute has gradually been increasing students' enrolment at different rates thuswhy has decide to open Babati campus. The students' enrolment is expected to increase to 5,760 by 2025/2026 implying that the estimated cumulative number of students at the completion stage of the buildings in degree-granting programs in priority disciplines. The proposed HEET project will increase learning infrastructures that will cater the demand of increasing students' enrolment.

Table 4. 1: Projections for enrolment and number of graduates 2025 to 2027

	Category	Growth Rate	2025/26	2026/27
1	Total	0.55	5551	7,338
1a	Female)	0.56	1070	2230
1b	Undergraduate level	0.53	3698	4208
1c	Masters level	0.66	783	900

Source: IAA Strategic Plan

4.8.3 Staff statistics

In terms of staffing, as at 6th February 2023 IAA-Babati campus had total of 87 staff (63 male and female 24. However with the increasing of the new buildings at IAA-Babati campus, it is expected that the number will increase through new employment.

4.8.5 Students accommodation

The Institute through internal sources continues to construct one hostels block of four storeys within the campus with capacity to accommodate 418 both undergraduate and postgraduate students with priority given to female students. The remaining students will stay outside the campus.

4.8.6 Gender issues at IAA-Babati campus

In the Tanzanian society, gender inequity is a major problem. To ensure proper handling of gender issues, the IAA-Babati campus will adopt the existing gender policy of its main campus from Arusha. IAA-Babati campus has formulated Gender Policy (2023) and Anti-Sexual Harassment Policy (2015). In addition, IAA has a Gender Dimension Unit, which is responsible for mainstreaming gender issues in all core activities of the institution as well as offering guidance and counselling services. Students Gender Club also exists at IAA to empower and create awareness of students on Gender issues. Despite of these interventions, still there is gender inequality and inequity in the academic staff cadre, with majority of those in senior ranks being males. Gender issues are also prevalent to IAA-Babati campus students. On the orientation week for the new enrolled students conducted at IAA-Babati campus from 16th to 20th November, 2022, IAA Gender Club Chairperson mentioned some gender issues facing students at the institution. She stated that Majority of female students at IAA-Babati campus do not involve themselves in vying for various leadership positions during the IAA-Babati campus general election. This is so due to lack of confidence as they believe that the male students are more superior, but also due to discouragement from their friends since it is believed that many positions in the IAA-Babati campus student government are held by male students and females go as various minor appointees. Some more issues mentioned were; sexual harassment, sexual corruption, abusive languages, drug abuse and homosexuality.

IAA Gender policy is currently being revised in-order to pro-actively promote gender equity and mainstreaming by: i) admitting talented students without gender bias, ii) taking affirmative action to increase the number of students among the disadvantaged groups in all priority programmes, iii) ensuring gender balance, equality and equity in institution's policies, programmes and regulations relating to teaching, research, consultancy and public services, iv) ensuring equality, diversity and equity in student enrolment, staff recruitment and development, and v) advancing equality in the governance and management structures.

4.9 Road Infrastructure

4.9.1 Road network, car parking and Traffic accident

IAA-Babati campus is located about 8 km from Babati town, the road connecting to Campus and Babati town has few movement cars as this lowers the risk the communities and in future will make students, teachers and other road users are prone to traffic accidents. Furthermore, as the number of teachers and students will be increasing at the IAA-Babati campus will experiences high influx of vehicles and motor cycles at the campus. The transportation of construction materials will be done at night to avoid the increase of traffics as well as noise. Also, the design will ensure enough car parking lots.

4.9.3 Public transport

As common for most of towns, all residents will be served by the most common public transport means known as *'Daladala'*. The area has a significant highway/main road which will assist in moving from one point to the other. Several daladala connects this site with other areas of Babati town. One route along institution road will starts from Babati town to Magugu. All these routes will have several bus stops and sheds which will help in ensuring that there is a comfortable public transport to, community, staff and students.

4.10 Public utilities

4.10.1 Water sources and supply

Water consumption at IAA-Babati campus will go directly with the growth of population and the activities undertaken within the campus like domestic activities, watering gardens, dispensary, cafeterias, construction activities, cleaning and car washing. An increase in water consumption reflects increase in demand of water at IAA-Babati campus, and the campus only depends on water which is mainly supplied by water authorities (BAUWASA). Others sources include streams and wells of which are currently not in use will remain as reserve. Due to increase in population and development at the institute, IAA-Babati campus must consider the increase of water supply due to an increase in population and development and therefore the reserved six water wells will be an alternative of water supply in the campus.

4.10.2 Solid and liquid waste management

The IAA-Babati campus will have waste management system for solid waste and liquid waste. Solid waste will be managed by an outsourced contractor. Currently, there will be solid waste collection points which will be scattered throughout the institute campus. Wastewater will be treated in two Up flow Anaerobic Sludge blanket (UASB) reactors with different capacities found at lower part (3,000 people) and upper part (6,000 people) of the institute campus. Once completed, the proposed new buildings will use septic tank and soak away system.

4.10.3 Electricity

Tanga ward where the construction site is found receives electricity supplied by the Tanzania Electricity Supply Company (TANESCO).The area can benefit from 11V and 33V that is close. However due to frequent power interruptions, the proponent will have alternative source of power so that construction activities are not interrupted by absence of power. The alternative power supply like solar power and generator needs to be sought when found feasible.

4.10.6 Telecommunication

The IAA-Babati campus like many other city dwellers, enjoy phone communication services from different companies namely: TTCL, AIRTELL, VODACOM, TIGO, and Halotel. These companies have installed several communication towers in order to boost reception. This implies that there is no communication barrier to users.

4.11 Community facilities

4.11.1 Health

There is one public health facility nearby IAA-Babati campus. The nearby health services Babati health centre can be found but also, one Babati referral hospital. The diversity of health services

implies that during construction workers will get medical treatment within very short time. However, first aid kit will be supplied in the building and the matron/patron will be trained for provision of first aid service.

4.11.2 Common Diseases at IAA-Babati campus

The IAA-Babati campus as other in the world institutions with large surrounding population is at high risk of the spread of third wave COVID 19. In fighting against disease, environmental cleanliness and personal hygiene are the major tools, in doing so the institute will assure collection of solid waste and the cleanliness of toilets are done daily. The institute as other institutions with high population the spread of transmitted diseases is the most challenge problem due to the fact of microbial contamination and personal contacts. It's difficult to prevent the microbial contamination and dermal contacts. In doing so the institute will introduce the hand washing systems and sanitizers. In addition, there will be presence of condom supply boxes to the site for fighting against the sexual transmitted disease such as HIV/AIDS.

4.11.3 Security

The security will be the big issue at the campus. The survey conducted at IAA-Babati campus revealed that theft likelihood at the campus is probable which means it is likely to occur due to the open environment of the institute. Therefore, presence of the security guards will be very paramount during construction phases and even after closure of constructions activities.

4.12Socio-economic and Cultural profile of the Communities surrounding IAA-Babati campus

The neighbouring environment is a mixed land use and there is interaction with the institute. The project is located in an area with an increasing trend development as the area is within a high-level residential area surrounded by medium to high end residential, commercial, and mixed-use and social economic activities.

4.12.1 Population size

The proposed IAA-Babati campus project is envisaged to increase the total current population within and around institute campus. Table 4.8 shows number population in the three communities/Streets surrounding IAA-Babati campus based on 2022 census.

Table 4. 2: Population at Waang'waray

Names of the community street/Mtaa	Female	Male	Total
Waang'waray	600	400	1400
Mrala	370	230	500

Sources: *Local governments' reports from Mtaa Executive Officers*

4.12.2 Social services/ infrastructure

The number of available social services infrastructure (education, health facilities, sources of energy, and sources of water, worshipping centers) in the three communities surrounding IAA-Babati campus are summarized in the following tables:

4.12.2.1 Education facilities in the three communities/Streets surrounding IAA-Babati campus

There are a number of educational facilities around the IAA-Babati campus community which enhance the learning atmosphere at institute. This means students with families can get education

services for their children while studying at IAA-Babati campus. Table 4.9 shows the available education services at the institute.

Table 4. 3: Education facilities nearby IAA-Babati campus

Name of the street	**Nursery**		**Primary**	**Secondary**	**Colleges**	**Total**
Waang'waray	Waang'waray		Waang'waray	Waang'waray	Babati VETA	3

4.12.2.2 Health facilities in the three communities/Streets surrounding IAA

The IAA-Babati campus community has one dispensary which serve for community and the neighbouring community. However, there will be other health service centre around IAA-Babati campus which will be constructed for serving students, staff and the community at large.

Table 4. 4: Availability of Health facilities within and around IAA-Babati campus

Name of the street/Mtaa	Hospitals	Dispensaries	Pharmacy	Total
Waang'waray	0	1	0	1

4.12.2.3 Sources of water in the in the three communities/Streets surrounding IAA-Babati

The main sources of water around IAA-Babati campus community are Rivers supplied by BAUWASA. Other sources include borehole. The presence of water tanks (Figure 4.23 and Table 4.11) campus shows that water is intermittently supplied, thus storage tanks are important for that case.

Table 4. 5: Water sources within and around IAA-Babati campus

Name of the street/area	Government sources	Private sources	Other sources
Waang'waray	BAUWASA (tape water)	1 borehole	Water supplied and sold through water tankers

CHAPTER FIVE

STAKEHOLDER ENGAGEMENT AND GRIEVANCES REDRESS MECHANISMS

5.1 Introduction and state of the Art

Stakeholder engagement is the continuous and interactive process by which the Borrower identifies, communicates, and facilitates a two-way dialogue with the people affected by its decisions and activities, as well as others with an interest in the implementation and outcomes of its decisions and the project. It takes into account the different access and communication needs of various groups and individuals, especially those more disadvantaged or vulnerable, including

consideration of both communication and physical accessibility challenges. The stakeholders' engagement under this construction project of IAA-Babati campus buildings was conducted for the following reasons;

i. To identify stakeholders and build and maintain a constructive relationship with them, in particular project-affected parties.
ii. To assess the level of stakeholder interest and support for the project
iii. To enable stakeholders' views to be taken into account in project design and environmental and social performance
iv. To assess the level of stakeholder interest and support for the project and to enable stakeholders' views to be taken into account in project design and environmental and social performance
v. To ensure that appropriate project information on environmental and social risks and impacts is disclosed to stakeholders in a timely, understandable, accessible and appropriate manner and format.
vi. To provide project-affected parties with accessible and inclusive means to raise issues and grievances and allow Borrowers to respond to and manage such grievances

5.2. Stakeholder Identification and Analysis

The study identified stakeholders to be consulted and involved throughout the project life cycle. Stakeholders' identification in this study was done through a continuous and comprehensive brainstorming process to collect an exhaustive list of people/ groups or institutions that are likely to be affected by the project/affect the project, influence the direction of the project or have those having interest over the project. In this study the following stakeholders were identified

i. Public institutions who have influence on the project- The identified stakeholders under this study were Ministry of Education Science and Technology (MoEST), Tanzania National Electric Supply company (TANESCO), Babati Water Supply Authority (BAUWASA), Babati Town Council, Occupation and Safety Authority (OSHA), CCM, Fire and Rescue Army
ii. Project Affected Communities- local communities of Pambazuko street
iii. Local government authority of Wang'waray ward
iv. Disadvantaged/Vulnerable Individuals: include vulnerable households such and particularly those that has to move to enable project execution and youth as well as students with disabilities
v. Non-Governmental Organizations working in the area adjacent to the site
vi. Private Sector: These were service providers within and outside the campus that will be providing goods and services to IAA-Babati campus community and local communities.

5.3 Engagement Approach during Preparation Phase

During this period the consultations, presentations and discussion with the above-identified stakeholders were conducted. In the presentations, the team shared with these stakeholders timely, relevant, understandable and accessible information in a culturally appropriately manner free of

manipulation, interference, coercion, discrimination and intimidation (Figure 4.24). During this stage, the team collected the views and opinions on project design, risk, and impact and mitigation measure associated with the Project. The stakeholders view and concerns are summarized in the appendix iii pg 196).

5.4 Analysis of stakeholder views and concerns

Consultation with stakeholders indicated that, the proposed project is viewed as a positive venture that may stimulate new economic and social activities and enhance academic excellence at IAA-Babati campus. In addition, participants were convinced that the project will not pose irreversible negative impacts on the environment or community in the foreseeable future if the project is well planned and monitored.

Environmental and Socio-economic issues that emerged during the consultations with stakeholders and from other sources regarding the HEET project can be categorized into; employment, businesses, health impacts; environmental, safety and security; community services; and general wellbeing impacts. Both actual and perceived impacts are described, having been gathered from people's opinion as well as factual data and comment.

Most of the economic impacts of the proposed project are positive, in that the implementation of HEET project at IAA-Babati campus is associated with benefits. Health impacts – both real and perceived – are those associated with water pollution as a result of the project, and increased risk of accident and security/ incidents. Many of the anticipated community impacts – especially on safety and security need prompt handling. The identified environmental and socio-economic impacts are summarised in the following Table 5.2.

Table 5. 1: Identified socio-economic impacts

Topics	Aspect	Potential Impacts
Economic issues	Macro economics	Tax payments to Government will increase due to improved business atmosphere resulting in local and national economic development
	Employment	Availability of jobs
Environmental and Health issues	Noise levels to the community	Perceived there will be an increase of noise levels in project area during construction and operation phase
	Air quality – dust from the project	Increase in dust generation and fumes/emissions from the project Perceived potential for increase air borne diseases
	Biodiversity	There will be clearance of vegetation during construction phase
	Water	There will be water pollution during project implementation
Occupational and Safety issues	Occupational accidents	Increased risk of accidents to workers from construction and operational activities
Staff accommodation	Staff allocation	Staffs residing in the campus will need to be provided conducive accommodation

Source: Consultant analysis, August 2024

5.5 Stakeholders Engagement during Implementation

During Project implementation, engagement activities will be undertaken in relation to project activities under Component 1: Transforming IAA-Babati campus with a focus on priority disciplines for Economic growth; Component 2: Strengthening management of the IAA-Babati campus system; and Component 3: Support for Project Coordination and Management. At this stage, the study will conduct a number of structured and formal meetings, focus group discussions, community meetings, one to one interview, distribution of information (pamphlets) and site visits that will involve a number of stakeholders as identified in 5.1 above. The timing for the conducts of the above meetings will be determined by the progress of the project implementation and when seems necessary to invite stakeholders for their comments and observation. However, the sharing of information and progress with stakeholders will be subject to scrutiny with regards to the kind of information to be shared and how the same will be communicated to both stakeholders, PAPs and OIPs. Furthermore, at this stage, the IAA-Babati campus will ensure equal and effective participation from project preparation to implementation stages. To ensure stakeholders' views and concerns are well captured, the SEP will have different methods of collecting information based on their needs i.e. disadvantaged or vulnerable groups.

Stakeholders Engagement during Implementation: Proposed Strategy for information Engagement

Information disclosure strategies attempt to increase the availability of information on the proposed construction of six buildings and the entire HEET project at IAA-Babati campus. The public disclosure of the information will be very useful in motivating and improving the performance of the project. During implementation, when new activities are being developed engagement will be undertaken to inform the development of the specific sub-project and plans. Further engagement on the frameworks will also be undertaken (Table 5.4). However and depending on the need of each stakeholder, IAA-Babati campus will use the following methods;

i. **Structured Agenda** – Depending on the issue at hand, IAA-Babati campus will be developing focused agenda so as to ensure that key strategic and risk items can be discussed with all relevant stakeholders in order to foster decision making and address risk factors and develop enhancement measures during project implementation

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

iii. **Formal meetings -** These meetings will be focused to identify and discuss specific stakeholder concerns and to disclose project information. Participation in these meetings will be influenced by the issues under consideration and will include adequate representation of women as well as other marginalized and vulnerable people where possible.

iv. **One-on-one interviews** – The interviews will aim to give chance to individuals to air concerns on project and will involve PAPs and OIPs depending on the issues to be addressed.

v. **Distribution of pamphlets** – This is a way of sharing information to a wide range of individuals.

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

5.7 Stakeholders' Engagement Plan (SEP)

The engagement plan will be reviewed and updated throughout the project implementation. During this process, the focus and scope of the SEP may change to reflect the varying stages of project implementation and to encompass any changes in project design and lessons learnt from previous phases of the Project. However, it is important to develop a guiding framework that may act as roadmap for stakeholders' engagement as shown in appendix v page 208.

5.8 Grievance Redress Mechanisms

A Grievance Redress Mechanism (GRM) is necessary for addressing the legitimate concerns of the project-affected persons. Grievance handling mechanisms provide a formal avenue for affected groups or stakeholders to engage with the project on issues of concern or unaddressed impacts. Grievances are any complaints or suggestions about the way a project is being implemented, and they may take the form of specific complaints for damages/injury, concerns around resettlement and compensation, concerns about routine project activities, or perceived incidents or impacts. GRM provide a formal avenue for affected groups or stakeholders to engage with the project on issues of concern or unaddressed impacts. In order to make this aim a reality, IAA will develop a grievances handling mechanisms and procedures to address grievances associated with the construction of new buildings and rehabilitation of existing buildings including grievances related to PAP and contractor's grievances. The proposed grievances officers at IAA-Babati campus lead Legal Counsel/Officer of the institute and Director of ender. However, the Rector has a mandate and jurisdiction to decide otherwise on the team composition or appoint new team when deemed fit and necessary to do so.

5.8.1 Levels of Grievances handling at IAA-Babati campus

The institute has no Grievance redress mechanism that is connected with the building projects. The grievance redress mechanisms at IAA-Babati campus will involve three levels as displayed in Table 5.6.

Table 5. 2: Levels of Grievances handling at IAA-Babati campus

SN	LEVEL OF GRIEVANCE	NATURE OF GRIEVANCES AND PROCEDURE FOR GRM	RESPOSNIBLE PERSON	SUPPORT PERSONS
1.	**Level One**	1. To resolve an issue quickly, politely, and transparently and amicably in order to facilitate project activities to move forward 2. Existing mechanisms such as at the Village/Mtaa level will be utilized as needed to address complaints on specific issues depending on their nature	Legal Counsel/Officer of IAA-Babati campus	Mtaa Executive Officers and Mtaa Chairpersons of waang'waray IAA-Babati campus Gender Director Representative from the contractor
2.	**Level Two**	1. Grievances that can't be resolved by team above or the one that's complicated in nature will be referred to the Higher IAA Management who will be responsible for receiving and resolving grievances in a fair, objective, and constructive manner, all claims or complaints raised by project affected persons.	Rector Deputy rector (PFA)	Legal Counsel/Officer of IAA
3.	**Level Three:**	1. The PAP that will not be satisfied by the decision of IAA GRM will be advised to seek for further redress to the MoEST	MoEST	Rector Deputy Rector (PFA)

5.6.2. Grievance Procedure for Construction and Operational GRMs at IAA-Babati campus

For a grievance to be full resolved, IAA has laid down a number of procedures that the whole process will go through as displayed in the Table 5.7.

Table 5. 3: Grievance Procedure for Construction and Operational GRMs at IAA

SN	STEP	PROCEDURE	MEANS OF COMMUNICATION	TIMEFRAME	RESPONSIBLE
1.	**Step 1: Submission of Grievances**	1. The affected person shall file their grievance to the institute Legal Counsel and Gender Unit of IAA-Babati campus, which will be recorded in writing	Through suggestion box in construction sites During regular meetings held with stakeholders During informal meetings Letter addressed to the management email, what's app messages and telephone	Anytime a grievance happen and the same will be channelled at the next stage within 5 working days after its submission	Legal Counsel/Officer of IAA, Gender experts
2.	**Step Two: Logging the Grievance**	1. Once a grievance has been received it must first be logged in the grievance database register before assigned a date for investigation and hearing	Through writing a formal letter By phone calls, WhatsApp messages and email, formal and informal meetings by IAA	Registration is done once the grievances is received and processed within five working days	Legal Counsel/Officer of IAA-Babati campus, Gender experts

3.	**Step Three: Providing the Initial Response**	1. The person, community, or stakeholder that lodged the initial grievance will then be contacted within 2 days to acknowledge that the same has been received and provide its status and notification 2. The notification will include details of the next steps for investigation of the grievance, including the person/department responsible for the case and the proposed timeline for investigation and resolution which will depend on the severity of the incident.	Through writing a formal letter By phone calls, WhatsApp messages and email, formal and informal meetings	Response to given within 5 days and the notification for next steps In case of continuous harms, immediate response will be taken without delay to prevent the harm	Legal Counsel/Officer of IAA, Gender experts
	Step Four: Investigating the Grievance	1. The GRM team will initiate investigation within one week after a grievance is received. 2. Depending on the nature of the grievance, the team involved in the investigation will vary. 3. The investigation team will involve the aggrieved	Through writing a formal letter By phone calls, WhatsApp messages and email, formal and informal meetings	The team will continually update the aggrieved on the progress of the investigation and the timeline for conclusion. The investigation should be completed within	Team to be selected by Rector Deputy Rector (PFA), depending on the issue at hand

		person/people in this investigation, where possible.		the period of 14 days	
	Step Five: Communication of the Response	1. The grievances team will outline the steps taken to ensure that the grievance does not re-occur and any measures needed to resolve the complaint.	Through writing a formal letter By phone calls, WhatsApp messages and email, formal and informal meetings	The response will be communicated within 1 day of the resolution being determined.	Legal Counsel/Officer of IAA, Gender experts
	Step Six: Complainant Response	When complainant is satisfied then the team will seek their sign off 1. The team and the complainant will agree and determine if any follow up is needed to monitor the implementation of the resolution.	Through writing a formal letter By phone calls, WhatsApp messages and email, formal and informal meetings	Within a period of 5 days	Legal Counsel/Officer of IAA, Gender experts
	Step Seven: Grievance Closure or Taking Further Steps if the Grievance Remains Open	1. Once the measures have been implemented to the complainant's satisfaction, the grievance should be closed.	Through writing a formal letter By phone calls, WhatsApp messages and email, formal and informal meetings		

CHAPTER SIX

ASSESSMENT OF IMPACTS AND IDENTIFICATION OF ALTERNATIVES

6.1 Introduction

This section outlines the process of impact identification and assessment of the impacts in each stage of the proposed project. The proposed mitigation measures are outlined in chapter seven of which MoEST through IAA is committed to undertake so as to prevent or reduce the identified adverse impacts. This study is conducted for envisaging a road map to ensure the investments to be financed under this project are designed and implemented in an environmentally sound and socially acceptable manner that meets both requirements of World Bank Environmental Standards (ESS) and the Government of Tanzania (GoT) legislations.

- Environmental risks and impacts assessment done included: (i) those defined by the WB Environmental Health and Safety Guidelines, EHSGs; (ii) those related to community safety; (iii) those related to climate change (iv) any material threat to the protection, conservation, maintenance and restoration of natural habitats and biodiversity; and (v) those related to ecosystem services and the use of living natural resources;
- Social risks and impacts assessment done included: (i) threats to human security through crime or violence; (ii) risks that project impacts fall disproportionately on individuals and groups who, because of their particular circumstances, may be disadvantaged or vulnerable; and (iii) negative economic and social impacts relating to the involuntary taking of land or restrictions on land use.

6.2 Impact Identification

Impact identification is a process designed to ensure that all potential significant impacts are identified and taken into account in project design and implementation. A number of 'tools' are available to assist in impact identification. The simplest, and most frequently used, are checklists of impacts, although matrices, network diagrams and map overlays are also commonly used. In this ESIA study, a checklist and matrix methods were used. The checklists, which have been developed from previous experiences, provide lists of potential impacts associated with specific activities. They provide a quick method of identifying the impacts and in such help also practitioners to avoid overlooking some of potential of the impacts associated with a particular activity. The matrix provides a rather systematic way of evaluating the identified impacts.

6.2.1 Impacts associated with preparatory, construction, demolition and operational phase

The following issues were identified to be occurring during the preparatory and demolition phase of the project.

6.2.2 Positive Social Impacts during Pre-Construction and Construction

6.2.2.1 Provision of Job Opportunities

Contract provisions for the proposed construction activities stipulate the requirement for 90% of the labour force to be drawn from the local population with particular emphasis on women.

180 workers are expected to be employed during the peak construction period. However, given the local population's educational backgrounds and skills, most of the residents will only be in a position to take on semi-skilled and unskilled labor. The majority of job opportunities to be created during pre-construction and construction phases will be temporary project-based jobs. Almost all of the temporary labor force can be hired from the local community but will be subject to the skills level needed and the strategies of contractors and subcontractors in sourcing their workforce.

Many indirect benefits are expected to be encountered in the targeted areas during the pre-construction and construction phases, due to the need for supportive services for the workers and contractors who will be working in the various locations.

Increased economic activity in the project area is expected through the following supply chain:

•Implementation of works and provision of supplies related to construction, and closure of the site.
•Drivers and mini-bus, and motorcycles owners will benefit from the transportation of workers.
•Provision of food supplies, catering, and cleaning services.
•Provision of building and auxiliary materials and accessories, engineering, installation, and maintenance services.
•Provision of electronic appliances, communications, and measurement equipment.
•Security personnel (trained and unarmed).
•Retail services
•Rental house owners by benefit from workers and engineers and may need accommodation facilities.

The creation of jobs should be properly managed to ensure the implementation of a fair recruitment process and to avoid the potential negative impacts associated with sourcing a local workforce. It is recommended that a Labor Management Plan be developed. In addition, the exact employment needs for the project (labor forecast) and the availability of local communities to provide the workforce and specific training needs should be identified. The contractor should establish transparent recruitment procedures to be shared with local authorities for further dissemination to increase the probability of attracting higher-skilled labourers from the surrounding communities. Recruitment priority should be given to residents of local communities for less specialized services or work as stipulated in the contract agreement. Finally, opportunities for sub-suppliers and sub-contractors should be awarded to local firms where possible, which in turn employ local labor.

To stimulate the positive impacts of job opportunities for the local community, the following actions should be taken:

•Involvement of local leaders in the recruitment process to ensure full and fair participation of local communities
•Priority for recruitment to be given to local residents available in nearby site for less specialized work.
•Create opportunities for employment of women in both management and casual placements.
•Prioritize local companies and suppliers for sub-contracts
•The contractor should procure all the available building materials from local suppliers.
•Where possible, raw materials should be procured from nearby the project area.

•Earth materials shall be procured from legal/licensed quarries/burrow pits and the proponent should be contractually obliged to restore all depleted quarry sites upon closure.

6.2.2.2 Increased Revenue of Local Vendors/Services

The creation of local business opportunities for the resident population is expected during the construction phase, and local entrepreneurs and vendors will be encouraged to offer services and food and drink products to workers, suppliers, and sub-contractors. The proposed construction of buildings will stimulate businesses, many owned by women, such as food and drink vendors, cleaning as well as transportation, freight, and storage services. The proponent should involve local leaders in the recruitment process to ensure full and fair participation of local communities and make local entrepreneurs aware of the resulting economic opportunities available to them. This will create economic opportunities for women in the form of informal placements. Female vendors should be given priority in setting up their stalls closer to, but not within, the project construction site.

6.2.2.3 Increased Revenue of Local Materials Suppliers

Considerable volumes of building materials such as sand, aggregates, ceiling boards, timber, bricks, iron sheets, cement and steel will be required for construction. Procurement of these resources represents significant financial opportunities for local materials suppliers. Raw materials should be procured from approved sources within the project area, where possible and available. Earth materials should be procured from legal/licensed quarries, or the proponent should restore all depleted quarry sites upon closure. These measures will ensure the sustainable management of natural resources. The contractor should purchase seeds of native vegetation species from local agricultural suppliers to be used in site restoration and revegetation activities. Finally, IAA-Babati campus management should consider hiring some of the local farmers as landscape managers/labourers.

6.2.2.4 Negative Impacts during Pre-Construction and Construction

Negative impacts during the pre-construction and construction phase are anticipated to affect the physical, biological and human environments and predominantly center on issues involving noise, air quality, soils, waste generation and water resources.

6.2.2.5 Dust and Particulate Matter (PM)

The primary impact of construction activities on air quality will be due to increased dust levels arising from construction machinery, excavations, rock drilling, cement mixing and road construction. Emissions of small particulate matter from diesel trucks and idle combustion engines as well as road dust are difficult to accurately measure and quantify but the impacts will be intermittent and short-lived.

6.2.2.6 Gaseous Emissions

In addition to dust, air quality may be affected by gaseous pollutant emissions such as nitrous oxides (NOx) and sulphur dioxide (SO2) from the exhausts of internal combustion engines of construction machinery, vehicles, and diesel generators.

6.2.2.7 Noise andVibrations

Noise and vibrations will be generated from vehicular movements, sand and aggregate processing, concrete mixing, excavation machinery, rock drilling operations, etc. Also, the presence of personnel will serve as a continuous source of low-level noise emissions. Vibration levels are expected at their maximum levels during compaction works in preparation for structure foundations. All noise and vibration levels are not expected to exceed WB/IFC and Tanzanian standards however, if they do, the contractor will be required to implement the below mitigation strategies to assure the safety of the workforce and the surrounding environment.

6.2.2.8 Soils Erosions

During the construction works, the soil will be impacted by activities like vegetation stripping, grading, soil removal, backfilling, compacting, excavation, and disposal of surplus soil. Vegetation clearing during construction will result in the temporary exposure of bare soils resulting in increased soil vulnerability to Aeolian and water erosion. Failure to re-vegetate the land promptly may accelerate soil erosion, although the limited scale and duration of the earthworks combined with the favourable topography are likely to prevent major or significant soil erosion or soil slides. The impact assessment of soil erosion is considered to be of minor severity

6.2.2.9 Soil Contamination

Construction activities inherently pose a risk of releasing pollutants or contaminants into the environment. If not properly stored, managed, and transported, construction wastes and the accidental spillage of petroleum-based products, such as lubricants, hydraulic fluids and fuels can lead to pollution of land and potentially seep into waterways. Other hazardous materials including paint and other chemicals used in the building process must be contained and handled properly to prevent the potential for spillage and contamination. It is assumed that there will be no use or handling of any contaminants that contain Persistent Organic Pollutants (POPs). The impact assessment of soil contamination is considered to be of minor severity.

6.2.2.10 Water Pollution

During the construction phase, soil erosion from earthworks and runoff of crushed and ground rock material from drilling, stone crushing, etc. are not expected to cause increased sediment load on rivers as in both project sites there are no water bodies available, only seasonal water channels exist during the rain period

The workers' sanitation facilities will generate sanitary effluents which are potential sources of microbiological and organic pollution of surface and groundwater. The presence of workers will also produce domestic waste amounting to an estimated 150 kg/worker/day based on 0.5 kg/capita/day. Unless the waste and wastewater from domestic and construction origins shall be connected to the available sewage system in the project sites to avoid the increased pollution of soils.

6.2.2.11 Solid, Liquid and Hazardous Waste

Construction works will generate both hazardous waste and non-hazardous wastes. The former includes paper, plastic, wood, debris (brick, concrete) as well as garbage generated from the presence of the workforce while the latter includes machine oils, hydraulic fluids, paints, solvents, batteries, sludge from septic tanks, etc. The solid empty containers of oil, diesel, paints, paint thinner and other hazardous chemicals including cleaning agents will inevitably be generated and should be considered hazardous wastes and managed according to The Environmental Management (Hazardous Waste Control and Management) Regulations, 2021.Liquid wastes will be generated from domestic wastewater from construction workers as well as effluents from construction activity and equipment cleaning and maintenance (e.g., cleaning of cement trucks). If improperly handled, all waste, both hazardous and non-hazardous, generated from construction activities could negatively impact the environment and should therefore be properly managed according to the relevant standards and regulations. The impacts related to the generation of hazardous waste are expected to be of major significance

6.2.2.12 Occupational Health and Safety Impacts

OHS aspects are of great importance since the workforce will mostly be composed of semi-skilled and unskilled labourers recruited from the nearby. The majority of the local people have been exposed to projects of this nature during previous constructions, and therefore they are somehow aware of the safe operating procedures while undertaking their assignments. It is likely that the limited exposure of some of them will increase the risk of occupational accidents. In addition, community exposure to health and safety risks will also increase, especially due to the transportation of equipment and personnel through the neighbouring villages and streets (traffic safety, road accidents). Construction workers will be exposed to health and safety risks because of the movement and operation of heavy trucks and machines. The proposed construction project works will have the following Occupational Health and Safety (OHS) risks with the potential to cause serious injuries to workers:

- **Fall**-falling from scaffolding more than 6 feet or a steady ladder at a distance of more than 20 feet is among the most serious hazards at the site of construction and the most common. The usual cause of this accident is slipping or foot stumbling or using a loose ladder. There are many reasons to be at risk of falling. To get rid of them, the employer must have a fall protection program as part of the OSH program in the work place.
- **Stable and mobile stairs** - Fixed and mobile stairs are important causes of injuries and disasters among construction workers.
- **Scaffolding**-The most likely hazards are due to the movement of the scaffold components, their collapse due to damage to their component, lasso flood, suspension of suspended material, electrics hockormal function. Construction workers responsible for the installation and dismantling of scaffolding and work plat form sat construction sites face serious injuries due to falls.
- **Heavy construction equipment**. The main causes of such accident include the injury

of workers when the equipment is returning reverse or when the direction of the equipment is changed or when the brakes do not work properly, the flipping equipment injuring its operator, the equipment falling from the excavator, bucket, and other mobile construction equipment.

- **Electricity**-electricity is a major risk to people both a home and at work. Electricity line workers, electrical technicians and electrical engineers are constantly exposed to electricity and face daily risks.

The project involves a workforce and there will also be a regular flow of personnel, workers and employees entering and exiting the site, the potential for the spread of infectious disease (COVID-19) in the project is possible, as are the implications of such a spread. In addition to the health and safety risks, workers may encounter inappropriate working conditions or risks of complaints that are not appropriately addressed. Illegally dumped waste is also a potential health hazard for workers if the dumped waste is near project implementation areas. OHS impacts will potentially occur at any point during construction and operation. While some accidents could be minor, others might be grave leading to disability or loss of life of workers and inhabitants. Related OHS safeguards are comprised in The Occupational Safety and Health Act, NO.5 of 2003. The duration of the impact will be short-term occurring only during the construction phase. The extent of the impact will be local or national depending on the origin of the work. The likelihood of the impact occurring is high considering the usually low level of safety at construction sites in Tanzania. The impacts related to occupational health and safety are expected to be of major significance.

6.2.2.13 Community Health and Safety Impacts

Construction site activities and exhaust of heavy machinery can emit many types of hazardous substances to ambient air that can be of public health concern. Dust and particulate matters that arise from construction activities would raise the susceptibility of the surrounding community.

- Noise and Vibration: During construction, noise and vibration can impact the IAA-Babati campus community by inducing nuisance
- Temporary Labour Influx: Increased risk of communicable diseases can take place through the influx of workers as they might transmit diseases to the IAA-Babati campus and surrounding communities.
- Fire: Any fire occurring at the construction facility can further disseminate to neighbouring buildings.
- Traffic Safety: Traffic accidents can arise from the usage of vehicles entering the construction site. This can lead to injuries and fatalities among members of the community.
- Unauthorized entry to the construction site: The presence of an unauthorized individual from the public at the construction site without appropriate PPE can lead to accidents and injuries.

Since there are no high-density residential areas close to the project site, the previously described impacts will be reduced, as the only residential area near the project site are Administration Block and lecture/seminar rooms used by staff and students mostly during daytime. The impacts related to Community Health and Safety are expected to be of moderate significance.

Waste generated at the project. The contractor will arrange for safe storage, transportation and disposal of all hazardous waste generated during the construction phase by engaging a certified contractor or local authority to collect, transport and dispose of all hazardous waste generated at the project site according to the relevant national and international standards for hazardous waste management.

The Contractor shall identify and sort all waste streams. Waste management shall be based on a hierarchy that considers prevention, recycling and reuse, treatment, and disposal to increase resource efficiency and decrease the generation of waste in the first place.

Under the supervision of the contractor, solid waste generated during decommissioning shall be properly treated and safely disposed of only in clearly marked waste disposal sites with an appropriate lining material to prevent land contamination.

All refuelling of heavy equipment and machinery shall be undertaken by a competent and qualified individual, with appropriate safeguards and protection measures to prevent any spillage or contamination by chemical wastes or maintenance oils, lubricants, etc.

All employees working with hazardous materials should be trained in hazard identification, safe operating procedures, appropriate materials handling procedures, safe work practices, basic emergency procedures, and (if applicable) Special hazards unique to their jobs.

6.3 Impact Evaluation

Identification of impacts was followed by prediction or estimation of the magnitude, extent and duration of the impact in comparison with the situation without the project. The matrix method was used (Table 6.1). To be able to predict whether impacts are likely to occur as well as their scale, the initial reference or baseline data prior to the project was determined, and the future changes forecasted with or without the proposed project. The impact evaluation was based on experts' knowledge as well as checklists.

The significance of impacts was tested using the following criteria:

i. The magnitude and likelihood of the impact and its spatial and temporal extent;
ii. The likely degree of recovery of the affected environment;
iii. The value of the affected environment;
iv. The level of public concern; and
v. Extensiveness over space and time (magnitude);
vi. Intensiveness in concentration or in proportion to assimilative capacity;

vii. Exceedance of environmental standards or thresholds ;
viii. Level of compliance with environmental policies, land use plans, sustainability strategy;
ix. Level of adversity and seriousness in affecting ecologically sensitive areas;
x. Level of adversity and seriousness in affecting heritage resources, other land uses; communities and/or indigenous peoples, traditions and values.

The impacts were further rated at a scale of "–3" to "+3" through "0" in the following manner;

+3	High positive impacts
+2	Moderate positive impacts
+1	Minor positive impact
0	No impacts
-1	Minor negative impact
-2	Moderate negative impacts
-3	High negative impacts-

The team focused on significant positive and negative impacts that were rated -2, -3 and proposed mitigation measures.

6.4 Impact Rating Criteria

Seven criteria were used to determine the significance of the impacts in the Matrix, these include

Spatial Scale-The spatial dimension encompasses the geographical spread of the impacts regardless of whether they are short term or long term. Table 6.1 describes the ratings used in the Simple Matrix as far as spatial scale is concerned.

Table 6. 1: Spatial Rating

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

Temporal Scale-Temporal boundaries refer to the lifespan of impacts. Table 6.2 describes the ratings used in the Simple Matrix

Table 6. 2: Temporal Rating

Short-Term (ST)	during construction
Medium-Term (MT)	Life of project

Long –Term (LT)	Residual impacts beyond life of project

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

Reversibility of the impact- Every impact was checked if its effect can be reversed or not. Letter R was used to denote reversible impacts while IR was used to denote Irreversible impacts.

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

Residual Impacts- These are long term impacts which go beyond the lifetime of the project.

Table 6. 3: Impact Correlation Matrix for the proposed construction of IAA-Babati campus buildings

S/N	Impact	Project activities and phase														Impact Rating				
		Construction/Mobilization/Demobilization phase					Operation Phase							Decommissioning phase							
		Site clearance and demolition	Transportation of materials	Trench excavations of and casting	Construction of the superstructure and installation of services	Landscape activities	Running the Buildings	Liquid waste handling	Solid waste handling	Energy provision	Maintenance works	Presence of Auxiliary facility and Boundary	Water provision	Demolition of structures	Removal of solid	Termination of Temporary	Spatial Scale	Temporal Scale	Reversibility	Cumulative Effects	Residual Impact
1.	Job Creation and employment opportunities	+1	+1	+3	+3	+2	+2	+1	+1	0	+1	+1	0	+2	+1	+1	R	LT	R	✓	
2.	Increased market opportunities and sources of income	0	0	0	0	0	+3	0	0	0	0	0	0	0	0	0	R	MT	R	✓	
3.	Changes in lifestyle and quality of life	+1	+1	+1	+2	0	0	0	0	0	0	0	0	0	0	0	R	MT	R		
4.	Increased Revenues to local authorities				+2		+3	0	0	0	0	0	0	0	0	0	N	MT		✓	
5.	Food Insecurity and inflation of prices on other social services	0	0	0	-2		-2	0	0	0	0	0	0	0	0	0	L	LT	R	✓	
6.	Increased level of crimes	0	0	0	-2		-2	0	0	0	0	0	0	0	0	0	L	LT	R	✓	
7.	Prevalence of Communicable diseases	0	0	0	-2		-2	0	0	0	0	0	0	0	0	0	L	LT	R	✓	
8.	Exploitation of borrow pits/quarries and other natural resources	0	0	0	-2	0	0	0	0	0	0	0	0	0	0	0	L	ST	R	✓	✓

S/N	Impact	Project activities and phase															Impact Rating				
		Construction/Mobilization/Demobilization phase					Operation Phase							Decommissioning phase							
		Site clearance and demolition	Transportation of materials	Trench excavations and casting	Construction of the superstructure and installation of services	Landscape activities	Running the Buildings	Liquid waste handling	Solid waste handling	Energy provision	Maintenance works	Presence of Auxiliary facility and Boundary	Water provision	Demolition of structures	Removal of solid	Termination of Temporary	Spatial Scale	Temporal Scale	Reversibility	Cumulative Effects	Residual Impact
9.	Contamination and /impaired quality of receiving body – land and water	-1	-1	-1	-1	0	0	0	0	0	0	0	0	0	0	0	R	ST	IR		
10.	Disadvantages related to the management of solid wastes from demolition	-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	L	ST	IR		
11.	Income to local suppliers and service providers	0	0	0	+3		+3	0	0	0	0	0	0	0	0	0	R	LT	R	✓	✓
12.	Increased skills and impart knowledge to local communities	0	0	0	+2	0	0	0	0	0	0	0	0	0	0	0	R	LT	IR		✓
13.	Occupational Safety and Health impacts	0	0	0	-2	0	0	0	0	0	0	0	0	0	0	0	L	LT	R		
14.	Community Health, Safety and Security	0	0	0	-2	0	0	0	0	0	0	0	0	0	0	0	L	ST	IR		
15.	Gender discrimination	0	0	0	-1	0	0	0	0	0	0	0	0	0	0	0	L	ST	IR		
16.	Child labor	0	0	0	-1	0	0	0	0	0	0	0	0	0	0	0	L	ST	IR		
17.	Impairment of air quality due to dust	-1	-2	-2	-2	-1	0	0	0	0	0	0	0	-2	-1	0	0	0	0	0	

S/N	Impact	Project activities and phase															Impact Rating				
		Construction/Mobilization/Demobilization phase					Operation Phase							Decommissioning phase							
		Site clearance and demolition	Transportation of materials	Trench excavations and casting	Construction of the superstructure and installation of services	Landscape activities	Running the Buildings	Liquid waste handling	Solid waste handling	Energy provision	Maintenance works	Presence of Auxiliary facility and Boundary	Water provision	Demolition of structures	Removal of solid	Termination of Temporary	Spatial Scale	Temporal Scale	Reversibility	Cumulative Effects	Residual Impact
18.	Contribution to Climate Changes	-1	-2	-2	-2	0	0	0	0	0	0	0	0	0	0	0	I	LT	IR		
20.	Dust and Noise pollution	-2	-2	-2	-2	-1	-1	0	0	0	-1	-1	0	-2	-1	0	L	ST	R		
21.	Waste water management problems	0	0	-1	-3	-1	-3	0	0	0	0	0	0	0		0	L	LT	R	✓	
22.	Erosion of Exposed Surfaces	-1	-1	-1	-1	-1	-2	0	0	0	0	0	0	0	0	0	L	ST	R	✓	
23.	Solid waste management problems	-2	0	-2	-3	-2	-3	0	0	0	-1	-2	0	0	0	0	0	ST	R	✓	
24.	Loss of vegetation	-2	0	-1	-2	-1	0	0	0	0	0	0	0	0	0	0	L	LT	R		
25.	Construction vibration	-1	-1	-1	-2	-1	0	0	0	0	0	0	0	0	0	0	L	ST	IR		
26.	Increased revenue	0	0	0	+1	0	+3	0	0	0	0	0	0	0	0	0	N	LT	R	✓	
27.	Availability of adequate academic facilities	0	0	0	0	0	+3	0	0	0	0	0	0	0	0	0	N	LT	R		✓
28.	Increase of admission of students	0	0	0	0	0	+3	0	0	0	0	0	0	0	0	0	N	LT	R	✓	
29.	Increased commercial and social activities around project locations.	0	0	0	0	0	+3	0	0	0	0	0	0	0	0	0	L	LT	R	✓	

S/N	Impact	Project activities and phase															Impact Rating				
		Construction/Mobilization/Demobilization phase					Operation Phase							Decommissioning phase							
		Site clearance and demolition	Transportation of materials	Trench excavations and casting	Construction of the superstructure and installation of services	Landscape activities	Running the Buildings	Liquid waste handling	Solid waste handling	Energy provision	Maintenance works	Presence of Auxiliary facility and Boundary	Water provision	Demolition of structures	Removal of solid	Termination of Temporary	Spatial Scale	Temporal Scale	Reversibility	Cumulative Effects	Residual Impact
30.	Increased pressure on social services and utilities	0	0	-1	-1	0	-3	-3	-3	-3	-1	-2	-3	0	0	0	L	MT	R	✓	
31.	Health and safety risks due to fire hazards	0	0	0	0	0	-2	0	0	-2	0	0	0	0	0	0	L	LT	R		
32.	Incidence of Diseases	0	0	0	-2	0	-2	0	0	0	0	0	0	0	0	0	L	LT	R	✓	✓
33.	Water pollution	0	0	0	0	0	-2	-2	-1	0	0	0	0	0	0	0	L	LT	R	✓	
34.	Increased storm water generation and overflow	0	0	0	-2		-2	0	0	0	0	0	0	0	0	0	L	LT	R		✓
35.	Loss of employment and revenues	0	0	0	0	0	0	0	0	0	0	0	0	-3	-2		L	LT	IR		
36.	Loss of aesthetic value due to haphazard disposal of demolished waste	0	0	0	0	0	0	0	0	0	0	0	0	-3	-2	0	0	0	0		
37.	Dust and noise pollution from demolishing works	0	0	0	0	0	0	0	0	0	0	0	0	-3	-2		L	ST	IR		
38.	Loss of revenue to institutions and the government	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-2	N	LT	IR		

6.5 Potential Environmental and Social Impacts during the Preparatory Phase (Site Selection and Design)

Positive social impacts

6.5.1 Job Creation and employment opportunities

During this phase, about 180 people shall be employed by the contractor to do mobilization works such as construction of campsites, quarrying and material extraction and transportation activities etc. This shall increase the income to all those who have the opportunity to be employed by the contractor. During this phase, it is expected that the project will engage a qualified contractor(s) who will employ both skilled (25 people) and non-skilled labourers (150 people) from within and outside the project area for the preparation of the building sites and camps. In additional to that, there will be an increase of self-employment due to the higher demands and supply of various goods and services for people working in the project. For example, an increase in restaurants, *mama Ntilie* will be obvious to meet the increased number of the people working at this phase. This impact is high, regional and will be long term.

6.5.2 Increased market opportunities and sources of income

The influx of people and particularly skilled and unskilled labourers in the area will provide an opportunity for local people to engage in some sort of business activities that will enable them to get more income compared to the previous time. The project will create a new source of income for both the people within IAA-Babati campus (service providers), communities surrounding the institute and those from other areas interest. This impact is high, regional and will be long term.

6.5.3 Changes in lifestyle and quality of life

It is expected that, the increase in employment opportunities both formal and informal will result to the rise of high wages among the population in the areas as well as the surrounding communities. This is likelihood to increase their expenditure and consequently alter their living standard. This will also have a multiplier effect in the communities that the workers come from, as they will for example be able to pay for school fees as well as buy assets such as bicycles and radios. Apart from that, the influx of people in the area will result to an increased number of people with mixed culture hence easy to alter or influence the same to undergo some changes that may be positive or negative. This impact is moderate, localized and will be medium term.

6.5.4 Increased Revenues to local authorities

The proposed project development can benefit local communities in terms of income generating employment. This will allow opportunities within the local business community, such as the provision of services and supply of goods such as food, hotel and building materials. The local business community as such would therefore also have more money circulating within it creating additional spin off effects for improvement of the local economy. It is also expected that the increased business and investments in the area will give an opportunity for local government authorities to collect tax and consequently improve the availability of social services in the area. Overall, as users pay specific taxes and fees for services, the local and national revenue will increase even before the commencement of the operational phase. This impact is high, National and will be medium term.

Negative social Impacts

6.5.5 Re-allocation of staff settlements

The findings from ESIA indicate that IAA-Babati campus HEET project will not need a Resettlement Action Plan (RAP) because there will be no unwilling resettlement during project implementation.

6.5.6 Food Insecurity and inflation of prices on other social services

The stakeholders that were involved in this study have raised their concerns about shortage of food that may arise at the selection and design stage due to influx of workers causing pressure on available areas/sources of food. It was reported by both community members and mtaa village councils that the development of this project will likely attract many people to come and settle around the institute in order to use the available opportunities for income generating activities thus increasing the demand of foods and services. This is likely to cause a lot of chaos and inflation of prices on goods and services including food services. This impact is moderate, localized and will be long term.

6.5.7 Increased level of crimes

It is expected that the selection and design stage will recruit a considerable number of workers both skilled and non-skilled from the communities around and other from the nearby communities. In addition, the project will attract people from various areas to come and invest on the provisions of good and services. Although this stage is not expected to attract a big number of people, but population increase is expected to some extent and this in turn will stimulate the growth of the trading centres around the project site. Experience and sociological point of view show that where there is a big concentration of people from various backgrounds and behaviour, levels of crimes and changes in norms and behaviour are common. This is also is likely to be the case of the trading centers around the project sites like Pambazuko. This impact is moderate, localized and will be long term.

6.5.8 Prevalence of Communicable diseases

Influx of job speculators from other parts of Tanzania and neighbouring regions will increase interaction, consequently increasing the risk of getting HIV/AIDS infections and other communicable diseases. The growth of trading centers in the area will attract different businesses and different people to the extent that the level of prostitution will also increase in the area provided that there will be employees from other areas of the country. Increased prevalence of communicable diseases like HIV/AIDS will likely to happen and consequently result to the increased number of orphans and single parenting in the project area. This impact is moderate, local and will be long term.

Negative Environmental Impacts

6.5.9 Loss of flora and fauna due to exploitation of borrow pits/quarries and other natural resources

Extractions of water, construction materials from both authorized borrow pits and quarries on government land, communal land and on private-owned land are associated with rampant degradation with no efforts of restoration/re-vegetation. This impact is moderate, localized and will be short term.

6.5.10 Contamination and /impaired quality of receiving body – land and water

Main sources of construction waste are cleared vegetation and top soil (overburden) and domestic waste from quarries. During quarrying activities, various types of wastes will be

generated including solid and liquid wastes. The wastes may contaminate land or be washed into local surface and ground water resources and impair the quality of these receiving bodies. This impact is minor, localized and will be short term.

6.6 Potential environmental and social impacts during construction phase

Positive social impacts

6.6.1 Jobs creation

The construction activities are envisaged to create more employment opportunities to local people. The project components expect to employ many workers from the locality and it is expected that more jobs will be directly connected with construction of the proposed buildings and associated infrastructure. This impact is high, regional and will be medium term.

6.6.2 Income to local suppliers and service providers

The proposed project will need construction materials and other services in respective project region. Materials needed for this project is very large. This is good news to suppliers of building materials as well as those who will provide food and waste collection services in Babati. This impact is high, regional and will be long term.

6.6.3 Increased skills and impart knowledge to local communities

As noted in the previous paragraph, the construction phase of the three proposed buildings will provide a number of opportunities for both skilled and non-skilled labourers. There will potentially be training opportunities or practical learning for local people who will be employed in the project particularly technicians and machine operators during this phase and consequently acquire necessary skills that will be of paramount important in their lives IAA-Babati campus will construct the state-of-the-art buildings. This implies that the construction may deploy the use of equipment and technology which might be new to most practicing local engineers and consultants. The project activities will therefore benefit local experts in updating their knowledge and have opportunity for practical learning by participating in the whole process. This impact is moderate, regional and will be long term.

6.6.4 Improved quality of life and living standard

It is expected that, the increase in employment opportunities both formal and informal will result to the rise of high wages among the population in the areas. This is likely to increase their expenditure and consequently alter their living standard. This will also have a multiplier effect in the communities that the workers come from, as they will for example be able to pay for school fees as well as buy assets. Apart from that, the influx of people in the area will result to an increased number of people with mixed culture hence easy to alter or influence for the same to undergo some changes. During field studies, it was observed that most people believe that an increase of employment opportunities and the execution of the proposed project activities into the area will automatically lead to an improvement in social services. This impact is moderate, localized and will be short term.

Potential negative social impacts

6.6.5 Occupational Safety and Health impacts

On a daily basis, construction workers face some of the most perilous employment conditions. Even though construction workers are trained and know basic safety measures,

accidents can still happen. The risks taken every day during regular construction work make it difficult for job sites to remain accident-free. Accidents on site could be caused by defective or collapsing scaffold, electrocutions, falls, falls from ladders, and defective machinery such as forklifts, conveyors, hoists, cranes, malfunctioning tools and other equipment. Accidents can result in serious injuries or death. In case, construction is extensive, the potential significance of the risk to health and public safety will depend on the size of the population and the workers exposed and the degree of exposure. Workers permanently on the site will be exposed to air pollution throughout the construction period. Work accidents during construction work are quite common. This is due to the presence and handling of hazardous equipment and harmful building materials. It is therefore recommended that before the construction activities, there is need for the materials to be well inspected and harmonized to the occupational health and safety standards. This impact is moderate, localized and will be short term.

6.6.6 Community Health, Safety and Security

Due to technological developments and investment in labour saving equipment, the skilled and non-skilled workforce will be needed. The skilled construction workers will be imported to the area of construction and will reside in labour camps. A smaller number of local low-skilled jobs may be envisaged. These will include protection and guarding of the construction companies' properties. Low skilled workers will be hired around the project jurisdiction if necessary.

It is expected that the increased number of workers and higher concentration of residents near construction sites will have negative impact on local communities. Uncontrolled movement of workers will affect residents around the settlements. Due to this, workers must receive training and sign a labour code of conduct. With an increase in construction activities and the possibility of job seekers arriving, it may be more difficult to identify strangers in the community. In addition, the increase in cases of diseases like COVID-19 and HIV/AIDS associated with the entry of a temporary labour force into community could also occur. There may also be negative issues that need to be managed such as increases in local prices, crime, prostitution or alcohol abuse. The presence of a large number of workers can give rise to an increase in spread of communicable diseases. Also, construction of the project shall definitely be accompanied by in-migration of job seekers and opportunistic businesses and speculators. This will bring many people in the project areas. This will increase social interactions amongst the construction workers and local communities. This among other factors may produce an inherent increased risk of incidences of sexually transmitted diseases, HIV/AIDS and other contagious diseases taking into consideration that the project will be implemented within university campus.

In addition, during the construction phase risks related to public safety and the construction workers may increase. Increased traffic volume related to construction activities will contribute in increasing road accident risks especially on local roads, which will be used by trucks and construction equipment of the contractors. Construction vehicles and machines will pass through public roads and as such residents of local settlements located along these roads will be exposed to increased risks for accidents. The sources of harmful effects to the general public are identified in Table 6.3. This impact is moderate, localized and will be long term.

Table 6. 4: Sources of the harmful effects on health and community safety

Type of harmful effect	Sources of the threat

Accident risk	• During excavation work • Movements and operations of heavy equipment • Access to danger zones • Transport, handling and storage of the materials • Concrete batching and mixing plant
Indirect health risk	• Environmental pollution • Contamination of water or/and food

6.6.7 Gender based violence

The social cultural relationship in the project may have an implication to gender based violence. Gender-based violence is violence directed against a person because of their gender. Both women and men experience gender-based violence but the majority of violence is inflicted on women and girls, by men. Many forms of violence against women are rooted in power inequalities between women and men. This impact is minor, localized and will be short term.

6.6.8 Gender discrimination

The proposed project may cause men treating woman, unfairly because of their culture. This might lead into more project benefits to men than women. Tanzania regulations encourage equal opportunities to men and women. This impact is minor, localized and will be short term.

6.6.9 Child labor

There is a risk that some project-related activities could involve child labor - employment of children in project activities depriving children of their childhood and that is mentally, physically, socially or morally dangerous and harmful. The Labour Management Plan may need to be provided that no one under the age of 18 may be employed or engaged in connection with the project. This impact is minor, localized and will be short term.

6.6.10 Food Insecurity

The stakeholders that were involved in this study have raised their concerns about shortage of food that may arise at the selection and design stage due to influx of workers causing pressure on available areas for sources of food. In our focus group discussion with both community members and mtaa village councils, they argued that the development of this project would likely to attract many people to come and settle around the site in order to use the available opportunities for income generating activities thus increase demand of foods and services. This is likely to cause a lot of chaos and inflation of prices on goods and services including food services. This impact is moderate, localized and will be long term.

6.6.11 Increased level of crimes

It is expected that the construction phase of this project will recruit a considerable number of workers both skilled and non-skilled from the communities around and other from the nearby communities or outside the country. In addition, the project will attract people from various areas to come and invest in the provisions of goods and services. It is highly expected that this stage will attract a big population and this in turn will stimulate the growth of the trading centres around the project site. Experience and sociological point of view show that where there is a big concentration of people from various backgrounds and behaviour, levels of crimes and changes in norms and behaviour are common. This is also is likely to be the case of the trading centers around the project sites like Pambazuko. This impact is moderate, localized and will be long term.

Impacts on physical environment

The ESS3 'Resource Efficiency and Pollution Prevention and Management' recognizes that development projects often generate pollution to air, water, and land, and consume finite resources that may threaten people, ecosystem services and the environment. Impacts caused by pollution are described hereunder:

Negative Environmental Impacts

6.6.12 Impairment of air quality due to dust

Measurement done in seven locations around the proposed sites indicated that $PM_{2.5}$ and PM_{10} concentrations were between 16.2µg/m^3 and 24.4 µg/m^3; and between 24.1µg/m^3 and 36.2 µg/m^3 respectively. These ranges are below WHO and Tanzania Emission Limits. During the construction phase air quality is expected to decline as a result of an increase in levels of fugitive dust from the construction activities mainly due to vegetation clearance, foundation excavation and movements of heavy machinery. This may cause localized temporary disturbance to workers at construction sites and areas where sand and aggregates will be collected. Respirable particulates are a public health hazard and may otherwise create considerable nuisances to the public and fauna. The overall magnitude of the impact of the project is negative, temporary (only during construction phase) and high in significant taking into consideration that the most (Five) projects will take place outside the current core business area. Potential sources of dust at the site and off site are summarized in Table 6.5. This impact is moderate, localized and will be short term.

Table 6. 5: Project activities and Impacts

Activity	**Source of production of dust**
On-site building work producing dust and gaseous emissions	
Clearance and terracing of the site	Earthworks Initial soil spreading after excavation. The movement of construction traffic and movement of materials Stored materials subjected to wind action
Excavation	The important sources are: i. Movement of traffic construction vehicles ii. Handling and storage of waste iii. Excavation and transport of materials and on-site storage
Building Foundations	The important sources are: i. Foundation excavation ii. Movement of construction traffic iii. Handling and the storage of waste iv. Excavation and transport of materials and on-site storage
Building Works	Movement of traffic of construction vehicles. Potential of a certain strongly localized harmful effect like dust inhalation if the completion of work requires "smoothing and sanding" of the wall to obtain a desirable completion.
Auxiliary work -	
Off-site building work producing dust	
Material transportation	Any movement of traffic on unpaved roads Surface materials brought by the wind
Aggregate mixing unit	Stored materials Filtering and other methods for processing construction materials Handling of materials (loading output) Traffic congestion

Tool maintenance course	Materials on the surface brought by the wind Traffic of construction

6.6.13 Contribution to Climate Changes

The project will contribute to climate change in two ways. Firstly, it will be through generation of Green House Gas emissions (SOx, NOx, Cox, VOCs). Secondly, the project is expected to reduce Carbon dioxide sequestration due to reduction of vegetated area of the campus.

6.6.13.1 Increased Greenhouse gas generation

According to the ESS1, the current and projected atmospheric concentration of greenhouse gases (GHG) threatens the welfare of current and future generations. The construction of the proposed IAA-Babati campus buildings will most likely be associated with greenhouse emissions from cars, equipment, plants etc. Various internal combustion engines will release Greenhouse gases notably carbon-dioxide (CO_2), small quantities of noxious gases such as Nitrogen Oxides (NOx), Sulphur Oxides (SOx) and hydrocarbons. The generation and emission rate will depend on equipment type, road condition, speed of vehicles, quantities of equipment, duration, and prevailing atmospheric conditions, particularly wind and moisture of the air. The main source of emission of atmospheric pollutants will emanate from mobile sources-the exhaust engines (trucks/tipper, wheel loaders). Table 6.6 shows the emission factors of the various construction equipment and vehicles, and approximated emissions.

Table 6. 6: : Emission of construction equipment and vehicles

S/N	Type	Quantity	Emission factors (Giunta *et al.,* 2019)		Total Emission	
			CO - g/hp-hr	NOx - g/hp-hr	CO g/day	NOx g /day
1	Excavator	1	0.75	4.31	0.34	1.90
2	Bulldozer	1	0.94	4.67	0.42	2.09
3	Trucks	5	11.24	15.27	25.12	34.13
4	Motor grader	1	0.75	4.31	0.34	1.90
5	Compactor	1	0.94	4.67	0.42	2.09
6	Crane	2	170	260	340	520

Data collected around project sites indicated that all values are below WHO guidelines and Tanzania Emission Limits. Gaseous emissions are expected to increase due to construction activities, equipment and vehicle movements, hence contributing to climate change which has various global impacts. However, emissions from stationary emission sources are estimated to be far less compared to the mobile source emissions. Thus, the contribution of emissions from stationary source to cumulative emissions by mobiles sources is projected to be negligible. The level of the emissions of the precursory pollutants and the atmospheric pollutants from mobile sources will vary from day to day, according to the type of activity done. However, even if the impact is very limited in time, it does not remain the same depending on the weather conditions. Of this fact the intensity of the impact of the building construction on air pollution especially by mobile emissions is evaluated to be negative, cumulative, global, short term and moderate as there are

hundreds of vehicles plying in Arusha-Singida and Dodoma roads which emit same air pollutants. This impact is moderate, international and will be long term.

6.6.13.2 Reduction of CO_2 Sequestration Potential

The ESS1 recognised CO_2 sequestration potential as one category of the Ecosystem Services (i.e. regulating services). Vegetation clearance during construction activities will reduce the CO_2 sequestration process. Destruction of 62,756.91m^2 (40% impervious and 60% pervious) to pave the way to construction of the proposed new buildings will reduce Carbon dioxide sequestration and hence reduction of global efforts towards climate change mitigation. It is estimated that, a forest can absorb 162 g C/m^2 to 168 g C/m^2 annually (Getter et al. 2009). Based on the current green space coverage of IAA-Babati campus (240,245m^2), the total Carbon dioxide sequestered by the vegetated area of the campus ranges between 38.9 to 40.4 tons of Carbon dioxide per year. The proposed project will utilize an estimated area of 62,756.91m^2 implying a reduction of Carbon dioxide sequestration potential by 4.1 to 4.2 tons per year. Therefore, the proposed project will reduce Carbon dioxide sequestration of IAA-Babati campus per year by 10.4%. This amount of Carbon dioxide is negligible compared to total Carbon dioxide sequestered by the campus vegetated land. Hence, this impact is minor, international and Long-term.

6.6.14 Increased Noise level at the campus

Measurements done in different locations around the proposed project sites indicated that the daytime noise levels ranged between 43.35 dB (A) and 57.4 dB (A). Tanzania Standard limits (TZS) guidelines require noise emission levels to be less than 55 dBA during the day within residential/institution areas. This implies that the noise level is slightly above the range by 2.4dBA. The proposed project activities will inevitably increase noise level. Noises from vehicles, equipment, construction crew, etc may rather be significant. Noise beyond some level (70dBA) is itself a nuisance and need to be avoided. Due to an increase in activities and number of operational vehicles, the impacts of noise will cause disturbance to normal university operations especially due to the construction of the proposed studio building. This impact shall not be significant to projects to be implemented at the high zone of the campus as to a great extent are far away from busy campus activities. The impact of the project on noise level generation short-term, local and moderate.

6.6.15 Increased vibration

Construction activity can result in varying degrees of ground vibration, depending on equipment and methods employed. Vibration will be produced by construction vehicles, plant and machinery during delivery of materials, processing of materials, and actual construction work. The Construction activities that typically generate the most severe vibrations are blasting and impact pile driving for foundation. Due to an increase in activities and number of operational vehicles, the impacts of vibration include causing disturbance to neighbours and physical damage to properties near the construction site. This impact is moderate, localized and will be short term.

6.6.16 Wastewater Management problems

The types of wastewaters generated during construction activities include sewage, grey water and process water. Sewage effluent will be produced in the sanitary facilities provided and collected on site. Septic waste produced in scattered sites will also pose a problem to human health. This will be particularly severe if the waste is not collected

directly and / or is released directly into the environment without any treatment. Grey sewage will pose less of a direct problem to human health but will be produced in large quantities in the camps. Hunting and process water will be generated from batching plants, equipment maintenance centers and ordinary sites. Wastewater discharge in the natural environment can pollute environment and causing unhygienic sanitary conditions and nuisances to the human perceptions. Types and sources of wastewater are shown in Table 6.7. This impact is high, localized and will be long term.

Table 6. 7: Types and sources of waste water

Type	Source
Sewage	Works Camp
	Offices Other elements of the main camp
	Remote secondary facilities
	Sites
Grey water	Works Camp, cooking, personal and clothes washing
	Offices/Other camps
Process water	Oil spills
	Aggregates and process plants

6.6.17 Solid waste management problems

Main sources of construction waste are cleared vegetation and top soil (overburden), scrap metals, remnant of timbers and domestic waste from construction crews. During construction activities, various types of solid wastes will be generated including solid wastes from cafeteria and offices. The wastes may contaminate land or be washed into local surface and ground water resources and impair the quality of these receiving bodies. Other associated impacts include flies and increased bird population (attracted by food waste). This impact is high, localized and will be short term.

6.6.18 Erosion of Exposed Surfaces

Inadequate compaction and resurfacing compounded by rain, trampling, vegetation clearance etc. may cause erosion and consequent sediment load in runoffs. This is mostly likely to happen if construction is undertaken during the rain seasons. This impact is moderate, localized and will be long term.

6.6.19 Loss of Landscape and scenic view

Like any development, there is a 'zone of visual intrusion' from which it can be seen. These refer to the impacts of landscape change on people: on the views that people have from their homes, offices, footpaths, cars as they drive past, etc. Construction activities shall affect the landscape by removing existing landscape features in place such as trees and replacing them by concrete and gravel surface. If operated at night, the lights will lead to the increase of light pollution. The following components of the landscape can be affected by development:

- Physical factors: geology, landform, microclimate, drainage, soil, ecology; and
- Aesthetic factors: proportion, scale, enclosure, texture, colour views as well as sounds

However, the proposed project components can also change the overall character of an area to make it look more urban. This impact is moderate, localized and will be long term.

6.6.20 Loss of flora (vegetation) and fauna

Much of the artificial and natural vegetations in the project area is characterized by bushes and shrubs. There are also natural and manmade forests Overall the clearance of the plants will have significant impacts on ecology of the site and the nearby surroundings. The only negative impact anticipated from clearing of vegetation will be opening up of the area especially by felling large indigenous trees aforementioned and this will change the panoramic view of the area. Exposed area as a result of trees felling is likely to be exposed to the agents of soil erosion especially wind and water. Clearance of vegetation– especially bulldozing to ground level - has tendency to damage local vegetation cover and potentially damage/ loss of habitats and local biodiversity and increase risks to soil erosion. Permanent clearance will be confined only to project site. This impact is moderate, local and will be of long term.

6.7 POTENTIAL IMPACTS DURING THE OPERATION PHASE

Potential Positive Social Impacts

6.7.1 Increase of admission of students to IAA-Babati campus

The proposed project will provide adequate academic facilities to academic institutions, people and the country at large. These will increase admission of students from high schools and other colleges as a result access to higher education will be enhanced for the benefit of the country. Also the proposed project components shall provide adequate and conducive space for training, seminars, workshops etc. This impact is high, national and will be long term.

6.7.2 Increase of revenue to IAA-Babati campus

IAA will increase students' enrolment which in return will increase revenues through institution fees. This will increase academic institution's financial standing which will enhance good governance and efficient running of the institute. Thus, the goals of academic institutions to become centre for seeking knowledge and disseminating it to a wide spectrum of beneficiaries at national and regional levels are going to be fully realized. This impact is high, national and will be long term.

6.7.3 Job creation

Jobs to be created during the operation phase of the project can be divided into two (2) categories: direct and indirect jobs; their volume depends strongly on the level of operational activities. Direct jobs are those related to operational services, teaching, indirect jobs are those created by the positive impacts of the institution to economic sectors. These include cleanliness, stationeries, catering and commercial activities. In addition, indirect jobs will include agriculture, livestock, and energy and water sector. The ripple effect (or catalyst) on the entire regional and national economy is also the origin of the creation of 'indirect' jobs. This impact is high, regional and will be long term.

6.7.4 Increased commercial and social activities around project locations

Construction of the proposed project components is anticipated to attract more businesses due to demand of various services and goods required to sustain the institute. The institute will also cause growth of the existing businesses around the project location. This impact is high, local and will be long term.

6.7.5 Growth of Trade and Increased Investment

It is envisaged that the construction of three buildings at IAA-Babati campus and increased enrolments of students will attract a number of investors from within and outside surrounding communities to invest in meeting the needs of the increased population in the

area. This is likely to enhance the development of the centers surrounding IAA-Babati campus like Wang'waray Street. It is also expected that service providers such as food venders and general kiosks be established and increase during construction phase to provide services to both skilled and unskilled labourers working in the site. This impact is high, local and will be long term.

6.7.6 Production of skilled labour force for implementing various development policies, plans and goals for sustainable social and economic growth of the Nation

The project shall increase enrollment and production of quality professionals. Thus, the proposed IAA-Babati project will contribute to FYDP II through generation of more skilled labor to support industrialization. Thus contributing to the Tanzania economy through generation of quality graduates that are relevant to the labor market requirements. This impact is moderate, national and will be long term.

6.7.7 The growth of banking activities in the project area

The growth of population, investment and trading activities in the projects area will attract some banks to open their offices at IAA-Babati campus. Currently, there is no one in the area but it is expected that the increase in students' enrolments, employment and income of the people living in the area or working in the proposed projects will consequently result to an increased rotation of funds in the area hence acts as attraction to banking institutions in the area. It is also expected that, both skilled and unskilled employees at IAA-Babati campus will be paid their money through banking system and this play a major role for most of the banks to be attracted to simplify the access of funds to their customers hence the opening of the bank branches seems to be inevitable. This impact is moderate, national and will be long term.

Negative Social Impacts

6.7.8 Increased incidences of diseases and ill health

The concentration of a large number of people within the proposed project area could contribute to increased levels of communicable diseases such as Sexually Transmitted Diseases (STDs), HIV/AIDS, TB, COVID-19 and other ailments due to interaction and concentration of people from various places. This impact is medium, local and will be long term.

6.7.9 Increased pressure on social services and utilities

Residences in the project area and surrounding communities do not have sufficient social and infrastructural services provided to them such as in the areas of health, worship areas and water. In view of this, the increased students' enrolments in the project area will increase pressure on the already limited social infrastructure and may without the taking of steps to alleviate this place a heavy additional burden on the existing service delivery system. Furthermore, the institute has the potential to increase pressure on existing utilities such as electricity and water. The demand may strain the existing service delivery system in one way or the other. The increase of population due to employment opportunities and students' enrolment will definitely strain the existing social services. This impact is high, local and will be medium term.

Impacts on physical environment

6.7.10 Increased water pollution

Water pollution will mainly be caused if sanitation systems used during project operation will be inadequate. This is due to the fact the proposed project will cause an increase in enrolment. Onsite sanitation systems always cause groundwater and surface water pollution. Other liquid wastes will include chemicals from laboratories and cleanliness activities and training workshops. Thus, the risk of water degradation is assessed as important, which may have an indirect impact on the surface water too. This impact is moderate, local and will be medium term.

6.7.11 Increased storm water generation and overflow

The proposed project components will generate 5,246.5 m^3/year of storm water due to the presence pavements, concrete surfaces and building roofs. The project will contribute 2% of the current storm water generation (268,552m^3/year). The structures will tend to compromise the infiltration capacity of the land surface hence causing surface runoff to increase. The impact of storm water generation will be aggravated due to nature of the topography of IAA-Babati campus. The storm water generated might have impacts on structures downstream as well as being a causative factor for soil erosion and poor water quality. This impact is moderate, local and will be long term.

6.7.12 Health and safety risks due to fire hazards

Buildings are very prone to fire hazards because of different types of combustible materials and machines, which are used and installed, respectively. Electrical fault is by large the main culprit in fire accidents in buildings in Tanzania. The components of a fire are fuel (combustible substance), heat and oxygen. Some chemicals used in laboratories and training workshops may also cause fire eruption if not handled appropriately. Unless all three are present fire will not occur. Fire can cause the following effects:

i. Loss of lives;
ii. Serious Injuries;
iii. Loss of properties etc.

This impact is moderate, local and will be long term.

6.7.13 Contribution to Climate Change

During the operation phase, the proposed project will have both direct and indirect CO_2 emissions to the atmosphere hence contributing to climate change. The indirect emissions come from the use of electricity, water, forestry products (Paper and timber) and consumption of food stuffs. Thus, materials consumed at IAA-Babati campus have potential contribution to climate change through CO_2 emissions which cannot be realized by eyes onsite and offsite (Table 6.3). According to the electricity-specific emission factors for grid electricity for Tanzania (0.26675705 kgCO_2/kWh) obtained by dividing total emissions from the generation of electricity within a country and dividing that figure by the total amount of electricity produced by the country; the IAA-Babati campus produces 507,785.4kg of CO_2 annually. Also, estimates from cool farm tool shows that the total emissions from the use of timber, biomass and fossil fuel is 360,014.6 kg CO_2 equivalent while for food products is 3,607,892 kg CO_2 equivalent. The current consumption is expected to change tremendously during the implementation of the proposed project due to population growth (increasing students' enrolment); increase of new human activities; and changes in consumption behaviour where people will use more resources due to technological advancement and the modernization. This impact is moderate, international and will be long term.

6.8 Impacts during decommissioning phase

Social impacts

6.8.1 Loss of employment and business opportunities

People employed by the project will lose their jobs. This will have significant impact on these people and their families. Other dependents of the project, such as suppliers of various services (e.g. security and cleaning companies) and goods (such as food stuff and stationaries) will lose the business opportunities. This impact is considered negative, long term and of moderate significance. This impact is high, local and will be moderate term.

Environmental Impacts

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

In the event of future rehabilitations and upgrading, the buildings may need to be demolished necessitating disposal of demolishes wastes. Haphazard disposal may cause contamination of soil and water bodies. This impact is moderate, local and will be medium term. This impact is moderate, local and will be long term.

6.8.3 Dust and noise pollution from demolishing works

In the event of future rehabilitations and upgrading, the building needs to be demolished necessitating disposal of demolition waste. The noise pollution and air quality will be most affected during the demolition work with the emission of dust particles from machinery like excavators, electric grinders and mixer. The impact receptors are likely to include site workers and residents in the neighbouring areas. The substances which will most significantly contribute to air pollution will be particulate matter (PM). PM may cause health hazards when inhaled in significant amounts and can also reduce the visibility. This impact is moderate, local and will be short term.

6.8.4 Loss of revenue to institutions and the government

As discussed above both town and Central government will be receiving revenue from the project. In case of the decommissioning of the project, the revenue generated will cease and hence the revenue base of local and central governments will shrink. This impact is high, local and will be long term.

6.9 Cumulative impacts

Cumulative impacts are incremental changes caused by the project together with other presently ongoing, or reasonably foreseeable future planned actions/projects within the Project Area. Cumulative impacts act with others in such a way that the sum is greater than the parts. This is, however, not always the case – sometimes they will simply be the sum of the parts, but that sum becomes significant. The project will have both positive and negative cumulative impacts during its implementation as a direct result of the project. The nature of cumulative impacts can be both temporary in nature (restricted to the construction phase) and permanent (occurring in both the construction and operation phases). This subsection presents cumulative impacts of the proposed projects at IAA-Babati campus. The mitigation measures to either prevent or minimise risks related to potential cumulative impacts have already been planned in chapter seven.

6.9.1 Cumulative Socio-Economic Impacts

Positive Cumulative Socio-Economic Impacts

The proposed new classrooms, library and hostels e.t.c. are likely to have impacts during the operation phase. Thus, the proposed project will increase students' enrolment, revenue collection and enhanced learning environment during the operation phase as follows;

- The classrooms and library will enhance learning and teaching environmental, and hence more capacitated graduates,
- The hostels will provide safety, easy accessibility to classrooms and reduce negative social interaction with the outside community. The hostels will also enable the university to increase students enrolment

Together, the three will increase revenue collection by the institute and hence facilitate growth and competitiveness in the market. Furthermore, no other developments have been identified in the study area, which could give rise students enrolment or enhance the learning environment.

Negative Cumulative Socio-Economic Impacts

The proposed project will definitely increase the population at the at IAA-Babati campus. These are students, vendors, and staff from different social backgrounds. Such interactions existing at the institute are currently managed by different units at the institute (i.e. gender unit, dean of students etc.). The increased number of people will cumulatively increase the impacts of social interactions between students/ staff/vendors and visitors at the campus. Such impacts may include cumulative increase in communicable diseases (HIV, AIDS and other STDs as well as COVID 19 outbreak) and cumulative increase in theft, crimes and other security issues.

6.9.2 Cumulative Impacts on Bio-physical Environmental

6.9.2.1 Cumulative impacts of liquid and solid waste

Ongoing activities at the institute generated significant solid and liquid wastes. The increased number of people at the campus will result to cumulative increase to generation of both liquid and solid waste at the campus. This will increase deterioration of soil and water bodies.

6.9.2.2 Incremental noise and air pollution

The main sources of noise and air emissions at the campus are traffic and standby power generators. The proposed project shall definitely contribute to increase traffic flow within the campus, both during construction and operation. The proposed infrastructure shall be provided with standby power generators. These shall cumulatively increase noise levels and exhaust gasses emissions within the at IAA-Babati campus.

6.9.2.3 Greenhouse Gas Emissions and Climate Change

Greenhouse gas emissions have a major influence on climate. Naturally occurring greenhouse gases such as Carbon dioxide (CO_2), Methane (CH_4), Nitrous oxide (N_2O) and Ozone (O_3) play a key role in trapping the sun's heat, thereby maintaining the earth's temperature range necessary for life. Project implementation activities contribute to greenhouse gas emissions through the use of equipment, plants and vehicles during the construction phase. Also, the electricity use is associated with greenhouse gas emissions; since the electricity generation is met by hydropower and thermal generation plant. On the other hand, the increasing vegetation clearances during construction and operation phase reduce Carbon sequestration potential, hence reducing efforts towards climate change mitigation.

6.10 Analysis of Project Alternatives

Consideration of project implementation alternatives is crucial in ensuring that the developer and decision-makers have a wider base from which they can choose the most appropriate option. The planning stage of this project considered the No project alternative site, alternative energy sources, alternative waste management technologies, alternative construction materials and alternative roofing materials. These are explained hereunder;

6.10.1 No project alternative

The no project alternative entails retaining the current status quo (No construction of the proposed three building structures at IAA-Babati campus). Adopting the No Project alternative, this option would mean avoiding the predicted impacts of the project implementation, and missing the predicted positive impacts of the project. The HEET project at IAA-Babati campus is designed to revitalize and expand the capacity of the institute to contribute to key areas for innovation, economic development and labour market relevance. The proposed modern infrastructure is expected to enable effective teaching and research, and produce graduates who could become a catalytic force for the new industrial based economy of Tanzania. Based on the enormous benefit of the proposed project at national level, the No project alternative was abandoned. It is clear that identified impacts associated with project implementation are mostly temporary, and shorter, and are manageable at the institute level.

6.10.2 Alternative Site

As presented in Chapter 2 of this report, the proposed three structures will be located within the at IAA-Babati campus. The option of utilising an alternative site out of the campus was considered but over-weighted by the existing land at the institute due to the following advantages over other;

- The site is within at IAA-Babati campus (No need to buy a new piece of land);
- The selected area is compatible with the land use proposed by the IAA master plan;
- The site is located on a favourable piece of land; large area with a clear view
- The site is well served with road network and it is easily accessible to public transport; and
- Availability of water and electricity mains supply.

Even within the campus, several locations were considered against provision/availability of services such as waste management, water and power supply; location with respect to location of other structures and environmental protection. The following are the advantages of the selected sites over any other location within the campus;

- The selected corridor allows integrated management of generated solid and liquid wastes (both onsite and offsite);
- Accessibility to water and energy: to be taped from a mains towards the new hostel;
- Site selection considered areas, which have less vegetation cover, and avoided densely dareas. The proposed site is already a disturbed area.

6.10.3 Alternative Energy Sources

The main source of energy for the IAA-Babati campus is Electricity, supplied by the national grid. For the proposed infrastructure, the IAA-Babati campus considered four alternative sources of energy namely; electricity, diesel power generators and solar energy.

- ***Alternative one - Electricity:*** As it is the case in most of developing countries, supply of electricity from national grids is not reliable as it mostly originates from

hydroelectric power generators, which depend on rainfall frequency, intensity and pattern.

- ***Alternative two - Diesel generators:*** These utilise fossil fuels, which tend to emit greenhouse gases especially when operated for a long time. As such, diesel generators are used as standby power supply during outages.
- ***Alternative four - Solar energy****:* the last alternative considered was the installation of solar panels to harvest solar energy. It is intended that the solar energy be used for lighting within the buildings. It is also intended to install solar lights in various locations along the streets.

Conclusions: an evaluation of the three alternatives based on capital costs, availability of adequate supply, reliability, and environmental protection revealed that at least three options could be used together. Therefore, it is planned to connect the proposed infrastructure to electricity from the National grid as a basic power supply. Provisions will be made for installing solar panels in the future. However, since some machines and equipment require high voltage, which could not be supplied by solar energy, standby generators will also be provided.

6.10.4 Water supply Alternative

Alternative one: Water Supply (surface water) from the operating water utility company
Water supply from BAUWASA is the option considered to be appropriate as the water supply network is within the campus and therefore can guarantee reliable, clean and safe water supply to the proposed buildings.

Alternative two: Groundwater Extraction
Report from BAUWASA suggest that ground water is another alternative option for water supply and can supplement the water supply at the project site at such times of water shortage and scarcity. Ground water investigation and well drilling have are present to the project site.

Alternative three: Rainwater Harvesting
The project considered rainwater-harvesting potential as alternative source of water. It is proposed to harvest rainwater from both roof and land catchment. It will entail the design of rainwater harvesting system and underground water storage tanks. Although this may demand more investment (capital), its operation costs are relatively low. Rainwater harvesting is one of the best ways to reducing surface runoff and soil erosion.

Conclusion: *The Institute opted to use a combination of two water sources namely piped water supply from BAUWASA and rain water harvesting.*
BAUWASA water although relatively expensive, it is of most reliable quality. Therefore, BAUWASA water will be used for domestic purposes and in the running of institute. BAUWASA water will be complimented by rainwater, which will be used for cleaning and gardens maintenance.

6.10.5 Liquid waste Management Alternatives

Five alternatives were considered for liquid waste management, namely stabilization ponds/lagoons; connection to exiting wastewater treatment system (i.e. up-flow anaerobic sludge blanket (UASB) + ABR systems and Biogas reactor +ABR system); constructed treatment wetland; septic tank - soakaway system; and direct discharge to the sewer system.

Alternative one: Use of stabilization ponds/lagoons

This refers to the use of a series of ponds/lagoons, which allow biological processes to treat the wastewater to meet effluent quality standards. This method requires a large surface area on the ground, to facilitate natural treatment (degradation). This option has two major fallbacks:

i) It requires large space and is incompatible with the IAA masterplan
ii) The open ponds will attract scavenger birds and animals to feed into the wastewater. The scavengers will create unaesthetically conditions at the site.
iii) Generation of foul smells from the degradation of wastewater in the lagoons/ponds.

Alternative two: Constructed treatment wetland

The institute considered adoption of constructed wetlands, which are engineered system designed and constructed to copy natural processes taking place in the natural wetlands. Constructed wetlands remove pollutants in wastewater through the combination of physical, biological and chemical processes. They are either subsurface flow where the flow is below the surface of soil or surface flow where the flow of wastewater is above the soil. This alternative is feasible compared to waste stabilization ponds /lagoons given the space available for the proposed project.

Alternative three: Use of septic tank and soak pits systems

This involves the construction of underground tanks for treatment of sludge and is connected to soak pits for disposal of effluent. It is less expensive to construct though regular emptying in large discharge points is required. Septic tanks and soak pits demand little space compared to other options.

Alternative four: Discharge direct to the sewer system

There are no sewerage system in vicinity of the site. This is not feasible and it will cost a lot to make it available.

Conclusion: analysis of the four alternatives showed that alternatives two and four are the most favourable. The construction of the infrastructure will include construction of onsite septic soakaways systems for immediate use, and later construct a sewer line, to convey wastewater to existing treatment facilities (UASBs).

6.10.6 Solid Waste Management Alternatives

The proposed project will generate a considerable large amount of solid waste (estimated at 525 kg/day) from hostels, stationeries, workshops, restaurants and offices. The at IAA-Babati campus considered two alternatives namely;

i) Collection and transportation for disposal by private company
ii) Collection, sorting, resource recovery and transportation of remaining waste for final disposal

Alternative i: Alternative one will involve transportation of huge amounts of waste to the dumpsite. Since solid waste management is a service and doesn't generate any revenue, such practice will become a burden to the institute. The generated amount will require at least one trip per day. Therefore, alternative one was abandoned.

Alternative ii: alternative two will involve integrated solid waste management; where by management will start with:

- Efforts to reduce waste generation:
- Waste segregation and sorting into degradable and non-degradable; and recyclables and non-recyclables.

- Waste recycling: at this stage, all recyclables' wastes will be collected and untied in research work within the campus or sold to recycles (includes papers and plastic containers).
  Degradable wastes will be utilised in existing research activities such as composting, biogas generation and maggot production. Staff collect a small amount of food waste as animal feed.
- The remaining non-decomposable and no recyclables will be stored on site in constructed chambers, before it is transported for final disposal.

6.10.7 Alternatives building materials

It is estimated that building materials account for more than 60% of the total building cost, therefore, the selection of affordable building materials cannot be overemphasized.
The institute looked into a variety of building materials for different aspects of the proposed infrastructures. Architects consulted with structural engineers on the load-bearing capabilities of available materials. Five common materials namely *concrete, steel, wood, masonry and stone* were considered as briefly described hereunder:

Concrete: Concrete is a composite material made from fine and coarse aggregates, bonded together with cement. Its versatility, cost and strength make it the ideal material for building foundations. It is most preferred since it can carry heavy load and withstand harsh environmental conditions its

Steel: Steel is a metal alloy of iron and carbon and often-other alloying material in its composition to make it stronger and more fracture-resistant than iron. Because it is so strong compared to its weight and size, structural engineers use it for the structural framework of tall modern buildings and large industrial facilities

Wood: Among the oldest, or perhaps *the* oldest, of building materials, wood has been used for thousands of years and has properties that make it an ideal building material—even in the days of engineered and synthetic materials.

Stones: The longest lasting building material available is the one that's been here for thousands of years: stone. In fact, the most ancient of buildings still in existence in the world are made of stone.

Brick/masonry: Masonry construction uses individual units (such as bricks) to build structures that are usually bound together by some kind of mortar. The strongest and most commonly used masonry unit is a concrete block, which may be reinforced with steel. Glass, brick, and stone can all be used in a masonry structure

Conclusion: A team of Architects and Engineers evaluates these based on criteria such as *strength, weight and durability*, which would make it right for various uses; compatibility with National standards and testing methods that govern the use of building materials in the construction industry; consideration for structural integrity and cost and aesthetics.

The institute opted a combination of two of the construction materials i.e. concrete (for foundations, floors and columns) and Brick/masonry for walling.

6.10.7 Alternatives roofing materials

Roofing is a crucial part of the building construction. Every construction requires a stable and strong roof and should have the ability to protect the structure from natural conditions. The institute considered various options in terms of roofing materials, among these coated

aluminum roofing sheets and *clay roofing tiles*. The two materials were evaluated based on costs, availability, whether resistance, longevity, flexibility and corrosion resistance.

Conclusion: Although roofing tiles scored, more points in terms of whether resistance, longevity and resistance to corrosion, they were found to be more expensive that aluminum roofing (i.e. per square meter). Aluminum roofing sheets scored more point on capital costs, flexibility and less labor intensive during installation. Therefore, the institute opted to use corrugates aluminum sheets for roofing.

CHAPTER SEVEN

7.0 IMPACTS MITIGATION AND ENHANCEMENT MEASURES

This chapter is devoted to describing measures or interventions that shall be implemented to minimize the potential negative impacts and enhance the potential positive impacts identified in the preceding chapter. Many of the proposed mitigation measures are essentially good practice that shall be adhered to during all the project phases.

The design of the mitigation measures for the identified Environmental and Social impacts applied the mitigation hierarchy suggested in the ESF (i.e. ESS1) which are:

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

7.1 Mitigation measures during preparatory phase

Social Impacts

1.1.1 Food Insecurity and inflation of prices on other social services

The following measures are very vital in minimizing the problem of food insecurity;

i. Encourage traders to supply food and other products to the project area.
ii. Sensitization of the surrounding communities in order to make them aware of the employment and hence income generating opportunities with the proposed project.
iii. Provide more avenues for service providers e.g. cafeteria and restaurants

7.1.2 Increased level of crimes

. The following measures are very vital in minimizing the problem of crime;

i. Constructions of police stations at IAA-Babati campus and the surrounding communities in order to strengthen security services
ii. Establish community-based security in collaboration with mtaa/ward leaders.
iii. The contractor shall establish his own security to protect his properties and should establish community policing to support insufficient police force.
iv. The community should be encouraged to participate in security matters by providing information on suspects
v. The cooperation of local people together will help to lessen criminal incidents and maintain security of people and their properties.
vi. Participatory community security measures (*ulinzi shirikishi*) should be encouraged in the surrounding communities.

7.1.3 Prevalence of Communicable diseases

Influx of job speculators from other parts of Tanzania and neighbouring regions will increase interaction, consequently increasing the risk of the spread of communicable diseases. The following measures are recommended to mitigate this impact

- Provide awareness to public on pathways communicable diseases.
- Provide Voluntary Counselling and Testing (VCT) centres for HIV/AIDS at at IAA-Babati campus and the surrounding communities.

- Provide more health facilities
- Work close to government and private institutions that deal with the spread of communicable diseases

Environmental mitigation measures

7.1.4 Exploitation of borrow pits/quarries and other natural resources

i. Exploitation of construction materials will take place from authorized sources only;
ii. Restoration of the borrow pits/quarries after use constituting of levelling the area and seeding or planting of trees and/or grasses will be done in association with local government (department responsible for natural resources) and local environmental NGOs. If appropriate, the levelled area will be left for natural re-vegetation;

7.1.6 Contamination and /impaired quality of receiving body – land and water

i. Efficient collection and disposal system based on the principles of reduction, re-use and recycling of materials, shall be instituted at project areas;
ii. Introduction of waste disposal bins, warning notices, posted at strategic points;
iii. No, on site burial or open burning of solid waste shall be permitted;
iv. Wastes not suitable for incinerations and general municipal waste dumping (e.g. plastics, rubbers, tyres, etc.) shall be removed for recycling, treatment, and/or disposal by licensed contractor as appropriate; and
v. Instructions to contractor to put on his/her methodologies for handling hazardous waste such as oils, lubricants and non-combustible waste during bidding process.

7.1.7 Solid waste management problems during demolition activities

i. The Contractor will be required to prepare a detailed Demolition Plan and Construction Management Plan to the satisfaction of the proponent and relevant Authorities prior to the commencement of works on site;
ii. All materials which can be reused shall be reused;
iii. Materials that cannot be reused shall be sent to an authorised dumpsite ; and
iv. A hazardous materials inspection will be undertaken by an accredited consultant and a report issued. Hazardous materials notably asbestos will be removed in accordance with EMA 2004.

7.2. Potential mitigation measures during construction phase

Negative Social Impacts

7.2.1. Occupational Safety and Health impacts

viii. Institute good site practices including prevent public access to the construction site by securing equipment and demarcate excavate, using warning signs with appropriate text (local language) and graphic displays;
ix. Institute traffic management and safety programme including, training and testing of heavy vehicles operators and drivers, enforcement of speed limits, maximum loading restrictions and compliance with all Tanzania transportation law and standards;
x. Awareness campaigns /Education on HIV and STDs shall be provided to workers;

xi. Appropriate working gear (such as nose, ear and mouth mask and clothing) and good construction site management shall be provided;
xii. During construction, the contractor shall ensure that the construction site is fenced and hygienically kept with adequate provision of facilities including waste disposal receptacles, sewage, firefighting and clean and safe water supply;
xiii. A well-stocked First Aid kit (administered by medical personnel) shall be maintained at construction site. The medical personnel shall also be responsible for primary treatment of ailments and other minor medical cases as well as providing health education to the workforce;
xiv. Reporting mechanisms for the public to register concerns or complaints regarding perceived risks to their health and safety due to the construction operation should be put in place;
xv. Emergency contact details in the event of an accident shall be provided;
xvi. Develop and implement an emergency plan including spill response;
xvii. Training all contractor staff in emergency planning and spill response; and
xviii. Developing a detailed health and safety plan and training all contractor staff on the plan.

7.2.2 Gender based violence

- The project will prepare a GBV Action Plan that ensures project awareness raising strategy (for workers and community members), a list of GBV service Providers to which GBV survivors will be referred, revisions to the GRM to ensure it can address GBV complaints, and information on GBV allegation procedures in the workplace.

7.2.3 Gender discrimination

- This project will ensure that there is involvement of women in project activities.

7.2.4 Child labour

i. IAA-Babati campus will conduct regular monitoring of project workers in relation to health, working conditions, hours of work, minimum age, and the other requirement of national law.
ii. Work with local authorities and schools in the area to control school drop out
iii. Cooperate with relevant authorities like Ministry of Labour to control child labour
iv. Create awareness raising to the communities on the importance of education to the children
v. The local authorities should develop bylaws to control the engagement of children in petty business or work in project related activities

7.2.5 Food Insecurity and inflation of prices on other social services

. The following measures are very vital in minimizing the problem of food insecurity;

i. Encourage traders to supply food and other products to the project area.
ii. Sensitization of the surrounding communities in order to make them aware of the employment and hence income generating opportunities with the proposed project.
iii. Provide more avenues for service providers e.g. cafeteria and restaurants

7.2.6 Increased level of crimes

The following measures are very vital in minimizing the problem of crime;

i. Constructions of police stations at IAA-Babati campus and the surrounding communities
ii. Establish community based security in collaboration with mtaa/ward leaders.
iii. The contractor shall establish his own security to protect his properties and should establish community policing to support insufficient police force.
iv. The community should be encouraged to participate in security matters by providing information on suspects
v. The cooperation of local people together will help to lessen criminal incidents and maintain security of people and their properties.

Environmental Impacts

7.2.7 Impacts on physical environment

7.2.7.1 Impacts on air quality

Impairment of air quality due to emissions

xiii. Equipment shall be maintained in good running condition and equipment, which generate excessive black smoke shall not be used;
xiv. Enforce vehicle road restrictions to avoid excessive emissions from engine overloading, where practical switching off engines will be done when machines are not in use;
xv. There will be routine inspection of equipment;
xvi. Trucks transporting materials shall be fully covered; and,
xvii. Turn off engines to reduce idling.

Impairment of Air Quality Due to Dust

i. Protect stockpiles of friable material subject to wind through wetting;
ii. Cover loads with friable material during transportation;
iii. Restrict speed on loose surface roads to 30 km/hr during dry or dusty conditions; and,
iv. Douse with water work sites with loose open soil to reduce dust generation when necessary.

7.2.7.3 Contribution to climate change impacts

i. Equipment shall be maintained in good running condition and equipment, which generate excessive black smoke shall not be used;
ii. Enforce vehicle road restrictions to avoid excessive emissions from engine overloading, where practical switching off engines will be done when machines are not in use;
iii. There will be routine inspection of equipment;
iv. Turn off engines to reduce idling; and
v. Green spaces shall be maximized in project area

7.2.7.2 Impacts through noise

i. Vehicles carrying construction materials shall be restricted to work during night time only;
ii. Machine operators in various sections with significant noise levels shall be provided with noise protective gear; and,
iii. Construction equipment shall be selected, operated and maintained to minimize noise.

7.2.7.3 Impacts through vibration

i. Impact pile driving shall be avoided where possible in vibration sensitive areas; and,
ii. Vibratory rollers and packers shall be avoided.

7.2.8 Wastewater Management problems

i. Wastewater shall be properly treated in the Septic Tank Before disposal into the Soak Away Pit within the site;
ii. Contractor shall be instructed to put in place acceptable procedure for handling hazardous waste such as oils, lubricants and non-combustible waste; and
iii. Training on waste management shall be done to all personnel, operators and service providers.

7.2.9 Solid waste management problems

i. The contractor shall have adequate facilities for handling the construction waste; and
ii. Topsoil shall be stock piled and used for reclamation or re-vegetation at the site during landscaping.

7.2.10 Erosion of Exposed Surfaces

i. Construction will be done as per engineering design and procedure of which a maximum requirement of compaction strength is achieved during the construction. That is maximum dry density (MDD) specified in the design manual by consultant;
ii. Maintain gravel fill and/or re-vegetate around the structures;
iii. Unnecessary ground clearance and sensitive re-alignments shall be avoided;
iv. Directing flow to properly designated channels;
v. All excavation works shall be properly backfilled and compacted; and,
vi. Most of construction activities will be done during dry weather.

7.2.11 Landscape and visual impacts

i. Light pollution can be reduced by keeping lighting (e.g. of parking lots) to the minimum levels needed for safety, and through the careful choice of light fixtures such as the use of flat-glass lanterns in car parks; and,
ii. Locating parts of the development further away from the general public.

7.2.12 Loss of flora (vegetation) and fauna

i. Clearance of patches of native forest remaining in the neighbourhood of the proposed project shall be avoided;
ii. Close supervision of earthworks shall be observed in order to confine land clearance within the project site;
iii. The contractor shall be instructed to give the uprooted trees to the residents through ward/streets governments or any other arrangement may seem convenient provided he does not contravene the Forest Acts 2002; and,
iv. Appropriate landscaping programme to help in re-vegetation of part of the project area after construction shall be designed and implemented.

7.3 Potential mitigation measures during the operation phase

Negative Social Impacts

7.3.1 Increased incidences of diseases and ill health

x. A safety, health and environment induction course shall be conducted to all students and workers, putting more emphasis on HIV/AIDS, which has become a national disaster as well as other emerging pandemics such as COVID 19 and dengue fever;
xi. The project shall include information education and communication component (IEC) in its budget. This will help to raise more awareness on HIV/AIDS, and means to suppress its incidence;
xii. Environmental sanitation systems shall be improved; and,
xiii. Adequate medical services shall be made available at the at IAA-Babati campus for meeting the population demand.

7.3.2 Increased pressure on social services and utilities

i. Use of water conservatively by instituting technologies (e.g. self-lock water taps) and awareness raising notices to users, etc.;
ii. Construction of underground water reserve tank and introducing rainwater harvest system;
iii. Link to mandated structures to support improvement of social and infrastructural services at IAA-Babati campus and communities adjacent to the project area.
iv. Duty to the community requirement may be applied to justify the construction of new social services infrastructures or cooperate with local structures to strengthen the existing social services infrastructures
v. Extraction of underground water resources;
vi. Alternative measures like use of solar power, drilling a borehole at site, water recycling shall be explored and implemented if found feasible. For instance, use of energy savers bulbs shall be given high priority

7.3.3. Gender based violence

- The project will prepare a GBV Action Plan that ensures project awareness raising strategy (for workers and community members), a list of GBV service Providers to which GBV survivors will be referred, revisions to the GRM to

ensure it can address GBV complaints, and information on GBV allegation procedures in the workplace.

7.3.4 Gender discrimination

- This project will ensure that there is involvement of women in project activities.
- IAA shall revise the Gender Policy (2023) and Anti-Sexual Harassment Policy (2018) in-order to pro-actively promote gender equity

7.3.5 Child labour

vi. At IAA-Babati campus will conduct regular monitoring of project workers in relation to health, working conditions, hours of work, minimum age, and the other requirement of national law.
vii. Work with local authorities and schools in the area to control school drop out
viii. Cooperate with relevant authorities like Ministry of Labour to control child labour
ix. Create awareness raising to the communities on the importance of education to the children
x. The local authorities should develop bylaws to control the engagement of children in petty business or work in project related activities

7.3.6. Food Insecurity and inflation of prices on other social services

. The following measures are very vital in minimizing the problem of food insecurity;

iv. Encourage traders to supply food and other products to the project area.
v. Sensitization of the surrounding communities in order to make them aware of the employment and hence income generating opportunities with the proposed project.
vi. Provide more avenues for service providers e.g. cafeteria and restaurants

7.3.7. Increased level of crimes

The following measures are very vital in minimizing the problem of crime;

i. Constructions of police stations at IAA-Babati campus and the surrounding communities
vi. Establish community-based security in collaboration with mtaa/ward leaders.
vii. The contractor shall establish his own security to protect his properties and should establish community policing to support insufficient police force.
viii. The community should be encouraged to participate in security matters by providing information on suspects
ix. The cooperation of local people together will help to lessen criminal incidents and maintain security of people and their properties.

Impacts on physical environment

7.3.8. Water pollution

viii. Septic tank and soak away shall be designed in such a way waste treatment is achieved by 100% before disposal to the authorised disposal sites (Constructed treatment wetland);
ix. Minimize oil spillage;

7.3.9. Storm water generation and overflow

i. The design of storm water drainage will be given a high priority;

ii. Where feasible, rainwater harvesting will be used in proposed project sites to minimise generation of surface runoff; and,
iii. The design shall provide sufficient greenery area for facilitating soil infiltration.

7.3.10. Health and safety risks due to fire hazards

i. Adequate number of portable fire extinguishers shall be placed at strategic locations;
ii. Good housekeeping shall be maintained at all sites to reduce the fire risk;
iii. The design of buildings shall strictly adhere to the Fire Safety Standards;
iv. Regular fire and other disaster drills and awareness training shall be conducted;
v. Fire detectors and sprinkler system shall be installed in the buildings; and
vi. The proponent shall insure buildings against fire Hazards.
vii. Install water tanks

7.3.11 Contribution to Climate Change

IAA shall reduce direct and indirect greenhouse gas generation in the following ways;

i. To change the consumption behaviour in terms of energy and water
ii. Use of renewable energy technologies to minimize the carbon dioxide emission.
iii. Promote use of natural green space at IAA-Babati campus to increase energy saving
iv. The university has to transform to digital software operated work, in order to minimize paper consumption rates. This will greatly influence the educational standards. And will save a great deal to reduce the amount of forest resources consumed.

7.4 mitigation measures during decommissioning phase

Social impacts

7.4.1 Loss of employment

Seminars shall be conducted on alternative means of livelihood after termination of job

Environmental Impacts

7.4.2 Loss of aesthetics due to haphazard disposal of demolished waste

iii. The debris resulting from the demolition will either be transported by a licensed waste transporter for dumping at an approved site or used as base material for new construction work;
iv. All the necessary health and safety measures will be implemented including provision of personal protective equipment such as, safety harnesses, helmets, gloves, respirators, safety shoes, coveralls, goggles and ear protectors; and
v. Restoration of the affected land will involve the filling in of any open pits and grading the land to its natural contours, then planting appropriate tree species and under cover vegetation to hold the soil in place and to prevent flooding.

7.5 ENHANCEMENT MEASURES FOR POSTIVE PROJECT IMPACTS

Enhancement measures for project positive impacts during preparatory and construction phases

7.5.1 Jobs creation

i. The contractor shall be encouraged to employ local, unemployed yet willing to work hard manpower to the extent viable subject to a maximum of 50% unskilled labour. This will ensure that local people are more benefited out of the project;
ii. Employment should be based on the principle of equal opportunities for all gender;
iii. Local communities shall be encouraged to produce quality goods and services for the project.
iv. Employment opportunities to be offered based on merits and known interviewing procedures and grading systems.
v. Reasonable wages should be paid to both skilled and unskilled labourers to be employed by the project

7.5.2 Income to local suppliers and service providers

i. Ensure monitoring of labour standards among contractors, sub-contractors, workers and service providers; and
ii. Qualified local vendors/ entrepreneurs should be given priorities to supply different goods and services to the project

7.5.3 Increased skills and impart knowledge to local communities

Contractor shall provide on job skills and training.

1.5.3.1 Improved quality of life and standard of living

i. Creating awareness to the workers on employment schemes and work related rights
ii. Provide awareness to the local communities to use the opportunities available to improve their lives
iii. Paying workers reasonable wages at light time
iv. Local suppliers from the community should be given priority
v. Supporting the local communities to access quality and affordable social services in the project area.

7.5.3.2 Increased Revenues to local authorities

i. Local authorities should identify the new sources of revenue in the area
ii. Strengthening revenue collection mechanisms
iii. Awareness creation for the people in the area on the importance of paying revenues
iv. Accountability in revenue collection among local authority employees
v. Enhanced cooperation between the project and local authorities

7.6 Enhancement measures for project positive impacts during operation phase

7.6.1 Increase of admission of students to universities and colleges

i. Gender and disadvantaged groups will be considered during the students selection process
ii. at IAA-Babati campus shall increase advertisement to attract more students to study the priority programmes for the Nation

7.6.2 Increase of revenue to IAA-Babati campus

i. Innovate business activities linked with academic activities for enhancing income of the Institute

7.6.3 Job creation

i. Employment should be on equal opportunities for all genders.

7.6.4 Increased commercial and social activities at IAA-Babati campus

i. Provide good security within the project area and area of influence.
ii. Create conducive business opportunities for attracting investments

7.6.5 Growth of Trade and Increased Investment around at IAA-Babati campus

i. Sensitize the community to invest to accommodate business opportunities inclined by the increasing students' enrolment

7.6.6 Production of skilled labour force for nation development

ii. Production of skilled labour force for implementing various development policies, plans and goals for sustainable social and economic growth of the Nation

7.6.7 The growth of banking activities in the project area

i. Provide good security within the project area and area of influence.
ii. Create conducive business environment for investment

7.6.8 Increased Revenues to local authorities

ii. Local authorities should identify the new sources of revenue in the area
iii. Strengthening revenue collection mechanisms
iv. Awareness creation for the people in the area on the importance of paying revenues
v. Accountability in revenue collection among local authority employees
vi. Enhanced cooperation between the project and local authorities

CHAPTER EIGHT
ENVIRONMENTAL AND SOCIAL IMPACT MANAGEMENT PLAN

8.1Impact Management plan

Plans for the implementation of mitigation measures for the proposed project are provided in this Chapter. The Plans indicate institutional responsibilities, time to take the action, monitoring frequency and estimated costs (Table 8.1). The proposed costs are only indicative, should the proposed development proceed with the suggested changes, the developer will estimate actual costs and include them in the overall cost of the project. Based on the EMA, (URT 2004), NEMC requires the Social Impact Management Plan (ESMP).

8.2 Implementation of the Management Plan

The environmental and social mitigation measures incorporated in the detailed engineering design shall be handed over to the contractor during construction period. The Contractor shall take stock of the contents of the Environmental and Social Management Plan of the Project. The contractor shall implement the ESMP during the construction period under close supervision of IAA-Babati campus Management.

During implementation, the IAA-Babati campus Estate department shall be responsible for:

- Relocation of utility services and people is implemented and completed before the commencement of any construction works;
- Ensuring that the implementation of the ESMP is part of the Contractor's contractual obligations. IAA-Babati campus procurement entity will supervise the tendering process for all service providers;
- Ensuring that the ESMP is implemented and approval conditions are observed during the mobilization, construction and operation of the project.

During the Operation Phase, IAA-Babati campus Management will manage the building and implement the ESMP. When the project reaches a stage of decommissioning, the IAA-Babati campus shall prepare a decommissioning plan that will include environmental and social issues highlighted in the ESMP.

8.3 Environmental and Social Cost

The principal environmental and social cost includes the cost for implementing the mitigation measures proposed. These costs are indicated in Table 8.1 IAA-Babati campus shall cover all the costs proposed in the ESMP.

Table 8. 1: Environmental and Social Impact Management Plan for the proposed establishment of IAA-Babati campus buildings

Receptor / EHS Aspect	Impacts	Mitigation Measures	Residual Impacts	Responsibility		Est. Cost (Tshs)
				Implementation	Supervision	
Pre-Construction and Construction Phase						
Dust and Particulate Matter	Increased dust dispersion due to movement of construction traffic and operation of machinery, excavation, and drilling and road construction works.	• Spray water on the access road to avoid dust dispersion, if necessary. • Ensure that all trucks transporting loose material are covered with tarps to minimize loss and dispersion during transportation. • Maintain and store piles of loose material and soil suitably to minimize dust dispersion. • Limit truck speed • Routine maintenance of trucks to ensure compliance with emissions standards. • Select transportation routes that would minimize impacts on sensitive receptors. • Provide dust protection masks to workers	**Minor**	Contractor	IAA	4,5000,00

Receptor / EHS Aspect	Impacts	Mitigation Measures	Residual Impacts	Responsibility		Est. Cost (Tshs)
				Implementation	Supervision	
Gaseous Emission	Gaseous emissions from engines of machines and equipment and emissions from volatile hazardous materials, such as oils, paints, etc	• Ensure vehicle emissions comply with the relevant national/international standards. • Ensure routine maintenance of trucks and construction machinery to minimize unnecessary emissions from poorly maintained engine systems. • Select transportation routes that circumvent (stay away from) sensitive receptors to maximize the distance between the emission source and the sensitive receptors.	**Insignificant**	Contractor	IAA	2,000,000
Noise and Vibrations	Noise and vibrations will be generated by vehicular movement, aggregate processing, excavation works as well as the presence of workers	• Schedule noisy activities during regular daytime hours. • Install noise control devices on construction equipment if noise levels exceed the applicable standards. • Instruct the workforce to avoid unnecessary noise. • Prove all relevant PPE to workers including ear protection.	**Insignificant**	Contractor	IAA	2,500,000

Receptor / EHS Aspect	Impacts	Mitigation Measures	Residual Impacts	Responsibility		Est. Cost (Tshs)
				Implementation	Supervision	
		• If necessary, limit working time for labourers working in high-noise environments and operate a rotation schedule to limit exposure to unsafe noise levels. • All trucks should be maintained regularly to ensure the least noise generation.				
Soil Erosion	Soils may be susceptible to erosion due to vegetation clearing, excavation and other construction operations	• Limit vegetation clearance as much as possible • Stabilise highly vulnerable soils mechanically to reduce erosion potential • Re-grading of slopes and re-vegetation of exposed areas with native plant species chosen appropriately for the function of stabilizing soils (i.e. with extensive shallow root structure) • Remove the good topsoil (O-horizon) and store it separately from other excavated soils to be used in replanting and restoration. • Keep deeper soil layers separate from the O horizon layer.	**Insignificant**	Contractor	IAA	6,000,000

Receptor / EHS Aspect	Impacts	Mitigation Measures	Residual Impacts	Responsibility		Est. Cost (Tshs)
				Implementation	Supervision	
Land Contamination	Land could be contaminated by the spillage of hydrocarbons, hydraulic fluids as well as paints and chemical cleaning agents.	• Installation of oil separators and secondary containment at fuel storage sites • Store hazardous materials in properly designed and clearly marked storage facilities • All transportation of hazardous materials to and from the site shall be undertaken by an appropriate and qualified agent using vehicles that are equipped for function.	**Insignificant**	Contractor	IAA	9,000,000
Water Pollution	Underground water sources are susceptible to pollution via accidental spills of hazardous chemicals, effluent from cleaning of cement trucks as well as	• Secondary containment to collect diffuse and accidental spills. • Storage and handling of fuels and construction fluids should be kept well away from the rivers. • In the case of groundwater emergence during excavation, immediately report to the Responsible Authority	**Minor**	Contractor	IAA	3,000,000

Receptor / EHS Aspect	Impacts	Mitigation Measures	Residual Impacts	Responsibility		Est. Cost (Tshs)
				Implementation	Supervision	
	from domestic sewage from the construction force.					
Solid, Liquid and Hazardous Waste	Construction will generate several waste streams including: **Non-Hazardous Solid Waste:** paper, wood, garbage **Hazardous Solid Waste:** machine oils/fuels, hydraulic fluids, paints,	• The contractor will arrange for safe storage, transportation and disposal of all hazardous waste generated during the construction phase by engaging a certified contractor or local authority to collect, transport and dispose of all hazardous waste generated at the project site according to the relevant national and international standards for hazardous waste management. • The Contractor shall identify and sort all waste streams. • Waste management shall be based on a hierarchy that considers prevention, recycling and reuse, treatment and disposal to increase resource efficiency and decrease the generation of waste in the first place. • Under the supervision of the contractor, solid waste generated during construction shall be properly treated and safely disposed of only in clearly marked waste	**Minor**	Contractor	IAA	10,000,000

Receptor / EHS Aspect	Impacts	Mitigation Measures	Residual Impacts	Responsibility		Est. Cost (Tshs)
				Implementation	Supervision	
	paint thinners, etc. **Liquid Waste:** domestic wastewater, effluents from cleaning and maintenance of machines and equipment	disposal sites with an appropriate lining material to prevent land contamination. • All refuelling of heavy equipment and machinery shall be undertaken by a competent and qualified individual, with appropriate safeguards and protection measures to prevent any spillage or contamination by chemical wastes or maintenance oils, lubricants, etc. • All employees working with hazardous materials should be trained in hazard identification, safe operating procedures, appropriate materials handling procedures, safe work practices, basic emergency procedures, and (if applicable) Special hazards unique to their jobs. • The contractor should engage a qualified wastewater management entity which will be responsible for the regular evacuation of septic tanks during the construction phase. This will ensure that the tanks do not overflow and contaminate or pollute the environment.				
Vegetation	Clearance of vegetation may be	• Train workers on environmental conservation	**Insignificant**	Contractor	IAA	7,000,000

Receptor / EHS Aspect	Impacts	Mitigation Measures	Residual Impacts	Responsibility		Est. Cost (Tshs)
				Implementation	Supervision	
Clearing	necessary during construction, especially in the transmission line wayleaves.	• Vegetation clearance should be minimised as much as possible and should only take place when absolutely necessary. • Cleared areas will be re-vegetated with indigenous plant species • Cutting old, mature trees should be considered as the last option when all other avenues have been attempted.				
Occupational Health and Safety	Construction activity will involve OHS risks, particularly from falls, injuries, dust, and noise as well as improper training in machinery operation and	The Contractor shall adopt an Occupational Health and Safety Plan and job hazard analysis during the construction phase. The plan will include measures to protect workers from infection, and all national health regulations will be followed. According to IFIs EHS Guidelines and OHSA standards the main mitigations measures to prevent common construction hazards are: • The main contractor should submit a Job Hazard Analysis for all activities on site. An OHS plan/ Manual for risk management specific to the site and the foreseen activities, and following the risk control hierarchy. • All workers, especially those working in hazardous jobs, should be physically fit for the job. Evidence of	**Minor**	Contractor	IAA	9,000,000

Receptor / EHS Aspect	Impacts	Mitigation Measures	Residual Impacts	Responsibility		Est. Cost (Tshs)
				Implementation	Supervision	
	materials handling	their physical fitness should be carried out by specialized labs/centres every six months. Records of workers' physical fitness should be maintained. • Workers should be trained to identify and evaluate fall hazards and be fully aware of how to control exposure to such risks as well as know how to use fall protection equipment and PPE properly. • Workers must comply with IFIs EHS Guidelines and OHSA's general rule for the safe use of ladders and stairways • The contractual agreement with the contractor should include rigid commitments to apply the OHSP that should be prepared in full compliance with the IFIs EHS and national requirements. • The health and safety risk to the workers should be covered with appropriate insurance schemes. In addition, the Insurance should be covering work-related accidents (injuries and fatalities). • The contractor also will be obliged to maintain daily attendance sheets to verify the attendance of workers in case of accidents and provide the injured persons with				

Receptor / EHS Aspect	Impacts	Mitigation Measures	Residual Impacts	Responsibility		Est. Cost (Tshs)
				Implementation	Supervision	
		proper health insurance to prevent Heavy Construction Equipment risk, workers should follow all construction safety guidelines necessary to eliminate the exposure to such injuries and accidents • Rigid obligations and penalties will be added to the contractor/subcontractors' ToR to warrantee no child labour occurs in the project • A sufficient number of OHS supervisors should be assigned to minimize the breaching of OHS requirements • A daily toolbox should be given to workers to share any information about OHS • A worker's complaint system must be made available to workers on site • Fencing the work site, to protect the workers on the site and those around it. • Institute speed limits and traffic controls for project vehicles and equipment • Training workers on how to operate machines/equipment • Provision of all workers with requisite protective gear				

Receptor / EHS Aspect	Impacts	Mitigation Measures	Residual Impacts	Responsibility		Est. Cost (Tshs)
				Implementation	Supervision	
		• Presence of a construction engineer supervisor • Provision of the on-site toilet, clean drinking water, and washing water for worker • Provision of signage reminding use of PPE at appropriate locations in the project construction area including ancillary work sites. • Presence and implementation of emergency preparedness plan at the site • Training of workers on safety and health at the site • Contractor to ensure the provision of mosquito nets for all workers on-site during night hours. • Control contagious diseases (e.g. Cholera) through proper sanitation and awareness • Control occupational hazards related to: o Physical hazards(noise, vibrations, high temperature) o Chemical hazards o Mechanical hazards (moving equipment) o Electrical/ explosion hazards o Ergonomic injuries(poor working postures, heavy loads etc				

Receptor / EHS Aspect	Impacts	Mitigation Measures	Residual Impacts	Responsibility		Est. Cost (Tshs)
				Implementation	Supervision	
Community Health and Safety	Noise and Vibration, Temporary Labor Influx, Traffic Safety, Fire	• The contractor should prepare and implement a Community Health and Safety Management Plan including but not limited to: • Information related to community health and safety to be shared regularly and systematically • The contractor should submit a Job Hazard Analysis for all activities on site. An OHS plan/Manual for risk management specific to the site and the foreseen activities, and following the risk control hierarchy, should be submitted, • Development and implementation of a Traffic Management Plan (including routes and alternative routes, truck movements, transport of workers, and short-term closure of roads • The construction site is to be fenced and guarded to prevent any unauthorized access to the site • In case of transporting heavy equipment, the nearby population should be notified in advance • Develop and Implement a well-communicated and accessible grievance mechanism for community members to address any complaints,	**Minor**	Contractor	IAA	3,000,000

Receptor / EHS Aspect	Impacts	Mitigation Measures	Residual Impacts	Responsibility		Est. Cost (Tshs)
				Implementation	Supervision	
		• The mitigation measures identified under the sections on noise, air quality, waste management and traffic deviation, will all minimize the potential negative impacts on communities. • Provide adequate health care to protect workers and their families to avoid adding additional pressure on the existing health facilities • Support to communities in the provision of communal sanitation and waste management facilities • Together with the communities, identify measures for reducing the effects of floods (e.g., installation of proper drainage points along the access road) • Conduct preventive health campaigns for the communities with a particular focus on water and sanitation-related diseases • Dissemination of traffic management plans in the project area, through campaigns in schools and communities				

Receptor / EHS Aspect	Impacts	Mitigation Measures	Residual Impacts	Responsibility		Est. Cost (Tshs)
				Implementation	Supervision	
Temporary Labor Influx	There is a risk that the incoming workforce may exploit the natural resources of the area such as administrative burden, pressure on, food, risk of communicable diseases, health care and medication and potable source of water.	• To minimize impacts pertaining to labour influx the following should be thoroughly implemented: • Ensure adequate information-sharing and collaboration with the local authorities • IAA should take responsibility for the handling of grievances triggered by the workers in the community • Joint efforts on community policing with IAA setting up its security system. • Contractors to provide for their workforce, including health care, water and sanitation, housing, etc. • IAA should have a defined stakeholder engagement plan • Establish transparent recruitment procedures to avoid camp followers in form of jobseekers • Priority for recruitment to be given to residents for less specialised services • Recruitment procedures to be shared with the local authorities for further dissemination • Opportunities for sub-suppliers and sub-contractors should be awarded to local firms which in turn employ local labour	**Minor**	Contractor	IAA	3,000,000

Receptor / EHS Aspect	Impacts	Mitigation Measures	Residual Impacts	Responsibility		Est. Cost (Tshs)
				Implementation	Supervision	
		• Conduct public health campaigns to surrounding communities addressing issues of behavioural change, water and sanitation, Malaria, HIV/AIDS, etc. • Develop and implement procedures to avoid or minimize the transmission and spread of COVID-19 that may be associated with the influx of temporary or permanent contract-related labour. • A code of conduct for workers should be developed, all workers should be trained on it. All types of inappropriate behaviour of workers should be identified, and the importance of adhering to the code of conduct is emphasized. • All workers should be trained on the Code of Conduct • Code of conduct induction is to be done every 2 weeks for the recurrent workers and the newcomers before starting work. • Apply penalties to workers violating the code of conduct • Apply the full requirements related to operating the grievance mechanism including anonymous channels				

Receptor / EHS Aspect	Impacts	Mitigation Measures	Residual Impacts	Responsibility		Est. Cost (Tshs)
				Implementation	Supervision	
		• Reduce labour influx by tapping into the local workforce • Train workers on environmental conservation • Regulate access to the project site via security measures. • Workers should be prohibited from collecting firewood, cutting, or pruning any trees or branches without the authorization of the supervising engineer.				
Gender-Based Violence/Discrimination	Construction activity may bring about gender-based discrimination	• Ensure that the Code of Conduct and corresponding training concerning the commitment of labour towards the community and the different behaviour that should be avoided emphasizes zero tolerance of gender-based violence (GBV) i.e. sexual harassment, sexual exploitation and sexual abuse, • Apply penalties to workers violating the Code of Conduct, • The contractor to prepare an awareness session/training on GBV issues for workers, • The contractor to ensure all available capacity-building training is accessible to both male and female workers,	**Minor**	Contractor	IAA	N/A

Receptor / EHS Aspect	Impacts	Mitigation Measures	Residual Impacts	Responsibility		Est. Cost (Tshs)
				Implementation	Supervision	
		• Implement all facets of the established grievance mechanism, ensuring anonymous channels are available. • Conduct ongoing consultations with women and girls only that are understandable and culturally appropriate. • Establish a grievance mechanism that is sensitive to gender by assigning a female SWO in case of GBV incidents, • Apply the full requirements related to operating the grievance mechanism including an anonymous channel. Ensure a grievance mechanism that is survivor centred. • IAA must ensure positive discrimination in job allocation to construction workers whereby women are given responsibility for tasks that are well-suited to the individual woman's capacities, based on their potential. • The workplace environment including the ergonomics of tools and equipment should be gender friendly.				

Receptor / EHS Aspect	Impacts	Mitigation Measures	Residual Impacts	Responsibility		Est. Cost (Tshs)
				Implementation	Supervision	
		• Involve the ward office during the hiring of the labour force with an explicit focus on increasing the participation of women in the workforce.				
Child Labor	There is a risk that this common practice is used in the project	• Supervisors and Health and Safety officers should be hired by the contractors to oversee work sites and they will be largely responsible for the community and their safety around the construction site and to prevent the entry of unregulated child labour and monitor the construction site. Ensure an efficient grievance mechanism is put in place. • The contractor/ subcontractor, primary suppliers, and service provisions; so, will be obliged to maintain daily attendance sheets to verify the attendance of workers to prohibit any kind of hiring of minors in the project. • IAA must ensure zero underage employment at the construction site and employment of young people must adhere to the Employment and Labour Relations Act: 2004. • Adherence to the legal age for employment in accordance with national and international laws and regulations	**Minor**	Contractor	IAA	N/A

Receptor / EHS Aspect	Impacts	Mitigation Measures	Residual Impacts	Responsibility		Est. Cost (Tshs)
				Implementation	Supervision	
Public Infrastructure and services	Pressure on health services	• Provide adequate health care to protect workers and their families to avoid adding additional pressure on the existing health facilities • Support to communities in the provision of communal sanitation and waste management facilities • Conduct preventive health campaigns for the communities with a particular focus on water and sanitation-related diseases	**Minor**	Contractor	IAA	N/A
Road Traffic and Transportation	The increased traffic volume combined with nuisances such as dust and noise	• Institute speed limits and traffic controls for project vehicles and equipment • Dust control measures especially in sections close to schools and health centres • Conduct a traffic assessment study and develop and implement a traffic plan, including safety measures, • Signage should be installed on the access roads • Assigning a traffic man to arrange traffic in the vicinity of the sub-project site • Ensure vehicle safety and regular maintenance. • Review any complaints related to traffic and accidents	**Minor**	Contractor	IAA	N/A

Receptor / EHS Aspect	Impacts	Mitigation Measures	Residual Impacts	Responsibility		Est. Cost (Tshs)
				Implementation	Supervision	
		• The speed limit should be monitored, particularly, in the vicinity of sensitive receptors located close to the route (if any).				
Security Threats	Construction projects may attract opportunistic thieves and criminals	• Support local security systems to strengthen community policing and crime-handling measures • Cooperate with Auxiliary Police Post Available at Babati Area within IAA premises • Institute strict control measures for a project property • Ensure that the conduct of security personnel complies with good international practice • Establish a grievance mechanism for addressing security-related grievances	**Insignificant**	Contractor	IAA	3,000,000
During Operation Phase						
Dust and Particulate Matter	Little to no dust is expected to be generated during the	• Spray water on the access road to avoid dust dispersion, if necessary.	**Minor**	IAA	IAA	5,000,000

Receptor / EHS Aspect	Impacts	Mitigation Measures	Residual Impacts	Responsibility		Est. Cost (Tshs)
				Implementation	Supervision	
	operation phase but may occasionally occur from maintenance and repair activities.	• Chose an appropriate downwind location for maintenance and repair work during operation that would generate dust. • Provide appropriate PPE for staff undergoing maintenance or repair activities that are expected to generate a substantial amount of dust.				
Gaseous Emissions	GHG emissions will be generated by vehicular movement in and around IAA	• Utilize as much of the centre's energy needs as possible with 'clean' renewable energy and limit the use of fossil-fuel-based energy and equipment. • Incentivize potential visitors to carpool or provide energy-efficient hybrid shuttles for visitors.	**Insignificant**	IAA	IAA	5,000,000
Noise and Vibration	Noise and vibrations during operations are considered insignificant. The only	• Implement noise reduction procedures for nighttime e.g. no outdoor sports past 10 pm, etc.	**Insignificant**	IAA	IAA	3,000,000

Receptor / EHS Aspect	Impacts	Mitigation Measures	Residual Impacts	Responsibility		Est. Cost (Tshs)
				Implementation	Supervision	
	sources of noise will be the wind turbines and the presence of students and staff on the premises.					
Land Contamination	Land contamination may occur during operation from improper handling of generated waste streams or accidental spillage of hazardous materials such as fuels, oils and chemical agents.	• The contractor or IAA should work hand in hand with private refuse handlers and the Babati council to facilitate waste handling and disposal from the site. Solid waste will be collected, transported and disposed of at suitably approved dumpsites. • All solid waste should be properly separated and sorted to encourage recycling and reuse where possible. • Provision of large, secure dustbins near the site gate as the central collection point for all solid waste generated on campus. • Waste receptacles will be placed at strategic points throughout the facility to discourage littering	**Insignificant**	IAA	IAA	10,000,000

Receptor / EHS Aspect	Impacts	Mitigation Measures	Residual Impacts	Responsibility		Est. Cost (Tshs)
				Implementation	Supervision	
		• Ensure that any hazardous wastes are handled separately from common domestic and institutional solid waste.				
Water Pollution	During operation, water pollution may occur from accidental spillage of hazardous chemicals, improper management of effluents, wastewater and storm water.	• Provision of secondary containment on-site to collect diffuse and accidental spills of fuels and other hydrocarbons. • Storage and handling of fuels and construction fluids are to be managed by a qualified person and stored well away from any natural water courses. • Well-designed storm water collection system for the facility as a whole and rainwater harvesting system on all buildings. • Ensure proper waste management on-site, at all times, including separation and sorting of solid waste as well as separate protocols for the management of hazardous waste under the responsibility of qualified personnel or institutions.	**Insignificant**	IAA	Babati Council Authority	10,000,000

Receptor / EHS Aspect	Impacts	Mitigation Measures	Residual Impacts	Responsibility		Est. Cost (Tshs)
				Implementation	Supervision	
		• Ensure regular maintenance and cleaning of sanitation facilities on-site. • The proponent should ensure that the wastewater system capacity is appropriate for the number of users on-site at any given period and make modifications to the capacity of the system as necessary to safely handle the volume of wastewater generated. This will assure the efficiency of the system and minimise or eliminate incidences of untreated sewer spills to the environment • Install an independent storm water drainage system to the site area to minimize flooding and erosion potential as well as ensure no contaminants enter the storm water before discharging to the waterways. • Install rainwater harvesting systems on all buildings. This will increase the water efficiency of the centre by providing a sustainable source of non-potable water for use in gardens and washing cars, etc. Additionally, this will reduce the volume of water infiltrating the ground (soil and rocks) and reduce the possibility of flooding.				

Receptor / EHS Aspect	Impacts	Mitigation Measures	Residual Impacts	Responsibility		Est. Cost (Tshs)
				Implementation	Supervision	
Waste Generation	Operations will generate several waste streams including: **Non-Hazardous Solid Domestic Waste:** paper, wood, garbage, **Hazardous Solid Waste:** containers of machine oils/fuels, hydraulic fluids, paints, paint thinners, **Liquid Waste:** domestic wastewater, effluents from	• Waste management shall be based on a hierarchy that considers prevention, recycling and reuse, treatment and disposal to increase resource efficiency and decrease the generation of waste in the first place. • The proponent must ensure the provision of appropriate, clearly marked waste disposal receptacles with separate containers for hazardous and non-hazardous wastes. • The proponent should provide basic training to all staff and employees regarding the identification of potentially hazardous waste materials and their appropriate management. • All employees working with hazardous materials should be trained in hazard identification, safe operating procedures, appropriate materials handling procedures, safe work practices, basic emergency procedures, and (if applicable) Special hazards unique to their jobs. • The proponent should ensure that all waste streams generated on-site should be appropriately sorted and	**Insignificant**	IAA	Babati Council Authority	10,000,000

Receptor / EHS Aspect	Impacts	Mitigation Measures	Residual Impacts	Responsibility		Est. Cost (Tshs)
				Implementation	Supervision	
	cleaning and maintenance of machines, equipment and systems	pre-treated, if necessary, in compliance with local and international standards before transportation off-site. • The proponent must engage a competent and qualified refuse company or the local municipality for the handling, transportation, and disposal of hazardous solid wastes. • All refuelling of heavy equipment and machine maintenance shall be undertaken by a competent and qualified individual, in a designated area with appropriate safeguards and protection measures in place.				
Habitat Degradation/ Fragmentation	Terrestrial habitat degradation will occur due to the construction of new buildings However, the project area is not a unique habitat and	• Ensure the provision of appropriately-sized 'escape routes' for small terrestrial animals in the site perimeter fence • Ensure that all visitors and staff abide by a set of rules and practices that limit the attraction of animals to the campus (e.g. rules on food storage, food waste management, etc.)	**Insignificant**	IAA	IAA	N/A

Receptor / EHS Aspect	Impacts	Mitigation Measures	Residual Impacts	Responsibility		Est. Cost (Tshs)
				Implementation	Supervision	
	wildlife are expected to easily find suitable habitats outside the project area.					
Health and Safety Impacts	**Fire Risk** Fire risks are inherent in all buildings and Tanzania policy dictates all residences must be equipped with firefighting preparedness plan and devices.	• Fire management training to staff members Fire extinguishers shall be stationed at each strategic area • Water hydrants should be installed. • All the electrical connections shall be designed by a registered engineer.	**Insignificant**	IAA	IAA	5,000,000
Health and Safety Impacts	**Security Threats** During operation, opportunistic	• Support local security systems to strengthen community policing and crime-handling measures	**Insignificant**	IAA	IAA	3,000,000

Receptor / EHS Aspect	Impacts	Mitigation Measures	Residual Impacts	Responsibility		Est. Cost (Tshs)
				Implementation	Supervision	
	thieves may be attracted to the area given the commercial activities that will take place at IAA	• Cooperate with Auxiliary Police Post available at IAA Area within premises • Institute strict control measures for entering the project property • Ensure that the conduct of security personnel complies with good international practice • Establish a grievance mechanism for addressing security-related grievances				
Immigration Pressure	The project will offer opportunities like education and employment opportunities hence attracting the movement of people in the area or nearby	• Establish transparent recruitment procedures to avoid camp followers in form of job seekers. • Priority for recruitment to be given to residents for less specialised services • Recruitment procedures to be shared with the local authorities for further dissemination	**Minor**	IAA	IAA	4,000,000

Receptor / EHS Aspect	Impacts	Mitigation Measures	Residual Impacts	Responsibility		Est. Cost (Tshs)
				Implementation	Supervision	
	villages and streets. This would lead to a breakdown of the social fabric of the surrounding communities and exacerbate infectious diseases.	• Opportunities for sub-suppliers and sub-contractors should be awarded to local firms which in turn employ local labour • Conduct student and public health campaigns addressing issues of behavioural change, water and sanitation, Malaria, HIV/AIDS, etc.				

Receptor / EHS Aspect	Impacts	Mitigation Measures	Residual Impacts	Responsibility		Est. Cost (Tshs)
				Implementation	Supervision	
Traffic Flow	Disruption of local and regional traffic, raising the intensity of the road	• Conduct a traffic assessment study and develop and implement a traffic plan, including safety measures, • Assigning a traffic man to arrange traffic in the vicinity of the project site • Review any complaints related to traffic and accidents • The speed limit should be monitored, particularly, in the vicinity of sensitive receptors located close to the route (if any). • Coordination with local authorities to monitor traffic on the road.	**Insignificant**	IAA	TANROADS	1,000,000
During Decommissioning						
Dust and Particulate Matter	Dust will be generated during the decommissioning phase	• Spray water on the access road to avoid dust dispersion as necessary	**Minor**	Contractor	IAA	4,000,000

Receptor / EHS Aspect	Impacts	Mitigation Measures	Residual Impacts	Responsibility		Est. Cost (Tshs)
				Implementation	Supervision	
	from vehicular movement, demolition works and loose/friable materials transportation	• Securely cover all trucks hauling debris material such as bricks, sand and pieces of cement with tarpaulins during transportation to avoid dispersion to the air. • Set and enforce speed limits for hauling trucks to minimize the dispersion of loose materials to the environment. • Store and sort piles of materials and soil suitably in a sheltered location away from strong gusts of wind and cover if necessary to minimize dispersion.				
Gaseous Emissions	Gaseous emissions such as NO_x and SO_2 will be generated from the exhaust pipes of construction machinery	• Ensure vehicle emissions comply with the relevant national/international standards. • Ensure routine maintenance of trucks and construction machinery to minimize unnecessary emissions from poorly maintained engine systems. • Select transportation routes that circumvent (stay away from) sensitive receptors to maximize the distance	**Insignificant**	Contractor	IAA	3,000,000

Receptor / EHS Aspect	Impacts	Mitigation Measures	Residual Impacts	Responsibility		Est. Cost (Tshs)
				Implementation	Supervision	
		between the emission source and the sensitive receptors.				
Noise and Vibrations	Noise and vibrations will be generated by demolition works and the operation of heavy and light machineries such as bulldozers and jackhammers.	• Schedule noisy activities to appropriate daytime hours only. • Install noise control devices in construction equipment if noise levels exceed the applicable guidelines • Instruct the workforce to avoid unnecessary noise • Provide ear protection equipment to workers. • Limit working time to those workers operating in high-noise environments. • Use properly maintained truck storekeeper their noise ata minimum.	**Insignificant**	Contractor	IAA	5,000,000
Solid, Liquid & Hazardous Waste	Decommissioning will generate several waste streams including:	• The contractor will arrange for safe storage, transportation and disposal of all hazardous waste generated during the construction phase by engaging a certified contractor or local authority to collect, transport and dispose of all hazardous waste generated	**Minor**	Contractor	IAA	10,000,000

Receptor / EHS Aspect	Impacts	Mitigation Measures	Residual Impacts	Responsibility		Est. Cost (Tshs)
				Implementation	Supervision	
	Non-Hazardous Solid Waste: scrap steel, wood, cardboard, as well as debris such as bricks and concrete. **Hazardous Solid Waste:** containers of machine oils/fuels, hydraulic fluids, paints, paint thinners **Liquid Waste**: domestic wastewater, effluents from cleaning	at the project site according to the relevant national and international standards for hazardous waste management. • The Contractor shall identify and sort all waste streams. • Waste management shall be based on a hierarchy that considers prevention, recycling and reuse, treatment, and disposal to increase resource efficiency and decrease the generation of waste in the first place. • Under the supervision of the contractor, solid waste generated during decommissioning shall be properly treated and safely disposed of only in clearly marked waste disposal sites with an appropriate lining material to prevent land contamination. • All refuelling of heavy equipment and machinery shall be undertaken by a competent and qualified individual, with appropriate safeguards and protection measures to prevent any spillage or contamination by chemical wastes or maintenance oils, lubricants, etc.				

Receptor / EHS Aspect	Impacts	Mitigation Measures	Residual Impacts	Responsibility		Est. Cost (Tshs)
				Implementation	Supervision	
Total					**Tsh 143,000,000**	

8.4 Disaster Risk Management plan

8.4. 1 Disaster risks at IAA-Babati campus and level of management

IAA-Babati campus is vulnerable to range of disaster risks, which pose risk to the students, teacher and other staffs. IAA-Babati campus is vulnerable to the fire outbreak, diseases outbreak, traffic accident, robbery, ICT appliance damage and data loss, and chemical explosion. Other disaster risks include; ammunition accident, earthquake. The current level of disaster risk preparedness and management for IAA-Babati campus is moderate because equipment (Measures) are in place but not enough to accommodate the whole IAA-Babati campus (Table 8.2).

Table 8. 2: Disaster Risks and management level

Disaster risk	Standard practice	Management level	Remarks
Fire Outbreak	Fire fighting	Fire extinguisher Fire hose reel Alarm Smoke detector	Average preparedness
	Assembly points	Five point	Average preparedness
	Emergency exit	Present	Average preparedness
	Escape route	Absent	Poor preparedness
Disease Outbreak	Dispensary	Present	Good preparedness
	First aid kits	Present	Low preparedness
	Ambulance	Present	Good preparedness
Traffic Accidents	Traffic signs	-Zebra -speed limit	Average preparedness
	Car parking	present	Average preparedness
Robbery	Security guards	Present	Good preparedness
	Fence	Present	Average preparedness
	Identification card	present	Average preparedness
ICT appliance damage and data	Generators	Present	Average preparedness

8.4.2 Disaster Risk Management plan

The disaster risk management plan is intending to provide efficient and effective operational procedures that will allow the institute to save lives, minimize injuries, protect property, environment and preserve functioning campus in times of natural and man-made/technological hazards. In addition, it can be used to control hazards so as reduce the vulnerability, to reduce the risk and the overall management of disaster risk to the IAA-Babati campus community. The plan provides the basic information on the action to be taken during the pre-disaster, the disaster phase (during the event) and post disaster phase. The plan describes the emergency and assigns the responsibilities for various emergency tasks, specifically to WHO does, WHAT, WHEN AND HOW (Appendix VII).

8.4.3 Assumption made in the plan

The disaster risk management plan takes into account the following assumptions;

i. IAA-Babati campus will continue to be exposed to the impact of those Disaster risks identified and as well as others that may develop in the future because of climate variability, climate change and proposed future expansion in infrastructure.
ii. The possibility arises that an emergency or disaster may occur at any time.
iii. A major disaster or emergency can cause numerous loss of life and injuries, property damage, and disruption of normal life support.
iv. External services and resources may be necessary if an emergency exceeds the university capability.
v. Departments and agencies from the local government, state, and national levels may provide help to protect lives and property.
vi. IAA-Babati campus will follow all state and local regulations for safety plan and procedure review and inspection.

8.5 Health and Safety Management plan

Health Safety Management Plan (HSMP) helps in implementation, maintaining and continually improve Health and Safety management system in accordance with the requirements of Occupational Health and Safety Assessment Series (OHSAS) standards. It is therefore important that this is reflected in the institute operations and responsibilities of every level of management within an organization. This plan shall help to implement the Safety and Health direction of construction of library, classrooms, hostels, w and lecture theatre buildings. It clearly states the requirements of donors, legislations, suppliers, management and employees in Safety and Health management.

8.5.1 Responsibilities

i. **IAA-Babati campus Management:** The management is committed to the principle of safe working and desires that on no account should any person ever be exposed to risk.
ii. **Supervisors:** It is the responsibility of the Supervisors to review and ensure awareness of emergency procedures among all the personnel.
iii. **Employees:** It is also the responsibility of all employees to continually familiarize themselves with the assembly procedures for their relevant areas of work.
iv. **General:** Any information being relayed about an emergency shall be clear and precise giving the exact location, the nature of the emergency and the seriousness of the emergency and contact numbers and names.

8.5.2 Training

Suitable training will be provided to all personnel during various stages of the project and when new work force is added.

8.5.3 Awareness

Necessary posters and boards announcing action in case of an emergency will be put up at prominent places, and at all assembly areas.

8.5.4 Emergency plan

All actions will be coordinated with the overall emergency plan operated by the Supervisor. The General project Manager is overall responsible to coordinate all emergency procedures along with the Health & Safety Manager. All emergency telephone numbers and contact names shall be posted at strategic points on site.

Subsequent actions as listed below will be taken either as in instruction from the Supervisor.

i. Stop all work and report to the nearest evacuation area/ assembly area and await further instructions.
ii. Stop all equipment and vehicles.
iii. Contact the Health & Safety Manager and relay message to the Supervisor and General Manager.
iv. Ensure all personnel are aware of the emergency.

8.5.5 Assembly Point

In an emergency all personnel are to proceed in an orderly manner to the nearest safe assembly point.

8.5.6 Head Count

The Supervisor shall take a head count and check all employees area at the assembly point. He /She shall also inform the General Manager of the result of the head count.

8.5.7 Rescue Team

For missing personnel, a rescue team will be formed in consultation with the Engineer and depending upon the type and status of emergency, all efforts will be made to rescue the missing personnel.

8.5.8 Fire Fighting

In case of a fire, after the alarm has been sounded, all efforts will be made to put off the fire by use of fire extinguishers, fire hydrants, hoses etc. until more professional help come. Fire extinguishers will be available on site at strategic locations near stores, laydown area, and electrical distribution cabinets.

8.5.9 All Clear

Normal work will be resumed only after all clear signal is received from the Supervisor. As such the supervisors shall make all arrangements to meet the concerned authorities.

CHAPTER NINE
ENVIRONMENTAL AND SOCIAL MONITORING PLAN

9.1 Introduction

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

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

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

9.2 Health and Safety Monitoring

This shall involve careful observation of health and safety regulations and guidelines. Detailed HS plan has been included in appendix VI.

- **Construction phase:**
  - The safeguard personnel of the contractor shall monitor availability and use of safety gears including helmets, coats, shoes, gloves and dust masks to protect them from exposure to various products, etc;
  - The contractor shall hire a health specialist to monitor measures in place for prevention of the transmission of communicative diseases between the local community and construction workers. Monitoring may include conduction of voluntary HIV/AIDS testing and checking availability of free condoms at the construction site.
  - Monitor availability of adequate First Aid facilities and a trained first Aider on site.

- **During the operation phase;**
  - IAA-Babati campus shall monitor availability and adequacy of safety equipment such as fire alarms and fire extinguishers provision in all buildings;
  - Monitor functioning of constructed sanitation facilities, and waste management facilities;

- Monitoring safety environment in the laboratories (safe use of chemicals, use of protective gears while in the lab, storage of chemicals and so forth).

9.3 Cumulative impact monitoring

This development over time will result in a variety of changes. The most evident of these changes may be:

- This development will see a significant change in the land cover and landscape of the area; and
- The general culture of the area would change. A more likely result is a formal urban setting with the associated physical infrastructure and amenities.

IAA-Babati campus shall monitor landscape and cultural changes with time, in order to device management mechanism.

9.4 Monitoring of key environmental and social parameters

Monitoring of all key environmental and social parameters that could potentially lead to an impact will be required to analyse the impacts of construction and operation on the environment. Therefore, self-monitoring and reporting techniques will be adopted to carry out monitoring. IAA-Babati campus Management shall be responsible for monitoring of residual impacts. The ESIA has proposed monitoring techniques, monitoring frequency and methodology of selected parameters. Monitoring costs have also been provided. An outline of the monitoring programmes proposed for the construction and operation phases, is presented in Tables 9.1 to 9.3. Monitoring process will enable IAA-Babati campus to understand how environmental performance will change over time and facilitate improvements to the Environmental and social management system.

9.5 Monitoring Responsibility

The monitoring of environmental and social parameters during the construction phase shall be carried out by the Contractor's safeguard team (i.e. Environmental, social and safety experts), under the supervision of the Consultant's safeguard team. They will conduct mitigation monitoring as part of the regular works inspections. The Contractor's Environmental Manager and IAA-Babati campus safeguard team will undertake scheduled site inspection. A monthly Environmental and Social Compliance Report will be produced following each inspection and will incorporate any actions identified during inspections and site meetings. The inspection report will summarize the status of the site's compliance, and include photographic records if appropriate.

The responsibility for mitigation and monitoring during the operation phase will lie with the IAA-Babati campus Estate Department. IAA-Babati campus shall be responsible to produce reports on environmental and social compliance during operation, as part of their annual progress reports and annual EHS monitoring/Audit reports. Depending on the implementation status and sensitivity of any emerging issues, OSHA and /or NEMC will perform annual EHS reviews in which environmental concerns raised will be reviewed alongside project implementation.

Table 9. 1: Monitoring programme during the construction phase

Pre-Construction and Construction Phase							
Air Quality	**Gaseous and Dust Emissions**	• Ambient air quality (PM_{10}) • Concentrations of gaseous pollutants including SO_2, CO and NO_x • The concentration of Lead in air • Evidence of covering trucks hauling loose/friable materials. • Frequency of water spraying on roads and stockpiles • Number of complaints related to air quality	Contractor	Quarterly	On-site	• PM_{10} < 0.1 in µg/Nm^3 • SO_2< 0.5mg/Nm^3 for 10 mins • CO < 152 g/Nm^3 for less than 15 mins. • NO_x< 152 g/Nm^3 for 24 hours • Pb < 1.5 g/Nm^3 for 24 hours Conforming to EC directive 89/336/EEC and ISO 12103-1)	3,000,000
	Noise & Vibrations	• The noise level during construction • Evidence of hearing protection use by workers	Contractor	Quarterly	On-site	In compliance with WB and TBS standards: • Daytime noise levels < 60 dB	3,500,000

Pre-Construction and Construction Phase							
						• Night-time noise levels < 50 dB	
Soil	**Soil Erosion**	• Number of Trees Planted • Landscape	Contractor	Quarterly	On-site	• Site inspection. • Maximize tree planting on riverbanks	1,000,000
	Land Contamination	• Amount and type of waste generated, sorted, recycled/reused, treated and disposed • Number of dust bins • Signs of spillage of hazardous materials • Testing in case of accidental spills of hazardous	Contractor	Monthly	On-Site	• Site inspection with photo documentation • Zero hazardous wastes stored on-site	900,000
Water	**Water Pollution**	• The pH of sewage and effluent • The concentration of Pb in wastewater • Sulphate (SO_4) concentration	Contractor	Quarterly	On-site	**Physical Components** Below 30 mg/L of BOD5 at 20°C using TZS 861 (Part 3):2006 Five-Day BOD method	15,000,000

Pre-Construction and Construction Phase							
		• Type and amount of waste generated, sorted, recycled/reused, treated and disposed • Number, location and status of waste disposal sites • Number and status of toilet facilities • Wastewater quality parameters • Quality of secondary containment structures • Evidence of labelling hazardous waste • Evidence of pollution spill contingency plan				Below 60mg/L of COD using TZA 861(Part 4): 2006 Dichromate Digestion Method 100mg/L TSS using TZA 861(Part 1):2006 Gravimetric Method Below 0.2mg/L Dichloromethane using GCECF (ISO10301:1997) Determination of Highly volatile halogenated hydrocarbons using the Gas Chromatograph method	

Pre-Construction and Construction Phase							
						Inorganic Components Below 0.1mg/L Pb using TZS 861(Part 7):2006 Flame Atomic Absorption Spectrometry Below 500mg/L SO_4 using APHA Standard Methods: 4110 B. Ion Chromatography with chemical suppression of eluant conductivity **Organic Components** Below 0.5mg/: of Alkyl benzene sulfonate (ABS) using ISO 7875-1:1996 (Part 1) Determination	

Pre-Construction and Construction Phase							
						of surfactants by measuring the methylene blue index (MBAS) Below 10mg/L of Fatty matter and hydrocarbons using APHA Standard methods 5520	
Water	**Groundwater Emergence**	• Groundwater Emergence during Excavation	Contractor & Immediately to responsible Authority	Daily	On-Site	• Target Zero	N/A
Flora and Fauna	**Wildlife Disturbance**	• Noise Levels during construction	Contractor	Quarterly	On-site	• Noise levels below 60 dB during daytime • Noise levels below 50 dB during night-time	2,500,000
	Vegetation Clearing	• Land area cleared • Land area re-vegetated	Contractor	Quarterly	On-site	• Land area cleared.	700,000

Pre-Construction and Construction Phase							
						• The proportion of land area re-vegetated with native plant species	
Waste Management	**Domestic Solid Waste Generation**	• Waste segregation • Disposal receipts	Contractor	Daily	On-site	• Site inspections • Maintaining a record of the type, quantity, and disposal location of hazardous and non-hazardous waste. • Weekly disposal of solid waste via the certified private contractor or local municipality.	1,000,000
Labour Force	**Occupational Health and Safety**	• Emergency Preparedness Plan	Contractor	Monthly	On-site	• Condition of a perimeter fence around	2,000,000

Pre-Construction and Construction Phase							
		• Presence of specialist Environmental Engineer • Qualifications to operate machinery/equipment • Provision of easily accessible First-Aid Kit • Personal Protection Equipment (PPE) • Presence of Safety Officer • Evidence of OHS Plan • Number of workers trained in safety procedures • The proportion of workers using PPE • The structural integrity of worker accommodations and sanitary facilities				the construction area • Number of Trained Personnel in safety procedures • Inspection of Workers' OHS training records • Availability of PPE on site • Target Zero workplace accidents	

Pre-Construction and Construction Phase							
		• Workers' access to health services • The malaria prevalence rate in the workforce • HIV/AIDS prevalence rate in the workforce • Incident statistics (Total recorded injuries, fatalities, lost time injuries, restricted work cases, medical treatment cases, first-aid cases, near miss reports.					
Community	**Community Health and Safety**	• Number of accidents/ injuries • The number of complaints raised by the local community. • Disclosure activities including points of sharing information are in place	Contractor	Monthly	On-site	• Grievance log • Random site inspection • Reviewing community consultation reports • Interview with community members	3,000,000

Pre-Construction and Construction Phase							
		• Disclosed information through the project information documents • Available emergency responders in case of accidents. • Number of complaints raised about various CHS items including GBV and traffic • Site visit reports				• Data related to COVID 19 • Monitoring labour influx impacts	
Temporary Labor Influx	**Local Government and Administration** **Population and Demographics** **The Environment and Natural Resources**	• Availability of the code of conduct • Total number of trained workers on the code of conduct • Signed code of conduct • Penalties and disciplinary action being taken against workers who violate the code of conduct	Contractor	Monthly	On-site	• Lists of workers trained • Disciplinary actions taken • Review Grievance log • Site observation • Review Worker code of conduct	12,000,000

Pre-Construction and Construction Phase							
		• Complaints raised due to Labour influx • Documentation of corrective measures adopted • Recruitment Plan • The public health campaign plan				• Engagement with women minutes of meetings • Maximize the number of local employees. • Monitor the total number of employees • Engage in the public health campaign plan	
Community & working conditions	**Gender-Based Violence/Discrimination**	• The proportion of women employed on the project • The monitoring of workers' compliance to the Code of Conduct when interacting with the surrounding communities to avoid	Contractor	Quarterly	On and Off - site	• Periodic reports • Review Grievance log • Site observation • Review Worker code of conduct Target zero	1,000,000

Pre-Construction and Construction Phase							
		behaviours such as GBV. • Engagement activities carried out with women • Complaints raised related to the GBV • Documentation of corrective measures adopted • The proportion of unskilled workforce receiving training and skills enhancement				gender discrimination • The target number of female employees.	
Community	**Child Labor**	• Record of workers • Labour registry • Grievance log	Contractor	Monthly	On-site	• Site inspection with photo documentation • Monthly reports • Review Grievance log • Review Labour registry and IDs	N/A

Pre-Construction and Construction Phase							
Public Infrastructure and services	**Pressure on Health Services**	• Dispensary uses on-site • Grievance log	Contractor	Monthly	On-site	• Monitor the current and a maximum capacity of the on-site medical dispensary	N/A
	Damage to Water Pipeline	• Emergency Maintenance Plan • Grievance log • Documentation of affected infrastructure and corrective procedures taken	Contractor	Monthly	On and Off-site	• Periodic reports • Review documentation of affected infrastructure and corrective procedures taken • Review Grievance log	1,000,000
Community	**Road Traffic and Transportation**	• Traffic Management Plan • Dust Management Covers • Truck Speeds • Evidence of Traffic and Transportation Safety Plan	Contractor	Monthly	On and Off-site	• Site inspection with photo documentation • Monthly reports and grievance log • Review Grievance log	2,000,000

Pre-Construction and Construction Phase							
		• Traffic Incident Rate (worker, community, livestock) • Number of drivers trained and hold valid licenses • Evidence of signage, warnings and controls				• Review Accidents log (if applicable)	
Landscape	**Visual Landscape**	• Number of Trees Planted • The land area is exposed to vegetation clearing. • Quality of landscaping at restored sites. • Plant species used for re-vegetation • Number and location of spoil heaps • Cleanliness of construction site	Contractor	Annually	On-site	• Maximize the number of trees planted. • Minimize exposed soils from vegetation clearance. • Monitor number, and location and cover the status of spoil heaps during construction	1,000,000
Community	**Security Threats**	• Presence of Security Guards	Contractor	Annually	On-site	• The number of security	N/A

Pre-Construction and Construction Phase							
		• Compliance with voluntary principles on security and human rights • Evidence of training of security personnel in the use of force and firearms • Number of security-related grievances raised by the communities and workers				personnel on-site. • The number of personnel on-site trained in the use of force and firearms. • Target zero criminal activity on-site. • Record number of security incidences and security-related grievances by workers and community members	
Operation Phase							
Air Quality	**Gaseous and Dust Emissions**	• Ambient air quality (PM10) • Concentrations of gaseous pollutants	IAA	Quarterly	On-site	• PM_{10} < 0.1 in µg/Nm^3	3,500,000

Pre-Construction and Construction Phase							
		including SO_2, CO and NO_x • The concentration of Lead in air • Evidence of covering trucks hauling loose/friable materials.				• SO_2< 0.5mg/Nm^3 for 10 mins • CO < 150 g/Nm^3 for less than 15 mins. • NO_x< 150 g/Nm^3 for 24 hours • Pb < 1.5 g/Nm^3 for 24 hours (Conforming to EC directive 89/336/EEC and ISO 12103-1)	
	Noise & Vibrations	• The ambient noise level in dB during regular operations.	IAA	Quarterly	On-site	In compliance with WB and TBS standards: • Daytime noise levels < 60 dB • Night-time noise levels < 50 dB	5,000,000
Soil	**Land Contamination**	• Amount and type of waste generated, sorted,	IAA	Monthly	On-Site	• Site inspection • Zero hazardous	1,000,000

Pre-Construction and Construction Phase							
		recycled/reused, treated and disposed • Number of dust bins				wastes stored on-site	
	Water Pollution	• The pH of sewage and effluent • The concentration of Pb in wastewater • Sulphate (SO_4) concentration • Fatty matter and hydrocarbon concentrations • Dichloromethane Amount • Type and amount of waste generated, sorted, recycled/reused, treated and disposed • Number, location and status of waste disposal sites • Number and status of toilet facilities	ATC	Quarterly	Off-site	**Physical Components** Below 60mg/L of COD using TZA 861(Part 4): 2006 Dichromate Digestion Method -Below 100mg/L TSS using TZA 861(Part 1):2006 Gravimetric Method -Below 0.2mg/L Dichloromethane using GCECF (ISO10301:1997) -Determination of Highly volatile halogenated hydrocarbons	18,000,000

Pre-Construction and Construction Phase							
		• Wastewater quality parameters • Quality of secondary containment structures • Evidence of labelling hazardous waste Evidence of pollution spill contingency plan				using Gas Chromatograph method **Inorganic Components** Below 0.1mg/L Pb using TZS 861(Part 7):2006 Flame Atomic Absorption Spectrometry -Below 500mg/L SO4 using APHA Standard Methods: 4110 B. Ion Chromatography with chemical suppression of eluant conductivity **Organic Components** Below 0.5mg/: of Alkyl benzene sulfonate (ABS) using ISO	

Pre-Construction and Construction Phase							
						7875-1:1996 (Part 1) Below 10mg/L of Fatty matter and hydrocarbons using APHA Standard methods 5520	
Flora & Fauna	**Establishment of Invasive Plant Species**	• Land area cleared during construction • The proportion of land area revegetated • Number of trees planted • Land area coverage with invasive plant species.	IAA	Monthly	On-site	• Site inspection of invasive plants with photo documentation. • Maintain records of position, coverage and treatment of land areas with invasive plants.	N/A
Waste Generation	**Sewage and Effluents**	• BOD Level • COD LeveL • The pH of sewage and effluent	IAA	Monthly	On-site	**Physical Components** Below 30 mg/L of BOD5 at 20°C using TZS	17,000,000

Pre-Construction and Construction Phase							
		• The concentration of Pb in wastewater • Sulphate (SO_4) concentration • Fatty matter and hydrocarbon concentration • Type and amount of waste generated, sorted, recycled/reused, treated and disposed • Number, location and status of waste disposal sites • Number and status of toilet facilities • Wastewater quality parameters • Quality of secondary containment structures • Evidence of labelling hazardous waste				861 (Part 3):2006 Five-Day BOD method 100mg/L TSS using TZA 861(Part 1):2006 Gravimetric Method pH range of 6.5-8.5 using TZS 861(Part2):2006 – Electrometric Method ***Inorganic Components*** Below 0.1mg/L Pb using TZS 861(Part 7):2006 Flame Atomic Absorption Spectrometry -Below 500mg/L SO_4 using APHA Standard Methods: 4110	

Pre-Construction and Construction Phase							
		• Evidence of pollution spill contingency plan				B. Ion Chromatography with chemical suppression of eluant conductivity ***Organic Components*** Below 0.5mg/l of Alkyl benzene sulfonate (ABS) using ISO 7875-1:1996 (Part 1) Determination of surfactants by measuring the methylene blue index (MBAS)	
Waste Generation	**Solid Waste Generation**	• Amount and types of solid waste generated • The total amount of solid waste on-site. • Frequency of solid waste transportation and disposal	IAA	Bi-weekly	On-site	• Site inspections with photographic evidence • Maintaining a record of type, quantity, and disposal location of	N/A

Pre-Construction and Construction Phase							
						solid and liquid waste generation	
Health & Safety	**Fire Risk**	◆ Emergency preparedness plan ◆ Presence of fire standpipe system ◆ Installation of the water reservoir tank of 100,000litres ◆ Presence of emergency fire water pumps ◆ Presence of hose reels ◆ Presence of portable fire extinguishers ◆ Installation of fire detection and alarming system around the building ◆ Presence of emergency response plan ◆ Presence of a logbook for recording fire	IAA	Quarterly	On-site	• Fire system • Water reservoir tank • Assembly area with sign • Clear warning signs (Warning-No Smoking, No Naked Lights, Danger) • CO_2 and sand fire extinguishers	5,000,000

Pre-Construction and Construction Phase							
		incidents and fire drill ◆ Availability of emergency assembly point ◆ Installation of emergency lighting and exit sign ◆ Employee fire safety training ◆ Fire safety certificate					
Health & Safety	**Security Threats**	◆ The number of Security personnel on-site. ◆ Compliance with Voluntary Principles on Security and Human Rights ◆ Evidence of training of security personnel in the use of force and arms ◆ Number of security-related grievances raised by the	IAA	Weekly	On-site	◆ Zero incidences of crime and criminal activity on site.	N/A

Pre-Construction and Construction Phase							
		communities and workers					
Community	**Immigration Pressure**	• Recruitment plan • Student and public health campaigns on HIV/AIDS and STDs • The proportion of the local population in the overall project • The proportion of women employees in the overall project • Evidence of written contracts • Number of worker grievance • Age of workers • Quality of workers' accommodation • The proportion of the unskilled workforce that have had their skills upgraded	IAA	Quarterly	On-site	Number of local employees	9,000,000

Pre-Construction and Construction Phase							
	Traffic Flow	• Traffic Management Plan • Evidence of Traffic and Transportation Safety Plan • Traffic Incident Rate • Evidence of signage, warnings and controls • Grievance log • Number of road accidents • Number of complaints related to traffic and road accidents	IAA	Biannually	Off-site	• Reports and grievance log • Review Grievance log • Review Accidents log (if applicable)	5,000,000
Decommissioning Phase							
Air Quality	**Dust, particulate matter and gaseous emission**	• Ambient air quality (PM10) • Concentrations of gaseous pollutants	IAA	Monthly	On-site	• $PM_{10} < 0.1$ in $\mu g/Nm^3$	3,000,000

Pre-Construction and Construction Phase							
		including SO_2, CO and NO_x • The concentration of Lead in the air				• SO_2< 0.5mg/Nm^3 for 10 mins • CO < 150 g/Nm^3 for less than 15 mins. • NO_x< 150 g/Nm^3 for 24 hours	
Air Quality	**Noise and Vibrations**	-Ambient noise levels during regular operation of IAA	Contractor	Monthly	On-site	In compliance with WB and TBS standards: • Daytime noise levels < 60 dB • Night-time noise levels < 50 dB	4,000,000
Waste Generation	**Solid, Liquid & Hazardous Waste**	• Storage conditions of	Contractor	Weekly	On-site	• Site inspections	N/A

CHAPTER TEN
10. COST BENEFIT ANALYSIS OF THE PROJECT

10.1. Introduction

This chapter presents the cost benefit analysis (CBA) of the proposed three (3) new building structures (Academic building, hostels and library) to be built at IAA-Babati campus. The estimation of cost benefit analysis reflects 99 years of the project design period. The details are not disclosed since they are still confidential in accordance to the Tanzania Procurement Act that prevents a detailed cost benefits analysis to be undertaken before tendering process. For that case, presented costs in this section are indicative and elementary qualitative description of the costs and benefits. The total operation costs have considered the indicative costs for implementation of mitigation measures as well as the cost of monitoring. However, total cost of the project will be stated later as project tendering are still in process.

10.2. Benefits related to the project

Benefits from the proposed three new building projects at the IAA-Babati campus can be classified as direct benefits and indirect benefits to institute, neighbour and the government. However, primary benefits of this project are further classified as direct benefits and indirect benefits. Building construction projects may generate negative benefits though; they are usually minimal compared to the positive benefits. Some of those impacts are non-quantifiable thus cannot be used in the benefit-cost analysis estimations. Generally, the benefits of the project are experienced in all phases from mobilization, construction, operation to decommissioning phase. To mention few, employment opportunities and public benefits will occur during both the construction and the operation phases. Several benefits are associated with the proposed development both at local and national level in terms of revenue generation and the multiplier effects associated with linkages with local and national economy.

Direct benefits: the proposed project will create many job opportunities, good aesthetic view, good environments for students in their studies, entrepreneurial opportunities to the surrounding community as well as increase the number of skilled labourers due to increase in the enrolment and presence of conducive environment for self-studies. Most of the non-quantifiable impacts are directly benefits to the project receptors.

Indirect Benefits: Indirect benefits from a proposed project mainly include increase in government revenue through different sectors like; TANESCO, BAUWASA, TRA etc. cultural interactions, infrastructural development, and economic growth. But since the construction project requires inputs from other sectors to produce this output, and the other sectors subsequently require inputs themselves, there will be multiple rounds of interaction among the sectors resulting in additional output from each sector of the economy.

10.2.1 Benefits to IAA-Babati campus

The proposed projects have positive impacts to IAA-Babati campus since its benefit is a lifetime process throughout the project life span (99 years). The completion of these projects will be one of the pooling factor for increased number of students' enrolment thus in monetary cost its value has potential to increase annually. IAA-Babati campus financial capacity and sustainability are

going to improve by far. Further, the improved financial standing is not only going to promote enrolment but also good governance and efficient running of the Institute. Teaching, Research and Public Service and its envisioned centre of excellence in knowledge and dissemination to a wide spectrum of beneficiaries at national and regional levels are ones among the benefits. The project will also have several intangible benefits to IAA-Babati campus which include improving the Institute's image.

10.2. 2 Benefit to the Neighbourhood

The proposed construction of new buildings meant to increase the capacity of IAA-Babati campus in infrastructure. This improvement may lead to the increase in staff requirement that is technical, administrators and academicians. During and after construction phase the project is going to provide additional employment opportunities for people surrounding IAA-Babati campus related to operation and maintenance. However, non-skilled labourers will benefit from the daily wages. The institute will also create business opportunities in vicinity of the campus. Business opportunities will be supporting government initiatives to create employment opportunities for Tanzanians as advocated by the current Government. Notwithstanding that now salaries are yet to be specified, it is envisaged that from employment, workers will get incomes, which will improve quality of their lives and perhaps improve their lifestyles. However, employment opportunities and income from salaries provided will extend beyond the workers and benefits many other people including dependants.

Moreover, employment opportunities and the benefits therein will depend on whether suitably qualified local personnel that can take up positions are available. Capacity building therefore is a prerequisite for these benefits to be realized. Alongside capacity building, there shall be a need for putting in place deliberate policies that would compel developers in the real estate economic sector to employ local labour with the requisite skills and experience. In addition, the project will also have following economic and social benefits:

- Utilization of locally available resources;
- Revenue to the Government will increase through payment of the various taxes (indirect and direct).
- Contribute to the development of housing and settlements as well as commercial real estate industry in Manyara region.
- Boosting the infrastructure and economy of the country and Babati Municipality in particular the ward in which the project is located.

10.2.3 Benefit to the Government

The project will benefit the government in different aspects. These includes budget saving due to the relatively decrease in IAA-Babati campus financial dependence on the government. It is anticipated that during the operation phase the project will improve IAA-Babati campus financial capacity and sustainability resulting from project earnings. For that case, the government will have the opportunity to use the share of the budget which was supposed to go to IAA-Babati campus for other government development plans. Further the ability of IAA-Babati campus in contributing towards the realization of National Policies such as Education Reforms through expansion of enrolment of students into various degree programmes is going to increase. The increase in the number of enrolments means the increase in financial capacity of the institution. However, the government will benefit from the increased number of experts in priority discipline with different

disciplines that will be graduating from IAA-Babati campus. This will create the potential of the government to use internal resources (home country experts) in different future projects rather than contracting foreign experts.

10.3 Costs related to the project

The estimated costs for implementing enhancement measures, impact management as well as monitoring process as outlined in Chapters 8 and 9 is about **TSh. 280,000,000** per annum. The estimated costs for mitigation do not include the environmental costs, which could not be accurately calculated. Since some of the impacts will only to be realized during construction phase, the costs for these will also be short term, especially if mitigation measures are fully implemented. The construction costs for all the projects are detailed in Bills of Quantities.

10.3.1 Costs to community

The resulting negative environmental and social impacts such as noise, impairment of air quality, and Safety and health risks due to project activities will be absorbed by the surrounding communities. However, the introduction of mitigation measures will reduce the anticipated impacts. Apart from the above, no any community activities will be disrupted. IAA is committed to mitigate the negative social and environmental impacts.

10.3.2 Costs to Government

The Government of the United Republic of Tanzania through the Ministry of Education, Science and Technology (MoEST) has secured fund from World Bank to promote higher education as a catalytic force in the new Tanzanian economy. The project is designed to revitalize the key areas for innovation, economic development, and labour market relevance. Also as already mentioned the Government will directly and indirectly benefit from taxes generated during both phases of the project. Apart from tax generation, the investment will also enhance the economic growth, enhancement of industrialization and businesses.

10.3.3 Environmental Cost

Environmental cost benefit analysis is assessed in terms of the negative and positive impacts. Furthermore, the analysis is considering whether the impacts are mitigatable and the costs of mitigating the impacts are reasonable. The total cost for the mitigation of identified impacts and monitoring will be **Tsh. 185, 00,000** and **73,000,000** per year, respectively.

10.5 Project cost benefit analysis

As it has been mentioned in Chapters 6 – 9, the potential benefits of the project, in terms of financial and social benefit are substantial. The environmental impacts are reasonably mitigatable and the financial resources needed to mitigate negative impacts, when compared to the required investment are relatively small. However, the benefit cost ratio concluded the project to have more benefits compared to the total cost of the project, this implies that the project is viable and the proponent is encouraged to develop it.

CHAPTER ELEVEN
11.0 DECOMMISSIONING

11.1 Introduction

As decommissioning will take place in the remote future, the specific conditions for mitigation are generally inherently uncertain. In view of this, specific mitigation measures pertaining to environmental impacts of decommissioning works cannot be proposed at the moment with a reasonable degree of certainty. A detailed decommissioning plan that takes environmental issues into consideration shall be prepared by the proponent prior to the decommissioning works. Should it occur, decommissioning may entail change of use (functional changes) or demolition triggered by change of land use. Therefore what is presented here is just a Preliminary Deccommissioning Plan which merely sheds some light on what shall be done if the need for decommissioning arise.

11.2 Preliminary Decommissioning Plan

This Section provides a brief outline of the works required to demolish the proposed project components on the site incase it happens. This Plan will be used as a reference document that provides the framework to ensure that demolition activities on the site do not adversely affect the health, safety, traffic or the environment of the public and neighbouring properties. The Contractor will be required to prepare a detailed Demolition Plan and Construction Management Plan to the satisfaction of the proponent and relevant Authorities prior to the commencement of works on site.

11.2.1 Components to be Demolished

The project components to be demolished shall generally be constructed with load bearing masonry walls with steel or timber framed roofs and metal roofs.

11.2.1 Demolition Methods

It is anticipated that the Contractor will prepare a detailed Demolition Plan prior to the commencement of work on site, however, the indicative demolition methods will be as follows:

- The strip out and removal of non-structural elements will be undertaken utilising manual labour and small plant including – bobcats, 3-5t excavators and dingo type loaders.
- The materials will be removed from site using small to medium sized trucks.
- The structures will be demolished using larger plant and equipment including 15-40t hydraulic excavators. These machines will be equipped with rock breakers, pulverisers and the like which would be used in a sequential manner.
- The engineer will be engaged to provide further engineering advice in relation to temporary support or backpropping of the structure during demolition.
- During the demolition process erosion control measures will be established. These will include treatment of dust and potential discharge into stormwater systems.
- Materials Handling

Materials handling will be done by mechanical plant (including excavators and wheel loaders) loaded into trucks (bogie tippers and semi trailers). The debris will be hauled offsite to an approved waste facility or recycling centre.

The contractor shall submit a Demolition Waste Management Plan to IAA-Babati campus, which outlines the objectives of:

- Maximisation, reuse and recycling of demolition materials

- Minimisation of waste disposal
- Evidence of implementation for specified arrangements of waste management

Reusable materials will be stored at the site. Recycling and disposal containers will also be accommodated at this location for collection vehicles. Hazardous materials will be treated separately. A hazardous materials inspection will be undertaken by an accredited consultant and a report issued. Hazardous materials will be removed in accordance with EMA 2004. A final clearance report will be provided by the hygienist which will include the provision of tip dockets from waste centres.

11.2.3 Proposed Sequence

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

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

In principle, the demolition process is undertaken in the reverse sequence as construction. Essentially, internal finishes will be stripped out first. Service amenities will then be removed including air conditioning, pipework and conduits. The facades will be removed where necessary and the structure will then be demolished using the larger plants and equipment. It is estimated that it will take 3 months to demolish and clear the site.

11.2.4 Protective Measures

An A Class hoarding will be erected around the perimeter of the construction site prior to the commencement of demolition works. Additionally, wherever the risk arises of material falling into public areas, overhead protection will be provided in the form of a B Class hoarding. Scaffolding will be erected to facades where materials could fall in excess of 4m. The scaffolding will be clad with chainwire and shadecloth to enclose debris and dust onto the site. During the demolition, dust control measures will be used to minimise the spread of dust from the site. The Contractor will have a senior representative on site at all times to ensure compliance with the safety guidelines and agreed work methods.

11.2.5 Traffic Management

The management of construction traffic during the deccommissioning phase will be subject to the provision of a detailed traffic management plan. This plan will be prepared by the Contractor for the various stages of demolition. During demolition, all traffic will be held within the site boundaries. The site will remain closed to pedestrian traffic and will be generally manned by security.

11.2.6 Occupational Health and Safety

A detailed OH&S measures will be provided by the Contractor prior to work commencement. A detailed Site Safety Plan will be prepared for the specific project.

11.2.7 Environmental Management Plan

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

11.3 Potential Impacts and Mitigation Measures

11.3.1 Dust and Noise Pollution

The demolition activities for the remained part (foundation structure) shall be accompanied with emission of a lot of dusts since the demolition works are expected to be carried out by conventional method using mechanical breakers and jackhammers. However, alternative methods of demolition including explosive techniques can be used.

Mitigation Measures

i. Water sprinkling shall be applied to open earth to reduce dust emission;
ii. Trucks transporting construction materials shall be covered if the load is dry and prone to dust emissions;
iii. The demolition area shall be fenced with iron sheets; this will prevent the dust at the ground to be picked up by the wind;
iv. Public notifications shall be posted where appropriate especially in nearby residential areas likely to be impacted by dust;
v. Construction equipment, with noise sinks, shall be used;
vi. Machine operators in various sections with significant noise levels shall be provided with noise protective gear; and
vii. Construction equipment shall be selected, operated and maintained to minimize noise.

Costs to Undertake Mitigation Measures: Approximately TShs. **50,000,000**

11.3.2 Increased Waste

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

Mitigation Measures

i. All materials which can be reused shall be reused;
ii. Materials that cannot be reused shall be sent to an authorised dumpsite.

Costs to Undertake Mitigation Measures: Approximately TShs. **10,000,000**

11.3.3 Loss of Employment

Many people shall suffer loss of employment if it happens that the buildings have to be decommissioned, including security guards, cleaners, etc.

Mitigation Measures

i. Prior notice shall be given to all those who are going to be affected;
ii. Credit and Savings account shall be established; and,
iii. Proper compensation shall be given to those who deserve it.

Costs to Undertake Mitigation Measures: Approximately TShs. **10,000,000**

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25. URT, 2021: Environmental and Social Framework (ESF) for Higher Education for Economic Transformation project (HEET), Dodoma
26. URT, 202: Stakeholder Engagement Plan(SEP) for Higher Education for Economic Transformation project (HEET), Dodoma
27. URT, 2021: Resettlement Policy Framework (RPF) for Higher Education for Economic Transformation project (HEET), Dodoma

Appendices

Appendix i: Title Deed for land ownership

TITLE No. 32286
REGISTERED ON 12-5-2011
at 11:00 A.M.
Asst. Registrar of Titles

Stamp Duty Shs. 100/= Paid
Land Form No. 22
and Revenue Receipt No. 40749020
of 27.4.2010 issued
Asst. Registrar of Titles

Stamp Duty Shs. 288280/= Paid
on Original Revenue Receipt No.
40749020 of 27.4.2010
Asst. Registrar of Titles

THE UNITED REPUBLIC OF TANZANIA

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

CERTIFICATE OF OCCUPANCY

(Under Section 29)

LAND REGISTRY MOSHI

Title No: 32286
L.O. No. 284753
L.D.No.BBT/8497

The 3rd day of March, 2011

THIS IS TO CERTIFY that **INSTITUTE OF ACCOUNTANCY ARUSHA** established **under the Institute of Accountancy Arusha Act, No.1 of 1990 and having its registered office in Arusha** of P.O.Box 2798, **ARUSHA** (hereinafter called "the Occupier") is entitled to a Right of Occupancy (hereinafter called "the Right") in and over the land described in the Schedule hereto (hereinafter called "the Land") for a term of **Thirty Three** years from the first day of **April, Two Thousand and Ten** according to the true intent and meaning of the Land Act and subject to the provisions thereof and to any regulations made thereunder and to any enactment in substitution therefor or amendment thereof and to the following special conditions:-

1. The Occupier having paid rent up to the thirtieth day of June, **2007**; shall thereafter pay rent of shillings **Seven Million Six Hundred Ninety Five Thousand. (Tshs. 7,695,000.00/=) only** a year in advance on the first day of July in every year of the term without deduction PROVIDED that the rent may be revised by the Commissioner for Lands.

Telephone No. 53210

LAND REGISTRY,
P.O. BOX 190,
MOSHI.

Ref: No: LR/MS/T/32286/2
To: INSTITUTE OF ACCOUNTANCY
ARUSHA BOX 2798 ARUSHA

Date 13th MAY 2011

Sir/Gentlemen/Madam

RE: THE LAND REISTRATION ACT (CAP. 334)
TITLE No: 32286 L.O. No. 284753 PLOT No. 259 & 260
BLOCK "CC" WAANG'WARAY BABATI

I have the honour to enclose herewith the duplicate of Certificate Title numbered as above.

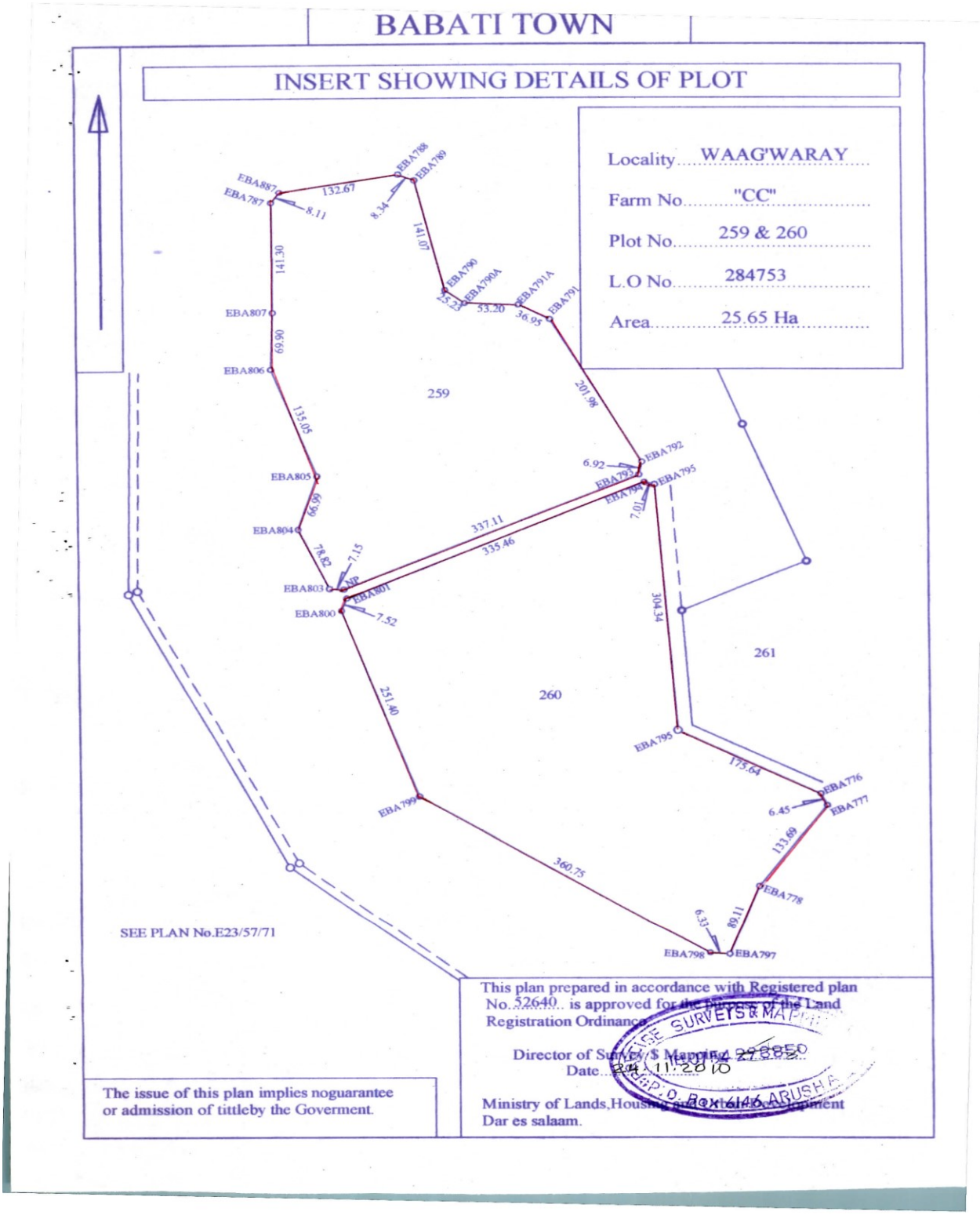
Please endorse your signature on the enclosed form of receipt and return the same to me in due course.

I am, Sir/Gentlemen/Madam
Your Obedient Servant`

ASSISTANT REGISTRAR OF TITLES
MOSHI
E. E. Bundala

C.C: The Regional Land Officer,
P.O. Box
KILIMANJARO/ARUSHA/TANGA/MANYARA

Date of C.O. 3. 3. 2011


BABATI TOWN
INSERT SHOWING DETAILS OF PLOT
Locality WAAG'WARAY
Farm No "CC"
Plot No. 259 & 260
L.O No. 284753
Area 25.65 Ha
EBA788
EBA789
EBA787
EBA807
EBA806
EBA805
EBA804
EBA803
EBA801
EBA800
EBA790
EBA790A
EBA791A
EBA791
EBA792
EBA793
EBA794
EBA795
EBA776
EBA777
EBA778
EBA797
EBA798
EBA799
132.67
8.11
8.34
141.07
141.30
69.90
135.05
66.99
78.82
7.15
NP
7.52
251.40
360.75
89.11
6.33
133.69
6.45
175.64
304.34
337.11
335.46
7.01
6.92
201.98
36.95
33.20
259
260
261
SEE PLAN No.E23/57/71
The issue of this plan implies noguarantee or admission of tittleby the Goverment.
This plan prepared in accordance with Registered plan No. 52640 is approved for the purpose of the Land Registration Ordinance
Director of Surveys & Mapping
Date 24/11/2010
Ministry of Lands, Housing and Human Settlements Development
Dar es salaam.
SURVEYS & MAPPING
P.O. BOX 6146 ARUSHA

2. The Occupier shall:-

(i) Be responsible for the protection of all beacons on the land throughout the term of the Right. Missing beacons will have to be re-established at any time at the Occupier's expenses as assessed by the Director responsible for Surveys and Mapping.

(ii) Do everything necessary to preserve the environment and protect the soil and prevent soil erosion on the land and do all things which may be required by the authorities responsible for environment and to achieve such objective.

(iii) Erect on the land buildings in permanent materials designed for use in accordance with the conditions of the Right and which conform to the building line (if any) decided by the **Babati Town Council** (hereinafter called "**the Authority**").

(iv) Submit to the Authority building plans within Six months from the date of commencement of the **Right**

(v) Begin building construction within six months after the approval of the building plans by the Authority.

(vi) Complete the building construction within Thirty Six months from the date of commencement of the **Right.**

3. **USER:** The land shall be used for **Education purposes only**. Use Group 'K' use class **(b)** as defined in the Town and Country Planning (Use Classes) Regulations, 1966 as **amended in 1993.**

4. The Occupier shall not assign the Right within three years of the date hereof without the prior approval of the Commissioner.

5. The Occupier shall deliver to the Commissioner notification of disposition in prescribed form before or at the time the disposition is carried out together with the payment of all premia, taxes and dues prescribed in connection with that disposition.

6. The President may revoke the right for good cause and in public interest.

SCHEDULE

ALL that land known as Plot No. **259 & 260** Block '**CC**' situated at **Waag'waray Babati Town** containing **twenty five decimal six five (25.65) Ha** shown for identification only edged red on the plan attached to this Certificate and defined on the registered Survey plan Numbered **52640** deposited at the Office of the Director for Surveys and Mapping at Dar es Salaam.

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

COMMISSIONER FOR LANDS

The within named **INSTITUTE OF ACCOUNTANCY ARUSHA** hereby accept the terms and conditions contained in the foregoing Certificate of Occupancy.

SEALED with the **COMMON SEAL** of the said)
INSTITUTE OF ACCOUNTANCY ARUSHA)
And **DELIVERED** in the presence of us)
This 01.....Day of December...2010)
Signature .....)
Postal Address:...P. O. Box 2798.....)
.....ARUSHA.....)
Qualification: AG: PRINCIPAL AND SECRETARY TO GOVERNING COUNCIL)
Signature .....Mzdaely.....)
Postal Address: P. O. Box 9111)
DAR ES-SALAAM)
Qualification: CHAIR PERSON)

Appendix III: Disaster Risk Management Plan

Aspect		Responder at IAA								Responder outside IAA			
Key responsibilities		Rector	DPFA	Emergency management team		Health center	Estate manager	Security guards		Fire and Rescue force	OSHA	RED CROSS	Police Force
1	**Fire outbreak**												
Steps to be completed in pre-disaster	Post directions on each buildings on how to utilize emergency equipment		**P**	**S**			**S**						
	Post locations of fire alarms and assembly points		**P**	**S**			**P**			**S**			
	Post locations of fire extinguishers		**P**				**P**			**S**			
	Train students, teachers and staffs on use of alarm systems and extinguishers at least once per semester (Refresh annually.)	**P**	**P**										
	Train all university community on, and exercise RACE procedures	**S**	**P**				**S**			**S**			
Steps to be done During event	During fire event, use the RACE procedure R - Rescue residents in immediate danger A - Sound nearest alarm if not already activated C - Close doors behind you to confine the fire E -Utilize fire extinguisher as situation permits or Follow evacuation procedures.	**P**		**P**		**P**	**P**	**P**					**P**

	Call # 101 for assistance	**P**		**P**		**P**	**P**	**P**						
2.	Disease outbreak													
Steps to be completed in pre-disaster	Ensure the students, teacher and other staffs Wash hands often	**P**	**S**	**S**		**P**		**S**						
	Provision of vaccination	**P**		**S**		**P**								
	Ensure availability of Ambulance	**P**				**P**	**S**							
	Ensure control of food security at cafeteria	**P**		**S**										
	Disinfect surfaces; clean and disinfect on the surface which are frequently touched in all buildings			**S**		**P**	**S**							
	Provide education for safer sex (training for sexually transmitted diseases (STDs)		**P**											
	In case of pandemic disease follow the government guidelines	**P**												
	Provide the location of first aid kit and the dispensary		**P**	**S**			**S**							
Steps to be done During event	Call (health officer) to the illness													
	Call ambulance for emergency and serious illnesses													
	If its communicable disease, record the Number of new cases everyday													
	Ask for assistance from outside	**P**				**S**							**S**	
Steps to be completed in pre-disaster	Traffic accidents													
	Provide all traffic signs required in a road and car parking	**P**	**S**					**S**						
	Control all random parking						**S**	**P**						
	Remove all unstable tree parts in car parking						**P**							

Steps to be done During event	Provide the first aid service to the victim					**P**								
	Report him/her to the dispensary or hospital depending to nature of injury													
	Report the accidents to nearby police station					**P**								
4.	Chemical explosion													
Steps to be completed in pre-disaster	Maintain proper storage of all chemicals in laboratory		**P**	**S**										
	Ensure the proper uses of chemicals during experimental practical's			**P**		**S**	**P**							
	Ensure all laboratory rules are followed		**P**	**P**			**S**							
	Provide the first aid kit in all laboratory		**P**	**S**			**P**							
Steps to be done During event	Provide the first aid service to the victim					**P**								
	Report him/her to the dispensary or hospital depending to nature of injury													
	Ask for assistance from large hospital, when the case is serious					**P**								
	Sound the nearest alarm													
5.	Robbery													
Steps to be completed in pre-disaster	List the Number and names of security guards		**S**	**S**			**P**	**S**						
	Provide light in open areas, buildings and all road within the campus	**S**					**P**							
	Insist students to walk in groups during the night	**P**						**S**						
	Insist student, teachers and all staffs to wear identification card within the campus	**P**	**S**	**S**				**P**						
	The campus should be full protected with fence	**S**					**P**							

Steps to be done During event	Call#_____(Police/security guards) to report the crime event	**P**											**P**
	Make noise to get assistance from nearby person												
	Report the event to security guards/policy												
6.	Terrorist attack												
Steps to be completed in pre-disaster	The campus should be full protected with fenced	**S**					**P**						**P**
	Insist student, teachers and all staffs to wear identification card within the campus		**S**	**S**				**P**					
	Ensure the visitors registration	**P**					**P**	**P**					
Steps to be done During	Call (Police/security guards) to report the event	**P**											**p**
	Report the event to police	**P**	**P**	**P**		**P**	**P**	**P**					
	Follow the government rules and guidelines	**P**	**P**	**P**		**P**	**P**	**P**					
7.	ICT appliances damage and data loss												
Steps to be completed in pre-disaster	List names and numbers of maintenance personnel	**S**					**P**						
	Evaluate back-up generator needs. Consider power needs for critical safety and medical equipment, refrigeration, temperature control, etc.	**S**					**P**						
	Install the alternative source of power such as solar panel	**P**					**S**						
Steps to be done During	Call (power company) to report outage												
	Notify maintenance staff.												
	Evacuate the building if danger of fire.												

	Keep refrigerated food and medicine storage units closed to retard spoilage.												
	Turn off power at main control point if short is suspected												
	Turn off all the switch sockets												
	Disconnect all appliance from the electric power source												
8.	**Other disaster risk such as earthquake, tsunami and building collapse**												
Steps to be completed pre-in	In case of Earthquake evaluate the campus for potential dangers and fix the problems		**P**				**S**			**S**			
	Remove potential fire risks		**P**	**S**			**S**						
	Train and exercise on "Drop, Cover and Hold".		**P**	**S**						**S**			

Appendix III: List of Stakeholders Consulted, their views and concerns a, the rate of interest in the Project and provided response

Authority/ Stakeholders Consulted	Role of the stakeholder	Issues Raised	Rate of Interest	Response Section on issues raised
National Council for Technical and vocational Education and Training NACTVET)	• Issuing policy guidance • Providing legal frameworks • Issuing licenses, provisions of certificates of compliances • Enforcement of laws and regulations Project monitoring.	• Generally buildings should be equipped to reduce noise and sounds (noise pollution) especially classrooms, laboratory, seminar rooms. • Size of the doors and lifts for equipment has to be considered, for example BICO-IAA size of the door allows a small car to pass. • Lift and lamp should be added • Building construction has to consider access for disabled, installation of sound proof materials and the building to follow the natural terrain. • Sewerage systems have to be constructed and managed properly • The IAA should take into account issues of solid waste management	**High**	All expected buildings have sound proof All are considered clearly All buildings will have lift by considering students with disability They are well designed construction of disposal site

Authority/ Stakeholders Consulted	Role of the stakeholder	Issues Raised	Rate of Interest	Response Section on issues raised
				where scavengers will be picking for recycling
Babati town	Overall advice on both professional works (land, Planning, environments, social, economics) with regards to the execution of the project at IAA-Babati campus	1. Install the sanitation facilities in all buildings in relation to the number of students to be occupied 2. During operation the proponent should ensure adequate handling and disposal of all hazardous wastes such as chemicals from construction. 3. The solid waste contractor should be registered and authorized in the particular Municipal as per EMA 2004 and its amendment of 2018 4. The proponent should know where all wastes are disposed by the contractor 5. The contractor should handle back all the receipts to the proponent after disposing wastes at a particular dumpsite 6. There should be an adequate storm water management system in order to avoid social conflicts (difficulties during cleanliness) which may arise due to solid wastes	**LOW**	1. Design has in cooperated it 2. IAA-Babati campus will prepare good waste management system to handle hazardous waste (Incinerators) 3. IAA-Babati campus will contact with babati council for guidance 4. Receipt handling will be part of the agreement between IAA-Babati campus and contractor 5. IAA-Babati campus will have good storm water management system of which will be connected to the system of the proposed new buildings
Occupational Health and	Provide advice and advice on all work	1. The proponent should make sure the project is registered under the	**LOW**	1. IAA-Babati campus shall adhere to it as part of

Authority/ Stakeholders Consulted	Role of the stakeholder	Issues Raised	Rate of Interest	Response Section on issues raised
Safety Authority (OSHA)	related safety measures to the project	Workplace Information Management System (WIMS) before pre-construction and construction phases 2. There should be trained First Aiders at all project phases, as well as First Aid Kits with all necessary facilities. 3. The First Aider should renew the certificate after every 1 year as per OSHA requirement 4. The proponent should conduct Risk Assessment before construction and prepare a Risk Assessment report 5. The proponent should prepare the Occupational Health and Safety Policy both in English and Swahili languages, and it should be posted in aa accessible place within a work place 6. Medical examination should be done to all workers before construction and operation phases as well as during operation phase. 7. All workers should be provided with sufficient Personal Protective Equipment (PPEs) during all project phases		compliance to OSHA regulations 2. IAA-Babati campus shall have safety and health management plan for all project phases 3. The contractor shall work with First Aider with up to date certificate 4. This is part of ESIA report 5. Contractor shall adhere to it as part of safety and health plan 6. Workers shall be tested their fitness as per OSHA regulations 7. PPE are inevitably to be provided due to nature of the construction activities and associated risks 8. This is part of the conditions for contractor to be awarded the tender 9. IAA-Babati campus and contractor shall adhere it

Authority/ Stakeholders Consulted	Role of the stakeholder	Issues Raised	Rate of Interest	Response Section on issues raised
		8. There should be a trained Safety and Health Representative 9. The proponent should ensure there is sufficient water supply system, adequate sanitation facilities and changing (both male and female) at the workplace during construction as well as operation phase. 10. There should be safety signs at the project site during construction and operation 11. The proponent should maintain compliance to avoid unnecessary penalties		for the health and safety pf workers 10. Due to nature of risks in construction perimeters, enough signs shall be provided 11. IAA-Babati campus and contractor shall adhere to it so as to avoid the interference of the project budget
TANESCO	Oversees the provision, availability and control of power in the project area at IAA-Babati campus and the surrounding communities	1. The project should consider underground wire systems 2. The project should consider the use of renewable sources of energy	**LOW**	1. IAA-Babati campus will check the feasibility of such an option without compromising the safety 2.This shall be considered due to unpredictable power cut and security reasons in internal road networks especially at night
BAUWASA	Oversee utilization, management, development, and	1. The proponent should ensure protection of all water supply systems around the project site	**LOW**	1. IAA-Babati campus will have good solid and liquid waste management system

Authority/ Stakeholders Consulted	Role of the stakeholder	Issues Raised	Rate of Interest	Response Section on issues raised
	availability of water resources in IAA-Babati campus and the surrounding communities	2. Water pipe sizes should be relevant to the demand based on the projections made on demand and infrastructures of this particular project 3. Alternatively, the proponent should increase the storage capacity since the current storage capacity yet meets the current demand 4. The proponent should look for alternative water sources		waste passes through treatment systems before disposal to environment 2. IAA-Babati campus has already made projections for the future demand 3. IAA-Babati campus is near the main storage tanks. It will also increase storage tanks to meet the demand 4. IAA-Babati campus has been looking at the feasibility of harvesting rainwater to ensure enough water availability and reduction of water use costs
Fire and Rescue Force	Provide overall guidance, advice and management of fire and rescue	2. Two files of all architectural drawings should be submitted at Fire and Rescue Force office for payment and to be reviewed, signed and approved. 3. There should be at least two doors (entrance and exist) in all classrooms and Library and they should open outward.	**LOW**	1. IAA-Babati campus shall submit service drawings when ready for guidance and approval 2. The design has accommodated such a requirement for safety purposes

Authority/ Stakeholders Consulted	Role of the stakeholder	Issues Raised	Rate of Interest	Response Section on issues raised
		4. There should be detection, alarming and lighting systems as well as portable fire extinguishers in all buildings 5. For hostels, no cooking activities should be conducted in the rooms otherwise install the kitchen, and it should have a heat detector 6. There should be no grilled windows in hostels 7. For the Research Centre, a suppression system should be installed in the server room 8. In stores, 80cm should be left from ceiling and 1m from the wall		3. The design has considered the requirement 4. The design shall adhere to it for easy escape in case of fire 5. The design shall accommodate the suppression system 6. Already addressed in the design 7. IAA-Babati campus shall consult Fire and Rescue Force when needed
Gender Unit at IAA	Promote gender equality, equity and disadvantaged rights	1. Inclusion of gender analysis and mainstreaming in project implementation	**MEDIUM**	1. Gender issues will be a key during project implementation so as to leverage the project benefits to all genders
Influencer /power Stakeholders in the society	• Regional commissioner (RC)	i. The institute should make sure that the construction is completed on time as per contract ii. Should do community engagement to be aware with the project	**MEDIUM**	The IAA management will adhere with contract management

Authority/ Stakeholders Consulted	Role of the stakeholder	Issues Raised	Rate of Interest	Response Section on issues raised
	• District commissioner(DC	i. Employment should be provided to local community in the construction site ii. The institute should adhere to environmental management	**LOW**	The management takes into account all these comments
	• Members of Parliament(MP)	i. The institute should ensure that the project is completed on time ii. All opportunities should consider the local community	**MEDIUM**	IAA will take into consideration all issues raised
	• Religious leaders	i. The Institute should ensure that local people considered first on different opportunities ii. Waste management is very important	**MEDIUM**	IAA will take into consideration all issues raised
Local Government Members and Community Members of waang'waray	Potential beneficiaries of Project components. Participation required in the Project including development of EIAs/ESMPs etc.	2. That the new projects should use modern technology for controlling wastes and not rely on the traditional and widely used method of septic tank 3. The communities around the institute should be allowed to use pathways/roads that cuts across the institute at all times of the project 4. Local communities should be given priority in terms of employment and	**MEDIUM**	**1.** IAA-Babati campus will have liquid waste recovery center within the campus and it performs very well **2.** IAA-Babati campus management shall consider it without compromising security and safety of IAA-Babati campus community 3. The contractor shall be insisted to employ local

Authority/ Stakeholders Consulted	Role of the stakeholder	Issues Raised	Rate of Interest	Response Section on issues raised
		service provision during the implementation of the project 5. The contractor should be encouraged to use local supplies surrounding the town 6. Security matters should be strengthened by the institute by constructing a police post 7. The institute was advised to clear bushes as a means of strengthening security during the implementation of the project 8. The institute should construct play grounds and allow local communities to use the same in order to strengthen social relationship between the two		community especially for non-skilled force 4. IAA-Babati campus shall advice the contractor to use local supplies without compromising the quality 5. IAA-Babati campus shall consider the presence of police post in future 6. IAA-Babati campus shall cooperate with local government to enhance the security of IAA community and surrounding community at large 7. Clearance of bushes will only be done within the project area to avoid acceleration of erosion
Non-state actors (NGO's, CBO's, FBO's)	Providing information to inform environmental and social plans, baseline information and representation of	1. There must be a mechanisms to be established between the institute and surrounding local communities for feedback and information sharing about the project	**HIGH**	1. IAA-Babati campus management shall do that when need arises

Authority/ Stakeholders Consulted	Role of the stakeholder	Issues Raised	Rate of Interest	Response Section on issues raised
	various groups at local level.			
Private sector	Employment opportunities associated with project	2. Local suppliers and business people should be given priority in working with the project	**HIGH**	1. IAA-Babati campus management shall open the room to all people who are willing to invest within the campus and the screening criteria shall be set; and there be a fair and transparent selection procedure

Appendix IV: Summary of the stakeholders' engagement during Implementation

SN	OBJECTIVE	MESSAGES	MEANS OF COMMUNICATION
		PROJECT PREPARATION	
1.	To present the draft SEP (for comment) and final versions of the instruments.	• Presentation of the Project and its implementation schedule • Present potential environmental and social impacts reports and its enhancement and mitigation plan.	• Organized public meetings /Consultations based on Stakeholders needs and circumstances. (GD, one on one meetings etc. • Disclosure on IAA-Babati campus Website • Emailing to respective stakeholder
2.	ESIA / ESMP Preparation and Disclosure	• To inform the preparation of the Environmental Statement/ ESMP etc. and present findings when drafted to all the identified stakeholders	• Face to Face Meetings • Community Meetings • Site Visits based on stakeholders needs and circumstances.
		CONSTRUCTION PHASE	
2.	Meetings to Alert stakeholders to the start of construction	• Inform stakeholders on the commencement of construction activities • Provide project Information and education on the risks and impacts, GRM, workers code of conduct etc.	• Public Meetings • Face to Face Meetings • Groups Discussions based on stakeholders needs and circumstances. • FGD, one on one meetings etc.
	Alert stakeholders of any new activities and Provide updates on project progress (every month)	• Inform public about any emerging issues; provide information on risks and impacts. GRM, workers code of conduct etc.	• Public Announcements • Focus Group Discussions • Community Meetings • Meetings with mtaa Council of Pambazuko
4.	Contact with the Project Coordination Team	• Provide phone number/WhatsApp account and email for stakeholders to submit questions and give out comments	• Meetings with mtaa Council of Meetings with mtaa Council of Pambazuko
		THROUGHOUT THE PROJECT	

5.	Information dissemination	• General information on IAA HEET implementation	• Posting on bulletin boards; Information leaflets • Outreach activities with students such as presentations, workshops and public meetings. • Sharing on IAA-Babati campus social media and website

Appendix V: Stakeholders' Engagement Plan

SN	**Stakeholders group**	**Specific needs**	**Language**	**Communication Means**
1.	Government Entities and Implementing Institutions and Agencies (TANESCO, BAUWASA, FIRE, SMC)	i. Inclusion in the decision making processes and implementation role of the project	Kiswahili	Correspondence by phone/email meetings Roundtable discussions
2.	Communities and local government authorities of Pambazuko	i. Sensitization as to the project, its benefits and their role.	Kiswahili	Community meetings. Outreach activities
4	Vulnerable Groups (women, youth and elders)	i. Sensitization as to the project, its benefits and their role.	Kiswahili	Disclosure of Project documentation in a culturally appropriate and accessible manner. Community meetings.
5	Other interested parties (NSAs (NGOs, CSOs, RBO), private sector etc.)	i. Depend on stakeholder to be met.	Kiswahili	Correspondence by phone/email meetings Roundtable discussions

Appendix VI: The recorded PM 2.5 and PM 10 concentrations levels

SITE NAME	STATION POINTS COORDINATE (BASE GNSS RECEIVER AND ROVER GNSS RECEIVER)	O_2 (%)	O_3 (%)	CO_2 (%)	CO (mg/m^3)	NO (mg/m^3)	SO_2 (mg/m^3)	H_2S (%)	CH_4 (%)
Administration block, library and computer laboratory	**POINT A** Latitude.-4°11'48.4117" Longitude.35°46'31.3815"	20.9	0.00	0.09	2.3	0.008	0.00	0.00	0.00
	POINT B Latitude. -4°11'48.3636" Longitude.35°46'31.5434"	20.9	0.00	0.03	0.00	0.004	0.00	0.00	0.00
	POINT C Latitude.-4°11'42.1407" Longitude35°46'35.1091"	20.9	0.00	0.08	0.01	0.0080	0.00	0.00	0.00
	POINT D Latitude.-4°11'32.6811" Longitude.35°46'29.8765"	20.9	0.00	0.04	1.90	0.0020	0.00	0.00	0.00
	POINT E. Latitude.-4°11'29.0341" Longitude.35°46'28.6014"	20.9	0.00	0.07	2.07	0.0019	0.00	0.00	0.00
	AT THE MIDDLE OF THE FARM Latitude.-4°11'18.7140" Longitude.35°46'16.2941"	20.9	0.00	0.05	2.35	0.0025	0.00	0.00	0.00
	WHO/IFC Guideline	19.5	0.1	-	30	0.2	0.5	20	-
	TBS LIMITS	23.5	0.12	0.5	10	0.12	0.5	-	-

Appendix VII: Dust Level as Particulate Matter in terms of PM10, and PM2.5

SITE NAME	STATION POINTS COORDINATE (BASE GNSS RECEIVER)	Particulate Matter (PM10) µg/m^3 in a 24Hour Period	Particulate Matter (PM2.5) µg/m^3 in a 24Hour Period
Administration block, library and computer laboratory	**POINT A** Latitude.-4°11'48.4117" Longitude.35°46'31.3815"	15.3	14.7
	POINT B Latitude. -4°11'48.3636" Longitude.35°46'31.5434"	12.3	11.3
	POINT C Latitude.-4°11'42.1407" Longitude35°46'35.1091".	19	6
	POINT D Latitude.-4°11'32.6811" Longitude.35°46'29.8765"	8.0	5.7
	POINT E. Latitude.-4°11'29.0341" Longitude.35°46'28.6014	11	7
	AT THE MIDDLE OF THE FARM Latitude.-4°11'18.7140" Longitude.35°46'16.2941"	14	13
	Local standard (TZS:845:2005)	150	75
	International standard (WHO:2005)	50	25

Appendix VIII: Noise Levels

SITE NAME	STATION POINTS COORDINATE (BASE GNSS RECEIVER)	The average noise level in dBA
Administration block, library and computer laboratory	**POINT A** Latitude.-4°11'48.4117" Longitude.35°46'31.3815"	61.1
	POINT B Latitude. -4°11'48.3636" Longitude.35°46'31.5434"	55.5
	POINT C Latitude.-4°11'42.1407" Longitude35°46'35.1091".	56.6
	POINT D Latitude.-4°11'32.6811" Longitude.35°46'29.8765"	53.4
	POINT E. Latitude.-4°11'29.0341" Longitude.35°46'28.6014"	58.2
	AT THE MIDDLE OF THE FARM Latitude.-4°11'18.7140" Longitude.35°46'16.2941"	60.7
WHO guideline		**85**
TBS LIMITS		**85**

Appendix IX: Vibration level recorded at the site

SITE NAME	STATION POINTS COORDINATE (BASE GNSS RECEIVER)	Vibration level measured (mm/s PPV)
Administration block, library and computer laboratory	**POINT A** Latitude.-4°11'48.4117" Longitude.35°46'31.3815"	0.003
	POINT B Latitude. -4°11'48.3636" Longitude.35°46'31.5434"	0.0071
	POINT C Latitude.-4°11'42.1407" Longitude35°46'35.1091".	0.0002
	POINT D Latitude.-4°11'32.6811" Longitude.35°46'29.8765"	0.0009
	POINT E. Latitude.-4°11'29.0341" Longitude.35°46'28.6014	0.0006
	AT THE MIDDLE OF THE FARM Latitude.-4°11'18.7140" Longitude.35°46'16.2941"	0.002
	TBS STANDARD LIMIT	5
	Human Detection level	0.15