

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT

FOR

THE PROPOSED CONSTRUCTION OF LEVEL 6 HOSPITAL

AT

BUNGOMA



GPS Coordinates: 0.7305828 34.6083747

APRIL 2026

Proponent
Ministry of Health
P. O. BOX 30016 - 00100
Nairobi KENYA

DOCUMENT AUTHENTICATION

This Environmental Social Impact Assessment report (ESIA) has been prepared in accordance with the Environmental Management and Coordination Act (EMCA) 1999 and the Environmental Impact Assessment and Audit Regulations 2003 which requires that every development project must have an EIA report prepared for submission to the National Environmental Management Authority (NEMA). We the undersigned, certify that the particulars in this report are correct and righteous to the best of our knowledge.

EIA/EA LEAD EXPERT:

EDGAR EREDI (NEMA/ENVIS/EL/0559)

ECOTECTURE LIMITED FIRM REG.NO 13981

EMAIL: muyesuedgar@gmail.com

P.BOX 60160-00100, NAIROBI, KENYA

[TEL:0724904217](tel:0724904217)

Signature.....



...Date.....7th May 2026.....

PROPONENT:

MINISTRY OF HEALTH

P.O.BOX 25839-0100, NAIROBI.

PROPOSED BUNGOMA COUNTY LEVEL 6 HOSPITAL TEACHING AND REFERRAL

NAME: Dr. Hossan Ajuck.

POSITION: Project Manager

Signature:



Date: 7th May 2026

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EXECUTIVE SUMMARY

The Government of Kenya (GoK) has received financing from the African Development Bank (AfDB) to support the development of healthcare infrastructure aimed at improving access to quality and specialized medical services across the country. The main objective of this initiative is to enhance the availability, accessibility, and efficiency of healthcare services, particularly in underserved regions.

Bungoma County has been identified as one of the priority areas to benefit from this programme through the proposed construction of the Bungoma Level 6 Hospital. The project is designed to upgrade healthcare capacity in the region by providing advanced medical services, reducing referrals to distant national hospitals, and strengthening emergency response and specialized care.

The Project Executing Agency (PEA) will be the Ministry of Health Kenya in collaboration with the Bungoma County Government. These institutions are responsible for the planning, development, and management of healthcare infrastructure and services within their respective jurisdictions. The project will also involve coordination with relevant stakeholders to ensure effective implementation, sustainability, and alignment with national health policies, including the realization of Universal Health Coverage (UHC).

Proposed Project

The Ministry of Health (MoH) of Kenya through African Development Bank is proposing to construct Level 6 Hospital at Kabuchai Sub County, Bungoma. This is intended to improve modern health technologies and systems to improve efficiency, service delivery, and patient outcomes. The project aligns with national development priorities, particularly Kenya's Universal Health Coverage (UHC) agenda under Vision 2030, as well as county and regional strategies aimed at strengthening tertiary healthcare systems, reducing disease burden, and improving health outcomes.

Bungoma Town is strategically located along key regional transport corridors connecting Kenya to Uganda and the greater East African region, making it an important economic and logistical hub. The county has experienced significant population growth, with a population exceeding 1.7 million residents and a large catchment population from surrounding counties. Despite this, access to specialized and super specialized healthcare services remains limited.

Need for the Project

There is a high and growing demand for tertiary and super specialized healthcare services within Bungoma County and the broader Western Kenya region. This demand is driven by population growth, the rising burden of non-communicable diseases (such as cancer, cardiovascular diseases, and diabetes), and inadequate access to advanced healthcare services within the region.

Project Alternatives

The best alternative adopted therefore would be to implement the proposed project taking into consideration all the recommended environmental and social mitigation measures. Alternatives considered in relation to the implementation of the proposed construction of the Bungoma Level 6 Hospital included relocating the project to an alternative site. This option was found not to be viable because the proposed hospital is strategically intended to improve access to healthcare services within Bungoma County and surrounding regions. Relocation would result in increased costs, delays in implementation, and potential challenges in land acquisition, planning approvals, and integration with existing infrastructure.

Another alternative considered was the “No Project Alternative,” which implies maintaining the current status quo. While this option would ensure that the existing environmental and social setting remains undisturbed in the short term, it is the least preferred in the long run from public health, socio-economic, and environmental perspectives. Failure to implement the project would mean continued congestion in existing health facilities, inadequate access to specialized healthcare services, increased referrals to distant hospitals, and persistence of poor health outcomes among the population.

Alternative design and technology options were also analyzed, including different scales of hospital infrastructure and healthcare waste management systems. Stakeholders emphasized the need for modern, efficient, and environmentally friendly solutions, particularly in healthcare waste management, favoring non-burn technologies over conventional incineration due to concerns related to air pollution and climate change.

The best alternative adopted, therefore, is to implement the proposed construction of the Bungoma Level 6 Hospital while incorporating all recommended environmental and social mitigation measures. This approach will ensure improved healthcare service delivery, enhanced public health outcomes, and sustainable environmental management in line with national regulations and international best practices.

Need for Environmental and Social Impact Assessment (ESIA) Study

The environmental and social risks associated with the proposed construction of the Bungoma Level 6 Hospital are classified as substantial, considering the scale of the project, the nature of healthcare operations, and the potential environmental and social impacts. In line with the African Development Bank (AfDB) Operational Safeguards, several Environmental and Social Safeguards (ESS) are applicable to this project, with primary emphasis on environmental and social assessment, labor and working conditions, community health and safety, and pollution prevention and control.

The Environmental Management and Coordination Act (EMCA), 1999 (as amended), administered by the National Environment Management Authority, classifies large-scale infrastructure projects such as referral hospitals as high-risk projects. As such, the proposed hospital in Bungoma County requires a comprehensive Environmental and Social Impact Assessment (ESIA) to identify, evaluate, and mitigate potential impacts.

The Ministry of Health Kenya, as the project proponent, has appointed qualified environmental and social expert Ecotecture consultants to undertake the ESIA. This is to ensure that the implementation of the project complies with AfDB Operational Safeguards, Kenyan legal and regulatory requirements, and relevant environmental and social safeguard instruments.

These safeguard instruments include the Environmental and Social Management Plan (ESMP), Infection Prevention and Control and Waste Management Plan (IPC/WMP), Labour Management Procedures (LMP), Occupational Health and Safety Plans, and the Stakeholder Engagement Plan (SEP). These frameworks are designed to guide the project through all phases—planning, construction, and operation—ensuring that environmental and social risks are effectively managed, minimized, and monitored in line with national and international best practices.

Policy, Legal and Institutional Framework

The administrative and legal framework relevant to the Proposed Project in terms of applicable Policy Framework, Legal Framework, Institutional Framework, Social Statutes including African Development Bank Environment and Social Standards (ESS) and World Bank Group EHS Guidelines and other relevant Good International Industry Practice (GIIP) have been contextualized and presented in this ESIA.

Findings of the ESIA

The potential positive impacts associated with the implementation of the proposed construction of the Bungoma Level 6 Hospital, funded by the African Development Bank (AfDB), include the creation of employment and business opportunities during the construction phase, as well as improved efficiency and effectiveness in delivery of healthcare services during the operation phase. The project will enhance access to specialized medical care in Bungoma County, reduce referrals to distant facilities, and improve overall public health outcomes. Additionally, adoption of modern and environmentally friendly technologies—particularly in healthcare waste management—will minimize pollution and address concerns previously associated with poor waste disposal practices.

Possible adverse impacts during the construction phase of the proposed project include: interference with the physical environment such as clearing of vegetation and land disturbance; increased noise and vibration; air pollution and dust emissions; increased generation of construction waste; risks of accidental spillages of fuels and oils; increased demand for and extraction of construction materials; occupational safety and health (OSH) risks; fire hazards; and potential spread of communicable diseases. Social risks may include labour influx, increased risk of HIV/AIDS and other sexually transmitted infections, gender inequality concerns, possible human rights violations, conflicts and insecurity, sexual exploitation and abuse (SEA), and work-related or community grievances.

During the operation phase, some challenges that may be encountered include Noise from machinery, Dust, waste from construction, pressure in water usage and occupation safety.

Other concerns during operation include occupational health and safety risks to healthcare workers, potential exposure to infectious diseases, and risks associated with handling hazardous medical materials. There may also be increased pressure on local infrastructure such as water supply, sanitation systems, and energy demand.

Overall, while the project presents some environmental and social risks, these can be effectively mitigated through implementation of appropriate Environmental and Social Management Plans (ESMPs), adherence to guidelines by the Ministry of Health Kenya and the National Environment Management Authority, and compliance with AfDB Operational Safeguards. The long-term benefits of improved healthcare access and enhanced public health outcomes significantly outweigh the potential negative impacts.

Project Implementation and Monitoring Arrangements

The responsibility of supervision and monitoring of project environmental and social compliance falls mainly on Bungoma County Government through the County Health Department. Key players in the monitoring of compliance in the project will include inter alia the Public Health Officer, MoH (E&S Specialist, Hospital Administrator); Public Works Engineer (PWE) and Occupational Health and Safety Officer.

Recommendations

The following are recommended going-forward with the project:

- a. Though the anticipated negative environmental and social impacts of the project sub-components are considered moderate, localized and can be easily mitigated, the ESMP needs to be operationalized to ensure sustainable delivery of this project.
- b. In addition, the institutional framework for the delivery of the project needs to be operationalized to effectively follow up compliance as per their mandates.

Conclusion

- i. The proposed project does not pose any serious environmental and social concerns, other than those of a moderate scale that accompany similar projects;
- ii. The positive impacts associated with the implementation and operationalization of the proposed project far outweigh the probable negative ones, which will be adequately checked by following the prescribed environmental and social impact management and monitoring plans;
- iii. As such, as per the above analysis on the aspects of both positive and negative environmental and social impacts of the project development and operations, we, the experts found no significant negative impacts that could pose adverse effects to the extent of barring the proposed project from being implemented assuming the project is designed, constructed, monitored and operated in compliance with all applicable design and ESHS requirements.
- iv. Given that the MoH and the Hospital Management are committed to implementing all the recommendations made in this ESIA report via the developed ESMP/ESMMP and following the other guidelines annexed to ensure optimal operation of the Bungoma level 6 Hospital.

1. INTRODUCTION

1.1 Introduction to the Project

The Government of the Republic of Kenya (GoK) has prioritized the strengthening of the healthcare system to ensure universal access to quality and affordable health services for all citizens by the year 2030. This is in line with the United Nations Sustainable Development Goals (SDG) No. 3 objective of “ensuring healthy lives and promoting well-being for all at all ages.”

The Government of Kenya has further initiated the “Big Four Agenda,” which places Universal Health Coverage (UHC) as a key pillar aimed at improving access to essential healthcare services in line with the Constitution of Kenya 2010. A key benchmark of the Constitution is stipulated under Chapter IV - Bill of Rights, Article 43(1)(a), which states: “Every person has the right to the highest attainable standard of health, which includes the right to healthcare services.”

It is in this respect that the Government of Kenya (GoK) has received financing from the African Development Bank (AfDB) to support the development of healthcare infrastructure across the country. The main objective of this initiative is to improve access, availability, and quality of healthcare services with the aim of:

- Catalyzing efficient healthcare service delivery
- Driving socio-economic growth
- Improving the quality of life of the population
- Reducing disease burden and mortality rates
- Enhancing resilience against public health emergencies and pandemics

To achieve this objective, Bungoma County has been prioritized as one of the regions to benefit from the programme through the proposed construction and operationalization of the Bungoma Level 6 Hospital.

The Project Executing Agency (PEA) will be the Ministry of Health Kenya in collaboration with the Bungoma County Government. These institutions are responsible for policy formulation, development, and management of healthcare services and infrastructure within their respective jurisdictions.

The Ministry of Health Kenya is mandated to provide leadership and policy direction in the health sector, ensuring provision of quality and affordable healthcare services nationwide. The Bungoma County Government, under the devolved system of governance, is responsible for the delivery of health services at the county level, including the management of county health facilities and implementation of health programmes.

As stipulated in the Constitution of Kenya 2010 and relevant health sector policies, once completed, the Bungoma Level 6 Hospital will be managed and operated under a collaborative framework between the National and County governments to ensure efficient service delivery.

The proposed Project is located within Bungoma County and is expected to serve not only the local population but also neighboring counties by providing specialized and referral healthcare services. The facility will play a critical role in decongesting existing hospitals and reducing referrals to national referral facilities.

Additionally, the project will support capacity building for healthcare workers, strengthen health systems, and improve overall service delivery within the region, thereby contributing to the realization of Universal Health Coverage and sustainable development in Kenya.

1.2 Project Background

Access to quality and specialized healthcare services remains a significant challenge in Bungoma County and the wider Western Kenya region. Rapid population growth, changing disease patterns particularly the rise in non-communicable diseases such as cancer, cardiovascular conditions, and diabetes and increasing demand for advanced medical care have placed considerable strain on the existing healthcare system. Despite ongoing investments in the health sector, there remains a critical gap in the availability of tertiary and super specialized healthcare facilities capable of delivering advanced diagnostics, complex surgical procedures, research, and training services.

Bungoma Town, the administrative and economic center of Bungoma County, has experienced steady urbanization and population growth, with the county’s population exceeding 1.7 million residents and an even larger catchment population extending to neighboring counties such as Busia, Kakamega, Trans Nzoia, and parts of Siaya and West Pokot. The town is strategically located within the Western Kenya transport network and serves as a key regional hub, enhancing its suitability for hosting a national-level

referral facility.

However, the absence of a Level 6 Referral Hospital within Bungoma and the wider Western region has resulted in heavy reliance on distant facilities such as Moi Teaching and Referral Hospital in Eldoret and Kenyatta National Hospital in Nairobi. These facilities are often overstretched, leading to congestion, prolonged waiting times, and limited access to timely and specialized care.

Patients requiring advanced and super specialized treatment are frequently forced to travel long distances, incurring high transportation and accommodation costs, experiencing delays in receiving care, and facing increased health risks particularly in emergency and critical cases. Additionally, the lack of local access to high-level healthcare services limits opportunities for medical training, research, and capacity building within the region.

This situation underscores the urgent need for the proposed construction of a Level 6 Referral Hospital in Bungoma. The project aims to enhance access to equitable, efficient, and high-quality healthcare services by decentralizing specialized care, reducing congestion in existing national referral hospitals, and strengthening the overall healthcare system in Western Kenya. The facility will also serve as a center of excellence for medical training, research, and innovation, contributing to improved health outcomes and socio-economic development in the region.

1.3 Problem statement

The proposed establishment of Bungoma level 6 Hospital in Bungoma County arises from the growing demand for accessible, safe and general healthcare services driven by population growth, increased service utilization, and the need to strengthen primary and secondary healthcare delivery within the area. Existing healthcare facilities in and around Bungoma are constrained by limited capacity and inadequate infrastructure, resulting in operational challenges and increased referrals to higher-level hospitals. The proposed development is therefore necessary to enhance service availability, improve environmental health standards, and strengthen continuity of care.

The project is consistent with national health and development policies that prioritize equitable access to quality healthcare services as a foundation for socio-economic development. Kenya Vision 2030, the Constitution of Kenya (2010), the Kenya Health Policy 2014-2030, and the Universal Health Coverage (UHC) Policy 2020-2030 emphasize the need to strengthen healthcare infrastructure and improve maternal and newborn health outcomes. By establishing a modern health facility and providing essential support infrastructure such as reliable water supply, improved sanitation facilities, and enhanced security, the project directly contributes to national objectives of improving quality of care, reducing preventable maternal and neonatal morbidity, and ensuring geographical access to essential health services.

At the local level, the proposed development responds to persistent healthcare infrastructure gaps faced by Bungoma and surrounding communities.

The project also has strong social and economic justification. Improved healthcare infrastructure is expected to lead to better health outcomes, reduced referrals, enhanced patient safety, and improved working conditions for healthcare staff. During the construction phase, the project will generate temporary employment opportunities for local artisans and labourers, contributing to local economic activity. In the long term, strengthened maternal and general healthcare services will support human capital development, productivity, and community wellbeing.

Furthermore, the proposed development will be undertaken on designated project land, ensuring compatibility with surrounding land uses and avoiding involuntary displacement. Potential environmental and social impacts associated with construction and operation have been identified and will be managed through appropriate mitigation measures in compliance with the Environmental Management and Coordination Act (EMCA), public health regulations, occupational safety standards, and Ministry of Health guidelines.

1.4 The proposed solution

The proposed solution entails the construction and operationalization of Bungoma Level 6 Hospital as a modern referral healthcare facility designed to enhance access to quality, specialized, and emergency medical services within Bungoma County and the wider Western region. The project integrates sustainable construction practices and robust environmental management measures to ensure minimal adverse

environmental and social impacts throughout its lifecycle.

The construction phase will involve site preparation, excavation, foundation works, structural development, installation of utilities (water, sewer, stormwater drainage, and energy systems), and development of access roads and ancillary facilities. Environmental considerations during this phase will include soil erosion control, proper management of construction waste, dust and noise suppression, safe disposal of excavated materials, and adherence to occupational health and safety standards for workers and the surrounding community.

To enhance environmental sustainability, the hospital design will incorporate green building principles such as energy-efficient systems (including solar power integration), water conservation measures (rainwater harvesting and low-flow fixtures), and climate-resilient infrastructure. Landscaping and green spaces will also be integrated to improve air quality and promote a healing environment.

During operation, the hospital will implement a comprehensive Environmental and Social Management Plan (ESMP) and Infection Control and Waste Management Plan (ICWMP). These frameworks will address key areas including waste segregation, handling, storage, treatment, and disposal in compliance with national environmental regulations. The hospital is expected to generate significant quantities of healthcare waste due to its Level 6 status and expanded service capacity. However, with proper segregation, only a fraction of this waste will be classified as infectious or hazardous.

To manage this effectively, the project proposes the installation of a modern, environmentally friendly non-burn Medical Waste Treatment Machine (MWTM), such as an autoclave or microwave system. This technology will ensure safe treatment of infectious waste without generating harmful emissions associated with incineration. The system will be adequately sized to handle projected waste volumes and may also serve surrounding healthcare facilities, thereby improving regional waste management capacity.

Additional environmental measures will include proper wastewater treatment through an onsite sewage treatment plant, stormwater management to prevent flooding and contamination, and continuous environmental monitoring to ensure compliance with regulatory standards. Staff training programs on infection prevention, waste management, and environmental sustainability will also be implemented to support effective operations.

The need for this project is justified by the increasing demand for advanced healthcare services, population growth, and the current strain on existing healthcare facilities. The integration of environmentally sustainable construction and operational practices ensures that the Bungoma Level 6 Hospital will not only improve healthcare delivery but also safeguard environmental quality and public health in the region.

1.5 Project Objectives

The overall objective of the proposed Bungoma Level 6 Hospital project is to improve access to quality, affordable, and specialized healthcare services for residents of Bungoma County and the wider Western Kenya region, while ensuring environmental sustainability and public health protection.

Specific Objectives

- To construct a modern, well-equipped Level 6 referral hospital with adequate capacity to provide specialized, emergency, and general healthcare services.
- To reduce patient referrals to distant facilities by enhancing local capacity for advanced diagnostics, treatment, and specialized care.
- To integrate environmentally sustainable design and construction practices, including energy efficiency, water conservation, and climate-resilient infrastructure.
- To establish an efficient and compliant healthcare waste management system, including waste segregation, handling, treatment, and disposal using environmentally friendly technologies.
- To minimize environmental and social impacts associated with construction and operation through the implementation of an Environmental and Social Management Plan (ESMP).
- To improve infection prevention and control measures within the hospital through proper infrastructure design and operational protocols.
- To enhance emergency preparedness and response capacity within the region.
- To create employment opportunities and stimulate local economic development during both construction and operational phases of the project.

- To support the realization of Universal Health Coverage (UHC) by increasing access to equitable and quality healthcare services.
- To strengthen regional healthcare systems by serving as a referral center for surrounding counties and supporting lower-level health facilities.

1.6 ESIA Scope

The goal is to identify the potential environmental and social impacts associated with the proposed project and recommend appropriate environmental and social mitigation measures for integration in all phases of the project cycle.

1.7 Terms of Reference (ToRs)

The primary objective of the consultancy is to undertake a comprehensive ESIA study for the proposed construction of Bungoma Level 6 Hospital in order to determine the technical, environmental, social, and economic viability of the project.

The Terms of Reference (ToRs) for this ESIA study are:

- To assess the technical feasibility of constructing the proposed Level 6 Hospital, including site suitability, design requirements, infrastructure needs (water, energy, sewerage, and access roads), and construction methods;
- To evaluate the environmental and social viability of the project, including identification of potential environmental and social risks and opportunities associated with the construction and operation of the hospital;
- i. To analyze the economic and financial feasibility of the project, including capital investment costs, operational and maintenance costs, potential funding sources, and long-term sustainability;
- ii. To assess demand and service need, including population projections, disease burden, healthcare gaps, and the hospital's role as a referral facility within Bungoma County and neighboring regions;
- iii. To undertake project alternatives analysis, including site alternatives, design options, technology choices, and the "no project" scenario;
- iv. To evaluate environmental, health, and safety considerations, including proposed mitigation measures to ensure compliance with national regulations and international best practices throughout the project lifecycle;
- v. To assess institutional and operational capacity, including staffing requirements, management structures, and governance frameworks necessary for effective hospital operation;
- vi. To conduct stakeholder consultations with key stakeholders, including government agencies, local communities, and healthcare providers, to gather input and enhance project acceptability;
- vii. To develop a preliminary Environmental and Social Management Framework (ESMF) outlining mitigation measures, monitoring mechanisms, roles and responsibilities, and implementation schedules;
- viii. To prepare an ESIA study report that provides clear recommendations on the viability of the project and guidance for subsequent design, financing, construction, and operation phases Justification for Preparation of Safeguards Instruments

Under the provisions of the EMCA, 1999, amended in 2015, the EMCA (Environmental Impact Assessment and Environmental Audit) Regulations of 2003 (Revised in 2016) it is a requirement that an ESIA is undertaken prior to construction and commissioning of a medical waste treatment equipment. The Legal Notice Number 31 read together with Legal Notice Number 32 of 2019 classifies Construction of level 6 hospital as–High Risk Projects that need to be subjected to –Comprehensive ESIA prior implementation. The proposed project is prepared under the African Development Bank, whereby the Environmental and Social Risk associated with the proposed project was initially classified as –High considering that Kenya has limited experience in managing infectious medical wastes; however, however, this has since been downgraded to substantial based on overall improvement of project performance.

Carrying out this ESIA aims to inform the process of decision making (whether to implement the project or not, and under what conditions) by identifying and addressing the potentially significant environmental, social and economic risks of projects as well to promote sustainable development by ensuring that the project does not undermine critical resource and ecological functions or the well-being and livelihood of the communities who depend on them around the project site

1.8 Definition and Purpose of the ESIA

ESIA is a process for predicting and assessing the potential environmental and social impacts of a proposed project, evaluating alternatives and designing appropriate mitigation, management and monitoring measures (Business Biodiversity and Offsets Programme (BBOP) 2012)

1.9 Methodology of ESIA

For the purpose of the assessment and preparation of the ESIA Study, the following approaches and methodologies were employed:

- Desktop studies which involved review and analysis of literature (project documents, design layout and specifications, legislative framework) for acquisition of secondary data, environmental and Social Screening Form)
- Environmental and social screening was carried out following the requirements, in which the project is identified as among those requiring ESIA. The Second Schedule of EMCA 1999 as amended in 2015 classifies the investment as a High-Risk project. In addition, under the World Bank ESF, the Environmental and Social Risk associated with the proposed project is currently classified as – Substantial.
- Environmental scoping that provided the key environmental and social issues to be investigated in relation to implementation of the proposed project;
- Physical inspection of the site characteristics and environmental status of surrounding areas;
- Consultative public participation (CPP) to get input into the project activities/risks/impacts and proposed mitigation measures. The CPP was done as per the Stakeholder Engagement Plan (SEP) guidelines and in conformity with the provisions of the Constitution of Kenya (2010), the EMCA (2015), the EMCA (Environmental Impact Assessment and Environmental Audit) Regulations and the Legal Notice Number 31 and 32 of 2019, that all demand for public engagement prior to the implementation of a project such as the one being assessed;
- Identification of potential environment and social impacts and preparation of an ESMP; and reporting.

1.9.1 Consultation and Public Participation

CPP was done with involvement of stakeholders within the Project Area of Influence (PAI). This promotes open governance whereby participants are granted equal opportunity to voice their opinion/views with regard to the proposed project for better planning. It further presents an opportunity to raise awareness concerning the proposed sub-projects.

This was done as per the SEP guidelines and in conformity with the provisions of the Constitution of Kenya (2010), the EMCA (2015), the EMCA (Environmental Impact Assessment and Environmental Audit) Regulations and the Legal Notice Number 31 and 32 of 2019, that all demand for public engagement prior the implementation of a project such as the one being assessed.

2. PROJECT DESCRIPTION

2.1 Introduction

The proposed project entails the Construction of Bungoma Level 6 Referral Hospital including development of modern healthcare infrastructure, installation of medical equipment, and operationalization of comprehensive healthcare services.

The project will include:

- Site preparation and civil works
- Construction of hospital buildings and support infrastructure
- Installation of medical equipment and ICT systems
- Staffing and commissioning of healthcare services

The proposed Construction of Bungoma Level 6 Referral Hospital will be designed as a comprehensive, modern healthcare facility with an estimated capacity of 1800 beds, capable of delivering both general and specialized medical services. The hospital will be organized into functional units to ensure efficiency, patient safety, and quality service delivery.

2.2 Proposed Location of the Project

The proposed site for the Proposed Bungoma Level VI Hospital is located in Kabuchai sub-county, Mukuyuni ward, Sichei village within Kabuchai constituency, Bungoma County. The land is currently undeveloped and predominantly open, with agricultural activities being the main previous use under lease arrangements with the County Government of Bungoma. The greenfield site sits next to Chwele Kenya medical training college (KMTC). The gps coordinates 0.728608,34.579199

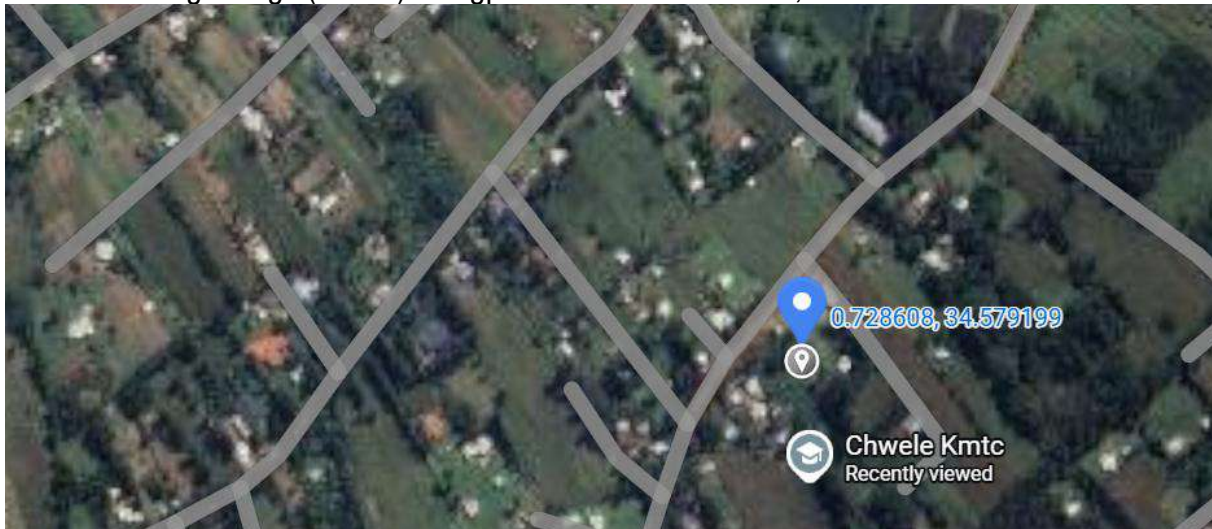


Figure 2: Location and Direction Map (Source: www.earth.google.com).

2.2.1 Site and Land Ownership

The proposed site for the proposed Level 6 Teaching and referral hospital was identified as a green field site, comprising of three parcels in different stages of ownership, these include:

- 1.Existing approx. 22 Acres land parcel, comprising 13 acres currently occupied by Sichei KMTC and 9 acres green field.
- 2.An additional 11 acres, currently under acquisition by the county, with the survey and beacon points taken by the time of collecting this data.
- 3.An extra 13 Acres earmarked for acquisition for future expansion.

While the area is not covered within an approved Physical Development Plan (PDP), the site sits within an institutional zone, with the neighboring institutions including the Sichei KMTC, and the Sichei FYM comprehensive school in the vicinity of the site.

Land ownership documentation, including cadastral survey records and title registration for land under acquisition, is under processing. Authentication of survey records is undertaken by the Director of Surveys under the Ministry of Lands, Public Works, Housing and Urban Development, followed by registration and issuance of title by the Chief Land Registrar. The acquired land shall be administered by the County Government of Bungoma.

At the time of assessment, it was established that there are no encumbrances, disputes, or adverse legal claims affecting the site reported.

2.3 Project Description

2.3.1 Project Design Considerations

The proposed project entails the Construction of Bungoma Level 6 Referral Hospital including development of modern healthcare infrastructure, installation of medical equipment, and operationalization of comprehensive healthcare services.

The project will include:

- Site preparation and civil works
- Construction of hospital buildings and support infrastructure
- Installation of medical equipment and ICT systems
- Staffing and commissioning of healthcare services

The proposed Construction of Bungoma Level 6 Referral Hospital will be designed as a comprehensive, modern healthcare facility with an estimated capacity of 1800 beds, capable of delivering both general and specialized medical services. The hospital will be organized into functional units to ensure efficiency, patient safety, and quality service delivery.

Accident and Emergency (A&E) Unit

The Accident and Emergency Unit will serve as the primary entry point for emergency cases and will operate on a 24-hour basis. It will be strategically located for easy access and rapid response.

Key components will include:

- Triage area for patient prioritization
- Resuscitation rooms equipped with life-support systems
- Emergency treatment bays
- Minor and major procedure rooms
- Ambulance bay and patient reception area
- Emergency pharmacy and diagnostic support

This unit will significantly enhance the hospital's capacity to handle trauma cases, accidents, and acute medical emergencies, reducing mortality associated with delayed care.

Intensive Care Unit (ICU) and High Dependency Unit (HDU)

The ICU and HDU will provide critical care services for patients with life-threatening conditions requiring continuous monitoring and advanced medical support.

Features will include:

- Fully equipped ICU beds with ventilators and monitoring systems
- HDU beds for patients requiring close observation but less intensive care
- Central monitoring stations
- Isolation rooms for infectious cases
- Backup power systems to ensure uninterrupted care

This facility will address the current gap in critical care services within the region.

Maternity and Neonatal Care Unit

This unit will provide comprehensive maternal and child health services, contributing to reduced maternal and infant mortality rates.

Components will include:

- Antenatal and postnatal care wards
- Labor and delivery suites
- Operating theatre for caesarean sections

- Neonatal Intensive Care Unit (NICU)
- Kangaroo mother care (KMC) rooms
- Immunization and child welfare clinics

The unit will support safe deliveries and specialized neonatal care.

Surgical Theatres (General and Specialized)

The hospital will include modern surgical theatres designed to handle a wide range of procedures.

Facilities will include:

- Fully equipped general operating theatres
- Specialized theatres (e.g., obstetric, orthopedic surgeries)
- Pre-operative and post-operative recovery rooms
- Sterilization unit (CSSD - Central Sterile Services Department)

These theatres will enable the hospital to perform both elective and emergency surgical procedures, reducing referrals to distant hospitals.

Diagnostic Centre

The diagnostic unit will provide comprehensive laboratory and imaging services to support accurate diagnosis and treatment.

Key services will include:

- Clinical laboratory (hematology, microbiology, biochemistry)
- Radiology services (X-ray, ultrasound)
- Advanced imaging (CT scan)
- Pathology services

The integration of diagnostic services will improve efficiency and quality of care.

Outpatient and Inpatient Departments

Outpatient Department (OPD):

- Consultation rooms for various specialties
- Waiting areas and reception
- Minor procedure rooms

Inpatient Department (IPD):

- General wards (male, female, pediatric)
- Private and semi-private wards
- Isolation wards for infectious diseases

These departments will ensure continuity of care from diagnosis to treatment and recovery.

Pharmacy and Support Services

The hospital will include a fully functional pharmacy and essential support services to ensure smooth operations.

Pharmacy services:

- Drug storage and dispensing units
- Cold chain systems for vaccines
- Inventory management systems
- Support services:
- Laundry and linen services
- Kitchen and catering services
- Waste management systems (including medical waste handling)
- Mortuary services

Administrative and Staff Facilities

Efficient hospital management will be supported through well-designed administrative and staff facilities.

These will include:

- Administrative offices.
- Medical records department.
- Staff rooms and changing areas.
- Training and conference rooms.
- Staff accommodation.

These facilities will enhance institutional capacity, coordination, and service delivery efficiency.

2.3.2 Project Activities

i) Planning and Design Phase

This forms the foundation of the project and is purely preparatory stage for the proposed of Bungoma level 6 hospital. Generally, this phase involves minimal physical engagements at the project site apart from boardroom consultations/ meetings, site visits, desktop works and awareness meetings and stakeholders and public consultations and participation. The specific activities during this phase entail the design and drawing of the specific architectural plans for the proposed construction of the hospital, applying for approvals from the Bungoma County Government section, getting into collaborative agreements with key stakeholders, undertaking the ESIA and seeking NEMA approvals.

ii) Construction Phase

The activities at this stage of the proposed construction of level 6 facility will include recruitment of construction staff by the construction company; transportation of building materials; storage of the construction material; civil works and installation of utility services.

iii) Operation Phase

During the operation phase, the facility will undertake routine maintenance activities including cleaning, regular inspection of medical equipment, infrastructure servicing, and timely repairs to ensure continuous and safe service delivery. Skilled personnel will be employed across various departments, including doctors, nurses, technicians, and support staff, who will operate hospital systems and handle minor repairs and maintenance tasks.

The hospital will provide a wide range of healthcare services including outpatient and inpatient care, surgical procedures, maternal and child health services, emergency and trauma care, laboratory diagnostics, radiology services, and specialized treatments such as dialysis and intensive care. In addition, the facility will handle healthcare waste generated from its operations, including infectious waste, sharps, pathological waste, pharmaceutical waste, and general waste.

Waste management will be conducted in accordance with national regulations such as the Kenya Waste Management Regulations 2024 and the guidelines provided by the Ministry of Health Kenya. Proper segregation of waste at source will be emphasized to minimize health and environmental risks. Hazardous waste such as chemical, radiological, and pharmaceutical waste will be handled and disposed of using specialized and approved methods in line with best practices and regulatory requirements.

Failure to properly segregate healthcare waste may result in contamination risks to healthcare workers, patients, and the environment. Therefore, strict infection prevention and control measures will be implemented, including staff training, provision of protective equipment, and adherence to established waste handling protocols. Additionally, wastewater generated from hospital operations will be treated appropriately before discharge to prevent environmental pollution.

Overall, the operation phase of the Bungoma Level 6 Hospital will focus on delivering sustainable healthcare services while ensuring safety, regulatory compliance, and environmental protection.

3. ENVIRONMENTAL AND BASELINE INFORMATION

Baseline information establishes the current biophysical conditions against which the performance of environmental and social strategies will be evaluated. The expected environmental, social and economic gains from the proposed project must be weighed in light of possible negative impacts on the surrounding environment and social fabric and tenable measures that have been proposed to mitigate against such impacts. The baseline information for this project was gathered from both secondary sources and the field visits undertaken.

3.1 Physiographic and Natural Conditions

The County covers a land area of 3024 km², of which 618 km² is gazetted forest reserve (the Mt. Elgon Forest reserve), 61 km² is non-gazetted forest, and 50.7 km² is Mt. Elgon National Park. The altitude of the County ranges from 1,200m to 4,321m above sea level. The County's major physical features include Mt. Elgon; Chetambe, Sang'alo, and Kabuchai hills; the Nzoia, Kuywa, Sosio, Kibisi and Sio-Malaba/Malakisi rivers; and waterfalls like Nabuyole, Malakisi and Teremi. (Bungoma County Integrated Development Plan, 2023-2027). The County's topography is scenic and is home to tourist attraction sites, for instance, Mount Elgon forms one of Kenya's five water towers. Wind energy can be tapped in the hills and mountain top. However, the steep terrain in the highland areas of the County constrains infrastructural expansion. There is soil erosion during heavy rains from Mount Elgon slopes and other hilly areas. This is caused by human encroachment and poor farming practices on these fragile sites. The low-lying areas such as Bumula experience flooding from run-off from the hilly areas

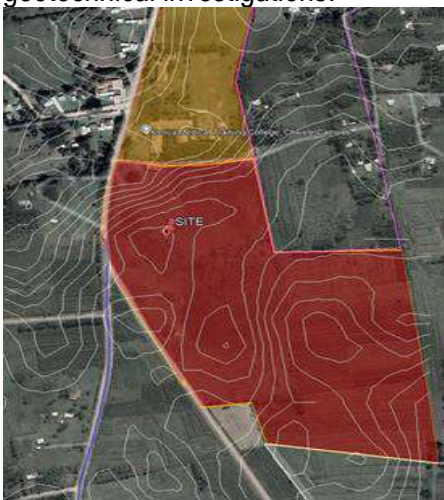
3.1.1 Climatic Conditions

Bungoma County, located in western Kenya near the Ugandan border is influenced by the Lake Victoria basin and Mount Elgon, features a tropical savanna climate (Köppen classification: Aw). This results in warm, stable temperatures year-round with minimal extremes, moderated by elevations of approximately 1,200-1,500 meters above sea level.

The county experiences bimodal rainfall patterns driven by monsoon winds: the long rains from March to May (often extending into June) and the short rains from October to December. Dry periods typically occur from June to September and January to February. Annual precipitation averages between 1,100 and 1,400 mm, supporting agriculture but also posing risks of localized flooding. Thunderstorms are common during wet seasons, contributing to convective rainfall. Overall, the climate is favorable for human habitation and development, though seasonal variations require adaptation in infrastructure design, particularly for drainage and ventilation.

3.1.2 Soils

The soils observed during the site visit were inferred to be sandy loams, which is unique to the site. The appropriate structural systems for the proposed Level VI hospital shall be subject to confirmation through geotechnical investigations.



3.2 Biological Environment

3.2.1 Flora and Fauna

Land surrounding the site is largely undeveloped or under low-intensity use. There is limited presence of

industrial or high-density commercial activities in the immediate vicinity.

The site is visually open, with views toward adjacent open land under agricultural use. No incompatible land uses were identified adjacent to the site at the time of assessment.



3.3 Social and Economic Baseline

3.3.1 Demography

The proposed site for the Bungoma Level VI Hospital is located in Sichei Village, Mukuyuni Ward, Kabuchai Sub-County, Kabuchai Constituency, Bungoma County. According to the 2019 Kenya Population and Housing Census by the Kenya National Bureau of Statistics, Bungoma County has a population of approximately 1,670,570 people, with about 358,796 households and an average household size of approximately 4.7 persons. The county has a relatively high population density of approximately 552 persons per square kilometer, reflecting predominantly rural settlement patterns with expanding peri-urban growth around Bungoma town and major transport corridors.

Kabuchai Sub-County, within which the site is situated, is characterized by mixed rural and peri-urban settlement patterns. Livelihoods are largely based on small-scale agriculture, livestock keeping, informal trade, boda boda transport services, and employment within public institutions such as schools and health facilities. The proximity of the site to existing educational and training institutions, including Sichei KMTC and FYM Comprehensive School, contributes to localized population concentration during peak hours and reinforces the area's role as an emerging institutional and service node.

Settlement patterns around the proposed site are generally low to medium density, characterized by individual homesteads, agricultural plots, and linear development along access roads. Population concentration increases toward Bungoma town and Kanduyi centre, where commercial and administrative activities are more established. There are no known high-density informal settlements immediately adjacent to the site, and surrounding land use appears stable and long-standing.

Community interactions and local stakeholder sentiments indicate broad support for the proposed Level VI Hospital. Anticipated benefits include improved access to specialized healthcare services within Bungoma County, employment opportunities during construction and operation phases, stimulation of local economic activity, and enhancement of supporting infrastructure such as roads and utilities. At this stage, no significant concerns regarding displacement, land ownership disputes, or inter-community tensions have been identified.

3.3.2 Water Supply

The hospital does not do rain water harvesting but has water storage tanks of at least 130,000liters in total. The project site is situated in Mukuyuni ward, Kabuchai Sub County (Bungoma Central). Water Supply Project serving the area is a twin water supply;

1 Kibichori Bokoli

2 Nakayonjo

The latter, Nakayonjo WS was constructed in 2011 to augment Kibichori Bokoli Water Supply constructed earlier in 1978. The two projects share the same abstraction point on river Kuywa/Terem at Kapsambu, while the treatment plant is in Kapkateny, approximately 2kms from intake works at Kapsambu.

1.For efficiency in water supply consistently; the facility is required to have its own water storage of at least 200m³ constructed. This should be factored in the implementation budget for facility construction. The constructed tank can be used as a storage and feeder tank to other user points within the facility.

2.The facility should have a borehole as a back-up source of water; in the event the supply is stopped due to some failure, damage or routine system maintenance to ensure continual supply of water.

A thorough and comprehensive survey is recommended while prospecting for Ground water since the area has minimum groundwater potential; basing on the available data from nearby boreholes. The nearest borehole within the KMTC, Chwele Campus has a low yield.

3.3.3 Power Supply and Distribution

The project site adjacent location is currently served by a 100 kVA, 33 kV/415 V pole-mounted transformer supplying the adjacent KMTC institution and surrounding community. This confirms the presence of medium-voltage grid infrastructure at the site and provides an existing interface point for electricity supply.

Preliminary energy demand modeling for a Level VI hospital indicates that this infrastructure was designed for lower institutional loads and will require upgrading to support the hospital's operational requirements, including advanced diagnostic equipment, centralized HVAC systems, sterilization facilities, and 24-hour hospital services. Energy consumption within the hospital is distributed across major end-use categories, as summarized below.

No.	Time Period	Estimated Load	Key Activities and Equipment Drivers
1	00:00 - 05:00	Base Load (Low)	ICUs, Renal Unit, Emergency Department (A&E), security lighting, vaccine refrigeration
2	05:00 - 08:00	Ramping Up	Kitchen and laundry operations, ward lighting, commencement of sterilization (CSSD) cycles
3	08:00 - 13:00	Peak Demand	Full surgical theaters, Radiology (MRI/CT), laboratory equipment, administrative offices
4	13:00 - 14:00	Slight Dip	Reduced elective clinical and office activity during lunch hour
5	14:00 - 17:00	Secondary Peak	Continuation of surgeries, diagnostic services, outpatient clinics
6	17:00 - 21:00	Evening Shift	Extensive lighting (corridors and external), evening ward rounds, heating systems
7	21:00 - 00:00	Ramping Down	Shift change, shutdown of non-essential lighting and administrative equipment

3.3.4 Transport

The site is located approximately 18.9 km from Kanduyi town, which sits strategically along the A104 highway corridor and serves as a key access node within Bungoma County. Kanduyi provides linkage between Bungoma town and the wider regional road network, supporting movement of people, goods, and services within the county and beyond.

Access to the site is achieved through two primary road corridors. The first route is via the Chwele-Kimilili-Kamukuywa (C42) road, from which the site is accessed approximately 2 km from the main road junction. The second route is via the Kanduyi-Kimilili Road, with the site located approximately 5.8 km

from the junction along this corridor. These routes provide flexibility in accessing the site from different directions within Bungoma County and support both local and regional connectivity.

The site is directly linked to these corridors by an access road that is currently in murram condition. Plans are underway for the county government of Bungoma to upgrade the access road to bitumen standards to support construction traffic and long-term operational demands associated with the proposed development.

Kanduyi -Kimili road conditions



Murram road access



3.3.5 Communication

The whole Bungoma is served by multiple mobile network operators, providing 3G and 4G/LTE and 5G (Within Bungoma CBD) coverage for voice and data services.

Mobile broadband currently supports general communication needs and offers a degree of connectivity redundancy within the area.

While mobile broadband contributes to overall connectivity availability, it is not suitable as a primary broadband solution for a Level VI hospital due to inherent limitations related to latency, capacity, and service stability for mission-critical health systems.

3.3.6 Local Land Uses

Land surrounding the site is largely undeveloped or under low-intensity use. There is limited presence of industrial or high-density commercial activities in the immediate vicinity. The proposed Bungoma Level VI Hospital site is located within a predominantly low-density, rural-neighborhood around Sichei village, characterized by a mixed-use landscape comprising residential settlements, educational institutions, and agricultural land. The immediate surroundings include low-rise residential homes, and expansive open land under active farming, confirming the site as a Greenfield location with minimal prior disturbance. Educational facilities in the vicinity contribute to localized pedestrian and vehicular activity during peak hours.

The site is visually open, with views toward adjacent open land under agricultural use. No incompatible land uses were identified adjacent to the site at the time of assessment.

3.3.7 Grievance Redress Mechanism

The contractor will employ a Community Liaison Officer and or sociologist who will be responsible for collating written complaints and co-coordinating responses to all complaints. Both verbal and written complaints are to be entered into a Grievance Complaint Log as addressed

When receiving a complaint all employees shall refer the complainant to the Community Liaison Officer (CLO) or the resident engineer. The person receiving a complaint shall ensure that the Grievance Complaint Log is completed. The form shall then be forwarded to the Community Liaison Officer who will assign it a number. The Community Liaison Officer shall ensure that all actions are made to close out the complaint.

Information on proposed corrective action sent to complainant (if appropriate); the date the complaint was closed out; and Date response sent to complainant. All complaints shall be responded to in writing, though a verbal response will be provided as well if this is more appropriate in the circumstances (e.g., where the complainant cannot read). All complaints must be responded to within two weeks of being received, even if the response is just a summary of what is planned and when it is likely to be implemented. Further correspondence should be given once the complaint is closed out.

The CLO through the contractor will be responsible for providing CRVWWDA and LVNWWDA with a monthly report detailing the level of complaints and any outstanding issues to be addressed. Monthly reports will include analysis of the type of complaints, levels of complaints and action taken to reduce complaints. The CLO shall file all documentation related to complaints in a file in his office.

4. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

Development of infrastructure Projects such as the Proposed Construction of level 6 Bungoma hospital Project is guided by several laws, by-laws, regulations, Acts of Parliament as well as policy documents. This objective of this section is to assess the existing Policies and Legislative Framework, Economic Tools and Enforcement Mechanisms for the Management of Infrastructure Projects at different stages.

4.1 Policy Framework

Table 1: Policy Framework

#	Policy	Provision	Relevancy
1.	National Environmental Policy, 2013	The policy promotes the use of Environment assessment tools such as ESIA/EA necessary to ensure environmental quality and resource productivity on long term basis. Further it calls for management in use of hazardous and toxic chemicals as well as radiation regulations.	The Policy requires that projects which are likely to have significant environmental and social impacts to undergo ESIA in order to establish sound environmental and social management practices.
2.	The National Occupational Safety and Health Policy, 2012	The Policy seeks to reduce the number of work-related accidents and diseases, and equitably provide compensation and rehabilitation to those injured at work or who contract occupational diseases.	The policy requires the provision of appropriate and adequate PPE, avail First Aid services on site as well as development of Safety and Health Emergency Contacts at the site and workplace registration.
3.	Kenya Health Policy 2012 – 2030	The Policy aim is to achieve this goal through supporting provision of equitable, affordable and quality health and related services at the highest attainable standards and minimize exposure to health risk factors to all Kenyans.	The Policy calls for the provision and distribution of healthcare services to all people that is commensurate with that of a middle-income country without segregation.
4.	National Plan on Healthcare Waste Management 2016-2021	Provides a viable technical and management options as well as a roadmap for the domestication of the National HCWM Strategic Plan 2015 -2020. Strategic planning for HCWM covers waste handling, storage, transportation, treatment, and disposal, capacity-building and awareness creation. This is to prevent, reduce and mitigate the likely risks of transmission of infections.	The policy requires the hospital to have best waste management practice
5.	National Guidelines for the Management of COVID -19 Wastes, 2020	The Environmental Management and Coordination (Waste Management) Regulations of 2024, has clear provisions on the management of Biomedical waste. The provisions relate to segregation of biomedical waste, securing, packaging, storage and disposal of all generated medical waste within the country, to ensure proper waste disposal the main methods used are microwaving, incineration, shredding, and chemical disinfection.	The GIIP best practices in HCWM specifically wastes generated from the cancer center and treatment centers.

4.2 Regulatory Framework

Table 2: Regulatory Framework

#	Legislation	Provision	Relevancy
1.	The Constitution of Kenya, 2010	Article 42 of the Bill of Rights of the Kenyan Constitution provides that _every Kenyan has the right to a clean and healthy environment, which includes the right to have the environment protected for the benefit of present and future generations through legislative and other measures. Part 2 of Chapter 5 is dedicated to Environment and Natural Resources where Article 69 in Part 2 provides that the state shall; (v) Establish systems of environmental impact assessment, environmental audit and monitoring of the environment; In addition, Article 43 (1 provides that every person has the right to the highest attainable standard of health, which includes the right to healthcare services, including reproductive health care, accessible and adequate housing, and to reasonable standards of sanitation and to clean and safe water in adequate quantities.	The project should ensure compliance with the Constitution on issues of environmental protection and safeguard of public health through provision of more comprehensive health services to every citizen.
2.	National Infection Prevention and Control Guidelines for Healthcare Services, 2015	Provides comprehensive standardized information regarding the prevention and control of transmissible infections. It acts as a central reference for all healthcare facilities and healthcare workers. The guideline is intended to provide administrators and Healthcare Workers with the necessary information and procedures to implement Infection Prevention Control (IPC) core	The project shall be reference for all healthcare facilities and workers with the necessary information and procedures of managing, handling and disposal of healthcare wastes to avoid infections. Considered installation of microwave will help reduce

		activities.	the volume of wastes generated at the hospital.
3.	Environmental Management and Coordination Act, 1999 (Amendments 2015)	The Act empowers the NEMA to exercise general supervision and co-ordination over all matters relating to the environment and to be the principal instrument of government in the implementation of all policies related to the environment. The Second Schedule to the Act specifies the projects for which an ESIA or environmental audit must be carried out.	The project shall comply with the provisions of this regulation on issues related to environmental assessment, solid waste and waste water management, emissions, noise and vibrations among others.
4.	Environmental (Impact Assessment & Audit) Regulations, 2019	This regulation provides guidelines to govern the conduct of Environmental Assessment and Audits in Kenya. Section 3 indicates that the regulations apply to policies, plans, programs, projects and activities specified in Part IV, Part V and 2nd schedule of the Act	Environmental Assessment is being carried out for the project and appropriate mitigation measures shall be proposed commensurate with the scale of the project E&S aspects.
5.	Environmental Management & Coordination (Waste Management) Regulations, 2024	The regulations provide guidelines on waste management (handling, storage, transportation, treatment and disposal) of various waste streams including: domestic waste, industrial waste, hazardous and toxic waste, pesticides and toxic substances, biomedical wastes; and radioactive wastes.	The project will generate highly infectious waste (15-25%) and hence expected to comply with the requirements of this regulation in management of HCW. The proponent must observe this law strictly in the operation of the hospital waste by applying for the necessary licenses to operate the waste treatment equipment.
6.	Environmental Management & Coordination (Air quality) Regulations, 2014	Provide for the prevention, control and abatement of air pollution to ensure clean and healthy ambient air. Part II sections 5 to 9 prohibits compromise of the ambient air quality levels specified in the first and third schedules of the regulations. Section 11 of the regulations prohibits offensive emissions into controlled areas (national parks, schools, hospitals, residential areas and populated urban centers) Section 33 prohibits any person from causing/allowing emissions of particulate matter during demolition of structures while section 34 prohibits any person from allowing stock piling of material to cause effect to ambient air quality. Further, section 35 prohibits operators of the incinerators to cause emission of air pollutants as set out in second schedule in excess of mass emission rates indicated in third schedule of the regulations.	The project contractor during the construction will abide with sections 33 & 35 of these regulations. Management of the Hospital will apply for the license to own and operate a waste treatment facility.
7.	Environmental Management and Coordination (Water Quality) Regulations, 2024	The regulation provides guidelines for the protection of sources of water for domestic use, water for industrial use and effluent discharge as well as water for agricultural use. Part II section 6 prohibits any person from discharging effluent from sewerage works, industry or other point sources into aquatic environment, abstract ground water near lakes, rivers, streams, springs and wells that is likely to have any adverse impact on quality and quantity of the water without an environmental impact assessment license.	The proponent will ensure that the appropriate measures to prevent pollution of underground water and surface water sources are implemented in all project phases such as channeling all waste water effluent from the waste treatment area to the septic tank system and undertake periodic monitoring of the waste effluent from the HCF to ensure compliance with the acceptable standards. Necessary water supply or waste water discharge permits, and compliance with such permits shall also be sought,
8.	Environmental Management & Coordination (Noise and Excessive Vibration Pollution) Regulations, 2009	Part II section 3(l) of these Regulations states that: no person shall make or cause to be made any loud, unreasonable, unnecessary or unusual noise which annoys, disturbs, injures or endangers the comfort, repose, health or safety of others and the environment and section 3(2) states that in determining whether noise is loud, unreasonable, unnecessary or unusual depends on; (i) the time of the day, (ii) proximity to residential area (iii) whether the noise is recurrent/constant, level/intensity of noise.	The contractor will be required to take into consideration monitoring of the noise and vibrations levels within the hospital during construction period to ensure compliance.
9.	Public Health Act (Cap 242) revised 2012	Part III of the Public Health Act provides for the protection of human health through prevention and guarding against introduction of infectious diseases into Kenya from outside, to promote public health and prevention, limitation or suppression of infectious, communicable or preventable disease within Kenya.	The proponent will adhere to the act.
10.	The Health Act, 2017	It formalizes collaboration between national and county governments, obliges Kenya to address the health needs of vulnerable groups, and mandates the provision of emergency and specialized care. In a progressive step, the law also ensures the provision of free maternity care, vaccinations for children under	The collaboration between MoH and the County Government of Bungoma in the implementation of project is within the provisions of this Act. All interests of the aged, women, children and PLWD should be observed in the implementation

		age five, and workplace breastfeeding facilities. It further seeks to safeguard access to healthcare services for vulnerable groups by making clear the state's obligation to provide these for women, the aged, persons with disabilities, children, youth, and members of minority or marginalized communities. The Act also requires that the national health system ensures that measures for managing environmental risk factors to curtail occurrence and distribution of diseases are put in place and implemented.	and operation the project via the provision of PLWD friendly facilities, protecting the welfare of children, respecting women and the aged. The project management, the benefiting facility and the contractor shall ensure the provisions of the Act relating to the promotion and advancement of public and environmental health are adhered to during the project implementation.
11.	Physical and Land Use Planning Act, 2019	The County Governments are empowered under Section 29 of the Act to prohibit or control the use and development of land and buildings in the interest of proper and orderly development of an area.	The collaboration between MoH and the County Government of Bungoma is required to seek developments approval from the County Physical planning departments for the civil works (construction activities).
12.	Work Injuries Benefits Act, 2007	This Act provides for compensation to employees for work related injuries and diseases contracted in the course of their employment and for connected purposes.	The contractor shall comply with part II of this act with regard to obligations of the employer including Compensation for temporary total or partial disablement, treatment as well as provision of first Aid Services to workers at all times.
13.	Occupational Safety and Health Act, 2007	This is an Act of Parliament to provide for the safety, health and welfare of all workers and all persons lawfully present at workplaces. It applies to all workplaces where any person is at work, whether temporarily or permanently	All Safety and Health measures should be in place to ensure workers and the neighboring communities are not exposed to Safety and Health risks during project construction, operational and decommissioning phase namely: provision of appropriate PPE, training of workers, appointing health and safety committees and safety advisor where there are civil works, keeping incident logs and reporting to DOSHS and WB, registering work place and screening off active construction site.
14.	HIV/AIDs Prevention and Control Act, 2006	Part 11 Section 7 requires HIV and AIDs education in work places; specifically, provision of basic information and instruction on HIV/AIDS prevention and control	During the construction phase, the contractor to a large extent is expected to create awareness to the employees and local community on issues related to HIV/AIDs.
15.	The County Government Act No. 17 of 2012	Part II of the Act empowers the county governments to be in charge of planning by coordinating and ensuring integrated planning within the county.	The collaboration between MoH and the County Government of Bungoma is required to seek development approval from the County Physical planning departments for the civil works (construction and installation activities).
16.	National Construction Authority Act, 2011	The National Construction Authority Act 2011 seeks to regulate the construction industry and coordinate its development	Management of the Hospital (MoH) shall liaise with NCA to ensure licensed contractors are the ones to be awarded contract to install the microwave at the hospital.
17.	The Employment Act 2007	The Act stipulates that no person shall use or assist any other person, in using forced labour. The Act further states that it shall be the duty of the Cabinet Secretary/ Minister, Labour officer, the National Labour Court and the subordinate labour courts to; Promote equality of opportunity in employment in order to eliminate discrimination in employment Promote and guarantee equality of opportunity for a person who, is a migrant worker or a member of the family of the migrant worker lawfully within Kenya. Other clauses include the right and Duties of employment including the basic minimum and condition of contract including the Maternity Leave.	The proponent, contractor and the employees to be engaged in the proposed project stands guided on labour relations that at times have negative and detrimental impacts on project implementation if poorly handled.
18.	The Disability Act 2010	An Act to provide for the establishment of a National Council for Disability, its composition, functions and administration for the promotion of the rights of persons with disabilities set out in international conventions and legal instruments, the Constitution and other laws, and for other connected matters.	People with disability interest including access to the healthcare facilities will be catered for including the ramp, abolition and WASH facilities, as well as access to employment and healthcare services.

4.3 Compliance to Applicable Kenya EHS Regulatory Requirements

While noting that the HCF is not fully compliant to applicable Kenya EHS regulatory requirements on issues related to medical waste treatment and disposal, there is need to ensure that the HCF adheres to the applicable EHS regulatory requirements as laid out in the EMCA Waste Management Regulations, 2024, Occupational Safety and Health Act of 2007 together with the EHS requirements of the subsidiary legislation on Workers Injury and Benefits Act. Important also to note is that the Proponent will be required to ensure that this ESIA and ESMP forms part of the contract document and the main contractor prepares a contractor specific Environment and social management plan and includes adequate measures to promote safety and health of workers and community during the construction phase of the proposed project. The contractor is expected to handle issues of occupational health and safety and community health and safety especially during construction phase of the project. The proponent will handle the same issues during the operational phase.

4.3.1 Specific EHS Permits/Authorizations/Reporting Needed for the Construction activities at Bungoma

- ESIA License from NEMA to construct and install the medical waste treatment microwave.
- MoH to liaise with NCA to ensure licensed contractors are the ones to be awarded the contract to construct the level 6 hospital
- Need to acquire the necessary workers 'insurance as per the provisions of the WIBA, 2007
- Development approval/permits from the Bungoma County Physical planning departments for the civil works (construction and renovation activities).
- Provision of appropriate PPE, training of workers, appointing health and safety committees and safety advisor, registering work place with DOSHS and screening off active construction / renovation.
- Report any accident that has occurred to the Directorate of Occupational Health and Safety Service within 24 hours from the date of occurrence or receiving notice.

4.3.2 Specific EHS Permits/Authorizations/Reporting Needed for the Operation of the hospital

- Apply for the licenses to own and operate the MWTM from NEMA
- Need to acquire the necessary insurance of healthcare waste handlers as per the provisions of the WIBA, 2007
- Bungoma hospital management to report any accident to the Directorate of Occupational Health and Safety Service within 24hrs from the date of occurrence or receiving notice.

4.4 Institutional Framework

Some of the institutions relevant to the proposed project are presented on Table 3.3 below:

Table 3: Institutional Framework

#	Institution	Provision	Relevancy
1.	National Environment Management Authority (NEMA)	The responsibility of NEMA is to supervise and co-ordinate all matters relating to the environment and to be principal instrument of government in the implementation of policies relating to the environment.	The construction of level 6 Hospital is a major construction activity and thus it shall undertake the ESIA and the report submitted to NEMA for review and issuance of License. NEMA also has the mandate for solid waste management, including hazardous waste and medical waste management as well as the licensing of waste handling activities.
2.	Ministry of Health	The proposed project is under the MoH and it shall be the primary role of the Ministry to monitor and measure the progress of implementation of the social and environmental safeguards.	The Ministry, through the hospital management shall prepare periodic reports, which shall be submitted to the African Development Bank for review and further action shall be taken.
3.	County Government	The County Government has powers to control or prohibit all businesses, factories and other activities including the proposed project which may become a source of danger, discomfort or annoyance to the neighborhood and to prescribe conditions subject to which such activities shall be carried.	County Government shall supervise the project roll out through the technical team to ensure no activity being implemented may become a source of danger, discomfort or annoyance to the neighborhood.
4.	Directorate of Occupational	The mandate of the Directorate is to ensure compliance with the provisions of the Occupational	The Hospital shall need approval from DOSHS. Note that the hospital is already in use and it has the occupation /

#	Institution	Provision	Relevancy
	Safety and Health Services (DOSHS)	safety and health Act 2007 and promote safety and health of workers.	workplace certificate for the premises.
5.	The National Construction Authority (NCA)	The NCA is responsible for issuing permits to construction sites and advising the government of Kenya on construction.	The Management of the Hospital shall liaise with NCA to ensure licensed contractors are the ones to be awarded contract to construct the hospital.
6.	The African Development Bank	The World in line with the Project Environment and Social Commitment Plan and other environment and social instruments prepared for the project including the ESMF, LMP and SEP, is duty bound to undertake periodic monitoring of the project implementation.	The Bank's implementation support mission shall be periodically done to ascertain the level of implementation of the project.

4.5 Relevant Social Statutes

The key social aspects of this project include inclusion, including the GBV/SHEA prevention, stakeholder engagement and feedback mechanism including GRM.

Table 4: Relevant Social Statutes

Social element	Legal/Regulatory framework	Institutional framework	Relevance
Gender-based violence and SEA	- Sexual Offences Act, 2006 - Penal Code - HIV/AIDS Prevention and Control Act 2000 - Protection Against Domestic Violence Act, 2015 - Prohibition of Genital Mutilation Act, 2011 - National Gender and Equality Act, 2011	- The State Departments of Gender in the Ministry of Public Service and Gender - National Gender and Equality Commission (NGEC)	- Abuse by workers (both foreign and national), normalization of GBV and lack of interest, stigma leads to non-reporting, poverty forces women/girls to engage in transactional sex - Lack of access to services to address SEA, stigma, corruption.
Public participation and consultations	- CoK, 2010, Article 10(2) a, b - County Public Participation Guidelines³	- Every state actor is required to apply the national values and principles whenever they formulate, implement or interpret laws and policies - A complementary right is the right to access information in Article 354	- The project will put measures in place to consult communities on the project. The use of alternative means of consultation such as call-in will to be used to engage communities - CoK 2010 confers all the sovereign power to the people of Kenya and it is exercised through delegated power by the State actors⁵
Grievance redress mechanism	- Employment Act in Part XII - Employment and Labour Relations Court Act - Labour Relations Act	- State Department of Labor (MLSP) - National Employment Authority - Kenya National Labor Board - Wages Council(s) - Directorate of Occupational Safety and Health Services - National Council for Occupational Safety and Health (NACOSH) - Commission for the Administration of Justice - Ministry of Health	- There is need have an elaborate GRM that will allow the PMT to manage grievances related to the project especially for the workers. However, in case the complainant is dissatisfied with the decision made, he/she can make use of any of other institutions with a mandate to address disputes.

4.6 African Development Bank Environmental and Social Standards

The African Development Bank will help the Bank to manage the risks and impacts of the projects, and improve their environmental and social performance, through a risk and outcomes-based approach. This will ensure that proposed programs are environmentally and socially sustainable, and thus improve decision-making. The relevant Environment and Social Safeguards to the project are outlined below:

Table 5: African Development Bank Environmental and Social Standards relevant to the project

#	ESSs	Relevant		Reason
		No	Yes	
1.	Assessment and Management of Environmental and Social Risks and Impacts		X	Environmental Assessment (EA) is used in the AFDB to identify, avoid, and mitigate the potential and actual negative environmental impacts associated with Bank lending operations. Environmental and Social risk associated with the project was initially classified as –High risk since Kenya has limited experience in managing the highly infectious medical waste; however, this has since been downgraded to –Substantial based on the overall project performance improvement. The level 6 hospital construction during construction and operation phase may cause significant environmental, social, Safety and Health risks due to the dangerous nature of the wastes especially Biomedical wastes. Healthcare associated infections due to inadequate adherence to OSH standards can lead to illness and death among healthcare workers. Environmentally and socially sound healthcare will require adequate provisions for minimization of OSH risks, proper management of hazardous waste and sharps, use of appropriate disinfectants and appropriate chemical and infectious substance handling.
2.	Labor and Working Conditions		X	Most activities supported by the project will be conducted by health workers, i.e., civil servants employed by County Government and Government of Kenya as well as the contracted workers for the Contractor. All workers will have orientation on and sign a code of conduct on expected behavior and safety standards including GBV/SHEA risks. In line with AFDB as well as the Kenyan law, the use of child labour and forced labour is prohibited in the project, both for construction and operation of healthcare facilities. The project will also ensure a basic, responsive GRM to allow workers to quickly inform their immediate management of labor issues, such as a lack of PPE and unreasonable overtime as well as to the national grievance hotline to the MoH.
3.	Resource Efficiency and Pollution Prevention and Management		X	Electricity from the National Grid will be connected to the Proposed site. It is advisable that electrical meter for the hospital facility will be installed for purposes of monitoring energy consumption, The handling of the medical and chemical waste (including waste water, reagents, infected materials, etc.) can have significant impact on environment and human health. Waste that may be generated from the hospital may include chemicals and other bio-hazardous materials, and other waste from hospital including of sharps, used in diagnosis and treatment. This ESIA has been prepared and identified the possible ways to prevent and mitigate the potential pollution to the environment (increased water use and liquid waste among others) see Table 9 (ESMP).
4.	Community Health and Safety		X	In line with safety provisions, it is equally important to ensure the safety of communities and Medical wastes and general waste from the hospital has a high potential of carrying micro-organisms that can infect the community at large if they are not properly disposed of. The disposal of masks and gloves at the hospital will need to be managed adequately to avoid secondary contaminations. The project will ensure the avoidance of any form of Sexual Exploitation and all forms of Abuse by relying on the WHO Code of Ethics and Professional conduct for all workers as well as the provision of gender-sensitive infrastructure such as segregated toilets and enough light. In as much as possible, measures should be put in place to have separate wash, meal, relaxation areas and sanitary conveniences for men and women. The project will also ensure via the above noted provisions, including stakeholder engagement, that the hospital is operated effectively without aggravating potential conflicts between host communities and patients.

4.7 World Bank Guidelines General Environment Health and Safety Guidelines

The World Bank Group (WBG) general EHS guidelines contain performance levels and measures for development of projects and are considered to be achievable in facilities at reasonable costs by existing technology.

a) Environmental (EHS Guidelines - Waste Management)

These guidelines apply to both non-hazardous and hazardous waste. They advocate for waste management planning where waste should be characterized according to: composition, source, types, and generation rates. This is essential for the hospital in relation to operation of the microwave project since there is a need to segregate the different categories of waste generated at the overall hospital level. These guidelines call for implementation of a waste management hierarchy that comprises prevention, recycling/reuse; treatment and disposal. The guidelines require segregation of conventional waste from hazardous waste streams and if generation of hazardous waste cannot be avoided; its management should focus on prevention of harm to health, safety, and environment, according to the following principles:

- i) Understanding potential impacts and risks associated with management of any generated hazardous waste during its complete life-cycle;
- ii) Ensuring that people handling, treating and disposing of hazardous waste are reputable and legitimate enterprises, licensed by the relevant regulatory agencies and following good international industry practice; and
- iii) Ensuring compliance with applicable regulations.

The hospital generates various quantities of hazardous and non- hazardous waste and the guidelines recommend monitoring activities to include:

- i. Regular visual inspection of all waste storage, collection and storage areas for evidence of accidental releases and to verify that wastes are properly labelled and stored;
- ii. Regular audits of waste segregation and collection practices;
- iii. Tracking of waste generation trends by type and amount of waste generated, preferably by facility departments; and
- iv. Keeping manifests or other records that document the amount of waste generated and its destination.

b) EHS guidelines- Air emissions and Ambient air quality),

These guidelines are meant for all types of projects with –significant emissions, sources of air emissions, and potential for significant impacts to ambient air quality to prevent or minimize impacts by ensuring that emissions do not result in pollutant concentrations that reach or exceed relevant ambient quality guidelines and standards. They require the application of national legislated standards, or in their absence, the current WHO Air Quality Guidelines, or other internationally recognized sources. Kenya, currently has Environmental Management and Coordination (Air Quality) Regulations, 2024 applicable to this project. In this project, there will be fugitive air emissions, which are expected especially during construction and operation phases of the project. These guidelines are useful as they give control and monitoring measures.

c) WBG EHS Guidelines: Noise

This section addresses impacts of noise beyond the property boundary of the facilities. These guidelines are applicable during construction phase whereby construction equipment and activities are expected to emit noise. Kenyan regulation, EMCA (Noise and Excessive Vibration) Pollution Control Regulations, 2009 give permissible levels during construction works. The proponent therefore has adequate guidance to ensure noise levels are maintained as low as reasonably practicable.

d) WBG EHS Guidelines: Occupational Health and safety

These guidelines guide employers and supervisors in fulfilling their obligation to implement all reasonable precautions to protect the health and safety of workers. The guidelines provide guidance and examples of reasonable precautions to implement in managing principal risks to occupational health and safety. Although the focus is placed on the operational phase of projects, much of the guidance also applies to construction and decommissioning activities. The guidelines also describe how facility operation workplace design should be undertaken to prevent occupational health and safety risks and hazards.

e) EHS Guidelines -Construction and Decommissioning.

These provide additional and specific guidance on prevention and control of community health and safety impacts that may occur during new project development, at the end of the project life-cycle, or due to construction or modification of existing project facilities.

4.8 World Bank Group EHS Guidelines - Healthcare Facilities

The EHS Guidelines for Health Care Facilities include information relevant to the management of EHS issues associated with health care facilities (HCF). It provides guidelines for basic infrastructure elements / activities of healthcare facilities to improve on health of patients, prevent transmission of infections among patients and staff and control impacts of environment health and safety including maintenance of sanitary conditions and use of appropriate disinfection techniques, portable water, clean air and nosocomial infection control

4.9 Guidelines on Prevention of GBV/SEA

The WB Guidance Note on GBV/SEA in civil works describes GBV/SEA as an umbrella term for any harmful act that is perpetrated against a person's will and that is based on socially ascribed gender differences.⁶ Consequently, it can occur in a variety of ways, including through the infliction of physical, mental, and sexual harm or suffering threats of such acts, as well as coercion and other deprivations of liberty, such as early or forced marriage, economic abuse and denial of resources, services and opportunities, trafficking and abduction for exploitation, or Intimate Partner Violence (IPV) perpetrated by a former or current partner. Most importantly, the WB applies 'GBV/SEA' as an umbrella term that includes sexual exploitation and abuse (SEA). The Bank defines SEA as any actual or attempted abuse of position of vulnerability, differential power or trust, for sexual purposes, including, but not limited to, profiting monetarily, socially or politically from the sexual exploitation of another. In Bank financed operations/projects, sexual exploitation occurs when access to or benefit from a Bank financed goods, works, non-consulting services or consulting services is used to extract sexual gain. Sexual abuse is defined as the actual or threatened physical intrusion of a sexual nature, whether by force or under unequal or coercive conditions. Sexual harassment (SH) is understood as unwelcome sexual advances, requests for sexual favors, and other unwanted verbal or physical conduct of a sexual nature. SH differs from SEA in that it occurs between personnel/staff working on the project, and not between staff and project beneficiaries or communities. The distinction between SEA and SH is important so that agency policies and staff training can include specific instructions on the procedures to report on both. Both women and men can experience SH. The WB Guidance Note defines four key areas of GBV/SEA risks:

1. SEA - exploitation of a vulnerable position, use of differential power for sexual purpose; actual or threatened sexual physical intrusion;
2. Workplace sexual harassment - unwanted sexual advances; requests for sexual favors, sexual physical contact;
3. Human trafficking - sexual slavery, coerced transactional sex, illegal transnational people movement; and
4. Non-SEA - physical assault, psychological or physical abuse, denial of resources, opportunities or services

Guidelines for Limiting Exposure to Electromagnetic Fields (100 KHZ To 300 GHZ)

The guidelines are for the protection of humans exposed to radiofrequency electromagnetic fields (EMFs) in the range 100 kHz to 300 GHz (hereafter –radiofrequency). They aim to provide a high level of protection for all people against substantiated adverse health effects from exposures to both short and long-term, continuous and discontinuous radiofrequency EMFs. Radiofrequency electromagnetic fields (EMFs) are used to enable a number of modern devices. However, EMFs at sufficiently high-power levels can adversely affect health. In addition to nerve stimulation, radiofrequency EMFs can affect the body via two primary biological effects: changes in the permeability of membranes and temperature rise.

Exposure to EMFs can induce electric fields within the body, which for frequencies up to 10 MHz can stimulate nerves. The effect of this stimulation varies as a function of frequency, and it is typically reported as a –tingling sensation for frequencies around 100 kHz. As frequency increases, heating effects predominate and the likelihood of nerve stimulation decreases; at 10 MHz the effect of the electric field is typically described as –warmth. When (low frequency) EMFs are pulsed, the power is distributed across a range of frequencies, which can include radiofrequency EMFs. If the pulse is sufficiently intense and brief, exposure to the resultant EMFs may cause cell membranes to become permeable, which in turn can lead to other cellular changes. Radiofrequency EMFs can also generate heat in the body and it is important that this heat is kept to a safe level. The Tables below provide the basic restrictions for occupational and public exposure to EMFs for different durations. MoH will require to periodically monitor the exposure levels for the MWTM (whose frequency is 2.450MHz) against these restrictions.

Table 6: Basic restrictions for electromagnetic field exposure from 100kHz to 300GHz, for averaging intervals ≥ 6 min

Exposure scenario	Frequency range	Whole-body average SAR (W kg ⁻¹)	Local Head/ Torso SAR (W kg ⁻¹)	Local Limb SAR (W kg ⁻¹)	Local S _{ab} (Wm ⁻²)
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Occupational	100 kHz to 6 GHz	0.4	10	20	NA
General public	100 kHz to 6 GHz	0.08	2	4	NA

Table 7: Basic restrictions for electromagnetic field exposure from 100kHz to 300GHz, for integrating intervals >0 to <6 min

Exposure scenario	Frequency range	Local Head /Torso SA (kJ kg ⁻¹)	Local Limb SA (kJ kg ⁻¹)	Local U _{ab} (kJ m ⁻²)
Occupational	100 kHz to 400 MHz	NA	NA	NA
General public	100 kHz to 400 MHz	NA	NA	NA

Table 8: Basic restrictions for electromagnetic field exposure from 100 kHz to 10 MHz, for peak spatial values

Exposure scenario	Frequency range	Induced electric field; E _{ind} (V m ⁻¹)
Occupational	100 kHz to 10 MHz	$2.70 \times 10^{-4} f$
General public	100 kHz to 10 MHz	$1.35 \times 10^{-4} f$

5. KEY STAKEHOLDER CONSULTATION AND PUBLIC PARTICIPATION

5.1 Introduction

Stakeholder consultations and public participation are geared towards informed decision making by all involved or likely to be affected in a project thereby promoting sustainability. The African World Bank, the Constitution of Kenya (2010), Legal Notice No. 101-the Environmental (Environmental and Social Impact Assessment and Audit) Regulations, 2003 (Revised in 2016), the Legal Notice Number 31 and 32 of 2019 and the EMCA (2015) require that the views of persons who may be affected by the project be sought during the process of conducting an ESIA.

The MoH of Kenya has developed a SEP whose overall objective is to define a program for stakeholder engagement, including public information disclosure and consultation, throughout the project cycle. The SEP outlines the ways in which the project team will communicate with stakeholders and includes a mechanism by which people can raise concerns, provide feedback, or make complaints about the project and any activities related to the project. The ministry through SEP recognizes that the involvement of the local population is essential to the success of the proposed project in order to ensure smooth collaboration between project staff, stakeholders and local communities, and to minimize and mitigate environmental and social risks related to the proposed project activities. In the context of infectious diseases, broad, culturally appropriate and adapted awareness raising activities are particularly important to properly sensitize the communities to the risks related to infectious diseases.

6. ANALYSIS OF PROJECT ALTERNATIVES

6.1 Introduction

This section analyzes the possible project alternatives for the proposed construction of the Bungoma Level 6 Hospital in Bungoma County. The analysis considers key aspects including project site, design and scale, construction technology, and healthcare waste management options. The selected alternatives are expected to be economically feasible, socially acceptable, and environmentally sustainable with minimal adverse Environmental, Social, Health and Safety (ESHS) impacts and minimal implementation delays.

6.2 The Alternatives

6.2.1 Relocation Option

Relocating the proposed Bungoma Level 6 Hospital to an alternative site is not considered viable. The current site has been strategically selected based on accessibility, land availability, proximity to the target population, and integration with existing infrastructure. Relocation would necessitate acquisition of new land, compensation processes, redesign, and additional approvals, leading to increased costs and significant project delays.

Additionally, the selected site allows for proper planning of hospital infrastructure, including isolation areas, waste management zones, and future expansion. The site can also be adequately secured and zoned to separate medical, administrative, and support functions, making it the most appropriate location for the project.

6.2.2 Zero or No Project Alternative

The No Project alternative implies maintaining the current healthcare situation without constructing the Bungoma Level 6 Hospital. This option is not desirable as it would perpetuate existing challenges such as inadequate healthcare infrastructure, congestion in existing facilities, limited access to specialized services, and increased referrals to distant hospitals.

From a public health, socio-economic, and environmental perspective, the No Project option is the least preferred, as it would hinder progress toward Universal Health Coverage and compromise the quality of healthcare services in the region.

6.2.3 Project Size

The proposed hospital is designed as a Level 6 referral facility with adequate capacity to serve Bungoma County and neighboring regions. During stakeholder consultations, there were proposals to increase the scale of the facility to accommodate future population growth and rising demand for specialized services.

The selected design balances current healthcare needs with future expansion possibilities, ensuring optimal utilization of resources while maintaining efficiency in service delivery. The hospital will include specialized units such as intensive care, maternity, surgical theatres, laboratories, and diagnostic services.

6.3 Conclusion

The proposed construction of the Bungoma Level 6 Hospital represents the most suitable alternative for addressing healthcare challenges in Bungoma County. Key alternatives considered included relocation, the no-project option, project scale, and healthcare waste management technologies.

The selected site and design provide optimal accessibility, cost-effectiveness, and room for expansion while minimizing environmental and social impacts. Non-burn healthcare waste treatment technologies are preferred due to their environmental sustainability and compliance with global best practices.

Overall, the project aligns with national development goals and environmental standards, and its implementation will significantly improve healthcare delivery while ensuring protection of public health and the environment.

Therefore, opting for microwaving against the other waste treatment options is well within the best environmental practices.

7. POTENTIAL IMPACTS IDENTIFICATION AND MITIGATION MEASURES

This chapter identifies and predicts the potential impacts on different environmental and social aspects arising from planning and design phase / pre-construction activities, construction activities and activities during the operation and decommission phases of the proposed project.

7.1 Potential Impacts During Planning and Design Phase

7.1.1 Potential Positive Impacts During Planning and Design Phase

i. Employment Opportunities

With the planning and design phase of the proposed project, there will be employment opportunities especially for professionals such as engineers, surveyors, environmentalists, health and safety, public health experts and sociologists among others. Those employed will improve their living standards from the fees they will be paid for their services.

ii. Creation of Awareness

During the planning and design phase of the proposed project, a lot of awareness has been done through consultations on different aspects of the project. Awareness creation improves project acceptance in its planning, implementation and operations phases as well as promote project sustainability.

7.1.2 Potential Negative Impacts During Planning and Design Phase

The proponent mobilised a team of project design experts from the Ministry of Public Works and Environmental and Social consultants to undertake the surveys and other studies required for the project. There are potential risks of poor siting of the facilities or non-adherence to the MoH guidelines and specifications on the design of the infrastructure. However, the planning and design studies do not allow for any large-scale destruction and disturbance of vegetation and soils. Mobilization of the skilled experts and the process of consultations with key stakeholders however lead to heightened expectations and speculations and especially on employment opportunities for the surrounding community members.

Proposed Mitigation Measures:

It is envisaged that there will be minimal to no negative impacts during the planning and design stage. However, the design team, Environment and Social experts shall take the necessary measures to mitigate risks through;

- Liaising with the relevant Technical Government department in development of the designs,
- Proper siting of the waste treatment facility and ensuring harmony with the hospital layout and planning,
- Ensure all the legally required permits such as getting the designs approved, acquiring the ESIA License are obtained prior to undertaking the construction activities,
- The contractor bidding documents should contain clauses on Environmental Social Health and Safety (ESHS) requirements to guide the contractor on the key requirements,
- Project Management Team (PMT) specifically the Environmental and Social Expert should ensure the design requirements are adhered too in the planning stage.

7.2 Potential Impacts during Construction Phase

7.2.1 Potential Positive Impacts during Construction Phase

- **Employment opportunities** during construction. The project will generate short-term employment opportunities during the construction phase for skilled and unskilled workers, including masons, electricians, plumbers, technicians, and casual labourers. Indirect employment opportunities will also arise for suppliers of construction materials, transport services, food vendors, and other service providers. These activities will contribute to local income generation, skills development, and stimulation of the local economy.

- **Provision of ready market** for construction materials such as sand, ballast and cement that will be sourced from local market, this will lead to injection of money into the local economy thereby supporting economic growth within Bungoma County.

- **Gender Equity and Social Inclusion**

The project will significantly benefit women and girls by improving access to quality reproductive, maternal, and postnatal healthcare services. Adequate antenatal and postnatal facilities, privacy in wards, and specialized neonatal care reduce health risks associated with pregnancy and childbirth. Improved access to maternal healthcare services promotes gender equity by addressing the specific health needs of women, while inclusive facility design ensures access for persons with disabilities, the elderly, and other vulnerable groups.

- **Social Cohesion and Community Wellbeing**

The proposed construction of level 6 hospital will enhance community confidence in public healthcare services. A functional and well-equipped facility serves as a key community asset, strengthening social cohesion and collective wellbeing. Improved healthcare availability reduces household healthcare burdens, enhances community resilience, and supports social stability by ensuring timely access to essential medical services.

- **Improved Sanitation and Environmental Protection**

Sanitation will improve through proper management of wastewater, medical waste, and effluent generated during and after construction. The project will incorporate appropriate waste treatment systems in line with guidelines from the Ministry of Health Kenya to ensure safe handling and disposal. This will reduce risks of environmental contamination and disease transmission, protect soil and water resources, and promote a cleaner and healthier environment. Proper drainage and effluent management systems will further prevent pollution of surface and groundwater resources.

- **Improved Access to Healthcare Services**

The construction of the Bungoma Level 6 Hospital will result in significant positive social impacts by enhancing the region's healthcare infrastructure. The improved facility will increase capacity for both specialized and general healthcare services, reduce congestion in existing hospitals, and improve patient flow. Enhanced service delivery will reduce referrals to distant national hospitals and improve accessibility to quality healthcare for communities within Bungoma and neighboring regions.

7.2.2 Potential Negative Impacts during Project Construction Phase

The following negative impacts are associated with the proposed project.

i. Interference with the Physical Setting

The proposed project will involve site clearance and excavation works that will interfere with the physical setting.

Proposed Mitigation Measures:

- The contractor should ensure that there is minimal disturbance to the topography of the area;
- The project designs should be such that they do not interfere with local drainage or change the topography or introduce physical changes that are not in harmony with the physical setting of the project area. Any topographical change needed should be done to avoid soil erosion or storm water drainage issues;
- The hospital and associated structures should be aesthetically acceptable to blend in with the surrounding environment and other hospital facilities;
- Restoration shall be undertaken to ensure that the original setting is as much as possible retained;
- The proponent should observe measures stipulated in the ESMP for sustainable project implementation.

ii. Improper Management of Construction Related Solid Wastes

Solid wastes to be generated during construction include papers used for packing, plastics, scrap wood, glass cullet, metal and debris. Dumping around the site will interfere with the aesthetic status and has a direct effect on the surrounding community. Disposal of the same solid wastes off-site could also be a social inconvenience if done in the wrong places. The off-site effects could be vector or pest breeding, pollution of physical components of the environment including water resources, soil/land, invasion of scavengers and informal recycling by communities.

Proposed Mitigation Measures

- The contractor shall prepare, as part of the C-ESMP, a waste management plan to be implemented at the site (storage, provision of bins, site clean-up, bin clean-out schedule, etc.) before commencement of any works, which should promote waste minimization and recycling.
- The contractor shall be responsible for handling and disposal of all construction and related waste.
- Encourage efficient use of materials to as much as possible avoid and minimize waste production.
- Ensure wastes are recycled / reused before opting to dispose of.
- Designate temporal waste / garbage holding areas at site.
- Use of waste receptacles that encourage segregation to hold waste on site before its collection.
- Minimize production of waste by using of durable, long-lasting materials that shall not need to be replaced often.
- Engage NEMA registered waste contractor to dispose of all wastes and have waste destruction certificate and waste transfer notes.
- Waste disposal by open burning shall not be permitted and signage should be erected directing banning such practice, and.
- Fine earth materials (sand and murram) should be covered using tarpaulins during haulage to prevent spillage, dust and particulate matter emission.

iii. Management and Disposal of Spoil Material

Construction works will involve earthworks and excavation which could lead to generation of spoil. If not well managed and finally disposed, it could become an eyesore creating hiding and breeding sites for rodents and other undesired creatures. This can be mitigated by observing the following measures:

- Contractor shall prepare waste management plan as part of the C-ESMP to be implemented at the site (storage, provision of bins, site clean-up, bin clean-out schedule, etc.) before commencement of any works, which should promote waste minimization and recycling
- Maximizing the re-use of excavated materials in the works as far as feasible to ensure that no permanent spoil dumps are created,
- Spoil dumping should be away from any water resources to avoid possible water pollution from

siltation/sedimentation,

- Extra loads of murrum should be used to make good of any worn-out sections of the walkways/ driveways within the hospital; this should be done in conjunction with the hospital management;
- Besides, the local community should be given the first priority while disposing the extra loads of murrum; this should be done at a consideration (reasonable fee) or better still donated in case of public use; and
- Properly disposing off the spoil in an area identified by the contractor and approved by the confirmed land owners, hospital management as well as by NEMA; care should be taken to avoid degrading land that could otherwise be used for productive purposes.

iv. Noise and Vibration Generation

Construction activities of the proposed project will most likely result in noise emissions and vibrations as a result of the machines that will be used, e.g., excavation equipment and construction vehicles delivering materials to site. Noise could also be generated by construction workers causing nuisance and/or adverse effects on patients at the HCF.

Proposed Mitigation measures

The contractor shall put in place several measures that will mitigate noise pollution during the construction phase to include the following:

- Contractor to coordinate with HF administration on acceptable days and times for work, and in particular related to any specific works that may cause more significant noise and/or for extended periods within a day.
- Noise suppression measures must be applied to all construction equipment such as installing portable barriers to shield compressors and other small stationary equipment, cover engine of generators where necessary;
- Use of quiet equipment (i.e., equipment designed with noise control elements such as those that utilize electricity as opposed to those which utilize diesel or petrol) and ensure all the equipment used on site are well maintained and in good working condition,
- Limit pickup trucks and other small equipment to a minimum idling time and observe a common-sense approach to vehicle use, and encourage workers to shut off vehicle engines whenever possible;
- Provision of appropriate PPE (hearing protection - ear muffs/plugs) to the workers and any other person visiting the construction and renovation site especially in work areas with heightened noise levels,
- Limit construction activities to during day time, between 8am and 5pm;
- Consider manual labour-based construction methodologies; and
- Construction workers should be made aware of the sensitive nature of the work place and advised to limit verbal and other forms of noise.

v. Air pollution through Dust and Emissions

Dust could most likely be emitted during excavation activities and from construction material stock piles and related earthworks which could potentially lead to air-borne particulate matter pollution. Gaseous emissions are also expected from the construction vehicles. This is likely to affect site workers and the neighbouring community members, in extreme situations leading to respiratory problems.

Proposed Mitigation measures

To mitigate on these, the following measures are proposed:

- Minimize the number of motorized vehicles on use and limit vehicle speeds to a maximum of 10Km/Hr around and within the project site;
- Make use of predetermined routes when bringing in construction material or in transportation of solid waste generated;
- Periodically service all the equipment and machinery and ensure in good working condition to minimize emissions;
- The contractor should wet all active construction areas as and when necessary to reduce dust; and
- Cover the stock piled construction materials and spoil generated from the excavations,
- Provide appropriate PPE (dust mask) to workers and enforce on use,
- When transporting construction material, ensure vehicles are covered with tarpaulins in order to minimize on dust emissions; and
- Burning of solid waste material should not be permitted at project site.

vi. Vegetation Loss

The project site has very little vegetation cover, most of them planted tree species. It is expected that the proposed structures will fit in the cleared section; hence no vegetation clearance is expected. To contain the potential negative impacts related to vegetation loss, the following mitigation measures are recommended:

- The contractor will ensure proper demarcation of the project area to be affected by the construction works;
- Strict control of construction vehicles to ensure that they operate only within the area to be disturbed by access routes and other works;
- None of the trees close to the site should be felled: and
- Make efforts of planting more trees once the construction process is over around the project site.

vii. Accidental Spills and Leakages

The main chemicals to be held on the site during the construction phase are likely to be; fuel lubricants, oil and grease (from construction vehicles/ equipment), paints and pest control substances to be applied on the wooden structures and foundations. Spillage of such compounds are likely to have an immediate impact upon the local water resources (storm water) and consequently on the terrestrial and aquatic flora and fauna. This can be checked by observing the following measures:

- Temporal storage on site of all hazardous /toxic substance will be in a bunded storage area to ensure containment of spillages/leakages;
- Ensure proper storage of chemicals / materials, and if possible, in secondary containers just in case of accidental puncturing, and away from storm water runways or exposure to weather elements such rain;
- Ensure proper handling, storage and disposal of waste oil, lubricants, oil filters and fuel from vehicles. Hazardous waste would be contained and properly disposed by licensed hazardous waste handler;
- The contractor should provide appropriate PPE (medical mask, gowns, heavy duty gloves, eye protection and boots) to workers on site;
- During the course of the construction works, temporary drainage channels should be constructed to encourage dispersal of meteoric waters;
- Contractor to have spill prevention and response procedure including all necessary equipment and that of workers are trained; and
- Contractor to immediately report to HCF and Project PIU any spills or accidental releases

viii. Extraction and Use of Construction Materials

Construction materials that will be used include; timber, building blocks, ballast, sand and cement are extracted from quarries and other natural resource banks such as rivers and land or obtained from hardware shops. To check on the impacts of material extraction and use, the following is recommended:

- The contractors should source construction materials such as sand and ballast from registered and NEMA licensed quarry and sand mining firms/groups and/or from suppliers of such firms are expected to apply acceptable environmentally friendly processes in their operations,
- The contractor should adhere to the procurement plan and only order for what will be required through accurate budgeting and estimation of actual construction material requirements;
- The proponent should only approve final payment to the contractor after confirmation that all excavated sites have been backfilled and other degraded areas have been restored.

ix. Increased Water Demand

To check on its sustainable use, the following mitigation measures have been proposed:

- The proponent, through the contractor, shall ensure that water is used efficiently at the site by sensitizing construction staff to avoid irresponsible water use,
- Install a discharge meter at water outlets to determine and monitor total water usage and enable the contractor to pay for the water he utilizes or wastes. Alternatively, the contractor should source water from licensed water vendors who can supply by use of water bowsers;

x. Archaeological and Other Cultural Properties

From the field visits there are no known archaeologically protected monuments and cultural properties in the proposed project area and therefore, there will be no impacts on them. Should any archaeological or culturally important artefact be discovered during the construction/excavation process, the contractor should implement the

xi. Occupation/Public Health and Safety Impacts

Construction works unavoidably expose workers to OSH risks such as accidents and injuries from accidental falls from heights, slips due to wet surfaces, burns from welding, electrocution and use of faulty hand tools and construction equipment. In relation to public safety, there will be risks related to use of heavy equipment at the construction site as well as construction materials storage areas. There will also be an increased risk of traffic related accidents from vehicles transporting construction materials. Such hazards and risks can be mitigated through observing the following:

- To reduce on the workers' accidents and hazards, the contractor is expected to comply with OSH rules and regulations as stipulated in the OSHA, 2007. Ensure the work place is registered by the Directorate of Occupational Safety and Health Services (DOSHS);
- The contractor shall prepare an OSH plan, as part of their C-ESMP, for the construction works and should include input from the HCF management on potential health and safety risks associated with the construction activities and meet all OHS requirements in Kenya laws and regulations.
- All construction workers should be sensitized on the health and safety requirements while at the project sites and risks associated with construction work;
- Workers should be provided with suitable PPE such as safety helmets, safety shoes, gloves, masks and overalls;
- Provision of clean and accessible sanitary facilities and drinking water to workers;
- Barricade the active work sites to limit entry of unauthorized people such as health staff and patients. Use of screens and nets to avoid flying debris and ensure good housekeeping at the construction site;
- Trenches over 0.5m deep or wherever soil conditions dictate should be secured against accidental fall by workers and the public;
- Install information and safety signage along the work areas;
- Site should have an accessible grievance redress mechanism to allow workers/community to raise safety issues and propose improvements of project sites
- Task based risk assessment should be done on daily basis to assess the risks and hazards thereby prescribing the appropriate prevention measures; and
- A safety officer shall be designated at the construction site and shall maintain a log of incidents (safety register) on site and report on any fatalities related to the project within 24 Hrs.
- Vehicle speeds should not exceed 10km/hr within and around the project site
- Have a traffic control person within the around the project site
- The contractor complies with provisions of WIBA, 2007 for all the workers engaged

xii. Spread of Communicable Diseases and Other Infections like Communicable diseases

During the construction phase there is a risk of spread of communicable diseases such as tuberculosis and pulmonary infections with the concentration of people at one place during construction, there will be a likelihood of increase in diseases such as typhoid, tuberculosis, diarrhoeal diseases, dysentery, and cholera and, respiratory diseases. Proposed mitigation measures include the following:

- Treat affected local and migrant workers which will control the spread of disease vectors (through contaminated water and between people);
- Provision of adequate and accessible sanitation facilities in good condition with adequate water supply;
- Create awareness to workers on proper sanitation and personal hygiene to promote proper health, and
- To mitigate risk from food related contamination amongst construction workers, food supplies will be from the vendors with public health certificate,

a) Increase in HIV/AIDS Prevalence and other STIs

As the project is going to bring in a significant population of new people in the project area it is possible to have new infections. This is due to the fact that the contractors, traders and workers will have money to attract women/men from the project area in a bid to solicit for sex, thereby creating avenues for spread of HIV/AIDS and other STIs. The most vulnerable members of the community are women and children as they are more vulnerable. It is recommended that the project proponent and the contractor should ensure that prevention and management of STIs as a result of social interaction between project workers and local populations is conducted through:

- Hiring workers from the local community to prevent social challenges associated with labour camps;

- Education and sensitization of workers and the local communities on HIV/AIDS and STIs including provision of condoms to the project team and the public;
- The contractor has to institute HIV/AIDS awareness and prevention campaign amongst workers and the local communities for the duration of the contract e.g., erect and maintain HIV/AIDS information posters at prominent locations as specified by the Public Works Engineer (PWE); and
- Contractor should sign code of conduct (CoC) to guide on promoting behaviour change among the workers

xiii. Labour Influx

The project is going to attract an average of 200 workers it is important that the contractor and the facility put mechanisms in place to limit labourers from other counties (especially unskilled labour) by

- The employees are hired from within the locality hence limited movement or very short distances from their homes;
- The skilled labour force from far to reside in hotels in close proximity to the project area;
- The contractor to ensure that the hiring process is done with fairness and gender sensitivity. The hiring should preferably be done through the local labour office or the area administration;
- Effective contractual obligations for the contractor will be done with workers to adhere to the mitigation of risks against labour influx;
- The contractor to keep proper and updated records of the labourers on site while avoiding child and forced labour;
- Fair treatment, non-discrimination and equal opportunity of all labourers;
- All contractors and contractor workers to sign a CoC that will have provisions on individual responsibilities; and
- The contractor to ensure that the workers have access to a GRM.

xiv. Human Rights and Gender Inequalities / Violation

Women face greater economic vulnerability as their labour participation is often highly informal, without social protection. Low-income women and women migrant workers are especially vulnerable. worsened the already high prevalence of GBV due to greater economic stress in households coupled with increased social isolation. It is recommended that:

- During recruitment of workers there will be no discrimination against one gender either by design or oversight;
- There will be equal compensation for excess working hours;
- Contractor will ensure there is appropriate sanitary, health and safety facilities measures, such as PPE;
- Contractor to engage an expert to conduct a training on GBV/SEA;
- The contractor to ensure provision of the necessary basic sanitary facilities according to gender -(separate for men and women);
- Contractor to put in place mechanisms for reporting and addressing GBV/SEA and other human rights violations;
- Treat women, children and men with respect regardless of race, colour, language, religion, or other status;
- Report any violations of the CoC to workers 'representative, HR or grievance redress committee and ensure that no employee who reports a violation to the code of conduct in good faith will be punished in any way;
- Comply with the National Gender and Equality Act, 2011, and
- The contractor to ensure that the workers have access and are informed about the GRM.

xv. Conflict and Insecurity

There could be notable conflict between construction workers and community. There may also be conflict between the contractor and the surrounding communities due to: labour recruitment, shared resources (road, etc.) and behaviour of workers.

Proposed Mitigation Measures

- The contractor should explore on the possibilities of having a different access to be able to enhance security and differentiate between patients, visitors and workers accessing the site;
- The contractor, in conjunction with the project management, should hire more security personnel and ensure they are well inducted to address security related issues as they arise;
- Prepare labour management plan (LMP) to guide recruitment of the workers in conjunction with local leaders,
- Limit worker's interaction where possible with community members;
- Proper management of shared resources e.g. Water;
- It is also recommended that the construction workers be provided with easily identifiable uniforms;
- Raise awareness on the GRM mechanisms;
- Adequate consultation with surrounding communities and workers regarding the construction works, and
- Contractor security personnel should sign the Code of Conduct that discourages the use of force unless for defensive purposes.

xvi. Sexual Exploitation and Abuse

During the construction phase, the interaction between construction workers and other project stakeholders such as community could lead to sexual exploitation and sexual harassment as senior workers may seek sexual favors from the juniors. It is recommended that:

- The contractor should adhere to the project's CoC which encompasses clear warning to workers on any kind of SEA and to be signed by every worker on site;
- The contractor provides a mechanism where workers are free to report any sexual advances and abuse to the senior management without fear of intimidation;
- Share information with the community on the GRM;
- Share information on GBV/SEA referral support services.
- Contractor to ensure that staff are sensitized on GBV/SEA risk management;
- Ensuring that the GBV/SEA one pager is placed on strategic points of the facility, and
- Develop an Action plan of all GBV/SEA incidences to avoid recurrence.

xvii. Grievance arising from construction activities

This is the procedure and mechanism through which relevant stakeholders specifically the project affected persons (PAPs) and community members express their concerns against the project and the implementing staff. Grievances will be expressed through completion of the grievance redress form while others will be expressed verbally or through letters brought to the attention of the project PWE and the representatives through the contractor. The following measures should be undertaken to manage complaints arising from the project construction activities.

- Put in place grievance mechanisms e.g.,
 - Assigning a contractor based GRM Focal Person
 - Putting in place channels to allow people complaint- e.g., Telephone, Email, registers, WhatsApp platform for workers, suggestion box among others, and
 - Ensuring documentation of complaints- Complaints registers
- Raise awareness to all stakeholders including project workers on the existing GRM and sensitizing them on the need to register their dissatisfaction with the contractor or the facility;
- Resolve complaints within the project timeline (acknowledging within 7 days and resolving within 21 days or as soon as possible (within 24 hours for GBV/SEA complaints), and
- Ensure complaints reporting to the PMT on a monthly basis - using the annexed format (Appendix.5)

xviii. Labor Disputes

The contractor and suppliers for the construction of hospital will have workers who will be involved in the construction. The potential labour disputes may arise due to breach of contract regarding conditions of employment, fringe benefits, hours of work, and wages negotiated or of already agreed terms. Labor disputes may also arise due to disagreements amongst the workers and between workers and the contractors and SMP service providers.

Proposed Mitigation measures

The project shall adhere to the requirements proposed in the project LMP including:

- Fair terms and conditions shall be applied for project workers (guided by relevant labour laws);
- The project shall also have GRMs for project workers (direct workers and contracted workers) to promptly address their workplace grievances;
- Project shall abide by the provision of the projects LMP;
- The project shall respect the workers' right of labor unions and freedom of association, and
- Ensure overtime is recorded and compensated.

xix. Child labour risks in the sub-project

Incidence of child workers may occur during construction especially in light of the rising livelihood needs at the household's level. It will be useful for the contractor management to protect the project from such incidence by ensuring that recruitment comply with the national laws and that continuous monitoring is done within the phase to ensure non-occurrence of such incidences.

Proposed Mitigation Measures

- The contractor will develop and implement a Children Protection Strategy that will ensure minors are protected against negative impacts associated by the Project including on SEA;

- All staff must sign, committing themselves towards protecting children, a contract which clearly defines what is and is not acceptable behavior;
- Children under the age of 18 years should not be hired on site as provided by Child Rights Act (Amendment Bill) 2014;
- Wherever possible, ensure that another adult is present when working in the proximity of children;
- Not to invite unaccompanied children to workers' home, unless they are at immediate risk of injury or in physical danger;
- Project workers must refrain from hiring children for domestic or other labor;
- Comply with all relevant local legislation, including labor laws in relation to child labor specifically provisions of Kenya's Employment Act Cap 226 of 2007 Part VII on protection of children against exploitation, and
- Ensure that recruitment inventory indicates the ages of employment applicants and age verification is done using the national identification cards.

7.3 Potential impacts during Operational phase

i. Medical waste

During the operational phase, waste management impacts are expected to be significant because a hospital generates multiple waste streams daily, including general waste and hazardous healthcare waste. If waste is not properly segregated, collected, stored, transported, treated, and disposed of, it can lead to infections, needle-stick injuries, odours, pest infestation, environmental pollution, and non-compliance with Ministry of Health and NEMA requirements. Poor waste handling can also compromise patient safety, increase healthcare-associated infections, and expose workers and the public to biological and chemical hazards.

Hospital waste generated during operation can be classified into several categories. General (non-hazardous) waste includes paper, food waste, packaging materials, office waste, and non-contaminated plastics, and is similar to domestic waste. Infectious waste includes materials contaminated with blood and body fluids such as dressings, swabs, gauze, bandages, gloves, blood bags, and items from isolation areas. Sharps waste includes needles, syringes with needles, scalpels, blades, lancets, and broken contaminated glass, which pose high injury and infection risks. Pathological waste includes tissues, placentas, body parts, and materials from delivery rooms and theatres. Pharmaceutical waste includes expired, damaged, or contaminated medicines and vaccines, while chemical waste includes disinfectants, laboratory reagents, solvents, formalin, and cleaning chemicals. Pressurized containers such as aerosol cans and gas cylinders and e-waste such as broken electronic equipment may also be generated. Wastewater and liquid waste from wards, laboratories, laundry, and kitchen operations constitute an additional pollution risk if not properly handled and discharged.

The greatest waste management risks arise when segregation is not done at source. Mixing infectious waste with general waste increases waste volumes requiring special treatment, increases costs, and exposes cleaners, waste handlers, and the public to infection risks. Poor sharps disposal can lead to needle-stick injuries, which can transmit blood-borne infections. Inadequate storage of waste may cause odours, attract flies and rodents, and result in spillages. Uncontrolled movement of waste through patient areas can increase cross-contamination. If incineration or treatment systems are poorly operated, they can generate air pollution and leave hazardous ash requiring controlled disposal. Illegal dumping or burning of medical waste can contaminate soil and water resources and create serious public health hazards.

Impact mitigation⁹

- Waste must be segregated at the point of generation in every ward, theatre, maternity, laboratory, pharmacy, kitchen, and laundry area.
- Segregation must separate general waste from hazardous healthcare waste to prevent cross-contamination.
- Clear signage and posters should be displayed above bins to guide staff and reduce mixing.
- Adoption of the 3Rs Waste Management Hierarchy
- The adoption of the 3Rs waste management hierarchy focuses on minimizing waste generation at the source through the principle of Reduce. This involves efficient use of materials, careful procurement practices, selection of products with minimal packaging, and preference for reusable or durable items where safety standards allow. By reducing waste at the point of generation, the facility can significantly lower the volume of waste requiring handling, treatment, and disposal, thereby minimizing environmental impacts and operational costs.
- The principle of Reuse emphasizes extending the life of materials and products through repeated use before disposal. This can be achieved by utilizing reusable containers, washable linen, and durable equipment, as well as repurposing suitable materials within the facility. Proper cleaning, sterilization, and maintenance procedures will be applied to ensure that reused items remain safe, hygienic, and fit for purpose, particularly within a healthcare setting.
- The Recycle component involves segregation of waste at source to separate recyclable materials such as paper, plastics, glass, and metals from non-recyclable and hazardous waste streams. Clearly labeled waste receptacles will be provided, and staff will be trained on proper waste segregation practices. Recyclable waste will be collected and handed over to licensed recycling service providers for environmentally sound processing. Through the effective application of the 3Rs hierarchy, the facility will promote sustainable waste management, reduce pressure on disposal facilities, and contribute to environmental protection.

ii. Occupational Safety and Health Risks for Healthcare Workers

OHS hazards associated with handling and transporting: needle-sticks injuries; injuries due to other sharps such as broken glass; ergonomic issues especially related to lifting; blood splatter during waste handling; aerosolized pathogens (disease-causing microorganisms released as aerosols or tiny droplets suspended in air) during loading, compaction, or break up of untreated waste; breakage and spills of infectious waste bags; chemical exposure. The hospital environment is a potential source of infectious waste and these could pose unsafe conditions for healthcare staff. Of particular concern are health workers handling infectious waste (including sharps) without adequate protective gear, storage of sharps in containers that are not puncture- Below is a list of OSH risk sources for healthcare staff:

- i Electrical hazard /Loose electrical installations;
- ii Lack of adequate lighting in workplaces;
- iii Lack of safe access particularly for disabled employees;
- iv Inadequate ventilation in rooms;
- v Lack of adequate training (or neglect of safety precautions/ guidelines) in use of medical equipment;
- vi Dust emission;
- vii Handling and transportation of contaminated wastes (biological hazards);
- viii Malfunctioning machine controls; and
- ix Loose mechanical fixes;
- x Misuse of equipment and materials for functions they are not designed;

Proposed Mitigation measures

- Development and implementation of comprehensive occupational health and safety policies and procedures in line with national legislation and international health care facility guidelines
- Establishment of infection prevention and control programmes, including standard and universal precautions for handling blood and other potentially infectious materials
- Provision and mandatory use of appropriate personal protective equipment such as gloves, masks, gowns, eye protection, and safety footwear
- Regular training of staff on infection control, safe handling of sharps, waste management, chemical safety, fire safety, and emergency response
- Installation of adequate handwashing facilities and promotion of strict hand hygiene practices among staff, patients, and visitors
- Proper segregation, storage, treatment, and disposal of medical and hazardous waste using color-coded systems and licensed waste handlers
- Safe handling and storage of chemicals and pharmaceuticals, including availability of Material Safety Data Sheets and spill response procedures.

iii. Environment Pollution

Solid waste to be generated during operation phase of the hospital. Littering around the site will interfere with the aesthetic status and has a direct effect on the surrounding community. Disposal of the same solid wastes off-site could also be a social inconvenience if done in the wrong places. The off-site effects could be vector or pest breeding, pollution of physical environment including water resource, invasion of scavengers and informal recycling by communities.

Proposed Mitigation Measures

- The management of the hospital shall prepare a waste management plan to be implemented at the site (storage, provision of bins, site clean-up, bin clean-out schedule, etc.) to promote waste minimization and recycling.
- The hospital management shall be responsible for handling and disposal of all waste originating from the waste treatment microwave area,
- Encourage efficient use of materials to as much as possible to avoid and minimize waste production.
- Ensure wastes are recycled / reused before opting to dispose of.
- Designate temporal waste / garbage holding areas at site.
- Engage NEMA registered waste contractor to dispose of hazardous waste and have waste destruction certificate and waste transfer notes.
- Waste disposal by open burning shall not be permitted and signage shall be erected.
- For the contaminated ash generated from the existing open burning practice, this should be disposed off in an ash pit constructed according to the MoH design specifications to avoid possible soil/water contamination.

iv. Community Health Risk

Improper waste disposal can cause public health risks due to environmental pollution via impaired air quality from open air burning of HCW, storm water contamination or when people rummage through raw waste stockpiles. Unless mitigation recommendations are implemented, the likelihood of the impact occurring is high if no proper HCWM practices are instituted, and if practices of open air burning of all waste types continue.

Proposed Impact Management Measures

- Ensure regular monitoring of solid, liquid waste management practices and waste treatment;
- Ensure proper management of pharmaceutical waste by engaging a consultant to develop measures and guidelines for each facility in accordance with the National Healthcare Waste Management Plan;
- The hospital administrator should undertake regular assessment of waste generation quantities and categories to facilitate waste management planning, and investigate opportunities for waste minimization on a continuous basis,
- Separate residual chemicals from containers and dispose of the containers to reduce generation of secondary contamination especially waste water;

v. Increased Water Use and Liquid Waste Generation

The operation of the proposed facility will place additional pressure on local water resources due to increased demand for potable water for medical procedures, sterilization, patient hygiene, cleaning, laundry services, kitchen operations, and general sanitation. Continuous hospital operations and an increased number of patients, staff, and visitors will significantly raise daily water consumption compared to existing baseline levels. If water abstraction and use are not efficiently managed, increased demand may strain existing water supply systems, reduce water availability for surrounding users, and exacerbate shortages during dry seasons or periods of low supply. Overreliance on limited water sources may also affect the sustainability of local water resources and increase vulnerability to climate variability and supply interruptions.

Proposed Mitigation Measures

- Install water-efficient fixtures and fittings to minimize unnecessary water use.
- Implement regular inspection and maintenance of plumbing systems to detect and repair leaks promptly.
- Provide adequate on-site water storage facilities to buffer against supply interruptions and peak demand.
- Monitor water consumption through metering and record-keeping to promote efficient water management.
- Promote water conservation practices among staff through operational guidelines and training.
- Explore supplementary water sources such as rainwater harvesting for non-potable uses where feasible.
- Schedule high-water-demand activities, such as laundry operations, to minimize peak pressure on supply systems.
- Ensure abstraction and water use comply with relevant regulatory requirements and permits.
- The septic tank should never be allowed to spill on land and it should be exhausted by a NEMA licensed exhauster, and
- Pre-treatment of wastewater from the health facility before release to the septic tank.

vi. Increased Energy Use

The proposed facility will result in a significant increase in energy demand due to continuous hospital operations and the use of energy-intensive equipment. Major sources of electricity consumption will include medical equipment (diagnostic machines, sterilizers, laboratory equipment), theatre lighting and ventilation, refrigeration for pharmaceuticals and blood storage, laundry services, kitchen appliances, water pumping systems, ICT infrastructure, and general lighting across wards and offices. Most hospital services operate on a 24-hour basis, leading to sustained energy use with peak demand during clinical procedures, laundry cycles, and operational hours.

Increased energy demand may place pressure on the local power supply network, potentially resulting in power instability, higher operational costs, and increased reliance on backup generators. Generator use, particularly during outages, may also contribute to increased fuel consumption, air emissions, and noise if not properly managed.

Proposed Mitigation Measures

- . Install energy-efficient lighting systems such as LED lights throughout the facility.
- Use energy-efficient medical, laboratory, and office equipment with high energy performance ratings.
- Design buildings to maximize natural lighting and ventilation to reduce reliance on artificial lighting and mechanical cooling.

- Implement a preventive maintenance program for electrical systems and equipment to ensure optimal energy performance.
- Install power meters and sub-meters to monitor energy consumption in high-demand areas such as theatres, laboratories, and laundry facilities.
- Utilize automatic controls, timers, and motion sensors to reduce unnecessary energy use in low-occupancy areas.
- Provide backup power systems that comply with safety and environmental standards and ensure generators are well-maintained.
- Explore the use of renewable energy options, such as solar power, to supplement grid electricity and reduce overall energy demand.

vii. Occupational Health and Safety Risk

During the operational phase of a health care facility, occupational health and safety risks are significant due to the continuous interaction between health workers, patients, visitors, and hazardous materials. Health care workers may be exposed to infectious diseases, including blood-borne pathogens such as HIV, Hepatitis B, and Hepatitis C, through contact with blood, body fluids, sharps, contaminated linen, and medical waste. Routine clinical activities such as injections, wound dressing, surgical procedures, laboratory work, and waste handling increase the risk of needlestick injuries, cuts, and splashes, which can lead to occupational infections. Inadequate infection prevention and control practices may also contribute to the spread of hospital-acquired (nosocomial) infections among staff and patients, affecting overall service delivery and staff wellbeing.

Hospital staff may also be exposed to hazardous substances during daily operations. These include disinfectants, sterilizing agents such as glutaraldehyde and ethylene oxide, pharmaceutical chemicals, cytotoxic drugs used in cancer treatment, laboratory reagents, and mercury from broken medical devices. Prolonged or unprotected exposure to these substances can result in respiratory irritation, skin conditions, eye injuries, allergic reactions, or long-term health effects. Workers involved in waste management, laundry, cleaning, and maintenance are particularly vulnerable if hazardous and non-hazardous wastes are not properly segregated and handled.

Physical and ergonomic hazards are also common during hospital operations. These include manual handling injuries from lifting and transferring patients, slips and falls on wet floors, electrical hazards from medical equipment, fire risks associated with oxygen use and flammable chemicals, and stress-related conditions arising from long working hours, emergency situations, and high patient loads. Exposure to radiation from diagnostic imaging and radiotherapy equipment presents additional occupational risks if appropriate shielding, monitoring, and controls are not enforced. Without adequate safety systems, training, and monitoring, these hazards may result in injuries, illnesses, absenteeism, reduced productivity, and legal liabilities for the facility.

Proposed Mitigation Measures:

- Development and implementation of comprehensive occupational health and safety policies and procedures in line with national legislation and international health care facility guidelines
- Establishment of infection prevention and control programmes, including standard and universal precautions for handling blood and other potentially infectious materials
- Provision and mandatory use of appropriate personal protective equipment such as gloves, masks, gowns, eye protection, and safety footwear
- Regular training of staff on infection control, safe handling of sharps, waste management, chemical safety, fire safety, and emergency response
- Installation of adequate handwashing facilities and promotion of strict hand hygiene practices among staff, patients, and visitors
- Proper segregation, storage, treatment, and disposal of medical and hazardous waste using color-coded systems and licensed waste handlers
- Safe handling and storage of chemicals and pharmaceuticals, including availability of Material Safety Data Sheets and spill response procedures
- Implementation of safe patient handling practices and use of mechanical aids to reduce manual lifting injuries
- Regular inspection, servicing, and maintenance of medical equipment, electrical systems, and fire safety installations
- Radiation protection measures, including controlled access to imaging areas, use of shielding, and monitoring of staff exposure
- Establishment of emergency preparedness and response plans, including fire drills, spill response, and first aid services
- Routine occupational health surveillance and monitoring to identify and address workplace hazards and health trends

viii. Security concerns and conflict

Lack of proper security arrangements may predispose the HCW facility and accessories to theft, vandalism and pilferage among other security risks. Therefore, there is need to ensure adequate security arrangements.

Mitigation measures

- Ensuring that security personnel undertake adequate surveillance
- Stock taking of the equipment and accessories to ensure there is no loss
- Ensuring proper fencing and lighting arrangement.

ix. Grievances arising from the project activities

Complaints can increase especially where there is lack of proper arrangement to dispose treated Microwave wastes and piles to the neighbourhood. Similarly there could be increased dissatisfaction of workers over terms and working conditions of operating the Microwave waste treatment facility and therefore the need to continuously operationalize the facility GRM mechanisms.

Mitigation measures

- Ensuring that there is an operational GRM that is responsive to stakeholders' concerns
- Continues stakeholder engagement to raise awareness of the project and clarify any outstanding issues
- The hospital should continue to create awareness about the GRM mechanism in place to all workers and patients
- Ensure appropriate and mutually acceptable redress actions are identified and implemented to the satisfaction of complainants
- Ensuring that there is a workable mechanism of opening complaints reported through suggestion boxes

i. Gender Based Violence/Sexual Exploitation and abuse

- During the project implementation period, the project will continue to monitor SEA risks in the supported healthcare sites. The hospitals will be required to report any SEA cases affecting sub-project workers to the PMT within 24-hour of the incidence.

Proposed mitigation measures

- Continuous sensitization of staff on SEA risk management
- Provision of GRM channels for reporting SEA cases
- Ensuring that the GBV/SEA one pager is placed on strategic points of the facility
- Document available GBV/SEA referral pathways for victims' information and support
- Develop an Action plan of all GBV/SEA incidences to avoid recurrence
- Ensure the facility is well lid to avoid hiding places for SEA perpetrators
- Provision of separate lavatories for men and women
- The hospital will continue to mainstream Gender Inclusivity in hiring of workers and entire Project Management as required by Gender Policy 2011 and 2/3 Gender Rule.
- To include prohibition of GBV/SEA in Employees Code of conduct e.g. discouraging the use of inappropriate language or behaviour, harassing, abusive, sexually provocative, demeaning or culturally inappropriate language towards women or children.
- Prohibiting sexual activity with children under 18 years—including through digital media and promoting respect to the rule of law in respect to children's rights.

7.4 Potential Impacts during Decommissioning Phase

At the end of the project life as will be recommended by a PWE, the proponent at that point may require vacating the site and institute decommissioning of the project. The decommissioning exercise will have both positive and negative impacts. During the decommissioning stage, demolition or renovations will be done, creating job opportunities for the youth and women. As well, rehabilitation works will be undertaken for the proposed project site to restore it to its original state. This will include replacement of the topsoil and re-vegetation, which will enhance the aesthetic value of the area. There will be need to employ people who will be involved in the reclamation of the site to near its original state.

The earth moving works during top soil replacement will lead to significant deterioration of the acoustic environment within the area and the surrounding areas. This will be as a result of the noise and vibration that will be experienced

from machines and workforce being utilized. Dust will also be emitted affecting the surrounding environment. The proponent will put in place mitigation measures for noise and dust pollution during the decommissioning phase. Further complaints and feedback mechanisms should be strengthened to ensure that stakeholders can register any concerns regarding the decommissioning activities.

8. ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLANS

8.1 Introduction

The MoH has developed the project ESMP to guide in the development of the recommended safeguard instruments based on the specific proposed project activities. The main objective of the project ESMP is to guide the PMT and the sub-project proponents on the E&S screening and subsequent sub-project E&S assessment, monitoring and reporting including development of sub-project specific plans that have to be developed in accordance with the African Bank Development.

The project ESMF forms the basis of this ESIA prepared for the proposed construction of level 6 Hospital. The proponent acknowledges the fact that the proposed project activities will have some impacts on the biophysical environment, health and safety of its employees, workers, the wider public as well as the local residents. Thus, the focus will be on minimizing/mitigating the negative impacts and enhancing the positive impacts associated with the project activities through a program of continuous improvements. Environmental and social management and monitoring plans (ESMMPs) are important tools developed to assist in guiding the proponent/contractor in mitigating of potential environmental, social, health and safety risks and impacts of the proposed project. It is worth noting that key factors and processes may change through the life of the project and considerable provisions have been made for dynamism and flexibility of the ESMP. As such, the ESMP will be subject to regular periodic reviews on need basis. A number of activities will be carried out during the various phases of the proposed project to ensure adequate E&S impact management. These include, but are not limited, to the following.

8.2 Project Preparation

- i. Collection of baseline data in relation to vegetation type, ambient noise or air quality for monitoring purposes;
- ii. Training of the relevant project staff in E&S management;
- iii. Review and appreciation of project design details;
- iv. Inclusion of environmental health and safety specifications in Tender Documents, and development of CoC for the Contractor; and

8.3 Construction Phase

- i. Implementation of mitigation measures, through development of contractors' E&S Management Plan (C-ESMP) that shall include the following: OSH Plan, HIV/ AIDS management Plan, Waste Management Plan, labour management plan, Emergency Response Plan, among others.
- ii. Enforcement of Environmental and OHS requirements (conditions at the contractor's yard, materials storage, condition of equipment, use of PPE, etc.) by the ESH Expert; as provided in the ESMP;
- iii. Environmental monitoring on air quality by a hired Air Quality Specialist as per the provision of the Air Quality Regulations of 2014 and noise and vibration levels by noise and vibration levels consultant as per the Noise and Excessive Vibration Pollution) (Control) Regulations, 2009.
- iv. The contractor should prepare an occupational /community safety and health plan and a C-ESMP for use during project construction, to be reviewed and approved by the PIU and HCF prior to start of any construction works.
- v. Enforcement of Environmental and OHS requirements (conditions at the contractor's yard, materials storage, condition of equipment, use of PPE, etc.) by the ESH Expert; as provided in the ESMP;
- vi. Environmental monitoring on air quality, noise and vibration levels by hired Air Quality Specialist as per the provision of the Air Quality Regulations of 2014 and noise and vibration levels consultant as per the Noise and Excessive Vibration Pollution) (Control) Regulations, 2009;
- vii. Disposal of construction solid, liquid and sanitary wastes in an acceptable manner and in conformance with regulations;
- viii. Ensuring that the contractor is following the CoC and environmental health and safety specifications as provided in the ESMP and C-ESMP;
- ix. Training the contractor's workforce in environmental and social awareness and responsibility (including STD/HIV/AIDS awareness); and
- x. Liaison with local administration and community leaders in matters of disturbance to the public, security issues,

- and other matters arising from the project; and
- xi. Ensure engagement with the key stakeholders as identified in the SEP.

8.4 Operation Phase

- i. Development (or updating existing) and implementation of Health Safety and Environmental Management Plan, Waste Management Plan (for all hospital wastes), and Emergency Response Plan;
- ii. Establish written agreement with other HCFs related to accepting and treating their HCF wastes at a fee.
- iii. Monitoring of emissions, discharges, waste management (generation, treatment, disposal), HSE incidents (leakages and spills, accidents, etc);
- iv. Operation and maintenance, calibration and checking of all equipment as specified in respective manuals or as required by the regulations;
- v. Disposal of solid and sanitary wastes in an acceptable manner and in conformance with the regulations;
- vi. Compliance with OHS manual to be prepared by project proponent/ hospital management during the project operational phase;
- vii. Environmental and social performance reporting (based on evaluation of data collected, investigations) especially the air quality monitoring;
- viii. Monitoring the implementation of the SEP, LMP and the ESMMP (Security Management, GBV/SEA, Grievance management and monitoring, labour related risks-child labour, labour influx and workers complaints; and
- ix. Observing and implementing all the guidelines in HCWM guidelines on infections spread control and other facets of human interactions vis-à-vis environmental bearing of these interactions.

Table 11: below describes how each of the main mitigation measures proposed should be implemented, the frequency, and the responsible party during the construction and operation phases. Monitoring indicators and means of verification have also been included in the ESMMP. It is imperative that this ESMMP forms part of contractors' bidding documents so that they can allocate resources required for implementing the proposed mitigation measures. Prior to mobilization, the Contractor should also prepare his own contractor-ESMP for review by the MoH E&S Specialist. In his schedule of works, the contractor must include all potential risks and mitigation measures, and the MoH E&S experts and the health facility public health officer should ensure that the schedule and ESMMPs are complied with. The responsibility of supervision of the implementation of all the proposed mitigation measures during construction and the defects liability period will lie with the MoH E&S specialist, public health officers, public works engineer (PWE), while the Contractor will be responsible for day-to-day operational matters of construction, which will include implementation of mitigation measures that s/he is responsible for. After the defect's liability period, responsibility for the operation and maintenance of the facility will rest with the hospital management and the County Government. **Error! Reference source not found.** also presents an estimate of the costs of implementing the proposed environmental and social management and mitigation.

8.5 Decommissioning

Decommissioning is an important phase in the project cycle and comes last to wind up the operational activities of a particular project. It refers to the final disposal of the project and associated materials at the end of the project lifespan. During this phase the proponent will be required to prepare a decommissioning management plan that will guide the decommissioning process and seek approvals/ permits from all the relevant government agencies such as NEMA, DOSHS, MoH, among others.

8.6 Monitoring Team

The primary role of monitoring and supervision of project environmental and social compliance will fall squarely in County Government of Bungoma framework since they have the mandate and institutional framework enshrined in the County Government Act of 2012. Key players in the monitoring of compliance in the project will comprise MoH environmental and social specialists; the contractor; public works engineer (PWE) and Community liaison Officer. These expertise is to be brought on board to oversee specific aspects of the project during its implementation to ensure compliance. In addition, the contractor will be required to have a contractor environmental and social management plan (C-ESMP) to facilitate self-monitoring of impacts and implement recommended mitigation measures, during the construction and the defects liability phase. Under these phases, the contractor shall hire/employ an Environmental, Health Safety (EHS) Specialist as part of his employees. During the operation phase

hospital administration, health facility public health officer and community liaison officer will play a greater role to ensure the mitigation measures are implemented.

8.7 Key Monitoring Indicators

Key monitoring indicators proposed include:

- i. Vegetation loss and remedial restoration measures instituted;
- ii. Air quality and noise pollution control measures in place and how they operate;
- iii. Erosion control measures
- iv. Control measures for traffic accidents
- v. OHS measures for workers and the hospital staff
- vi. Public health observance
- vii. Waste management measures and performance;
- viii. Water Supply and Wastewater
- ix. Energy Use
- x. Material storage
- xi. Employment opportunities
- xii. HIV/AIDS interventions and related sexual behaviors among workers, and
- xiii. Labour recruitment by gender and age
- xiv. GRM including number of complaints received, resolved and closed within the project timeline
- xv. Number of stakeholders consulted during the sub-project period
- xvi. Number of staff inducted on safeguards requirements and those who have signed the CoC
- xvii. Security incidences and systems
- xviii. GBV/SEA prevalence reported in the facility

Table 10: Roles and Responsibilities

Entity	Roles and Responsibilities
MOH Environment and Social Specialists	➤ Ensure the project is screened including coordinating the impact assessment and audit. ➤ Preparation of the E & S instruments, review of the instruments and ensure they are cleared by African World Bank and disclosed prior to implementation of the project, ➤ Ensure the environmental and social requirements are prescribed in contractors bidding documents ➤ Periodic monitoring and surveillance of all project's investment to ensure compliance with the mitigation measures as set out in the ESMMP. ➤ Required to provide monthly, quarterly environmental & social status of the project progress to feed into the overall project progress reports ➤ Report immediately to the WB upon occurrence of any significant environmental, social, or health and safety incident ➤ Advice on implementation of corrective actions wherever necessary.
County government of Bungoma Housing, Lands urban Renewal, urban Planning and Projects Management	➤ Supervise the Contractor and monitor works at all sites in particular; ➤ Provide specific technical advice on mitigation measures for construction and operational activities related to the project, ➤ Supervise the implementation of the approve project design, ➤ Supervise project's implementation for construction progress with regard to timelines and quality.
County of Bungoma Technical Team Labour / Probation Officer, Labour Officer, Engineer, others	➤ Mainly to ensure that respective activities are being done in compliance with the relevant laws, regulations and guidelines. ➤ Contractors have access to construction materials, ➤ Mobilisation of the communities to keep project on truck, ➤ Monitoring of the project works with regard to the technical issues, ➤ Monitoring project's compliance implementation with the mitigation measures set out in the EMMP and other contractual requirements ➤ Advice on implementation of corrective actions where required, and ➤ Recruit employees according to the Employment & Labour Act. ➤ Develop and fully implement, including all necessary resources, all operational phase EHS plans
Contractor's Community Liaison Officer/ Sociologist.	➤ Develop the Contractor ESMP focusing on social Issues with reference to the relevant documents i.e., client ESMP, NEMA licence and any contractual condition ➤ Display and educate the workers on the workers' code of conduct, ➤ Work with the Clerk of Works to address worker's and community concerns in a timely manner, ➤ Liaise with the HIV/AIDs service provider, undertake HIV/AIDs sensitization and organize-Special clinic days for the workers and the community adjacent to the site. ➤ Create awareness on importance of child protection and GBV in relation to the project; and as appropriate organize counselling sessions for any victims, workers and the adjacent community. ➤ Develop a Social, Gender and HIV/AIDs/ Child protection Checklist, COC, stakeholder engagement/ communication plan and report regularly on progress ➤ Educate the communities on the site operations and the Grievance Redress System, ➤ Make available the telephone to facilitate community liaison. ➤ Establish a grievance handling committee; create awareness on mechanism/committee/process. ➤ Manage the complaints log and act as a secretary to the Grievance Committee, and ➤ Manage the environmental and social impacts and implement mitigation measures as stipulated in the ESMP. ➤ Provide information to PIU and HCF related to health safety and Environment (HSE) performance, and immediately report any significant environmental incident or worker accident
Contractor's HSE personnel	➤ Develop the Contractor ESMP based on the Client ESMP, NEMA certificate and any contractual conditions ➤ Develop traffic management plan, ➤ Ensure safe storage of the materials on site, ➤ Prepare a waste management Plan for the site and ensure its implementation ➤ Prepare safety management plan for the site and ensure safety on site ➤ Ensure staff regular orientation on environment management and safety drills, and ➤ Display of the ESMP and Safety information. ➤ Ensure availability and access of drinking water at the work site by all workers.

Entity	Roles and Responsibilities
	➤ Develop an Environment, Health and Safety Checklist, and report regularly on progress. ➤ Take responsibility for mitigation and management of potential environmental and social issues on site; ➤ Organize and maintain briefing session records and mitigation and monitoring documentation on all matters of HSE; ➤ Respond to site inspection findings; ➤ Receive and respond to any complaints from external parties on project issues on HSE ➤ Institute management of accidents (if they occur), keep a log book/ sheet ➤ Follow up on the health insurance requirements including compensation related to accidents (in case of any occurrence). ➤ Provide information to PIU and HCF related to HSE performance, and immediately report any significant environmental incident or worker accident
Public Works Engineer	➤ Supervision and manage all the sites with regard to the administration of the Construction Contracts including E&S management compliance ➤ Review and approve contractor ESMP and other plans ➤ Ensure compliance with the ESMP etc. and other laws ➤ Ensure that payment certificate includes environment and social costs duly endorsed, ➤ Responsible for ensuring that, the office block with its associated facilities are constructed in accordance with the approved designs, ➤ Responsible for approvals of the construction materials to be used in the project, ➤ Undertake supervision and monitoring of environmental and social issues and report to the Hospital Administrator, and ➤ Clear contractors' compliance with managing environmental and social risks.
Directorate of Occupational Safety and Health Services (DOSHS)	➤ Ensure compliance with the provisions of the Occupational safety and health Act 2007 and promote safety and health of workers, and ➤ Issue the Certificate of Workplace for the construction site and supervise the implantation of the conditions in the certificate.
The National Construction Authority (NCA)	➤ Issuing of the construction permit for the construction site and advising the Hospital over the construction related activities on value for money. ➤ Ensure that the contractor is licensed by NCA,
National Environment Management Authority (NEMA)	➤ Issuance of the EIA Certificate and supervise and co-ordinate all matters relating to the environment and to be principal arm of government in the implementation of policies relating to the environment. ➤ Carry out site inspection to ensure compliance with the EIA conditions of approval.
African World Bank	➤ Carry out the Implementation Support Mission periodically to ascertain the level of implementation in line with the Environment and Social Commitment Plan and other environment and social instruments prepared for the project namely: ESMF, ESIA/ESMP.

Table 11: : Environmental and Social Risks and Mitigation Measures during Planning and Designing, Construction and Operation Phase

Key Activities	Potential Environment & Social Risks and Impacts	Proposed Mitigation Measures	Responsibilities
Planning and Designing Phase			
Designs for the construction of level 6 hospital	Risks of poor siting of the facilities or non-adherence to MOH guidelines, Improper designs.	▪ Liaising with the relevant Technical Government department in development of the designs, ▪ Proper siting of the waste treatment facility and ensure harmony with the hospital layout and planning, ▪ Ensure all the legally required permits are obtained prior to undertaking the construction activities, ▪ The contractor bidding documents should contain clauses on Environmental Social Health and Safety (ESHS) requirements to guide the contractor on the key requirements, ▪ PMT specifically the Environmental and Social Expert should ensure the design requirements are adhered to in the planning stage	County Government, MOH E&S Expert
Construction Phase			
Interference with the physical setting	Site clearance and excavation works that will interfere with physical setting	▪ The contractor should ensure that there is minimal disturbance to the topography of the area; ▪ The project designs should be such that they do not interfere with local drainage or change the topography or introduce physical changes that are not in harmony with the physical setting of the project area. Any topographical change needed should be done to avoid soil erosion or storm water drainage issues;;	County Government, MoH E&S Expert,

		▪ The proposed hospital and associated structures should be aesthetically acceptable to blend in with the surrounding environment and other hospital facilities; ▪ Restoration shall be undertaken to ensure that the original setting is as much as possible retained; ▪ The proponent should observe measures stipulated in the ESMP for sustainable project implementation.	
Solid wastes	Improver management of construction related solid wastes	▪ Contractor shall prepare waste management plan, as part of the C-ESMP, to be implemented at the site (storage, provision of bins, site clean-up, bin clean-out schedule, etc.) before commencement of any works, which should promote waste minimization and recycling. ▪ Contractor shall be responsible for handling and disposal of all construction and related waste. ▪ Encourage efficient use of materials to as much as possible avoid and minimize waste production. ▪ Ensure wastes are recycled / reused before opting to dispose of. ▪ Designate temporal waste / garbage holding areas at site. ▪ Use of waste receptacles that encourage segregation to hold waste on site before its collection. ▪ Minimize production of waste by practicing use of durable, long-lasting materials that shall not need to be replaced often. ▪ Engage NEMA registered waste contractor to dispose of hazardous waste and have waste destruction certificate and waste transfer notes. ▪ Waste disposal by open burning shall not be permitted and signage should be erected. ▪ Fine earth materials (sand and murrum) should be covered using tarpaulins during haulage to prevent spillage, dust and particulate matter emission.	County Government, NEMA, MoH E&S Expert
Management and disposal of spoil materials	Poor management and disposal of spoil materials which could be hiding and breeding sites for rodents	▪ Maximizing the re-use of excavated materials in the works as far as feasible to ensure that no permanent spoil dumps are created, ▪ Spoil dumping should be away from any water resources to avoid possible water pollution from siltation/ sedimentation, ▪ Extra loads of murrum should be used to make good of any worn-out sections of the walkways/ driveways within the hospital; this should be done in conjunction with the hospital management; ▪ Besides, the local community should be given the first priority while disposing the extra loads of murrum; this should be done at a consideration (reasonable fee) or better still donated in case of public use; and ▪ Properly disposing off the spoil in an area identified by the contractor team and approved by the confirmed land owners, hospital management as well as by NEMA; care should be taken to avoid degrading land that could otherwise be used for productive purposes	County Government, NEMA, MoH E&S Expert
Noise and vibration generation	Noise emissions from machineries and vibration from construction activities	▪ Contractor to coordinate with HF administration on acceptable days and times for work, and in particular related to any specific works that may cause more significant noise and/or for extended periods within a day, ▪ Inform the health facility administration when constructions activities are likely to generate excessive noise, ▪ Noise suppression measures must be applied to all construction equipment such as; Install portable barriers to shield compressors and other small stationary equipment, cover engine of generators where necessary; ▪ Use of quiet equipment (i.e., equipment designed with noise control elements such as those that utilize electricity as opposed to those which utilize diesel or petrol) and ensure all the equipment used on site are well maintained and in good working condition, ▪ Limit pickup trucks and other small equipment to a minimum idling time and observe a common-sense approach to vehicle use, and encourage workers to shut off vehicle engines whenever possible; ▪ Provision of appropriate PPE (hearing protection - ear muffs/plugs) to the workers and any other person visiting the construction and renovation site especially in work areas with heightened noise levels, ▪ Limit construct activities during day time, between 8am and 5pm; ▪ Consider manual labour-based construction methodologies; and	County Government, NEMA, MoH E&S Expert

		Construction workers should be made aware of the sensitive nature of the work place and advised to limit verbal and other forms of noise.	
Air pollution	Dust and gaseous emissions are likely to be emitted during excavation and construction activities	- Minimizing the number of motorized vehicles on use and limit vehicle speeds to a maximum of 10Km/Hr; - Make use of predetermined routes when bringing in construction material or in transportation of solid waste generated; - Periodically service all the equipment and machinery and ensure they are in good working condition to minimize emissions; - Wet all active construction areas as and when necessary to reduce dust; and - Cover the stock piled construction materials and spoil generated from the excavations, - Provide appropriate PPE (dust mask) to workers and enforce on use, - When transporting construction material, ensure vehicles are covered with tarpaulins in order to minimize on dust emissions; and - Burning of solid waste material shouldn't be permitted at project site.	County Government, NEMA, MoH E&S Expert
Vegetation loss	The site already cleared of vegetation	- The contractor will ensure proper demarcation of the project area to be affected by the construction works to limit vegetation removal to project site, - Strict control of construction vehicles to ensure that they operate only within the area to be disturbed and designated access routes, - Ensure retention of grass and mature trees close to the site to the extent possible and - Re-vegetate the area in the disturbed sections and surrounding environment after completion of works,	County Government, NEMA, MoH E&S Expert
Accidental spills and leakages	Fuel lubricants, oil and grease, paints and pest control substances may have immediate impact on local water resources	- Temporal storage on site of all hazardous /toxic substance will be in a bunded storage area to ensure containment of spillages/leakages; - Ensure proper storage of chemicals / materials, and if possible, in secondary containers just in case of accidental puncturing, and away from storm water runways or exposure to weather elements such rains - Ensure proper handling, storage and disposal of waste oil, lubricants, oil filters and fuel from vehicles. Hazardous waste would be contained and properly disposed by licensed hazardous waste handler, - The contractor should provide appropriate PPE (medical mask, gowns, heavy duty gloves, eye protection and boots) to workers on site, and - During the course of the construction works, temporary drainage channels should be constructed to encourage dispersal of meteoric waters, - Contractor to have spill prevention and response procedure including all necessary equipment and that of workers are trained. - Contractor to immediately report to HCF and Project PIU any spills or accidental releases	County Government, NEMA, DOSH, MoH E&S Expert
Extraction and use of construction materials	Construction material extracted from quarries and other natural resources banks such as rivers	- The contractors should source construction materials such as sand and ballast from registered and NEMA licensed quarry and sand mining firms/groups and/or from suppliers of such firms are expected to apply acceptable environmentally friendly processes in their operations, - The contractor should adhere to the procurement plan and only order for what will be required through accurate budgeting and estimation of actual construction material requirements; and - The proponent should only approve final payment to the contractor after confirmation that all excavated sites have been backfilled and other degraded areas have been restored.	County Government, NEMA, MoH E&S Expert
Increased water demand	Increased water demand for mixing materials, wetting surfaces or cleaning/curing completed structures	- The proponent, through the contractor, shall ensure that water is used efficiently at the site by sensitizing construction staff to avoid irresponsible water use, - Install a discharge meter at water outlets to determine and monitor total water usage and enable the contractor to pay for the water he utilizes or wastes. Alternatively, the contractor should source water from licensed water vendors who can supply by use of water bowsers; - Encourage prompt maintenance of water pipeline leaks, and - Upon commissioning of the hospital the hospital management will be required to supply water to the facility at its cost for normal operations. The hospital is already connected to piped water supply. We recommend that water conserving taps that turn-off automatically when water is not being used be installed at the facility coupled with waterless urinals and cisterns of low water volume use.	County Government, MoH E&S Expert,

Occupation/Public Health and Safety Impacts	Occupation/Public Health and Safety Impacts	▪ Contractor is expected to comply with OSH rules and regulations as stipulated in the OSHA, 2007. Ensure the work place is registered by the DOSHS; ▪ All construction workers should be sensitized on the health and safety requirements while at the project sites and risks associated with construction work; ▪ Workers should be provided with suitable PPE; ▫ An approved unused overall; ▫ Safety gumboots; ▫ Right grade hand gloves; ▫ The recommended goggles; ▫ Helmet; ▫ Right grade respirators; and ▫ Ear Plugs. ▪ Provision of clean and accessible sanitary facilities and drinking water to workers; ▪ Barricade the active work sites to limit entry of unauthorized people such as health staff and patients. Use of screens and nets to avoid flying debris and ensure good housekeeping at the construction site; ▪ Trenches over 0.5m deep or wherever soil conditions dictate should be secured against accidental fall by workers and the public; ▪ Install information and safety signage along the work areas; ▪ Site should have an accessible grievance redress mechanism to allow workers/community to raise safety issues and propose improvements of project sites ▪ Electrical works should be done by a trained and certified experienced personnel, ▪ Task based risk assessment should be done on daily basis to assess the risks and hazards thereby prescribing the appropriate prevention measures; and ▪ A safety officer shall be designated at the construction site and shall maintain a log of incidents (safety register) on site and report on any fatalities related to the project within 24 Hrs. ▪ The contractor complies with provisions of WIBA, 2007 for all the workers engaged	County Government, DOSH, MoH E&S Expert
Increased in HIV/AIDS Prevalence and other STIs	Increased in HIV/AIDS Prevalence and other STIs	▪ Hiring workers from the local community to prevent social challenges associated with labour camps; ▪ Education and sensitization of workers and the local communities on HIV/AIDS and STIs including provision of condoms to the project team and the public; ▪ The contractor has to institute HIV/AIDS awareness and prevention campaign amongst workers and the local communities for the duration of the contract e.g., erect and maintain HIV/AIDS information posters at prominent locations as specified by the PWE; ▪ The contractor has to ensure that staff are made aware of the risks of contracting or spreading sexually transmitted diseases	County Government, MoH E&S Expert
Social Risk Management	Significant increase in population within the site and the facility	▪ The workers should be hired from within the locality hence limited movement or very short distances from their homes; ▪ The skilled labour force from far to reside in hotels in close proximity to the project area; ▪ The contractor to ensure that the hiring process is done with fairness and gender sensitivity; ▪ Effective contractual obligations for the contractor will be done with workers to adhere to the mitigation of risks against labour influx. ▪ The contractor to keep proper and updated records of the labourers on site while avoiding child and forced labour; ▪ Fair treatment, non-discrimination and equal opportunity of all labourers. ▪ Contractors and contractor worker to sign Code of Conduct with provisions of individual responsibility	County Government, Labour officer, MoH E&S Expert

Human rights and gender inequalities / violation	- During recruitment of workers there will be no discrimination against one gender either by design or oversight; - There will be equal compensation for excess working hours; - Contractors will ensure there is appropriate sanitary, health and safety facilities measures, such as PPE; - Contractor to engage an expert to conduct a training on GBV/SEA; - The contractor to ensure provision of the necessary basic sanitary facilities according to the gender (separate for men and women) - Contractor to put in place mechanisms for reporting and addressing GBV/SEA and other human rights violations. - Contractor to ensure that workers have an access to a GRM for workers	County Government, Gender Officer, MoH E&S Expert
Gender based Violence/Sexual Exploitation and Abuse	- The contractor should develop a code of conduct which should encompass clear warning to workers on any kind of sexual exploitation and abuse. - The contractor should provide a mechanism where workers are free to report any sexual advances and abuse to the senior management without fear of intimidation. - The contractor should communicate to the workers that there should be no or minimal interaction with the patients. - Contractor to ensure that workers are sensitized on GBV/SEA management - Document GBV/SEA referral pathways for victim information and support - Ensuring that the GBV/SEA one pager is placed on strategic points of the facility - Develop an Action plan of all GBV/SEA incidences to avoid recurrence	MoH E&S Expert, County Gender Officer, NGEC
Grievance arising from construction activities	- A verbal or written complaint from a complainant will be received by the site supervising engineer/site agent and recorded in a complaints log that is kept on site. The log will indicate grievances, date lodged, action taken to address complaint or reasons the grievance was not acted on; information provided to complainant and date the grievance was closed. - Put in place grievance mechanisms e.g., - Assigning a contractor based GRM Focal Person - Putting in place channels to allow people complaint- e.g., Telephone, Email, registers, What's up platform for workers, suggestion box among others - Ensuring documentation of complaints- Complaints registers - Raise awareness to all stakeholders including project workers on the existing GRM and sensitizing them on the need to register their dissatisfaction with the contractor or the facility	MoH E&S Expert, CLO, County Children's Officer, Contractor, Hospital Management

	- Resolve complaints within the project timeline (acknowledging within 7 days and resolving within 21 days or as soon as possible (within 24 hours for GBV/SEA complaints) - Ensure complaints reporting to the PMT on a monthly basis - using the annexed formats	
Child labour	- The contractor will develop and implement a Children Protection Strategy that will ensure minors are protected against negative impacts associated by the Project including on SEA - All staff must sign, committing themselves towards protecting children, a contract which clearly defines what is and is not acceptable behavior - Children under the age of 18 years should not be hired on site as provided by Child Rights Act (Amendment Bill) 2014. - Wherever possible, ensure that another adult is present when working in the proximity of children. - Not to invite unaccompanied children to workers' home, unless they are at immediate risk of injury or in physical danger. - Refrain from physical punishment or discipline of children). - Refrain from hiring children for domestic or other labor, which is inappropriate given their age, or developmental stage, which interferes with their time available for education and recreational activities, or which places them at significant risk of injury. - Comply with all relevant local legislation, including labor laws in relation to child labor specifically provisions of Kenya's Employment Act Cap 226 of 2007 Part VII on protection of children against exploitation	MoH E&S Expert, Project Manager, Contractor, Hospital Management

	Conflict and insecurity	▪ The contractor should explore on the possibility of having a different access to be able to enhance security and differentiate between patients, visitors and workers accessing the site. ▪ The contractor, in conjunction with the hospital management, should hire more security personnel and ensure they are well inducted to address security related issues as they arise. ▪ Prepare labour management plan (LMP) to guide recruitment of the workers in conjunction with local leaders, ▪ Limit worker's interaction where possible with community members, and ▪ Proper management of shared resources e.g. Water. ▪ It is also recommended that the construction workers be provided with easily identifiable uniforms ▪ Raise awareness on the GRM mechanisms ▪ Adequate consultation with surrounding communities and workers regarding the construction works ▪ Contractor security personnel should sign the Code of Conduct that discourages the use of force unless for defensive purposes.	
	Labor disputes	▪ Fair terms and conditions shall be applied for project workers (guided by relevant labour laws); ▪ The project shall also have GRMs for project workers (direct workers and contracted workers) to promptly address their workplace grievances; ▪ Project shall abide by the provision of the projects LMP, and ▪ The project shall respect the workers' right of labor unions and freedom of association; ▪ Ensure overtime is recorded and compensated ▪ Register contractor workers with WIBA	County Government, Labour Officer, Local Chief, MoH E&S Expert
Operational Phase			
Waste management	Improper HCWM	▪ Waste should be identified and segregated at the point of generation. Non-hazardous waste, such as paper and cardboard, glass, aluminum and plastic, should be collected separately and recycled. Food waste should be segregated and composted. Infectious and / or hazardous wastes should be identified and segregated according to its category using the colour-coded system. ▪ Prevention and minimization of the production of waste (integrating systems and practices to avoid the creation of waste and management and equipment and consumables purchasing). ▪ Reuse or recycling of wastes to the degree feasible ▪ Seal and replace waste bags and containers when they are approximately three quarters full. Full bags and containers should be replaced immediately.	County Government, NEMA, MoH E&S Expert,

		▪ Identify and label waste bags and containers properly prior to removal. ▪ Transport waste to storage areas on designated trolleys / carts, which should be cleaned and disinfected regularly. and never transport infectious and no-infectious waste together ▪ Instructions on how to handle the infectious waste from isolation and treatment centers should be made available to the waste handlers. ▪ Ensure safety and health of the HCW handlers through provision of appropriate PPEs, vaccination against Hepatitis B and tetanus as well as provision of post-exposure prophylaxis (PEP). ▪ Waste storage areas should be located within the hospital and sized to the quantities of waste generated, ▪ Unless refrigerated storage is possible, storage times between generation and treatment of waste should not exceed 48 hours during cool season, 24 hours during hot season. ▪ Packaging containers for sharps should be puncture-proof ▪ Ensure microwaved and shredded waste are secured to prevent pieces of shredded waste getting scattering as particles during transportation to final disposal site. ▪ Routine monitoring of shredded waste for quality assurance of the de-contamination. ▪ Properly transport treated waste to disposal facility (i.e. the inert waste to sanitary landfill) ▪ Seek an operational license for the waste treatment equipment (the MWTM) from NEMA to ensure compliance with the EMCA (Waste Management Regulations, 2006).	
Fire risk	Risk of fire outbreak	▪ Provide serviceable fire safety equipment and train workers on use ▪ Provide adequate and strategically located fire safety equipment, including sand buckets, fire extinguishers, hose reels, and fire hydrants across all critical areas of the hospital (wards, theatres, laboratories, stores, and waste treatment units), and ensure regular inspection, servicing, and maintenance. ▪ Ensure all hospital staff, including healthcare workers, support staff, and waste management personnel, receive basic training in fire prevention, detection, and control measures. ▪ Clearly display fire emergency contacts and evacuation procedures at visible and accessible points throughout the hospital, including corridors, wards, and high-risk areas. ▪ Develop a comprehensive Fire Emergency Management Plan in collaboration with the hospital administration, safety officers, and relevant public health authorities, and ensure all staff are trained on its implementation. ▪ Conduct regular fire drills across all departments to assess preparedness, test emergency response systems, and identify gaps for continuous improvement. ▪ Install and maintain functional fire detection and alarm systems (smoke detectors, heat sensors, and alarm panels) throughout the facility to enable early warning and rapid response. ▪ Design and maintain clearly marked emergency exits, fire assembly points, and unobstructed escape routes to facilitate safe evacuation during fire incidents. ▪ Ensure proper storage and handling of flammable materials, medical gases, and chemicals in designated, well-ventilated areas with appropriate safety signage. ▪ Establish a trained fire response team within the hospital responsible for coordinating fire emergency actions and liaising with external emergency services. ▪ Carry out routine fire risk assessments and safety audits to ensure compliance with national fire safety regulations and standards, and implement corrective actions promptly. ▪ Provide continuous refresher training and awareness programs on fire safety for all staff to reinforce a culture of safety within the hospital.	County Government, DOSH, MoH E&S Expert

Occupational Safety and Health Risks	Occupational Safety and Health Risks for Healthcare workers	▪ Ensure the implementation of standard precautions and transmission-based precautions in line with national guidelines for IPC in healthcare facilities, the MOH waste Management plan (2016 - 2021). These shall be customized through the development of the health facility specific instruments, among this include facility level infection control and waste management plan that incorporate among others health and safety aspects which must contain appropriate safety measures; ▪ Update and implement HCF emergency response plan. ▪ Ensure identification of risks (Job Risk Assessment) and instituting proactive measures, ▪ Train the healthcare workers on the potential OSH risks, of particular interest are the operators of the MWTM, who must be trained on the contents of the health and safety plan including on the general functioning of the treatment facility, including heat recovery and flue-gas cleaning technologies, where appropriate; Health, safety and environmental implications of treatment operations; Technical procedures for operation of the plant; Recognition of abnormal or unusual conditions; Emergency response, in case of equipment failures and alarms; Maintenance of the plant and record keeping; Surveillance of the final waste treated product ▪ Provision of adequate and required personal protective equipment (PPE) to health workers and enforce on use. This includes: single use medical mask, gown, Apron, eye protection, boots or closed shoes. ▪ Provision of a system for disinfection of the multi-use PPE if not available.	County Government, DOSH, MoH
		▪ Implementation of systemic risk management plan comprising risk prevention, evacuation of accident victims, evaluation and improvement measures. ▪ Limit access to the waste treatment area only to authorized persons; ▪ Warning and safety signage to be placed at the areas within the microwave site; ▪ The waste holding area/chambers should be well sheltered from direct rainfall, sunlight and strong winds but should be adequately aired; ▪ All machinery and equipment involved in the waste treatment and disposal process should be washed and disinfected prior to leaving site; ▪ Thorough, complete and up to date records on healthcare waste management, incidents and accidents and grievances should be kept. ▪ Provide adequately stocked first aid kit to be placed at strategic locations to allow ease of access by workers on-site;	
	Occupational health and safety risk to waste handling operators	▪ The MoH waste management strategic plan, guidelines and infection control and waste management plan should be applied, observed and customized through the development of the facility specific instruments. This should be augmented by guidelines issued by WHO; ▪ All the operators should be in the appropriate PPE during operations of the medical waste microwave; ▪ There must be a health and safety plan that is kept on-site which must contain appropriate safety measures; ▪ The operators of the medical waste microwave must be trained on the contents of the health and safety plan; ▪ Provide adequately stocked first aid kit and ensure placed at strategic locations to allow ease access by workers on-site; ▪ Provide serviceable fire safety equipment and workers on use, ▪ Regular fire safety drills should be undertaken to gauge the levels of preparedness of the operators, ▪ Ensure good documentation and inventory on waste received and treated, ▪ Maintenance of an accident incident log book on site ▪ Carry out periodic measurement of occupational electromagnetic frequencies (EMF) exposure for the workers	County Government, DOSH, MoH E&S expert,

Environment pollution	Solid waste generation	▪ The management of the hospital shall prepare a waste management plan to be implemented at the site (storage, provision of bins, site clean-up, bin clean-out schedule, etc.) to promote waste minimization and recycling. ▪ The hospital management shall be responsible for handling and disposal of all waste originating from the MWTM area, ▪ Encourage efficient use of materials to as much as possible avoid and minimize waste production. ▪ Designate temporal waste / garbage holding areas at site. ▪ Use of waste receptacles that encourage segregation to hold waste on site before its collection. ▪ Engage NEMA registered waste contractor to dispose of hazardous waste and have waste destruction certificate and waste transfer notes. ▪ Waste disposal by burning shall not be permitted and signage should be erected. ▪ wastes generated from maintenance of MWTM facility should be collected and disposed as per the management and handling guidelines of medical waste including decontamination, reuse and recycling	County Government, MoH E&S Expert, NEMA
Community Health risk	Improper waste disposal	▪ Targeted procurement of only required pharmaceutical, equipment, and other medical supplies in small quantities; ▪ Ensure regular monitoring of solid, liquid waste management practices and waste treatment; ▪ Ensure proper management of pharmaceutical waste by engaging a consultant to develop measures and guidelines for each facility in accordance with the national healthcare waste management plan; ▪ Ensure proper sewage management; ▪ Install appropriate drainage channel within the health facility;	County Government, DOSH, MoH E&S Officer
		▪ The hospital public health should undertake regular assessment of waste generation quantities and categories to facilitate waste management planning, and investigate opportunities for waste minimization on a continuous basis, ▪ Separate residual chemicals from containers and dispose of the containers to reduce generation of secondary contamination especially waste water; ▪ Seek NEMA license for the MWTM,	
Water Use at the Hospital	Increased water uses and liquid waste generation	▪ The MWTM shelter construction will provide for a toilet connected to the septic tank system. ▪ Designs have to provide for the MWTM shelter to be fitted with easy to clean tiles on their walls as well. ▪ Put roof gutters to collect rainwater from the facility iron sheet during the rainy season, ▪ Encourage prompt maintenance of water pipeline leaks, ▪ Install water conserving taps that turn-off automatically when water is not being used, ▪ The septic tank should never be allowed to spill on land and it should be exhausted by a NEMA licensed exhauster ▪ Pre-treat wastewater from the health facility before release to the septic tank.	County Government, MoH E&S expert,
Use of electricity	Increased energy use	▪ Use load shedding on lighting system and other equipment to avoid creating peaks in demand, ▪ Turn lights off using automated sensors or a building automation system, ▪ Install solar energy resources to provide for additional security lighting within the hospital in case of power outages ▪ Optimization of the load being treated at any one time for maximum efficiency.	County Government, DOSH, MoH E&S Expert,

Social Risk Management	GBV/SEA	- Continues sensitization of staff on SEA risk management - Provision of GRM channels for reporting SEA cases - Ensuring that the GBV/SEA one pager is placed on strategic points of the facility - Document available GBV/SEA referral pathways for victims' information and support - Develop an Action plan of all GBV/SEA incidences to avoid recurrence - Ensure the facility is well lid to avoid hiding places for SEA perpetrators - Provision of separate helping places for men and women - The hospital will continue to mainstream Gender Inclusivity in hiring of workers and entire Project Management as required by Gender Policy 2011 and 2/3 Gender Rule. - To include prohibition of GBV/SEA in Employees Code of conduct e.g. discouraging the use of inappropriate language or behavior, harassing, abusive, sexually provocative, demeaning or culturally inappropriate language towards women or children. - Prohibiting sexual activity with children under 18 years—including through digital media and promoting respect to the rule of law in respect to children's rights.	Hospital management, County Gender Officer
	Security and conflict	- The hospital will install CCTV cameras at strategic point to enhance security - The hospital will train the microwave operators periodically to enhance proper maintenance of the microwave - The hospital suggested to employ more police force to improve on the security situation at the hospital - It was suggested that the hospital was looking on raising the walls on the lower side which was acting as a security threat fir the hospital - The security guards should ensure proper surveillance of the facility - Security guards should be sensitized on the CoC and the provision of the Security management plan	Hospital Management, PHO, Security team
	Increased grievances	- The hospital should create awareness about the GRM mechanism in place to all workers and patients - Provide affected people with avenues for making complains or resolving any dispute that may arise during the course of stay.	Hospital Management ,
		- Ensure appropriate and mutually acceptable redress actions are identified and implemented to the satisfaction of complainants - Avoid the need to resort to judicial proceeding, unless the complainant decides that the process provided has failed	County Labour Officer
Decommissioning			
Equipment/ Machine decommissioning	Soils Degradation	- All machinery, equipment, structures and partitions that will not be used for other purposes must be removed, fumigated, containerized for disposal by NEMA licensed waste handler. - Where recycling/reuse of the, equipment, implements, structures, partitions and other demolition waste is not possible, the materials should be taken to a licensed waste disposal site	MoH, DOSH, MoH E&S Expert, CDE, CPHO, PWE
Structures decommissioning	Soils degradation / water Resources pollution / air pollution	- All foundations must be removed and recycled, reused or disposed of at a licensed disposal site - All anchorages plinths must be removed, recycled, reused or disposed by NEMA licensed waste handler. - Use dust screens and nets to mitigate on dust/particulate matter	MoH E&S Expert, CDE, CPHO, PWE
Demolition Wastes	Soils pollution / air pollution / water resources pollution	- Use an integrated solid waste management system I.e. through hierarchy of options 1. Source reduction 2. Recycling, 3 Composting and re0use 4. Combustion. 5 Sanitary land-filling - Provide appropriate waste skips that encourage waste segregation - Ensure proper waste collection, storage and disposal of waste generated - Donate reusable demolition waste to charitable organizations, individuals and institutions - Properly dispose of the demolition debris when no longer considered useful	MoH E&S Expert, CDE, CPHO, PWE

Project Decommissioning	▪ OHS/ Public Safety	▪ The decommissioning Contractor should have a well-developed EHS plan for the decommissioning exercise certified by a Qualified EHS Officer. ▪ A qualified EHS officer should be stationed at the decommissioning site during the entire decommissioning period to ensure compliance to Health and safety plan. ▪ Ensure the workers are provided with adequate and appropriate PPE (dust mask, ear plugs, helmets, gloves) on site and enforce on use ▪ While working at height provide safety harnesses and scaffolding equipment ▪ Fence off/ barricade the site prior to demolition to minimize health and safety risks ▪ Restrict demolition activities during day time between 0080hrs to 1700 hrs. ▪ Provide adequately well stocked first aid kit and ensure one of the workers can administer first aid.	▪ MoH E&S Expert, CDE, CPHO, PWE
Site Rehabilitation	▪ Soils pollution/water resources pollution/ Air pollution	▪ Proper treatment of the site should be carried out (Decontamination)	▪ MoH E&S Expert, CDE, CPHO, PWE
	▪ Backfilling excavation sites	▪ Ensure the contractors backfill and rehabilitate excavated sites before final payment	
Re-vegetation	▪ Soils degradation/ water resources pollution/ air pollution	▪ Implement an appropriate re-vegetation programme to restore the site to its original status	
		▪ Consider use of indigenous plant species in re-vegetation	
		▪ Trees should be planted at suitable locations so as to interrupt sight lines (screen planting), between the adjacent residential area and the development.	
Social risk management	▪ GBV/SEA	▪ The hospital will mainstream Gender Inclusivity in hiring of workers and entire Project Management as required by Gender Policy 2011 and 2/3 Gender Rule. ▪ The existing community structures headed by location chiefs should be involved in local labour hire, emphasize the requirement of hiring women, youth and people with disability. ▪ Protecting Human Risk Areas Associated with, Disadvantaged Groups, interfering with Participation Rights and interfering with Labour Rights. ▪ To include promotion of human rights, including gender equality and equity in Employees Code of conduct ▪ Ensure safe employment for women, including training for all staff on SH COC, sex-disaggregated latrines, regular consultation with female employees and other measures§ to ensure physical safety and dignity of female employees	▪ Hospital management, County Gender Officer
		▪ GBV constitutes acts of gross misconduct and are therefore grounds for sanctions, penalties and/or termination of employment. All forms of GBV including grooming are unacceptable be it on the work site, the work site surroundings, or at workers camps. Prosecution of those who commit to be pursued. ▪ Treat women and children (persons under the age of 18) with respect regardless of race, color, language, religion, political or other opinion, national, ethnic or social origin, property, disability, birth or other status. ▪ Do not use language or behavior towards women or children that is inappropriate, harassing, abusive, sexually provocative, demeaning or culturally inappropriate. ▪ Sexual activity with children under 18—including through digital media is prohibited. Mistaken belief regarding the age of a child and consent from the child is not a defense.	
	▪ Security and conflict	▪ The hospital will install CCTV cameras at strategic point to enhance security ▪ The hospital will train the microwave operators periodically to enhance proper maintenance of the microwave ▪ The hospital suggested to employ more police force to improve on the security situation at the hospital ▪ It was suggested that the hospital was looking on raising the walls on the lower side which was acting as a security threat fir the hospital ▪ The security guards should ensure proper surveillance of the facility ▪ Security guards should be sensitized on the CoC and the provision of the Security management plan	▪ Hospital Management, PHO, Security team

▪ Child welfare and protection	▪ The hospital will develop and implement a Children Protection Strategy that will ensures minors are protected against negative impacts associated by the Project including on SEA. ▪ All staff must sign, committing themselves towards protecting children, a contract which clearly defines what is and is not acceptable behavior ▪ Children under the age of 18 years should not be hired on site as provided by Child Rights Act (Amendment Bill) 2014. ▪ Wherever possible, ensure that another adult is present when working in the proximity of children. ▪ Not invite unaccompanied children to worker's home, unless they are at immediate risk of injury or in physical danger ▪ Refrain from physical punishment or discipline of children) ▪ Refrain from hiring children for domestic or other labor, which is inappropriate given their age, or developmental stage, which interferes with their time available for education and recreational activities, or which places them at significant risk of injury. ▪ Comply with all relevant local legislation, including labor laws in relation to child labor specifically provisions of Kenya's Employment Act Cap 226 of 2007 Part VII on protection of children against exploitation	▪ County Children's Officer, Hospital Management
▪ Increased grievances	▪ The hospital should create awareness about the GRM mechanism in place to all workers and patients ▪ Provide affected people with avenues for making complains or resolving any dispute that may arise ▪ Ensure appropriate and mutually acceptable redress actions are identified and implemented to the satisfaction of complainants ▪ Avoid the need to resort to judicial proceeding, unless the complainant decides that the process provided has failed	▪ Hospital Management, County Labour Officer

Table 12: Environmental and Social Management Plan

Aspect	Potential Impact	Proposed Mitigation Measure (s)	Timing	Responsibility	Estimated cost of implementation (KShs)
Construction Phase					
Soil resources	Soil erosion	Re-vegetation through grassing	After construction	Contractor, MoH E&S Expert	100,000.00
		Provision of silt traps during construction as necessary	Continuous		
	Soil compaction by equipment and machinery	Restrict construction vehicle movements to defined tracks/paths	Continuous		
Water Quality and Resource use efficiency	Contamination of local water resources from inappropriate wastewater discharges	Direct wastewater from site activities to a sump from where suspended solids can be deposited before discharge to local drainage systems	Continuous	Contractor, MoH E&S Expert	90,000.00
	Contamination of water resources from spillages and leakages	Institute spill prevention and response procedures	Continuous	Contractor	60,000
	Increased demand on local water resources	Ensure efficient use of water in construction activities	Monthly		0.00
Construction materials usage	Depletion of natural resources	Ensure efficient use of building materials	Continuous	Contractor	0.00
		Optimize materials through reuse	Continuous		
	Building materials	- Efficient use of building materials - Optimize materials reuse	Monthly	Contractor, MoH E&S Expert	0.00
Air Quality (Dust and Emissions)	Nuisance and adverse health due to dust emission	- Wetting of project site to reduce dust - Put up dust screen/nets around the construction and renovation sites, - Provision of PPE (dust masks) for the workers, - Covering all trucks delivering construction material - Covering of stock piled construction material	Continuous	Contractor, MoH E&S Expert	100,000.00
	Adverse health impacts as a result of emissions of fumes from vehicles,	- Use of low emission machinery that use electricity as source of power or use manual labour; - Periodically Service all the equipment and machinery used during construction phase	Continuous		
Noise and Vibration	Nuisance and adverse health impacts from high noise and vibration levels	- Planned schedules for Construction during day time; - Using silencers in heavy machines, - Use of PPE such as ear muffs - Operation and maintenance of equipment used on site	While at site and during operation of heavy machines	Contractor, MoH E&S Expert	50,000.00
Waste Management	Health and safety hazards and environmental pollution from poor management of wastes	- Provide appropriate solid waste receptacles on site - Sensitize workers on appropriate solid waste management - Engagement of a NEMA licensed contractor to collect and dispose the waste	Continuous	Contractor, MoH E&S Expert	50,000.00
Social Concerns during construction and operational phases	Insecurity / public safety	Having guards dedicated to the project sites and fencing off the project sites	Continuous	MoH	30,000.00
	Exclusion (ethnicity, gender,	Public awareness of the project requirements,	Continuous	MoH E&S Expert,	30,000.00

	age, location and disability	- Stakeholder engagement and collective reasoning, - Implementation of the requirements of the LMP, and the GBV Action Plan.			
	Gender based Violence/Sexual Exploitation and Abuse	- The contractor should develop a code of conduct which should encompass clear warning to workers on any kind of sexual exploitation and abuse. - The contractor should provide a mechanism where workers are free to report any sexual advances and abuse to the senior management without fear of intimidation. - The contractor should communicate to the workers that there should be no or minimal interaction with the patients.	Continuous	MoH E&S Expert,	30,000.00
	Lack of access to grievance redress mechanism	A verbal or written complaint from a complainant will be received by the site supervising engineer/site agent and recorded in a complaints log that is kept on site. The log will indicate grievances, date lodged, action taken to address complaint or reasons the grievance was not acted on; information provided to complainant and date the grievance was closed.	Continuous	MoH E&S Expert	30,000.00
	Labour influx	effective community engagement and strong grievance mechanisms on matters related to labour, including sexual exploitation and abuse	Continuous	MoH E&S Expert, Contractor,	30,000.00
	Child labour	- Ensure no child of below 18 years is seen on site - Ensure contractor sign a CoC for child protection	Continuous	MoH E&S Expert Contractor	30,000.00
	Public health and safety hazards which may be potential risk to contract communicable diseases and infectious diseases at the site	- Treat affected local and migrant workers to control the spread of disease vectors (through contaminated water and between people); - Provision of adequate and accessible sanitation facilities in good condition with adequate water supply; - Create awareness to workers on proper sanitation and personal hygiene to promote proper health; and - To mitigate risk from food related contamination amongst construction workers, food supplies will be from the vendors with public health certificate. - Put in place all infectious diseases prevention and containment measures. - Publish health and safety information including site rules at the site - Ensure observance of public and community health and safety.	Continuous	MoH E&S Expert, Contractor	
General Health and Safety	Accidents, incidents causing harm or sickness due to existence of health and safety hazards on site	- Provision and use of proper personal protective equipment - Provision of first aid kits - Undertake first aid training and awareness creation on OHS - OHS policy strategically displayed - Erecting hazards warning signs on site	Continuous	MoH E&S Expert, Contractor	250,000 once
Operational Phase					

Waste Management	Healthcare Waste generated from the health facility	• Ensure appropriate and adequate segregation of HCW waste at source • Ensure appropriate on-site transportation of HCW to Waste treatment area, • Ensure proper records of waste received from the immediate health facility and other health facilities, • Appropriate healthcare waste storage area free from vermins • Ensure efficient treatment of healthcare waste • Appropriate transportation of microwaved waste to disposal site.	Continuous	Health facility manager, Biomedical engineer	200,000
General Health and Safety	Occupational and public health hazards	• Ensure provision of and appropriate use personal protective equipment • Erecting warning signs on site • Regular medical check-up for healthcare waste handlers and vaccination such as against Hepatitis A, B and tetanus, • Provision of appropriate sanitary facilities, • Provision of first aid kits • OHS policy strategically displayed • Ensure observance of public and community health and safety • Ensure thorough general cleanliness and disinfection of the facility among other appropriate housekeeping and ventilation practices.	Continuous	Proponent, biomedical - engineer	1,500,000
	Fire preparedness Operation of health facilitie	• Conduct regular drills on fire emergency response and evacuation. • Conduct regular inspection of fire-fighting equipment. • Install an adequate number of fire-fighting equipment and systems including portable fire extinguishers and hose reels	Continuous	, biomedical -engineer	
	Total cost				2,780,000

Table 13: Environmental and Social Monitoring Plan

Aspect	Potential Impact	Mitigation Measure (s)	Monitoring Indicators	Frequency of Monitoring	Responsibility	Estimated cost of implementation (KShs)
Construction Phase						
Soil resources	Soil erosion	Re-vegetation through grassing	Extent of vegetation cover; % of bare ground around the project site	After construction	Contractor, MoH E&S Expert	50,000
		Provision of silt traps during construction as necessary	Presence of silt traps	Continuous		0.00
	Soil compaction by equipment and machinery	Restrict construction vehicle movements to defined tracks/paths	Percentage of actual compacted area vis-à-vis the proportion that would inevitably be compacted even when caution is applied	Continuous		0.00
Water Quality and Resource use efficiency	Contamination of local water resources from inappropriate wastewater discharges	Direct wastewater from site activities to a sump from where suspended solids can be deposited before discharge to local drainage systems	- Existence and operation of a wastewater sump at the site - Size and type of drainage system	Continuous	Contractor, MoH E&S Expert	50,000.00
	Contamination of water resources from spillages and leakages	Institute spill prevention and response procedures	Established procedures for identified hazardous materials	Continuous	Contractor	0,000
	Increased demand on local water resources	Ensure efficient use of water in construction activities	- Records of amount of water used monthly. - Water saving measures instituted at the site	Monthly		0.00
Construction materials usage	Depletion of natural resources	Ensure efficient use of building materials	- Records of building materials tracking - Financial savings in subsequent bills	Continuous	Contractor	0.00
		Optimize materials through reuse		Continuous		
Air Quality (Dust and Emissions)	Nuisance and adverse health due to dust emission	- Wetting of project site to reduce dust - Put up dust screen/nets around the construction and renovation sites, - Provision of PPE (dust masks) for the workers, - Covering all trucks delivering construction material - Covering of stock piled construction material	- Air quality measurement to determine amounts of dust at site - Visual observation - Complaints received from staff	Continuous	Contractor, MoH E&S Expert	100,000.00
	Adverse health impacts as a result of emissions of fumes from vehicles,	- Use of low emission machinery that use electricity as source of power or use manual labour; - Periodically Service all the equipment and machinery used during construction phase	- Type of machinery being used, - Visual observation of emissions - Air quality measurements to determine air borne particulate matter. - Records of serviced construction vehicles	Continuous		
Noise and Vibration	Nuisance and adverse health impacts from high noise and vibration levels	- Planned schedules for Construction during day time; - Using silencers in heavy machines,	- schedules of activities - Noise and vibrations measurement in Decibels	While at site and during operation of heavy	Contractor, MoH E&S Expert	30,000.00

		• Use of PPE such as ear muffs • Operation and maintenance of equipment used on site	• Complains from workers and staff • Records of machine operation and maintenance	machines		
Waste Management	Health and safety hazards and environmental pollution from poor management of wastes	• Provide appropriate solid waste receptacles on site • Sensitize workers on appropriate solid waste management • Engagement of a NEMA licensed contractor to collect and dispose the waste	• Availability of waste receptacles • Waste streams and volumes generated on site including hazardous waste - used oil, waste paints • Waste tracking documents	Continuous	Contractor, MoH E&S Expert	30,000.00
Social Concerns during construction and operational phases	Insecurity / public safety	• Having guards dedicated to the project sites and fencing off the project sites	Presence of a security Personnel. Fence around the project site;	Continuous	The proponent /MoH, PWE	30,000.00
	Exclusion (ethnicity, gender, age, location and disability)	• Public awareness of the project requirements, • Stakeholder engagement and collective reasoning, • Implementation of the requirements of the LMP, and the GBV Action Plan.	Minutes of public awareness/stakeholder engagements carried out	Continuous	MoH E&S Expert,	30,000.00
	Gender based Violence/Sexual Exploitation and Abuse	• The contractor should develop a code of conduct which should encompass clear warning to workers on any kind of sexual exploitation and abuse. • The contractor should provide a mechanism where workers are free to report any sexual advances and abuse to the senior management without fear of intimidation. • The contractor should communicate to the workers that there should be no or minimal interaction with the patients.	Signed code of conduct Code of conduct for workers	Continuous	MoH E&S Expert,	30,000.00
	Lack of access to grievance redress mechanism	• A verbal or written complaint from a complainant will be received by the site supervising engineer/site agent and recorded in a complaints log that is kept on site. The log will indicate grievances, date lodged, action taken to address complaint or reasons the grievance was not acted on; information provided to complainant and date the grievance was closed.	• Grievance logs • No of resolved cases • No of escalated cases	Continuous	MoH E&S Expert,	30,000.00
	Labour influx	• effective community engagement and strong grievance mechanisms on matters related to labour, including sexual exploitation and abuse	Copies of employment contract segregated by gender	Continuous	MoH E&S Expert, Contractor,	30,000.00
	Child labour	• Ensure no child of below 18 years is seen on site • Ensure contractor sign a CoC for child protection	• The work force registry with details of age	Continuous	MoH E&S Expert, Contractor	30,000.00
General Health and Safety during construction &	Public health and safety hazards which may be potential risk to contract communicable diseases	• Treat affected local and migrant workers to control the spread of disease vectors (through contaminated water and between people);	• Visual inspection and observation of functionality of sanitary facilities	Continuous	MoH E&S Expert, Contractor	50,000

operation	and infectious diseases	• Provision of adequate and accessible sanitation facilities in good condition with adequate water supply; • Create awareness to workers on proper sanitation and personal hygiene to promote proper health; and • To mitigate risk from food related contamination amongst construction workers, food supplies will be from the vendors with public health certificate. • Put in place all infectious diseases prevention and containment measures. • Publish health and safety information including site rules at the site • Ensure observance of public and community health and safety • Ensure thorough general cleanliness and disinfection of the facility among other appropriate housekeeping and ventilation practices.				
	Accidents, incidents causing harm or sickness due to existence of health and safety hazards on site	• Provision and use of proper personal protective equipment • Provision of first aid kits • Undertake first aid training and awareness creation on OHS • OHS policy strategically displayed • Erecting hazards warning signs on site	• Display of OHS policy First aid training records, list of first aiders and those of health and safety committee members. • Well stocked first aid kit	Continuous	MoH E&S Expert, Contractor	50,000 once
	Fire preparedness Operation of health facilities	• Conduct regular drills on fire emergency response and evacuation. • Conduct regular inspection of fire-fighting equipment. • Install a n adequate number of fire-fighting equipment and systems including portable fire extinguishers and hose reels	• Presence of firefighting equipment • Statistical records and safety reports Served fire extinguishers. •	Continuous	biomedical - engineer	
		Operational Phase				
Efficient use of resources	Surface run-off and waste water management	• Embankment, re-vegetation, proper drainage systems • Efficient use of water resources • Spill prevention procedures and response plan	• Extent of vegetation cover; % of bare ground • Amount of water used monthly; water saving measures instituted	Continuous	Hospital management	50,000.00

			at the site • Presence of silt traps			
	Pollution of surface and ground water	Installation of pre-treatment chambers before discharge to hospital septic system	Established procedures for identified hazardous materials	Construction	Hospital management, hospital PHO	
	Increased use of Energy and indoor air pollution	- Efficient energy use and use of clean energy as back up source of power - Install a meter to monitor power consumption - Switch of lights when not in use	Power usage bills monthly; energy saving measures instituted, presence of a meter	Continuous	Hospital management, hospital PHO	
Waste Management	Healthcare Waste generated from the health facility	- Ensure appropriate and adequate segregation of HCW waste at source - Ensure appropriate on-site transportation of HCW to Waste treatment area, - Ensure proper records of waste received from the immediate health facility and other health facilities, - Appropriate healthcare waste storage area free from vermin - Ensure efficient treatment of healthcare waste - Appropriate transportation of microwaved waste to disposal site.	- Availability of waste receptacles - Waste streams and volumes generated on site including hazardous waste - used oil, waste paints - Waste tracking documents	Continuous	Health facility manager, , Biomedical engineer	200,000
	Total cost					790,000

9. SUMMARY, CONCLUSION AND RECOMMENDATION

9.1 Summary

In accordance with the Environmental Management and Coordination Act (EMCA) Cap 387 (Amended 2015) and the Environmental (Impact Assessment and Audit) Regulations, 2003, an Environmental and Social Impact Assessment (ESIA) was conducted for the proposed construction of a Level 6 Hospital. The assessment evaluated potential environmental and social impacts associated with the project during the construction, operation, and decommissioning phases.

The findings indicate that the anticipated impacts can be effectively mitigated through the implementation of the proposed Environmental and Social Management Plan (ESMP) outlined in Table 12, alongside the monitoring framework provided in Table 13. Based on the analysis of both positive and negative impacts, and assuming the project is designed, constructed, operated, and monitored in full compliance with applicable environmental, social, health, and safety (ESHS) standards, the project is not expected to result in significant adverse impacts that would preclude its implementation.

The proposed Level 6 Hospital is expected to generate substantial positive impacts, including creation of employment opportunities during both construction and operation phases, expansion and improvement of healthcare infrastructure, stimulation of local economic activities through demand for construction materials and services, and enhanced capacity building for healthcare personnel. Additionally, the facility will significantly improve access to specialized and referral healthcare services, thereby contributing to improved public health outcomes.

However, several potential negative impacts may arise during the construction phase. These include disturbance of the physical environment such as vegetation clearance and alteration of landforms, increased noise and vibration, air pollution from dust emissions, increased solid and liquid waste generation, accidental spillages of hazardous materials, and increased demand for construction materials. Social risks may include occupational health and safety (OHS) hazards, spread of communicable diseases, increased risk of HIV/AIDS and other sexually transmitted infections, labour influx-related challenges, potential human rights concerns, gender-based inequalities, security risks, sexual exploitation and abuse (SEA), and community grievances.

During the operational phase, potential impacts include risks associated with improper healthcare waste management (HCWM), fire hazards, occupational safety and health risks for healthcare workers and waste handlers, increased water and energy consumption, generation of liquid waste, and possible air pollution from inadequately managed medical waste.

To address these risks, the ESIA proposes a range of appropriate and cost-effective mitigation measures. These include controlled vegetation clearance and re-vegetation of disturbed areas, installation of proper storm water drainage systems, implementation of rainwater harvesting systems, dust suppression through regular water sprinkling, and strict adherence to occupational health and safety standards. Healthcare waste will be managed in compliance with national regulations through the use of designated containers for segregation, storage, transportation, and disposal, including engagement of NEMA-licensed waste handlers for hazardous waste.

All mitigation measures are comprehensively detailed in the ESMP (Table 12), with corresponding monitoring mechanisms outlined in Table 13 to ensure compliance and effectiveness throughout the project lifecycle.

Overall, the construction and operation of the proposed Level 6 Hospital are environmentally and socially viable, provided that the recommended mitigation and monitoring measures are fully implemented.

9.2 Conclusion

Based on the data collected, analyzed, and collated during the ESIA process for the proposed construction of the Level 6 Hospital, it is the considered opinion of the experts that the project is environmentally and socially viable, subject to strict adherence to the recommended mitigation and monitoring measures.

- i. The proposed construction of the Level 6 Hospital does not pose any significant or irreversible environmental concerns. The anticipated impacts are largely moderate and typical of large-scale infrastructure and healthcare development projects, and can be effectively managed through the implementation of appropriate mitigation measures.
- ii. The positive impacts of the project—such as improved access to specialized healthcare services, enhanced referral capacity, job creation, and strengthening of healthcare infrastructure—significantly outweigh the potential negative impacts. These adverse impacts can be adequately minimized and controlled through the prescribed Environmental and Social Management Plan (ESMP) and monitoring framework.
- iii. The project is critically needed to address existing gaps in healthcare service delivery and medical waste management. The establishment of a Level 6 Hospital will provide modern, efficient, and environmentally sound systems for handling healthcare waste, thereby eliminating unsafe practices such as open burning and improving overall public health and environmental quality.
- iv. The Ministry of Health (MoH) has already established appropriate measures for the management of medical waste across many health facilities, including referral hospitals. For the proposed Level 6 Hospital, there will be a need for continuous and routine monitoring of healthcare waste collection, segregation, transportation, and disposal processes, as well as regular validation of the functionality and efficiency of waste treatment and disposal systems.
- v. In light of the above considerations, the proposed project should be approved for implementation. However, its execution must strictly comply with the ESMP, relevant national legislation, and internationally recognized environmental and social safeguards to ensure sustainable development and protection of both the environment and surrounding communities.

9.3 Recommendations

The following recommendations are proposed to guide the successful and sustainable implementation of the construction and operation of the Level 6 Hospital:

- a. Although the anticipated negative environmental and social impacts associated with the construction of the Level 6 Hospital are moderate, localized, and manageable, it is essential that the Environmental and Social Management Plan (ESMP) be fully operationalized. This will ensure that all mitigation measures are effectively implemented throughout the project lifecycle, thereby promoting environmental sustainability and safeguarding community well-being.
- b. The institutional framework responsible for the implementation and oversight of the project should be adequately strengthened and operationalized. Relevant authorities and stakeholders must actively execute their mandates to ensure continuous monitoring, compliance, and enforcement of environmental, social, health, and safety (ESHS) requirements during both construction and operational phases of the Level 6 Hospital.
- c. The project should allocate sufficient resources towards continuous capacity building for hospital staff, particularly those involved in healthcare waste management and facility operations. Emphasis should be placed on training in occupational safety and health, emergency preparedness and response, and best practices in medical waste treatment and management systems to ensure safe and efficient functioning of the Level 6 Hospital.

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Appendix 5: Grievance Redress Management Plan

This ESIA provides for a Grievance redress mechanism (GRM) includes instruments, methods, and processes by which a resolution to a grievance is sought and provided. The processes are as shown below.

The project will have several channels for complaints and grievances including email, phone calls, texts, blogs, toll free number and letter writing that will also be accessible to all workers. Information on the project GRM will be made available to workers at all facilities, government offices (both national and county) and community level (chief's office, for instance) to ensure that all workers, including CHVs have adequate information on how to lodge a complaint and who to direct it to. Anonymity will be assured when handling workers' grievances. Although 'suggestion boxes' exist in many worksites and appear to be a preferred form of reporting complaints, the experience has been that these boxes are hardly opened. If these have to be used as part of the GRM, a structure needs to be put in place for opening, reviewing, responding and providing feedback on the issues raised.

The following actions will be used for managing complaints for this project:

- a. Complaints will be sent to the GRM focal point at the workplace by email, text, phone, letter or in person. The complaints will be collated onto a complaints form and logged into the register (and reported). The email addresses and phone number will be made available to the workers at signing the contract/recruitment.
- b. Complaints will be reviewed by the PMT weekly upon receipt. The grievance committee at the workplace will comprise of the in-charge (health superintendent or contractors (who will be the chair), GRM focal point will act as the secretary, and departmental heads. The team will review the complaints and provide guidance on the course of action and ensure follow-up on previous complaints. Any preliminary investigation should take place within 5 working days of the committee meeting. Feedback will be given to the complainant within 10 working days.
- c. For informal complaints i.e. those raised through social media, print media or not formally lodged, the committee will deliberate upon them to decide whether to investigate based on the substance and potential impact/reputational risk.
- d. If the complaint is referred to the main project GRM and government's legal complaints structures (EACC, CAJ, etc.), the African Development Bank will be notified.
- e. Complaints regarding SEA will be kept confidential, the name of the complainant will not be recorded, only the age and gender of the complainant, and whether a project worker was involved and should be sent directly to the PM who should immediately inform the African Development Bank.
- f. No disciplinary or legal action will be taken against anyone raising a complaint in good faith.
- g. A monthly report of complaints resolution should be provided to the PMT and the African Development Bank.