

**MALAWI COVID-19 EMERGENCY RESPONSE AND HEALTH SYSTEMS PREPAREDNESS PROJECT**

**P173806**

**ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP) FOR THE PROPOSED CONSTRUCTION OF OPD AND EMERGENCY SECTIONS OF MZUZU CENTRAL HOSPITAL PEDIATRIC CENTER IN MZUZU**

**December 2024**

# EXECUTIVE SUMMARY

**Introduction**

The Government of Malawi through Ministry of Health is implementing the Malawi COVID-19 Emergency Response and Health Systems Preparedness Project (C-ERHSPP) which is being funded by World Bank. The project is being implemented to prevent, detect and respond to the threat posed by COVID-19 in Malawi and strengthen national systems for public health preparedness. The project’s implementation period is from April 2020 to December 2025.

The project comprises three components namely, 1) Emergency COVID-19 Response, 2) Supporting National and Sub-national, Prevention and Preparedness and 3) Implementation Management and Monitoring and Evaluation with the aim of strengthening the MoH’s capacity. Under component 2 of the project, the Ministry of Health intends to undertake refurbishment/ rehabilitation and construction of various health facilities’ infrastructure, purchase and installation of Incinerator units, upgrading X-ray rooms, perimeter fence construction etc. in different health units are being proposed in the country. Among the proposed sub-projects is the Construction of Outpatient Department (OPD) and Emergency sections of proposed Mzuzu Central Hospital Pediatric Center in Mzuzu City, Mzimba District. The estimated cost of the project is MMK2, 626,500,000 ($1.5 Million). The project is planned to be implemented from October 2024 to December 2025.

This Environmental and Social Management Plan (ESMP) has been prepared to meet national legislation and the World Bank Environmental and Social Framework (ESF) requirements i.e. Environmental and Social Commitment Plan (ESCP), Environmental and Social Management Framework (ESMF) and Labour Management Procedures (LMP), to ensure that the project is implemented in a sustainable manner.

**Nature and scope of proposed project**

The proposed project will involve the construction of a Pediatric OPD and Emergency sections at Mzuzu Central Hospital will include the following works.

1. Pediatric OPD: 4 Clinic rooms, 7 Consultation rooms, Plaster of Paris (POP) room, 2 treatment rooms, observation room, on call room, staff lounge and kitchen, sluice rooms and waiting area will be constructed.
2. Emergency section: 2 Consultation rooms, Emergency room, Doctors office, sluice room, Porters room and Ambulance Bay will be constructed.

This ESMP is for both the construction and operation and maintenance phases where the contractor to undertake the works and the Ministry of Health and Mzuzu Hospital Management during operation phase will ensure that the proposed mitigation measures for the identified environmental and social risks and impacts are implemented.

**Objectives of the ESMP**

The main objective of this ESMP is to improve the overall environmental and social performance of the proposed project through identifying the potential positive and adverse impacts associated with the project. This process will help enhance beneficial impacts and minimize adverse impacts to ensure the project is implemented in a sustainable manner.

The specific Objectives of this ESMP were to:

* Identify and assess key potential environmental and social direct, indirect and cumulative risks and impacts including those on gender, which may be caused by the proposed construction works.
* Propose measures that will mitigate the anticipated negative impacts and risks of the proposed construction and operation and maintenance stages, both environment and social components, including gender concerns.
* To provide baseline information about the environmental, social, economic and cultural conditions in the project area.
* To review national and international policies and legal frameworks including Environmental Management Act (2017), National Environmental Policy (2004), Water Resources Act (2013), Land Acquisition Act (2017), the National Sanitation Policy and the World Bank Environmental and Social Framework and Environmental Health and Safety Guidelines (EHS) that are related to the proposed project.
* Conduct stakeholder consultative meetings which inform project key environment, social risks, and mitigation measures; and
* Develop a costed ESMP and monitoring plan with clear lines of responsibilities for key stakeholders.

**Summary of Positive and Negative Impacts of the Project**

**Positive Impacts**

The key positive environmental and social impacts from the project includes but not limited to 1) creation of temporary jobs, 2) increased skills transfer to local people 3) increased business opportunities 4) improved aesthetic value of the hospital 5) increased hospital capacity to accommodate more patients and reducing overcrowding; 6) increased infection prevention and control. 7) Increased access to pediatric care for patients by reducing the physical and logistical barriers in the current setup 8) improved water quality due to pond desludging. 9) Reduced odor and nuisance due to desludging of wastewater pond.

**Negative Impacts and their Mitigation**

1. Blockage of footpath connecting the communities and main road.

**Mitigation measures:**

* Relocate all affected footpath(s) before project commencement.
* Install signage of designated new footpath(s)
* Sensitize community about the proposed project

1. Potential for soil and ground water contamination by sludge

**Mitigation Measures**

* Contractor to prepare a detailed Dredge Management Plan to provide the details of the process, sludge handling and disposal
* Establish emergency response protocols for accidental exposure.
* Use analysis results to determine appropriate treatment methods (e.g., incineration, stabilization, or landfilling).
* Conduct periodic monitoring to assess any changes in sludge contamination over time.
* Dispose of sludge at designated disposal sites in consultation with MEPA and MCC.

1. Potential for Poor liquid waste management during operation phase

**Mitigation Measures**

* Conduct yearly comprehensive environmental audits of the facility to ensure they follow applicable environmental legislation
* Assess compliance of their wastewater discharges with the applicable discharge.
* Conduct quarterly training of hospital personnel on waste management at the facility
* Ensure regular maintenance of the wastewater system of the facility.
* Ensure the hospital has a valid permit for disposal of treated sewage into the environment from National water resources authority.

1. Increased risk of infections due to poor management of health care wastes

**Mitigation Measures**

* The MoH and KCH must continue to train and sensitize its staff in infection control and best practices for managing infectious wastes.
* Regularly monitor performance of equipment such as incinerator and carry out maintenance.
* Ensure there is enough supply of PPE for infections prevention and control for health care workers.

1. Increased Occupational Health and Safety risks during sludge sampling

**Mitigation measures**

* + Define procedures for safe sludge sampling, including collection, preservation, and transport to accredited laboratories.
  + Specify analytical parameters, such as heavy metals, pathogens, and organic pollutants.
  + Adhere to national and international guidelines for sludge sampling and disposal.
  + Use environmental consultants to oversee sampling and analysis.

1. Increased risk of soil erosion

**Mitigation measures:**

* Restrict land clearing and excavations only to spaces affected by construction activities and construct drainage where necessary.
* Avoid excavations and soil disturbance during rainy season.
* Back fill all excavations immediately
* Landscape/ re-plant vegetation of indigenous species as soon as constructions phase is completed.

1. Increased generation of solid waste

**Mitigation Measures:**

* + Develop and implement a waste management plan that includes segregation, recycling, and proper disposal of construction waste.
  + Train workers and staff on proper waste segregation procedures, ensuring everyone understands the risks and responsibilities.
  + Provide adequate clearly labeled bins on-site for different types of waste.
  + Set up secure, well-contained waste storage areas to prevent littering, contamination, and exposure to weather.
  + Promote recycling and reusing of wastes where possible.
  + Dispose solid waste at designated waste disposal at Mzuzu City dumpsite.

1. Increased dust emissions

**Mitigation Measures:**

* + Suppress dust regularly using water and regular cleaning to minimize the spread of dust
  + Provide appropriate PPE to workers such as dust masks for those working in dusty conditions.
  + Use closed/covered trucks for transportation of construction materials.
  + Reduce speed to 20km/ hour within the hospital premises

1. Increased noise pollution

**Mitigation Measures:**

* + Fence the construction site
  + Use equipment with noise silencers
  + Use well maintained equipment and vehicles
  + Limit works to daytime to avoid disturbing patients at night.
  + Sensitize workers to keep voices down.
  + Avoid unnecessary movement of construction vehicles at the facility.
  + Sensitize community/patients and guardians on time of noisy activities

1. Increased generation of hazardous wastes.

**Mitigation measures:**

* + Substitute hazardous construction materials with nonhazardous alternatives
  + Segregate scrap metals and glass from other waste streams to ensure safe handling.
  + Secure storage and label all storage areas for hazardous wastes to minimize the risk of accidents, spills, or contamination.
  + Dispose hazardous waste including dredged waste from the wastewater treatment pond at designated places and by a competent authority.

1. Occupational safety and health risks

**Mitigation measures:**

* + Develop and implement Health and Safety Plans
  + Conduct risk assessment before commencing any works
  + Conduct regular safety inspections to ensure maximum safety of workers.
  + Train all workers on proper use and handling of equipment.
  + Always provide all workers with appropriate PPE and effective use of such.
  + Install signage in all critical areas and indicating “Danger equipment”, slow down “Stop” etc.

1. Risk of chemical exposure to workers

**Mitigation measures**

* + Replace hazardous chemicals such as paints and sealants or non-toxic alternatives where possible.
  + Provide regular training on the proper handling, storage, and disposal of hazardous chemicals.
  + Develop and enforce safe work practices, such as proper labeling of chemicals and implementing emergency procedures.
  + Store hazardous chemicals in labeled, secure containers and in designated storage areas to prevent accidental exposure and spills.
  + Provide suitable PPE such as gloves, respirators, protective clothing, and eye protection to workers handling hazardous chemicals.
  + Dispose hazardous chemicals in consultation with LCC and MEPA.

1. Increased Gender-Based Violence (GBV) and Sexual Exploitation and Abuse (SEA) including defilement

**Mitigation Measures:**

* + Develop and implement GBV/SEA prevention plan
  + Sensitize workers and hospital community on GBV/SEA and harassment.
  + Conduct thorough background checks on all workers and ensure that those with a history of sexual offenses are not employed on the project.
  + Strengthen grievance redress mechanisms including reporting mechanisms for GBV/SEA and harassment.
  + Ensure workers sign and adhere to code of conduct that prohibits GBV/SEA
  + Put in a place a GRM committees having GBV/SEA champions
  + Map out and make available referral and support systems for GBV/SEA survivors

Risk of spread of COVID-19

**Mitigation Measures:**

* + Conduct sensitizations COVID-19 symptoms and prevention to workers.
  + Provide equipment to enhance hygiene i.e. water for washing hands, soap and sanitizers to be always made available at the work premises
  + Adhere to Covid-19 measures as specified by Government at that time.
  + Make protective face masks available at the workplace for those potentially ill can wear to avoid spreading Covid-19.

1. Increased risk to public health and safetydue to unsafe construction premises

**Mitigation Measures:**

* + Sensitize hospital community of the works and how to stay safe.
  + Fence the construction site to limit access.
  + Put safety tape around all potentially dangerous spaces.
  + Install signage to limit access to construction site.

Air pollution and operational risks from incineration of wastes

**Mitigation Measures**

1. Sort the waste to ensure only combustible waste goes into incinerators.
2. Train staff on how to operate the incinerators.
3. Plant trees around in the hospital area to help absorb emissions.
4. Regularly maintain the incinerator; and
5. Orienting staff to the Infection Control and Waste Management (ICWM) practices.
6. Increased Environmental Risks and exposure to contamination during wastewater treatment ponds dredging

**Mitigation Measures**

* Contractor to prepare a detailed Dredge Management Plan to provide the details of the process, sludge handling and disposal
* Provide personal protective equipment (PPE) such as gloves, masks, and protective clothing.
* Conduct training for workers on safe handling of hazardous materials.
* Establish emergency response protocols for accidental exposure.
* Use analysis results to determine appropriate treatment methods (e.g., incineration, stabilization, or landfilling).
* Conduct periodic monitoring to assess any changes in sludge contamination over time.
* Dispose of sludge at licensed hazardous waste facilities.

1. Increased resource gaps and operational deficiencies at operation and maintenance

**Mitigation measures**

* Allocate dedicated EHS resources e.g. sufficient staffing, training, and budget for the expanded EHS requirements.
* Engage external consultants to provide expertise in identifying risks and developing robust management systems.
* Conduct yearly environmental audit of the operations at the hospital and implement corrective action plans
* Periodically train staff in waste management, Infection Prevention and Control etc.
* Conduct regular maintenance and supporting facilities such as the Incinerator and the wastewater management system at the hospital.

**Project Cost**

The implementation of this ESMP is estimated to cost MMK37,000,000 (~20,000 USD) where MMK20,000,000 is the estimated cost for implementing enhancement and mitigation measures, MMK12,000,000 is the cost of implementing the monitoring plan and MMK5, 000,000 are training costs.

**Conclusions**

This project will likely generate significant socio-economic benefits to the hospital, staff and students as well as local people around Mzuzu Central Hospital (MCH)and the country at large as well as negative environmental and social impacts whose plan for mitigation has been established by this ESMP. The MCH should therefore adopt and implement all the recommendations and mitigation measures advanced in this ESMP and respective monitoring plan. The developer should also ensure adequate provision of capacity building to all key stakeholders who will be directly involved in the implementation of the project’s ESMPs, as it is an integral part to ensuring quality safeguards implementation in the project.

# TABLE OF CONTENTS

[EXECUTIVE SUMMARY ii](#_Toc183756258)

[TABLE OF CONTENTS i](#_Toc183756259)

[LIST OF ACRONYMS ii](#_Toc183756260)

[1. INTRODUCTION 1](#_Toc183756261)

[2. DESCRIPTION OF THE PROJECT 9](#_Toc183756262)

[3. POLICIES, LEGAL AND INSTITUTIONAL FRAMEWORK 34](#_Toc183756264)

[4. ENVIRONMENTAL AND SOCIAL SETTINGS 42](#_Toc183756265)

[5. PUBLIC AND STAKEHOLDER CONSULTATIONS 53](#_Toc183756266)

[6. ENVIRONMENTAL AND SOCIAL IMPACT IDENTIFICATION AND ANALYSIS 59](#_Toc183756267)

[7. ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLANS 81](#_Toc183756268)

[8. CAPACITY DEVELOPMENT, TRAINING AND REPORTING 118](#_Toc183756269)

[9. GRIEVANCE REDRESS MECHANISM (GRM) AND STAKEHOLDER ENGAGEMENT 122](#_Toc183756270)

[10. CONCLUSIONS AND RECOMMENDATIONS 125](#_Toc183756271)

[REFERENCES 127](#_Toc183756272)

[Appendix 1(a): Environmental and Social Screening Form 128](#_Toc183756273)

[Appendix 1(b): MEPAs Determination on Requirement for an ESMP and ToRs 132](#_Toc183756274)

[Appendix 2: List of Members Consulted 135](#_Toc183756275)

[Appendix 3: Suggested Forms for ESMP Reporting, Training and Follow-up 136](#_Toc183756276)

[Appendix 4: Environmental and Social Rules for Contractors 138](#_Toc183756277)

[Appendix 5: Grievance Redress Management Forms 143](#_Toc183756278)

[Appendix 6: Resource Efficiency Measures (Use of Water) 147](#_Toc183756279)

[Appendix 7: Incidents Reporting Form 148](#_Toc183756280)

[Appendix 8: Guidelines for Treatment and disposal methods for categories of health care waste 150](#_Toc183756281)

[Appendix 9: Monitoring Plan for the Operation & Maintenance (O&M) Environmental, Health, and Safety (EHS) Management System for Mzuzu Central Hospital Pediatric OPD and Emergency sections construction Project 153](#_Toc183756282)

# LIST OF ACRONYMS

|  |  |
| --- | --- |
| MC-ERHSPP | Malawi COVID-19 Emergency Response and Health Systems Preparedness Project |
| CESMP | Contractor Environmental and Social Management Plan |
| COVID-19 | Coronavirus Disease |
| DESC | District Environment Sub-Committee |
| DHO | District Health Officer |
| EMA | Environment Management Act |
| ESCP | Environmental and Social Commitment Plan |
| ESF | Environmental and Social Framework |
| ESMF | Environmental and Social Management Framework |
| ESMP | Environmental and Social Management Plan |
| ESS | Environmental and Social Standards |
| GBV | Gender Based Violence |
| GoM | Government of Malawi |
| GRM | Grievance Redress Mechanism |
| HAC | Hospital Advisory Committee |
| LMP  MCH | Labour Management Procedure  Mzuzu Central Hospital |
| MEPA | Malawi Environment Protection Authority |
| MoH  OPD | Ministry of Health  Outpatient Department |
| PPE | Personal Protective Equipment | |
| SEA | Sexual Exploitation and Abuse | |
| ToRs | Terms of Reference | |

# INTRODUCTION

* 1. **Background**

The Government of Malawi through Ministry of Health is implementing the Malawi COVID-19 Emergency Response and Health Systems Preparedness Project (C-ERHSPP) which is being funded by World Bank. The project is being implemented to prevent, detect and respond to the threat posed by COVID-19 in Malawi and strengthen national systems for public health preparedness. The project’s implementation period is from April 2020 to December 2025.

The project supports detection, surveillance, response, and system strengthening activities prioritized in the Malawi COVID-19 Preparedness and Response Plan. It addresses critical activities and fill financing gaps that have been identified and are not financed by other partners (e.g. risk communication).

The Project comprises three components, including:

1. **Component 1: Emergency COVID-19 Response:** This component provides immediate support to Malawi to prevent COVID-19 from arriving or limiting local transmission through surveillance and containment strategies.
2. **Component 2: Supporting National and Sub-national, Prevention and Preparedness:** This component supports strengthening the capacity of the public health system for preparedness and respond to COVID-19 pandemic and to future pandemics and other threats to health security, and;
3. **Component 3: Implementation Management and Monitoring and Evaluation:** Project Management, Monitoring and Evaluation (M&E) by the project implementation unit (PIU).

Under component 2 of the project, the Ministry of Health intends to undertake refurbishment and rehabilitation of various health facilities’ infrastructure, purchase and installation of Incinerator units, upgrading X-ray rooms, perimeter fence construction etc. in different health units are being proposed in the country. Among the proposed sub-projects is the Construction of Outpatient Department (OPD) and Emergency sections of proposed Mzuzu Central Hospital Pediatric Center in Mzuzu City, Mzimba District. The estimated cost of the project is MMK2,626,500,000 ($1.5 Million). The project is planned to be implemented from October 2024 to December 2025. The ESMP is for both the construction and operation and maintenance phases where the contractor to undertake the works and the Ministry of Health and Mzuzu Hospital Administration during operation phase will ensure that the proposed mitigation measures for the identified environmental and social risks and impacts are implemented.

* 1. **Justification of the project**

The proposed Construction of OPD and Emergency Sections of the proposed Pediatric Hospital Center at Mzuzu Central Hospital will be implemented under the Malawi COVID-19 Emergency Response and Health Systems Preparedness Project. The project seeks to undertake construction, refurbishment and installation of various health facilities’ infrastructure in different health units of the country in response and preparation to COVID-19 pandemic future occurrences as well as other future pandemics occurrences.

Mzuzu Central Hospital (MCH) is one of the largest referral hospitals in Malawi, located in the Northern Malawi’s city of Mzuzu. The hospital serves as a key healthcare facility for the Northern region of Malawi and provides a wide range of medical services, including specialized care to 6 districts (Rumphi, Mzimba, Chitipa, Karonga, Nkhatabay and Likoma) in the Northern region. During the COVID-19 pandemic, Mzuzu Central Hospital played a crucial role in managing and mitigating the impact of the virus in the country. At that time additional resources, including medical supplies and staff were provided to handle the surge in COVID-19 cases through support from international health organizations, NGOs, and donor agencies in the form of funding, equipment, and technical assistance. Furthermore, the hospital collaborated with local health centers and clinics to streamline patient referrals and manage the pandemic more effectively. However, despite efforts to effectively manage, Mzuzu Central Hospital faced challenges including the hospital’s strained infrastructure among others due to the high volume of COVID-19 patients and other patients, leading to overcrowding in some cases.

Among the notable infrastructure challenges at Mzuzu Central hospital, is that currently the hospital has the 36-bed Pediatric center against the estimated number of 100 children who get admitted per day. This has led to congestion of the children’s center, leading to sharing of a single bed by multiple sick children. With the presence of the parents and guardians for the admitted children in the center, the congestion has worsened and if this situation cannot be addressed, it can result in the spread of COVID-19 and other pandemics. Infrastructural improvements to accommodate the increased patient load and to ensure better infection control practices are therefore essential. This sub-project under the Malawi COVID-19 Emergency Response and Health Systems Preparedness Project of Construction of some section of Pediatric hospital center at Mzuzu Central Hospital is therefore essential.

* 1. **Objectives of the project**

The objective of implementing the proposed Construction of new OPD and Emergency Sections of the proposed Pediatric Hospital Center at Mzuzu Central Hospital is to:

* Increase the hospital’s capacity to accommodate more patients in both the OPD and Emergency Sections, thereby reducing overcrowding.
* Provide better access to pediatric care for patients by reducing the physical and logistical barriers in the current setup.
* Create a child-friendly environment with specialized areas that cater to the needs of pediatric patients and their families.
* Ensure the emergency section is specifically designed and staffed to provide immediate and specialized care for children.
* Design the new OPD and Emergency Sections with future expansion in mind, allowing for scalability as the hospital’s needs grow.
* Enhance Patient Care by Improving the quality and accessibility of the infrastructure and respective medical services to ensure better patient outcomes.
* Improve the physical environment to enhance patient comfort and recovery.
* Increase infrastructural improvements and aesthetic value of the hospital
* To ensure the hospital meets all applicable EHS requirements and adequately correct/resolve any existing material/significant environmental liabilities
  1. **Nature and scope of proposed project**

The proposed project will involve the construction of a Pediatric OPD and Emergency sections at Mzuzu Central Hospital following the completed design prepared in May to July 2024 by Infra Works Development Limited, and with recommendations from Ministry of Health and Management of Mzuzu Central Hospital. The development components will have the following Characteristics.

Table 1-1: Components or activities of the construction of selected sections of new paediatric hospital centre at Mzuzu Central Hospital project.

| **No.** | **Development Component** | **Area to be occupied (in Square meters)** | **Description** |
| --- | --- | --- | --- |
| 1 | OPD | 452 | 4 Clinic rooms, 7 Consultation rooms, Plaster of Paris room, 2 treatment rooms, observation room, on call room, staff lounge and kitchen, sluice rooms and waiting area will be constructed, 160 beds wards |
| 2 | Emergency | 556 | 2 Consultation rooms, Emergency room, Doctors office, sluice room, Porters room and Ambulance Bay will be constructed |

The project will also involve dredging of the wastewater treatment pond and maintenance of the treatment system during construction phase to increase capacity and residency time of wastewater in order to facilitate biological treatment.

* 1. **Justification of the ESMP**

The ESMP has been prepared in line with Guidelines for Environmental Impact Assessment (EIA) for Malawi of 1997. The study has also been conducted in line with the World Bank Environmental and Social Framework (ESF) and the General and Health Care Facilities Health and Safety Guidelines (EHS). Specifically, ESS1, which requires assessment and management of environmental and social risks and impacts. The Malawi Environment Protection Authority (MEPA) upon review of the project brief determined that an ESMP is to be developed. ToRs for the preparation of the ESMP from MEPA are presented in appendix 1. This ESMP was therefore essential as it identifies environmental and social impacts and suggests respective mitigation measures to be implemented throughout the project implementation period.

* 1. **Objectives of the ESMP**

The main objective of this ESMP is to ensure the project meets that Malawi and WB project specific ESHS requirements, thereby improving the overall environmental and social performance of the proposed project through identifying the potential positive and adverse impacts associated with the project. This process will help enhance beneficial impacts and minimize adverse impacts to ensure the project is implemented in a sustainable manner.

The specific Objectives of this ESMP were to:

* Identify and assess key potential environmental and social direct, indirect and cumulative risks and impacts including those on gender, which may be caused by the proposed construction works.
* Propose measures that would enhance the positive effects of the proposed constructions and operation activities on both the environment and social components including gender issues in specific sites.
* Propose measures that will mitigate the anticipated negative impacts and risks of the proposed constructions and operation activities on both the environment and social components, including gender concerns in specific sites.
* To provide baseline information about the environmental, social, economic and cultural conditions in the project area.
* To review national policies and regulations including Environmental Management Act (2017), National Environmental Policy (2004), Water Resources Act (2013), Land Acquisition Act (2017), the National Sanitation Policy and the World Bank Environmental and Social Framework and Environmental Health and Safety Guidelines (EHS).
* Conduct stakeholder consultative meetings which inform project key environment, social risks, and mitigation measures; and
* Develop a costed ESMP and monitoring plan with clear lines of responsibilities for key stakeholders.
* To ensure the hospital meets all applicable EHS requirements and adequately correct/resolve any existing material/significant environmental liabilities
  1. **Approach and Methodology**

This ESMP has been prepared based on World Bank ESF requirements that includes undertaking environmental and social assessment as guided by the Environmental and Social Management Framework (ESMF), the Project’s ESCP and LMP for the project as well as the WB EHS (General and for Health Care Facilities). The ESMP has been prepared through adopting the following methodologies.

***E&S Screening*:** This was the critical initial step in the Environmental and Social Impact Assessment (ESIA) process that was undertaken by the PIU and in collaboration with MEPA officials. The process involved preliminary evaluation of a project to determine its potential environmental and social risks and impacts. The screening step helped decide whether a full ESIA was required, and/or what type of assessment should have been conducted, and the level of detail needed. It was determined that an ESMP should be prepared for the project.

***Literature review:*** Review of World Bank ESF, World Bank’s General and Health Care Facilities EHS guidelines and national policies, laws, regulations, and guidelines related to environmental and social management. Project related documents, including the project’s Environmental and Social Management Framework (ESMF), Project Labour Management Procedures (LMP), Project Stakeholder Engagement Plan (SEP) and Environmental and Social Commitment Plan (ESCP) were also reviewed.

***Stakeholder consultations and Interviews:*** This step was undertaken in compliance with the requirements of a Project's Stakeholder Engagement Plan (SEP) and Environmental and Social Commitment Plan (ESCP). This was by following steps such as a) using SEP to identify all affected and interested parties, b) ensuring consultations are inclusive, especially for vulnerable groups (except where ethically, other groups like patients and guardians, were not supposed to be interviewed); c) consulting on Grievance redress mechanisms to establish feedback channels per the ESCP to address concerns promptly and d) document or record all consultations and align findings with the ESCP commitments. On overall, the consultations and interviews involved soliciting views/ concerns about the project from relevant identified stakeholders. The purpose was to get stakeholders’ views and contributions on the identification of potential impacts of the project and identification of appropriate mitigation and enhancement measures for negative and positive impacts respectively. The stakeholders consulted included Mzuzu Central Hospital officials, staff and Mzimba/Mbelwa District Environment Sub-committee (DESC). Participatory Rural Appraisal (PRA) methods were mainly applied during the consultations as they allow wider participation of stakeholders within a short period of time. During consultations, checklist was used with general information about the project delivered and followed by Q & A. Key Informant Interviews (KII) were also conducted with the relevant hospital staff. The approaches used ensured that there was an open and interactive communication between the consultant and stakeholders.



**Figure 1-1**: Stakeholder Consultations with Mzimba/ Mbelwa DESC members

***Site visit*:** Site visit was conducted with guidance from Hospital Administrators, management and other officials. The visit into the existing Pediatric unit of the hospital and the site where the project is being proposed to be constructed was carried out by both the Consultants and Hospital officials on 6 August 2024, to appreciate the proposed scope and sites. Other operations such as water supply, solid waste and hospital waste management site (incinerator) and the existing sewage line and treatment site was also visited. The objective of the site visit was to assess the scope of work and site conditions and predict the potential positive and negative impacts that the project would bring.

A rapid EHS Audit was conducted during the site visit on the existing hospital facility and the details of hospital deficiencies that were identified during the site visit have been provided in section 4.2.3 on table 4.1 and summarized below:

**Solid waste**: There is a new incinerator, which is used for managing health care waste. The incinerator has a tall chimney for ensuring that emissions are dispersed at high levels for effective dispersion. Waste segregation is not effectively done There are no records for quantities of segregated waste into different categories. The hospital generates approximately 13600 kg of waste in a month.

**Liquid waste:** The facility is connected to a sewerage system with two oxidation ponds. During the site visit one pond was seen not to be working as such wastewater was directed only to one pond. There is no water quality monitoring data of the sewer system available. The hospital also do not have a permit for the discharge of treated water into the environment (Lunyangwa River). The hospital generates approximately 6300 m33 of liquid waste a month

**Water supply**: The hospital uses approximately 9,000 m3 of water per month from Northern Region Water Board. The rehabilitation activities will use about 1515 m3 of water which will be sources from the Lunyamgwa River located about 1 km from the construction site. The project during operations and maintenance will not increase water usage. The waste is collected in bins around the facility to a skip that is later taken by the City Council for disposal at designated site. However, the city council takes time to empty the skip and dispose the waste.

**Power supply:** The hospital relies on ESCOM power. Approximately, the hospital uses 250, 660 kwh of electricity / month. The hospital has a power backup generator that used about 1000 L of diesel in a month.

* 1. **Potential users of the ESMP**

This ESMP contains useful information on the potential environmental and social impacts; measures for addressing the negative impacts and recommendations on enhancing the positive impacts by contractors and developers. Such information will be useful in planning and implementation of the proposed project activities. In this regard, the report will be useful to the following stakeholders: World Bank (MC-ERHSPP project financing body), MC-ERHSPP project management team at national level and at MCH as the Implementing Institution, project consultants, project manager, project contractors, Mzimba/Mbelwa DESC, workers at the project site, key government agencies e.g., MoH and other interested parties.

* 1. **Organization of this ESMP**

This ESMP has been organized as follows: a) Chapter 1 is the introduction; b) Chapter 2 is description of the project; c) Chapter 3 describes the policies, legal and institutional frameworks applicable to the proposed project; d) Chapter 4 presents the Environmental and social settings of the proposed project site; e) Chapter 5 presents Public and Stakeholder Consultations f) Chapter 6 presents Environmental and social impact identification and analysis; g) Chapter 7 presents Environmental and Social Management and Monitoring Plans (ESMMPP); h) Chapter 8 presents Capacity Development training and reporting; i) Chapter 9 Grievance redress mechanisms (GRM) issues; and j) Chapter 10 presents Conclusions and recommendations for this ESMP study.

* 1. **Preparation of this ESMP**

This ESMP has been prepared by Infra Works Development Limited, the Design and Construction Supervision Consultant for the proposed construction project. The Consultant has however prepared this ESMP in consultation with the Malawi COVID-19 Emergency Response and Health Systems Preparedness Project (C-ERHSPP). Additionally, this ESMP has been prepared following recommendations from Malawi Environment Protection Authority (MEPA) (an Environment regulatory body in Malawi), followed by review by the same. The ESMP was submitted to MEPA for review and approval.

# DESCRIPTION OF THE PROJECT

* 1. **Introduction**

This chapter documents the summary of description and scope of the proposed Mzuzu Central Hospital Pediatric center OPD and Emergency construction project. The chapter describes the project location, nature of the project components, outlines the project activities including main inputs and outputs of the project activities, final products, by-products, sources of raw materials at different phases of the project, land acquisition and ownership issues etc. The ESMP has been prepared based on the completed design of the project which was prepared by Infra Works Development Limited, the Design and Construction Supervision Consultant for the proposed construction project based on recommendations from Ministry of Health and Management of Mzuzu Central Hospital. The designs were completed in July 2024.

* 1. **Description of Project Location**

The OPD and Emergency Sections of the proposed Pediatric Hospital Center at Mzuzu Central Hospital will be constructed at the proposed site for the 160 bed Mzuzu Central Hospital. (See layout plan in Figure 2-4). Mzuzu Central Hospital is a tertiary referral hospital serving the Northen districts of Malawi. The site for the proposed project is located at geographic coordinates of -11.430892 (latitude) and 33.996316 (longitude) and map is presented in Figure 2-3.

The land to which the proposed site is located is owned by Mzuzu Central Hospital and is outside the hospital’s wire fence, is currently used as agricultural land by the hospital staff on temporary basis (See Figure 2-3). The area is near the mortuary and laundry sections of the hospital. Other nearby infrastructure is the guardian shelter of the hospital which is inside the main hospital premises but also separated by a wire fence from the proposed site, while communities are over a kilometre away from the site including the nearby school i.e. St. Peter's Secondary School, located approximately 1.5 kilometres and Mzuzu university which is about 3 kilometres away and are all outside the hospital premises boundary which is agricultural land Figure 2-1 below is a photo that highlights the site location taken on 6th August 2024. Meanwhile, Figure 2-2(a) shows part of the site with grass, while 2-2(b) shows the cultivated part of the land on site.



Figure 2-1: Photo that highlights the entire site location.

Figure 2-2(a): Vegetation at the proposed project site

Figure 2-2(b): Part of the proposed project site as agricultural land

Since the construction works will be carried out on a land area owned by the Hospital, it is expected that no land related issues will arise during the project’s implementation. Additionally, the limited impact on flora and fauna will emerge from the project since the land is currently used for agricultural purposes and hence has limited native biodiversity. However, the proposed site has a foot path which cuts across and connects the community outside the Hospitals land area/ premises and the main tarmac road (M1 road) at Luwinga area, as such, this footpath will be relocated. Adjacent to the project site there is line for sewer system for the hospital which passes across from the hospital to the sewer treatment ponds located down the site and on hospital land. The siting of the structures on the site have been done in such a way that the sewer line will not be affected but rather it will be easy to connect the new buildings to the sewer line.



Here

**Figure 2- 3:** Map showing location of MCH and the proposed site to which new paediatric centre construction is being sought

* 1. **Scope and Activities of the Project**

The construction of the proposed OPD section of the proposed Mzuzu Central Hospital Pediatric center will be single floor and will cover the total floor area of 452 m2 while the Emergency section will similarly be single floor and will cover the floor area of 556 m2 within the Hospitals land. The new construction facility will utilize water supply, wastewater collection and disposal, solid waste management, medical waste disposal, energy supply and site access roads facilities from the existing hospital, and hence having an impact on these facilities and the existing hospital. The specific infrastructure and/or components for this project are listed in Table 2-1 and shown in Figure 2-1.

Table 2‑1: Infrastructure components for the proposed OPD and Emergency Sections of the proposed Paediatric Hospital Centre at Mzuzu Central Hospital

| **No.** | **Development Component** | **Area to be occupied** | **Development Component** | **Number of Units** |
| --- | --- | --- | --- | --- |
| 1 | OPD | 452 Square meters | Clinic rooms | 4 |
| Consultation rooms, | 7 |
| Observation room, | 1 |
| POP room, | 1 |
| Treatment rooms, | 2 |
| On call room, | 1 |
| Staff lounge and kitchen, | 1 |
| Sluice rooms | 1 |
| waiting area | 1 |
| 2 | Emergency Section | 556 Square meters | Consultation rooms | 2 |
| Emergency room, | 1 (with 10 beds) |
| Doctors’ office, | 1 |
| Sluice room | 1 |
| Porters bay | 1 |
| Toilet room | 1 |
| Ambulance bay | 1 |

Table 2.2. Estimated quantities for construction works of outputs for Mzuzu Hospital

|  |  |
| --- | --- |
| **Inputs for construction activities** | **Estimated quantities** |
| Sand | 3443m3 |
| Cement | 1148 m3 |
| Water | 1515 m3 |
|  |  |

|  |  |
| --- | --- |
| **Estimated quantities of key outputs for Kamuzu Central Hospital** | |
| **Outputs for the entire hospital** | **Estimated quantities** |
| Water | 9,000 m3 per month |
| Power | 250,667 kwh/ month |

|  |  |
| --- | --- |
| Solid waste | 13,600 kg/month |
| Liquid waste | 9520 m3/month |

The project will also involve dredging of the blocked 15,372m3 wastewater treatment pond and maintenance of the treatment system to increase capacity and residency time of wastewater to facilitate biological treatment and accommodate the potential increase in wastewater and sewage material from the newly constructed OPD and Emergency sections of the proposed Mzuzu pediatric hospital. The blocked Wastewater treatment pond is connected to another 15,372m3 empty pond. When this blocked pond is unblocked, it will enable the wastewater to follow into the empty pond when it becomes full to a certain level. For more details, refer to Section 2.4.2, item 3 below.

* 1. **Project Phasing**

Description of the project activities follows the stages/phases that are followed in the construction projects. In this case, the project activities have been grouped into four phases. Phase one involves the preliminary site project activities or project planning stage where assessments and designs are undertaken. Phase two will involve the actual construction of the OPD and Emergency section construction of the proposed Mzuzu Central Hospital Pediatric center and its amenities. Phase three is the demobilization stage upon completion of construction activities and finally phase four is the operations and maintenance phase.

* + 1. **Planning/ Pre-construction Phase**

Preliminary project activities commenced in May 2023, and this stage mainly involved developing the designs of the proposed Pediatric OPD and Emergency sections and were completed in July 2024. After completion of the designs, preparation of the Environmental and Social management plans (this document) is made for the project. Upon acceptance of the prepared designs and this ESMPs by relevant Authorities, this phase will also have the project acquiring all the necessary licenses and approvals required for construction projects of such magnitude. The planned activities have mostly been recruitment of consultants for the tasks outlined.

* + 1. **Construction Phase**

1. **Description of main Construction Works**
2. *Construction of OPD section of MCH pediatric center*

During construction phase, the project proposes to construct a single-storey OPD section of the proposed Pediatric center with 4 Clinic rooms, 7 Consultation rooms, POP room, 2 treatment rooms, observation room, on call room, staff lounge and kitchen, sluice rooms and waiting area on occupying a total of 452 Square meters. Main construction materials will be cementing blocks, steel bars and wire, cement mortar, steel windows and door frames, IBR sheets etc. The implementation period shall be immediately after the approval of ESMP (from November 2024).

1. *The Construction of Emergency section of MCH pediatric center*

The proposed MCH Pediatric center will also be a single-storey Emergency section. The building will have 2 Consultation rooms, Emergency room, Doctors office, sluice room, Porters and Ambulance Bay being constructed. Similarly, the main construction materials will be cementing blocks, steel bars and wire, cement mortar, steel windows and door frames, iron sheets, planks/ steel for roof trusses etc.

The Floor plan for the entire Pediatric Hospital Center proposed at Mzuzu Central hospital and showing the Pediatric OPD and Emergency sections to be constructed with its respective amenities is shown in Figure 2-4.

1. *Dredging of the wastewater ponds*

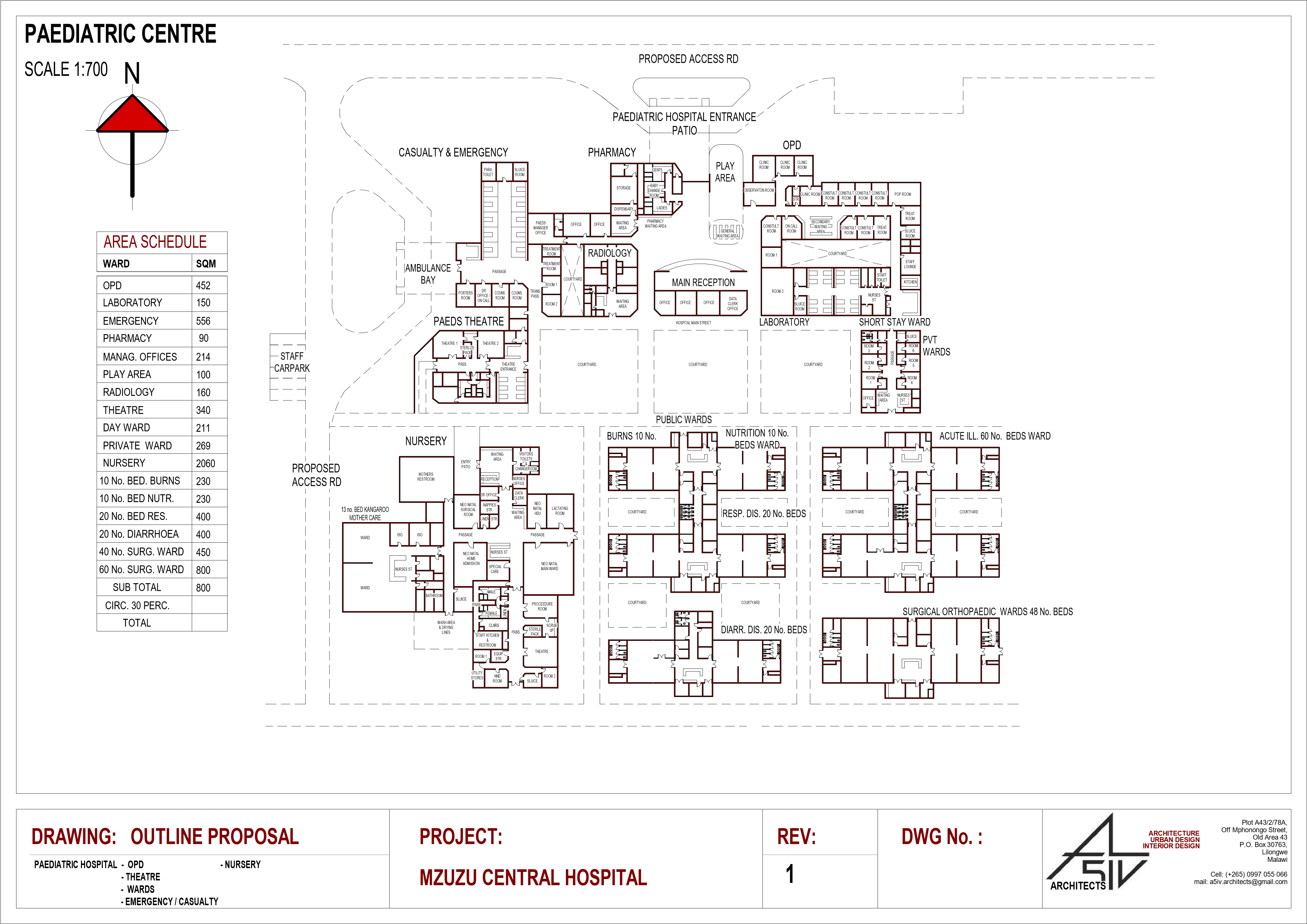
Mzuzu Central Hospital (MZCH) operates two wastewater oxidation ponds of 15,372 m3 each, giving a total capacity of 30,744 m3 as part of its treatment system. These ponds are part of an older design and consist of a series of shallow basins aimed at reducing organic pollutants and pathogens through sedimentation and biological processes. Though Hospital records show that the facility’s estimated number of people in any given day would not exceed 3500, while the existing wastewater treatment system at MZCH with total capacity of 30,744m3 can support about 8,500 people factoring in a sewage residency time of 14 days.

The dredging will increase the capacity to effectively hold and treat wastewater at the existing facility including the new load from the new structures even with increased future patient numbers. This will be undertaken though use of machinery and under strict use of PPE, to reduce exposure of workers to do heavy metals or hazardous chemicals which might be contained in the sludge.

The sludge will however be disposed at a designated place by Mzuzu City council, a body mandated to handle hazardous waste in Mzuzu City after being dried within the surroundings of the ponds, and under strict measures not to be accessible by surrounding communities. Thus, the activity will be undertaken during dry season to enable quick drying of the sludge before disposal by the competent authority.

The contractor will be required to develop and implement a detailed Dredging Management Plan as part of the C-ESMP before the commencement of the project. The plan should at a minimum contains section s on ;

* Analysis of the sediment’s characteristic e.g. if it contains heavy metals or hazardous chemicals
* Quantity of spoil to be removed
* Provide a description of the environmental conditions where dredging and spoil placement/disposal is to occur (e.g. current flow, flow rates, winds, waves, tides, temperature, turbidity, ecology etc.).
* Environmental and social impacts of the dredging and their mitigation measures.
* What dredge equipment will be used for the campaign and for what purpose.
* How the removed spoil is to be managed (e.g. transport, dewatering, placement, disposal).
* The schedule of works for the dredge campaign (timeline of the dredging and dewatering campaign)?

 Figure 2-4 : Site Plan of the Mzuzu Central Hospital paediatric centre showing the location of proposed OPD and Emergency sections of the centre to be constructed

This

This

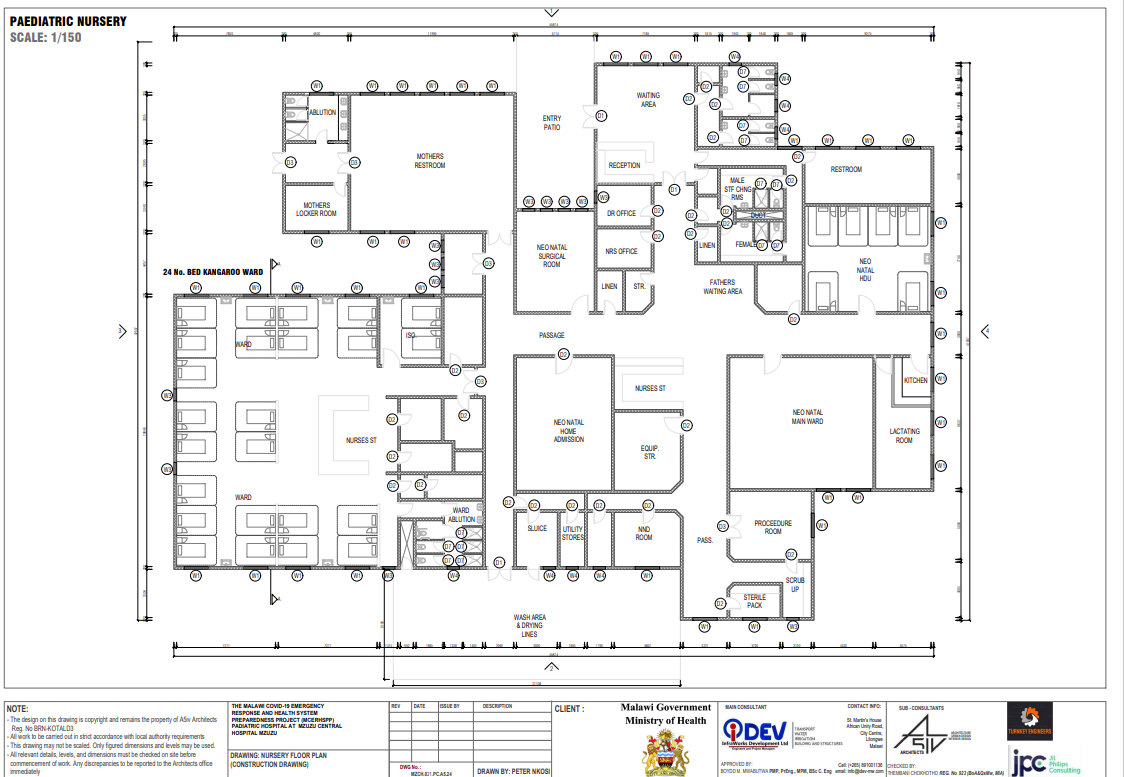


Figure 2-5 : Mzuzu Central Hospital paediatric centre floor plan

1. **Construction workers**

It is anticipated that about 80 people will be employed during the construction phase. The project will employ 100% of unskilled workers from the surrounding community and among all the employees, a minimum of 40% will be women. For the semiskilled and skilled workers, the Contractor will as well employ from the communities and only if those skills are not locally available, migrant workers will be considered. This is a way of making sure that the project benefits the community members in the project area.

1. **Construction equipment**

Different machinery will be used to construct the project facilities as provided in Table 2.2.

Table 2‑3: Different Machinery likely to be used in the project

|  |  |
| --- | --- |
| **Construction materials** | **Functions that the materials will perform** |
| Bull Dozers for clearing the site | Removal of topsoil and vegetation, and pushing out stumps and rocks |
| Graders | Grading and levelling land for buildings and access road formation |
| Excavator | Excavation |
| Compactor | Compacting the soils |
| Tippers/lorries | Transporting construction materials and workers |
| Light and heavy rollers | Compaction |
| Front end loader | Loading materials onto tippers and lorries |
| Wheel burrows, shovels, picks | Different construction activities |
| Earth mover | Removing earth materials |
| Concrete mixers | Mixing concrete |

1. **Construction materials**

Different raw materials will be required during construction phase. Materials such as sand, gravel and quarry stone will be sourced from the licensed/approved surrounding area suppliers which exist around Mzuzu city and its surrounding area mostly within 20 Kilometer distance from the site . The construction works will require approximately 3443m3 of sand. Quarry stone will also be obtained from surrounding licensed/ approved suppliers only if not locally available will be sourced from the licensed suppliers outside the area.

Water for construction activities will be sourced from Lunyangwa stream located approximately 1 km from the construction site. The construction workers will require approximately 1515 m3 of water to be used by construction workers for cooking and other domestic purposes during working hours, as the workers will be commuting from the surrounding communities, will be mainly from the Northern Region Water Board (NRWB) through negotiations by the contractor with NRWB. An agreement for payment of water bills will be made with the hospital. The contractor will also develop a water resources management plan which should specify payment modalities and periods for the water bills for the treated water and what other water sources will be utilized for construction activities including sustainability measures to be put in place for the water resources, as part of the contractors ESMP.

Use of concrete blocks for construction of the infrastructure will be more environmentally friendly than use of burnt bricks, which contribute to deforestation and green gashouse emission. The concrete blocks are stronger and long lasting, and do not lead to deforestation as burnt bricks do. Also, the use of steel bars/metal (as opposed to wood planks) in scaffolding and construction of roof structures for the planned building. In addition, steel metal will be used as door and window frames for the offices and rooms. The choice of steel will reduce pressure on use of wood.

Locally produced Portland cement will be trucked into the site and shall be used to construct the different infrastructures. Rapid hardening cement will be avoided due to greater evolution of heat, which can lead to increased shrinkage cracking. Care shall be taken not to use admixtures containing calcium or chlorides, as these will increase the risk of reinforcement corrosion. Plasticizers will be used, as increased workability is advantageous when working with complex shaped structures and structural forms. The project will require approximately 1048 m3 of cement.

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

Construction materials will be sourced depending on the construction stage and first from licensed suppliers within the city.

1. **Construction activities**

The construction activities will span from December 2024 to December 2025. Construction activities will be done by a contractor, and the Project has hired an Engineer (who has also hired an ESSS) to supervise the construction works and to ensure that the contractor complies with the design standards as well as all EHS requirements specified in this ESMP and the Contractor’s ESMP. Activities under construction will involve land clearing; landscaping; grading; excavation; compacting; trenching; backfilling with compaction consolidation; levelling and earth marking; and transportation of construction materials, excavation of foundation footing, laying down a brick base; pouring a concrete slab, installation of framework, installation of plumbing workers, putting a wall frame, roofing and finishing.

A soil raft of min 300 mm thick G 5 material will be used as pioneer layer of the foundations. Construction will generally be of plain concrete strip footing, load bearing cement blocks walls in foundations, load bearing cement block walls, reinforced concrete ground slab, steel frame structure, steel roof structure, steel door frames and windows, timber doors, ceramic tiles to some floors and glazed tiles to walls in toilets, lime putty plaster and paint to the rest of the walls internally, fair face pointed externally, painted ceiling, joinery fittings, sanitary, plumbing and electrical services.

Construction of external works infrastructure will consist of walkways and lined storm water drains and landscaping. The storm water drains will be covered surface water channels around the newly constructed hospital buildings, 190mm thick, 400mm wide x 600mm deep internally, with wide precast concrete cover slab. This storm water drain will mainly be used for receiving and collecting rainwater from the roofs of the hospital buildings and channeling them to safe places where the water cannot cause localized flooding. Sidewalks will be provided for pedestrians, and signage will appropriately be in place. Storm water drains will assist to control water movement with the project site into natural drains. A drainage system will be constructed to connect with the already existing one at the Hospital. This will aim to prevent the grey water from the building overflowing to roads and lawns. Also, closed drainage channels system will be done so as to maintain safety within the Children’s hospital and to prevent Children, guardians and staff from injury by falling into drains.

Once construction activities are finalized and before the facility is handed over to the Mzuzu Central Hospital, Mbelwa District Council and Ministry of Health, NCIC will test the integrity of the structure in order to ascertain its safety for use for the intended purpose.

*Occupational Health and Safety*

The construction site for the Mzuzu pediatric ward seek to be accident and fatality free and maintaining the rate of zero, especially for accidents that could result in lost work time, different levels of disability, or even fatalities of workers throughout the project. To achieve this, the following measures are proposed:

* Contractor to prepare and implement a C-ESMP which must include an OHS Plan
* Occupational Health and Safety Monitoring: The working environment will constantly be monitored for occupational hazards relevant to the specific project phase, as well as dust, noise emissions, health of the workers and other issues such as use of drugs or alcohol at the workplace. Monitoring will be designed and implemented by professionals including a site OHS officer who will be employed and stationed at the construction site to train workers and monitor OHS issues all the time.
* The construction site operations procedure will also include maintaining records and reporting all occupational incidents and accidents as well as diseases and other dangerous occurrences that could lead to accidents. Incident reporting form in Appendix 7 will be used for reporting the incidents to the relevant authorities and within 24 hours of occurrence.
* Always comply with the General EHS Guidelines for additional guidance on designing occupational health and safety monitoring program of the project
  + 1. **Project demobilization**

The main activities to be undertaken during demobilization phase shall include removal of temporary structures e.g. storage rooms of construction materials and shelters used by workers. The stage will also involve re-vegetating areas that were cleared by the contractor at the project site. This will take place once construction of all the planned infrastructure is completed. Rubble from construction activities and temporary structures will be used to level off excavated sites and act as fillers. Any leftover solid materials likely to be composed of bricks and crumbling of cement will be disposed of by levelling off earth roads nearby the site.

* + 1. **Operation and maintenance**

By the end of construction phase, the Pediatric OPD and Emergency sections buildings and its amenities will have been constructed and ready for commissioning and/or operations at Mzuzu Central Hospital. The inputs and outputs at this stage will both be general for the entire infrastructure in operation/service. Employment or labour, new and purpose-built children’s hospital and its amenities such as installed equipment for emergency section such as patient monitors, resuscitation equipment will be the positive outputs. Notably, other negative outputs will be waste water generation from sanitary facilities from the use of water as an input, energy wastage due to operational inefficiencies or use of inefficient equipment, health care facility waste and possibility of infection transmission and hence, need for special consideration of these in construction, so that the negative risks and impacts should be reduced during operation, while maximising the positive impacts. Also, at operation and maintenance stage, the major output it to have a pediatric hospital section constructed that is pleasant and child friendly. The design of the Pediatric OPD has therefore considered the following to ensure a child-friendly, safe, and efficient environment before and during operation:

1. Child-Centered Design: brightly lit rooms, welcoming Environment through use of soothing colors, child-friendly artwork, and natural light to create a less intimidating atmosphere for children.
2. Waiting Areas have play areas and activities to reduce stress and anxiety. Toys, books, and interactive games will be used and will be age appropriate.
3. Safety and Comfort: The design eliminates sharp edges, includes slip-resistant flooring, and restricts access to hazardous areas.
4. Comfortable Seating and Beds: Comfortable seating for parents and child-sized beds and examination tables for patients.
5. Specialized Medical Equipment/ Pediatric-Specific Equipment: The ER and OPD will be equipped with pediatric-sized medical tools, such as smaller blood pressure cuffs, ventilators, and IVs.
6. Child-Life Specialists: Access to trained specialists will be provided who help children cope with anxiety, pain, and fear in a hospital setting; while ensuring also that parents can stay close to their child during treatment, with spaces designed for family support and interaction.
7. Accessibility and Mobility: Clear signage and color-coded areas for easy navigation, and child-friendly, with symbols or characters that help children and families navigate the facility.
8. Wheelchair Accessibility: Hallways, rooms, and bathrooms will be fully accessible for children with disabilities.

**Infection prevention and control**

Infection Control and Hygiene is the key agenda and requirement for any hospital including the proposed pediatric OPD and ER at Mzuzu Central Hospital. While the existing hospital is partially compliant with all existing EHS regulatory requirements to ensure infection prevention and control, with no known existing material environmental liabilities so far, there will also be need to facilitate this at the new facilities, and the following measures will be undertaken during operation:

1. Always Ensuring Hygiene and Cleanliness: Maintain high standards of cleanliness, with child-friendly sanitation stations to prevent the spread of infections.
2. Separate Areas for Infectious Diseases: Designate separate areas for infectious patients to minimize cross-contamination, especially for vulnerable children with weakened immune systems.
3. Ensuring waste management protocols are followed at all times.
   1. **Main inputs and outputs at different phases of the project**
      1. **Construction phase inputs and outputs**

The knowledge of inputs and materials and how they are used in the project cycle may help to understand environmental and social impacts emanating from the project activities. The main inputs and outputs during construction phase refer to those that will be associated with the construction of the infrastructure on the proposed site. For instance, before all the land-based construction activities begin, there shall be land clearing, excavations, and levelling activities using manual labour and/or machines such as bulldozers, excavators and graders. In this case, the inputs will be labour or machinery and the land resources at which the activities are taking place while the outputs will be economic gains by the locals that will be employed etc. The generalized inputs and outputs of the construction related activities of this project are summarized in Table 2-3.

Table 2‑42: Inputs and outputs for main construction activities at Mzuzu Central Hospital

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Construction related activity** | **Inputs** | | **Outputs** |
|  | **Sources** |
| 1 | Land clearing, excavations, levelling activities and construction of access roads and alternative pathways. | -Labour/ Machinery (Bull dozers, excavators, graders, compactors  - Financial resources  -land resources at which the activities are taking place | -Community and Migrant workers  -Contractor  -Project financing  - Hospital land | -Employment of locals and migrant workers  -Loss of vegetative cover and potential erosion  -Rubble  -Noise  -Dust emissions |
| 2 | Construction of walls and roofs of the structures | -Water  -Cement and adhesives  -Cement blocks/ bricks, boulders,  -Labour/ machinery  -Gravel and Quarry stone and sand  - Steel bars and Iron sheets  -Glass  -Paints | -Community and Migrant workers  -Contractor  -Project financing  -Water | -Employment of locals and migrant workers  -Noise  -Construction wastes  -Dust emissions  -Solid and liquid waste generation and disposal problems  -Increased Business opportunities by locals |
| 3 | Construction and installation of pipelines and other finishing’s to the buildings | -Galvanized and PVC pipes and fittings  -Paints  -Gravel and Quarry stone and sand  -Cement, bricks, boulders, | -Community and Migrant workers  -Contractor  -Project financing  -Water | -Employment of locals and migrant workers |
| 4 | Dredging of wastewater treatment pond and maintenance of the wastewater treatment system | Dredging equipment  Personnel  Tipper for disposal  Specialised PPE for workers | Community and Migrant workers  -Contractor  -Project financing | -Employment of locals and migrant workers  -Solid and liquid waste generation and disposal problems |

* + 1. **Operations and maintenance phase Inputs and Outputs**

The inputs and outputs at this stage will both be general for the use of the infrastructure by patients, staff and other stakeholders in operation. The summary of main inputs and outputs at operation phase are shown in Table 2-4.

**Table 2-5**: Inputs and outputs for operation phase of the proposed sub-projects

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Structure(s) being Proposed** | **Operational Inputs** | | **Operational Outputs** |
|  | **Sources** |
|  | Paediatric hospital centres OPD and Emergency sections | -Labour | -Community and Migrant workers | -Employment of locals and migrant workers |
| -Water | -Northern Region Water Board | Bills and Wastewater generation |
| -Electricity | -ESCOM | Bills |
| Energy backup | To be installed solar energy | Convenient and back up energy supply |
| Hospital infrastructure in operations | Hospital: new | -Creation of safe and comfortable space for patients/ Children, guardians and staff at Mzuzu Central Hospital  -Infection prevention and control issues  -Hospital/ medical waste and management issues  -Improved aesthetic value of the hospital  -Improved hospital services delivery in a welcoming, safe and beautiful environment  -Increased Employment  -Increased demand for water and electricity  -Increased generation of solid and liquid wastes  Increased generation of health care waste  -Increased sewage generation |

* 1. **Environmental planning and design**

Environmental planning and design will look at environmental issues that will be considered during detailed design stage of the project. The inclusion of these issues in the detailed designs will ensure that identified negative impacts are mitigated and positive ones are enhanced. There is a need for environmental planning and design on issues relating to energy, water supply, sanitation and waste management at the project site.

* + 1. **Energy issues planning and design**

The construction and operation of the Pediatric OPD and Emergency sections at the proposed MCH Pediatric center will have an implication on energy supply. During construction, increased energy demand may arise due to activities such as assemblage of truces and steel bars which often require welding activities that use electricity. At the operation phase, the newly constructed building will also be connected to the electricity supplied at the hospital and this may increase demand. Measures such as installation of alternative energy sources such as back up solar energy to support the construction activities that may require electricity, and support operations after construction is completed, may be amongst the planned management measures to address the increased energy demand.

* + 1. **Water supply planning and design**

The construction works of the Pediatric OPD and Emergency sections at Mzuzu Central Hospital will have an implication on treated water to be used for construction activities. Water supply issues will likely emerge due to the facility is connected to piped water supplied by the Northern Region Water Board (NRWB). The contractor, as part of his Contractor ESMP, will prepare a Water Resources Management Plan. For construction purposes, the contractor will use water from the nearby Lunyangwa stream which is within one kilometer radius from Mzuzu Central Hospital. The contractor will only use NRWB water for cooking, drinking and other domestic purposes upon agreeing with the hospital management on payment of water bills. At operation and maintenance, water supply will be from the NRWB, (a treated water supplier by law) as the current situation of water supply at the hospital

* + 1. **Waste management planning and design**

Health-care waste from various departments at the hospital, including from the laboratory and the wards is segregated into sharps (e.g. syringes), infectious waste (e.g. cannulas) and non-infectious wastes (e.g. papers). The waste is collected in colour coded receptacles. The colour coding for the receptacles is, however, not consistent hence labels are also used. It was noted that no bin liners (hazardous waste bags) and covers (especially for infectious and non-infectious waste) are placed in the receptacles. When full, the receptacles are emptied into wheelie bins and are kept in a closed waste collection area.

From the collection area, wastes are carted to the waste disposal area where sharps and infectious waste is disposed in an incinerator whereas non-infectious waste is disposed at Mzuzu City designated facility. At MCH there is an existing high temperature, two chamber mechanical incinerator for health care wastes. The incinerator was installed in 2022. The incinerator has the following specifications.

Table 2.5: Specifications of the incinerator at Mzuzu Central Hospital

|  |  |
| --- | --- |
| **Property** | **Description/ Comment** |
| Operational temperature of  950 - 1320°C | To be able to fully incinerate highly infectious wastes |
| Two chambers | The second chamber to be equipped with an afterburner to allow for re-burn of harmful emissions |
| High chimney (Stack Height to be determined based on Good International Industry Practice – See General EHS Guideline) | To ensure that smoke does not impact on the surrounding people and environment. |
| Top loading for waste | For easy loading and effective spreading of waste |
| Mechanical and air-controlled operation | To ensure optimal combustion |
| 150 – 200 kg batch size | To be able to take in a large volume of waste that  would be expected from the project. |
| 100kg per hour burning rate | In the event that there is a lot of waste, a quick  burning rate will ensure that the waste storage time is minimized. |

General solid waste to be generated includes food waste, paper, plastics, construction wastes and demolition wastes in different streams such as rubble, glasses, steel, wood etc. There are no records of amounts of waste of various types generated, treated, discharged etc. Waste storage areas are not enclosed. The waste is bins around the facility and later Waste disposed disposal at MzuzuCity Council waste disposal site.

Liquid waste (except medical and chemical) will be directed to the sewerage pipeline that passes near the construction site. On the other hand, medical and chemical liquid waste will have to undergo through the process of segregation at source (by type i.e. infectious, chemical, pharmaceutical), then containment in leak-proof containers that are well labeled, then depending on type of waste, can either be disinfected (medical waste), neutralized of the chemicals (chemical waste) before discharged into the normal sewerage system or incinerated at the hospital’s incineration facility, whatever practical.

The sewerage system has two wastewater ponds of 15,372 M3 each, giving a total capacity of 30,744 M3. Currently, the hospital has a daily bed occupancy of 610 and about 50 inpatients are discharged from the hospital daily. Hospital records show that the facility also treats about 500 patients daily on an outpatient basis. (BMC Health Services Research, 2022). This means about 1200 people occupy the facility on a daily basis. With the coming in of the project, it estimated that the number of people at the facility on any given day would not exceed 3500. The wastewater generation per capita for developing countries is 95 m3 a year (Tiseo 2023). This translates to 0.26 m3 or about 250 L a day. The wastewater treatment system at MCH with total capacity of 30,744m3 therefore can support about 8,500 people factoring in a sewage residency time of 14 days. The system therefore has adequate capacity to effectively treat wastewater at the facility including the new load from the new structures provided the clogged pond at the facility is dredged and regular maintenance conducted.

The project as part of the scope of the works will undertake dredging of the treatment pond and maintenance of the sewer system to increase residency time and facilitate biological treatment, these activities will be continued during operation by the hospital management. The facility will also obtain a permit for the discharge of treated sewage from NWRA and will conduct water quality monitoring of the river on regular basis to ensure that the quality of effluent is within MBS allowable limits for discharge presented in the table below:

**Table 2.5. MBS limits for discharge into the environment (ETP discharge limits)**

| **PARAMETER** | **MBS limits** | **WB EHSG General and for Health Care Facilities limits** |
| --- | --- | --- |
| Temperature | >= 40 | Not more than 3°C above ambient water temperature |
| PH | 6.5 – 9.0 | 6–9. |
| Dissolved Oxygen | >= 5 | No specific standard |
| Chemical Oxygen Demand (COD) (mg/L) | <=50 | ≤125 mg/L |
| Biochemical Oxygen Demand (BOD) (mg/L) | <= 20 | ≤30 mg/L |
| Nitrates (mg/L) | <= 50 | ≤10 mg/L |
| Heavy metals | ++ | • Lead: ≤0.1 mg/L  • Mercury: ≤0.002 mg/L |
| Oil and grease | ++ | :≤10 mg/L |
| Oxidation Reduction Potential (ORP) (mv) | <= 100 | No specific limit |
| Fecal Coliforms (CFU/100ml) | <= 1000 | <1,000 CFU/100 mL |
| Total Suspended Solids (TSS) | <= 30 | ≤50 mg/L |
| Total Dissolved Solids | <= 500 | No specific limit, |

Source:MS539, MS732 and WB EHSG General and for Health Care Facilities

* + 1. Workers’ temporary toilets which are segregated by gender be constructed and directed to sewerage pipeline. **Medical waste planning and management**

Medical waste planning and management at operations and maintenance is critical for ensuring environmental safety, public health, and compliance with regulatory standards. Proper planning and management of medical waste involve identifying waste types, ensuring appropriate segregation and storage, employing effective onsite treatment methods, and ensuring environmentally safe final disposal. Adopting strict protocols, advanced technologies, and staff training can minimize health and environmental risks while maintaining regulatory compliance.

In terms of hospital waste types and sources, the following are being envisaged at the newly constructed paediatric hospital OPD and Emergency room.

### **1. Types of Medical Waste and Sources of Generation**

Medical waste is categorized based on its risk level, composition, and required treatment.

|  |  |  |
| --- | --- | --- |
| **Waste Type** | **Description** | **Sources of Generation** |
| **Infectious Waste** | Waste contaminated with blood, body fluids, or pathogens. | Emergency room and Operating rooms, and short stay room of OPD |
| **Pathological Waste** | Human tissues, organs, body parts, and fluids. | Surgery section |
| **Sharps** | Needles, syringes, scalpels, blades, and glass. | Injection rooms, surgical procedures, |
| **Pharmaceutical Waste** | Expired or unused medications, vaccines, and contaminated drug containers. | Patient care units. |
| **Chemical Waste** | Disinfectants, solvents, lab reagents, and heavy metals (e.g., mercury). | Laboratories, cleaning, radiology departments. |
| **Radioactive Waste** | Waste containing radioactive substances | radiology |
| **Non-Hazardous Waste** | General waste like food, paper, and plastics not contaminated by hazardous materials. | Administration, general hospital activities. |

**In terms of waste generation,** typically, hospitals generate **0.5–3 kg of waste per bed per day**, with 10–25% being hazardous or infectious. Color-coded bins as the common practice at the hospital will be used for waste segregation at the source. **Temporary Storage of Medical Waste will be undertaken and will** involve holding waste onsite/ in the unit before treatment or transport for final disposal at the incinerator unit. **Guidelines** for segregation storage and treatment onsite shall include:

* 1. Use color-coded, clearly labeled containers or bags:
     + **Red**: Infectious waste.
     + **Yellow**: Pathological and chemical waste.
     + **White/Blue**: Sharps.
     + **Black/Green**: Non-hazardous/general waste.

1. Designate storage location as a well-ventilated, secure, and easily accessible storage area and ensure it is isolated from patient areas, and other sensitive zones.
2. **Storage Time** for Infectious waste will be a maximum of **48 hours** (lower in hot climates).
3. **Staff Training** will be undertaken on segregation, labeling, and handling procedures.
4. Onsite treatment will be undertaken and aims to neutralize hazardous components, reduce waste volume, and prepare it for final disposal. This will depend on the type of waste but ways will be Microwave Treatment, Chemical Disinfection and incineration.
5. Final disposal will be undertaken to ensure treated waste is permanently removed in a manner that minimizes environmental and public health risks. Depending on waste types the following will be undertaken.

* **Landfill Disposal** by Mzuzu city council: this will include **General Waste** and sterilized **Infectious Waste**
* **Ash Disposal**: Ash from incineration (if non-toxic) can be disposed of in a **designated ash pit**.
* **Sewer Disposal**: Treated liquid waste e.g. from chemical disinfection may be disposed of via hospital drainage, subject to regulatory compliance.

1. Maintaining records of waste generation, treatment, and disposal and Conducting periodic waste audits will be part of this planning to ensure compliance with regulatory standards.
   * 1. **Environmentally friendly construction materials**

The use of environmentally friendly construction materials is incorporated in the designs of the buildings associated with the project as follows:

1. The use of concrete bricks/blocks than using burnt brick in the construction of walls, etc. The use of cement bricks will reduce demand for locally burnt bricks, which exert serious pressure on limited land and forest wood resources in the production and burning process.
2. The use of steel metal (as opposed to wood planks) in scaffolding requirements. The choice of steel will reduce pressure on use of wood.
   * 1. **Management measures for avoiding dust and noise pollution**

Dust and noise emissions are named as among significant impacts in construction projects including this project. Being hospital premises, the project therefore will put in place measures to contain dust and noise pollution during construction works as follows.

1. Use of water to regularly dampen and suppress dust to avoid dust emissions from the construction works.
2. Carrying out noisy construction activities during the day when usually noise level impacts are lower than during the night.

Use equipment with noise silencers to avoid generation of excessive noise.

* + 1. **Sanitation management planning and design**

Sanitation issues may also arise during the construction phase of the project. The project will be implemented within hospital premises where the population of patients, staff and patients is estimated to increase. The implementation of construction works will bring additional people in the project site. This addition will mean the need for additional toilets. To address the pressure on existing toilets during construction, the contractor will construct or elect hired temporary separate sanitary toilet structures for the construction workers and segregated by gender. This is because the toilets at the hospital may not be adequate to accommodate use by construction workers.

* + 1. **Fire Safety**

The risk of fire in health care facilities is significant due to the storage, handling, and presence of chemicals, pressurized gases, boards, plastics, and other flammable substrates. Fire safety recommendations applicable to occupational areas are presented under ‘Occupational Health and Safety’ in the General EHS Guidelines. Recommendations applicable to buildings accessible to the public, including health care facilities, are presented under ‘Life and Fire Safety’ in the General EHS Guidelines. The project will implement the following measures a) Installation of smoke alarms systems; b) Maintenance of all fire safety systems in proper working order; c) Training of staff for operation of fire extinguishers and evacuation procedures; and d) Development of facility fire prevention or emergency response and evacuation plans with adequate guest.

* + 1. **Air emission planning and design**

For the pediatric OPD and Emergency section to be constructed, key sources of air pollution and emissions will be pollution influenced by the operational efficiency of the incinerator which is at the hospital and direction of prevailing wind. Vehicular traffic may also provoke dust to pollute the air. Measures have therefore been put in the design for air quality control in the newly to be constructed pediatric hospital sections at MCH. These measures include the ones highlighted below.

Proper ventilation design ensures adequate indoor air quality in the new hospital pediatric OPD and emergency department. Thus, natural ventilation enhancements have been planned through use of cross-ventilation designs by strategically placing windows and vents to promote fresh air circulation and ensure openings face areas less affected by pollution sources (opposite to incinerator and high-traffic zones). This is on top of the hospital existing plan of conducting regular monitoring of incinerator emissions to ensure compliance with local air quality standards. Also, heavy vehicle movements will be restricted at the facility unless during construction activities and operating under conditions that reduce dust e.g. covering construction materials and ensuring lower speed limits.

# POLICIES, LEGAL AND INSTITUTIONAL FRAMEWORK

This Chapter provides an overview of the World Bank Environmental and Social Standards and Malawi national policies, legislations and regulation relevant for the preparation of the ESMP and implementation of proposed project activities, including the relevant actions that the project should consider as per the provisions.

* 1. **Policies and Legal Framework**

The Contractor and Management of the Hospital will ensure to follow the provisions of the policies and laws governing the implementation of this project in Malawi. The contractor and operator will adhere to these regulatory instruments in the form of national policies and legislation and the World Bank’s Environmental and Social Standards.

Table 3-1 summarizes the relevance of the policies and legislations to the proposed project and how the project will ensure compliance.

Table 3‑1: Summary of relevant national and World Bank policies and standards

| **Regulatory Frameworks** | **Relevance to the Project** |
| --- | --- |
| **National Policies** | |
| The National Environmental Policy, 2004 | * Promotes adherence to sound management of the environment and natural resources through promotion of sustainable social economic development against sound management of the environment and natural resources such as water, soil, flora and fauna. This construction project will trigger the policy as it will involve using chemical-based materials such as paint and sealants. Preventing contamination of water and soil from these materials will be a way of adhering to this policy. Mitigation measures of secure storage of these materials have been suggested and should be considered by the contractor |
| National Health Policy, 2017 | * Aims at overcoming challenges of sub-optimal healthcare service provision; as such it singles out provision of adequate health care, commensurate with the health needs of Malawian society and international standards of health care” as its main objective. The policy mentions “Medical Equipment and Infrastructure” as among priority areas. Therefore, at construction stage, the activities of the project will invoke the relevant Sections of the policy as it will involve improving health care infrastructure by construction for the hospitals selected sections. This therefore directly supports the National Health Policy by improving health related infrastructure and thereby enhancing health service quality. |
| National Sanitation Policy, 2006 | * Provides guidelines and an action plan for access to improved sanitation, safe hygienic behavior, recycling of solid and liquid waste practices for healthier living and better environment. The proposed project will need to adhere to the relevant policy requirement as its implementation will have to ensure that liquid and solid waste management is given full consideration complying with the provisions of the policy. |
| National Water Policy, 2004 | * Section 1.3 provides an enabling framework for integrated water resources management in Malawi. Through this policy, the protection and use of water resources has been accorded the highest priority over other uses by this policy. Water is one of the highest required materials in this project during both construction works implementation and operation phases. The implementation of water-efficient practices and technologies will be based on the policy pronouncements during the construction works and may benefit this policy. |
| National Decentralization Policy, 1998 | * Through section 2a, b, c, d and e, the policy advocates for involvement of decentralized structures at district and local levels in implementation of public related activities of the project such as managing infrastructure which will be developed by this project. Through this policy, Mzimba district councils decentralized structures have been involved as stakeholders and should continue being involved in the ESMP implementation and throughout the project life cycle. |
| Infection Prevention and Control Policy (2006) | * Under the Infection Prevention Control (IPC) section, the policy stipulates that all health care facilities (public and private) in Malawi shall have an active IPC program in place; aimed at promoting IPC practices and surveillance focusing on clients, patients, health care personnel and the environment. As such these new constructions of hospital facilities at MCH is part of the IPC program for the hospital. |
| **National Legislations** | |
| The Constitution of the Republic of Malawi, 1995 | * Section 13, establishes a framework for sustainable environmental and social management, promoting welfare and development through responsible policies and legislation. In section 13(d) it also integrates environmental and social considerations into development programs, requiring the government, partners, and private sector to ensure environmentally and socially responsible projects. Therefore, this ESMP has been developed in compliance to this constitution. In addition, MCH project management team will ensure that this ESMP is implemented by the contractor during construction works. |
| The Environment Management Act, 2017 | * Ensures clean and healthy living environment for the project implementers, and the surrounding environment in which the project is being implemented. Part II of the Act indicates that (1) Every person shall take all necessary and appropriate measures to protect and manage the environment, to conserve natural resources and to promote sustainable utilization of natural resources. This ESMP development for implementation throughout the MCH Pediatric center construction project life cycle, underscores adherence to the principle outlined in this Act |
| National Local Government Act, 1998 | * The act mandates local governments to regulate planning and development within their jurisdiction and empowers them to have by-laws that specify, among other issues, how development projects should minimize or avoid environmental degradation. Part IV second schedule includes provisions for waste management, specifically, empowering local assemblies to establish, maintain, and manage services for the collection, removal, and treatment of solid and liquid waste, ensuring safe disposal and treatment. The project implementation will lead to generation of different streams of waste. The Mzuzu City Council with respective relevant officers will have to be involved to ensure the contractor complies with waste management and disposal standards that minimizes environmental degradation. |
| Water Resources Act, 2013 | * The Act provides for the control, conservation, apportionment and use of water resources. Section 44 requires that people or companies who want to use water other than domestic uses to apply for permission from the National Water Resources Authority before abstraction. The Contractor should consider applying for water rights if surface water will be used during construction works of the project. |
| Occupational Health and Welfare Act, 1997 | * The Act through Section 13 regulates the requirements for adequate environmental health and safety measures within workplaces. This Act applies to MCH project because it will engage a contractor who will employ people, and the act stipulates that it is the duty of every employer to ensure the safety, health and welfare at work of all employees. |
| Gender Equality Act, 2013 | * The Act seeks to promote gender equality, equal integration, influence, empowerment, dignity and opportunities for men and women in all functions of society; to prohibit and provide redress for sex discrimination, harmful practices and sexual harassment; to provide public awareness on promotion of gender equality. Section 6 addresses non-discrimination in employment based on gender and Section 6 addresses non-discrimination in employment based on gender and Section 7 sets a provision for workplace policy to address issues of sexual harassment including defining the vice as a form of physical conduct like rape, verbal conduct like comments on a worker’s appearance and nonverbal conduct like whistling. The contractor of MCH project should therefore ensure that both men and women have equal opportunities and treatment in the workplace, and that sexual harassment issues should be redressed at the workplace as per this Act. |
| Public Health Act, 1948 | * The Act creates the legal framework for the protection of public health in Malawi and for this purpose provides for powers of the administration to regulate and control among others handling of water supply, sewerage, etc. Part X of the Act addresses the conservation of water, drainage, and sewerage, emphasizing the importance of maintaining these systems to safeguard public health. This is a construction project as such, if not properly managed, it may have an impact on water access and use at the health facility including sewerage system. The contractor and Mzuzu Central hospital management should work together to make sure construction doesn’t negatively affect water supply and sewerage systems at the facility. |
| Environment Management (Waste Management & Sanitation) Regulations, 2008 | * The regulations apply to the management of general and municipal waste in Malawi. Part III of the regulations has provisions on management of general or municipal solid waste with Section 7(1) regulating that any person who generates solid waste shall sort out the waste by separating hazardous waste from the general or municipal solid waste. The construction works will generate various waste streams. The waste generated at the site is therefore responsibility of the contractor and should therefore be disposed of at sites designated by Mzuzu City Council. |
| National Construction Industry Act, 1996 | * Section 3 sets out the NCIC as an institution responsible for regulating the construction industry in Malawi. Section 13 provides Standards and Specifications that NCIC has the authority to establish and enforce standards and specifications for construction works in Malawi. In Section 14, the Act empowers the Council to inspect construction works to ensure that they comply with the established standards and specifications. Regular inspections are therefore required during and after the construction process to verify that the construction meets the specified quality and safety requirements. Section 17 specifies Health, Safety, and Environmental Requirements. The Act requires that all construction projects adhere to health, safety, and environmental standards set by the Council. For public infrastructure projects, such as hospitals, this means ensuring that construction practices do not endanger the health and safety of workers or the public and that environmental impacts are minimized. |
| **World Bank’s Safeguard Policies** | |
| ESS1: Assessment and Management of Environmental and Social Risks and Impacts | * ESS1 sets out for the assessment, management and monitoring environmental and social risks and impacts associated with each stage of a project supported by the Bank, in order to achieve environmental and social outcomes consistent with the Environmental and Social Standards. ESMP has been prepared in adherence to this standard and the Contractor will need to adhere to principles of the ESMP including developing Contractor’s ESMP. |
| ESS 2: Labour and Working Conditions | * Provides the World Bank’s requirements on occupational safety and health for all programs/projects. ESS2 introduces labour management procedures (LMP); emphasizes non-discrimination and equal opportunity; provides for the treatment of direct, contracted, community, primary supply workers and civil servants. It also provides for protection of vulnerable workers such as women, persons living with physical disabilities and children from labour. Additionally, the standard spells out the need for a grievance mechanism for all workers as an accessible means to raise workplace concerns and its respective ways of redressing the grievances. * This ESMP recognizes the labour issues and suggests mitigation measures in relation to labour issues that are in line with this ESS. The contractor should adhere to mitigation measures suggested in this ESMP and commit to prepare a separate OHS Management plan in line with WBG ESS2. |
| ESS 3: Resource Efficiency and Pollution Prevention and Management | * Recognizes that development often generate pollution to air, water, and land, and consume finite resources that may threaten people, ecosystem services and the environment at the local, regional, and global levels. This ESS sets out the requirements to address resource efficiency and pollution prevention and management throughout the project life cycle. Under this standard, MCH construction project which has this ESMP prepared to make sure pollution is prevented during construction and operation and resource efficiency in water is achieved. See Appendix 5 |
| ESS 4: Community Health and Safety; | * Recognizes that project activities, equipment, and infrastructure can increase community exposure to risks and impacts. ESS4 also addresses the health, safety, and security risks and impacts on project-affected communities and the corresponding responsibility of implementers to avoid or minimize such risks and impacts, with particular attention to people who, because of their circumstances, may be vulnerable. This ESMP has been prepared and among other impacts, it recognizes impacts on community health and safety and suggests measures to address and/or avoid such. The contractor will have to adhere to measures specifies in the ESMP |
| ESS 10: Stakeholder Engagement & Information Disclosure | Recognizes the importance of open and transparent engagement between the developers and project stakeholders as an essential element of good international practice. Recognizes that effective stakeholder engagement can improve the environmental and social sustainability of projects, enhance project acceptance, and make a significant contribution to successful project design and implementation. Additionally, where properly designed and implemented, it supports the development of strong, constructive and responsive relationships that are important for successful management of a project’s environmental and social risks. Stakeholder engagement has also been recognized in the development of this ESMP with both institutional, community members and district authorities being consulted.   * The ESMP has also suggested involvement of other stakeholders at all levels during the monitoring of the implementation of the suggested enhancement and mitigation measures for various impacts, so as to address the project’s environmental and social risks and/or impacts. The project has also the GRM in place and through this mechanism, communities as relevant stakeholders will also be engaged by being part of the GRM structure for the project. |

* 1. **List of Statutory Licenses, approvals and Agreements Required for Implementation of the Construction of Pediatric OPD and Emergency sections at Mzuzu Central Hospital.**

**Table 3.2:** List of statutory licenses, approvals and agreements required for implementation of construction project at Mzuzu Central Hospital

|  |  |  |  |
| --- | --- | --- | --- |
| **List of statutory approvals or licenses to be obtained** | **Regulatory frameworks** | **Responsible Department/ Office** | **Responsible officer** |
| 1. **Environmental and Social Management Plan Approval:** *To guide the synchronization of environmental management practices.* | Environment Management Act, (2017) | Malawi Environment Protection Authority and World Bank | Director General, Malawi Environment Protection Authority and World Bank |
| 2. **Workplace Registration Certificate:** *To guide on procedures on workers environmental health, safety during project implementation and operations.* | Occupational Health, Safety and Welfare Act (1997) | Ministry of Labour | Director of Occupational Health, Safety and Welfare. |
| 3. **Water rights for abstraction**, *To regulate mechanisms of water abstraction for use in various planned activities.* | Water Resources Act (2013) | Water Resources Board | Director for Water Resources / Southern Region Water Board |
| 1. **Hazardous waste collection, transport and disposal agreement:** *To guide collection, transport and disposal of Asbestos containing materials* | Environment Management Act, (2017) | Malawi Environment Protection Authority | Director General, Malawi Environment Protection Authority |
| 1. **Solid waste collection, transport and disposal agreement:** *To guide collection, transport and disposal of solid waste* | Mzuzu city Council by-laws | Mzuzu City Council | Chief Executive Officer, Mzuzu City Council |

* 1. **. Other EHS standards that must be achieved during project Implementation**

**Table 3.3:** Other EHS standards that must be achieved during project Implementation of Construction works at Mzuzu Central Hospital

| **Parameter** | **EHS standards** |
| --- | --- |
| Air Quality | PM10: 50 µg/m³ (24-hour average) |
| PM2.5: 25 µg/m³ (24-hour average) |
| CO: 10 mg/m³ (8-hour average) |
| NO2: 200 µg/m³ (1-hour average) |
| SO2: 500 µg/m³ (1-hour average) |
| Water Quality | **pH**: 6.5 – 8.5 |
| **Total Dissolved Solids (TDS)**: Maximum 1000 mg/L |
| **Turbidity**: 5 NTU (Nephelometric Turbidity Units) |
| **Coliforms**: Should be absent per 100 mL |
| **Arsenic**: Maximum 0.01 mg/L |
| **Chloride**: Maximum 250 mg/L |
| Noise Levels | **Patient Rooms (Daytime)** 30-40 dB(A) |
| **Patient Rooms (Nighttime)** 25-30 dB(A) |
| **General Hospital Areas** 40-45 dB(A) |
| **Intensive Care Units (ICU)** 40 dB(A) or less  **Operating Rooms** 40 dB(A) or less |
| **Staff Rooms,** 45 dB(A) or less |
| **Patient Rooms (Daytime)** 30-40 dB(A) |
| Solid Waste Management | **Segregation into organic, recyclable, and non-recyclable categories.** |
| **Regular collection and transportation using appropriate vehicles** |
| **Disposal in sanitary landfills with proper leachate management** |
| **Encouragement of recycling, composting, and waste minimization practices.** |
| Hazardous Waste Management | Identification and classification of hazardous waste (chemical, medical, e-waste). |
| Safe storage in designated facilities with spill containment |
| Transportation using labelled and secure containers |
| Disposal through incineration or secure landfilling with proper safeguards |
| Personal protective equipment (PPE) for workers handling hazardous waste. |

While these EHS standards must be adhered to throughout project implementation, the project will also specifically comply with the WB EHSG General and the WB EHSG for Health Care Facilities

# ENVIRONMENTAL AND SOCIAL SETTINGS

This section describes the existing conditions regarding the physical, biological and Socio-economic environment of the proposed site for the Mzuzu Central hospital pediatric center construction project.

* 1. **The Physical Environment of the Project Area**
     1. **Geology**
     2. The geology of Mzuzu including the area to which Mzuzu Central Hospital Pediatric centers OPD and Emergency sections construction will be implemented is characterized by Precambrian basement complex rocks, which are typical of the broader Northern Region of Malawi. These rocks mainly consist of granites, gneisses, and schists. The area may also have lateritic soils, which are a result of the intense weathering of the basement rocks. **Topography**

Mzuzu city including the proposed project site is located at an elevation of approximately 1,250 meters (above sea level. This elevation contributes to the area’s relatively cool climate compared to other parts of Malawi. The topography around Mzuzu Central Hospital is generally gently sloping terrain, which can be advantageous for drainage but may require careful planning to prevent erosion. The surrounding area includes a mix of flat to moderately steep slopes, particularly as you move towards the outskirts of the city and into the more mountainous areas. This terrain requires well-designed infrastructure to manage stormwater and minimize erosion.

* + 1. **Soils**

The soils in Mzuzu and the surrounding areas including the site for the proposed construction of OPD and Emergency sections of Pediatric hospital center at Mzuzu central hospital are typically red to reddish-brown and sandy clay, reflecting the high iron content from the weathering of bedrock. According to the soil mapping for Malawi, these are humic ferralitic soils and have high organic content often fertile and when rains are intense, can become compacted. However, these soils support construction of such magnitude as proposed under this project.

* + 1. **Land Use and Land Tenure**

The Land tenure of the proposed project site is public land, such that the construction works of the pediatric hospital sections at MCH will be carried out on land belonging to the hospital and held by e Government on behalf of the people. Since the project is being proposed on public land and within Mzuzu Central hospital, issues of land conflicts due to development of the project are not expected.

Regarding land use, the site for the proposed project is primarily used by hospital staff for agricultural activities on a temporary basis as it is an institutional land. Other immediate adjoining land uses are land dedicated to wastewater treatment ponds, Agriculture land by surrounding communities and hospital market. However, as you move further away from the site, towards eastern side, there are residential areas of Luwinga, institutions such as St Peters secondary school and Mzuzu University and commercial areas which extends all the way to Mzuzu city.

* + 1. **Hydrology**

Mzuzu is near several rivers and streams, including the Lunyangwa River, which is the closest to Mzuzu central hospital (within 1km meters distance), and is one of the primary water sources for the city activities and the natural receptor for the effluent from Mzuzu Central Hospital sewage oxidation ponds. The source for Lunyangwa River is Kaning’ina. Other rivers and streams in the city include Chingámba, Katoto, Kavuzi and Kajiliwi. The existence of these water bodies is essential for the hospital’s water supply especially for other needs other than drinking (e.g. construction etc.) due to that pollution levels are high in these rivers due to influence of waste pollutants from the city and; hence, its waters are not safe for drinking or use in household activities. During the rainy season, these rivers can swell, leading to an increased risk of flooding in poorly drained areas though within their course, as Mzuzu central hospital premises have never flooded due to any of these rivers and more specifically Lunyangwa. This is mostly due to topographic differences of the locations between the two. Thus, the hospital is on the upper part of its plot area while the location of the river is down the valley. Proper storm water management systems however are crucial to prevent waterlogging and localized flooding around the hospital due to poor drainage.

According to an assessment of effectiveness of the Lunyangwa River catchment co-management model in Mzuzu City, Northern Malawi by [Elijah M.M. Wanda](https://journals.scholarsportal.info/search?q=Elijah%20M.M.%20Wanda&search_in=AUTHOR&sub=), degradation of trees for community livelihoods, which results in increased levels of silt loads that increases turbidity in Lunyangwa River catchment (turbidity range=130–225 NTU). The high turbidity levels led to an increase in the amount of coagulant dose used to treat raw water. Raw water of turbidity levels higher than 200 NTU used a coagulant dose of about 7.5mg/ℓ, which is higher than a 0.5mg/ℓ coagulant dose that was being used before high turbidity problems. In addition, inadequate sanitary facilities for human settlements, particularly those established in upper Lunyangwa River catchment area also contributed to the deterioration of the microbial quality of water in Lunyangwa River catchment and dam (fecal coliform>1000counts/mℓ). The water from Lunyangwa River could be classified as freshwater (TDS<1000mg/ℓ) which registered a uniformly fair water quality rating (WQI range=33.12–35.03%). (Wanda, 2014).

* + 1. **Ground water: depth at the site, quality and nearby uses**

Around Mzuzu Central Hospital, groundwater conditions vary, influenced by nearby water bodies and land use. Though groundwater depth and quality specifics at the hospital site are not well-documented in the sources available, However, environmental studies have pointed out that Lunyangwa River, which is adjacent to the hospital, and influences the ground water quality of the area, has been impacted by wastewater from the hospital’s treatment ponds, raising concerns about surface and potentially ground water quality of the surrounding areas and its use by local communities for domestic purposes. The ​contamination risk has majorly emerged due to inadequate treatment and leakage issues​.

* + 1. **Wind speed and direction**

Wind conditions at Mzuzu Central Hospital vary, with speeds typically ranging between 4 and 20 mph (6 to 32 km/h) depending on time and weather systems. Predominantly, the wind direction is from the southeast (SE) or south-southeast (SSE). Gusts can reach up to 24.5 mph (39.4 km/h) during certain stormy periods.

* + 1. **Air Quality**

Air pollution is not a significant environmental problem for Mzuzu City, as there are no major industries; and the number of cars is not large as compared to the other cities in Malawi. In addition, the city is surrounded by large forest reserves which contribute to fresh air. Though the actual values of ambient air quality, were not measured at the site, the National Environmental Action Plan (2002) identifies gaseous emissions from industries, car exhaust fumes as well as burning of old tyres as the main cause of air pollution in urban centers in Malawi including Mzuzu. Burning of wastes mostly through incineration of medical wastes in the hospitals such as Mzuzu central are also a source of air pollution.

* + 1. **Natural Hazards**

While Malawi is relatively free from major seismic activity and large-scale natural disasters, though some natural hazards still affect the country and the location of MZCH. Seasonal flooding along Lunyangwa river has been experienced in the past, however its impact hasn’t been able to affect Mzuzu Central hospital due to topographic differences on the locations of these two. Localized flooding across the institution due to severe rains which its waters overtake the capacity of storm water drains to carry excess water, has been the only hazard that has been experienced at the hospital and proposed site. Localized flooding increases the hospital’s vulnerability, as localized flooding may affect access. Improved drainage infrastructure, including the installation of storm water management systems, can help alleviate flooding risks in the area.

* + 1. **Rainfall**

Mzuzu experiences a distinct rainy season from November to April. This period is characterized by frequent and sometimes heavy rainfall. The average rainfall for the city including the proposed project site is about 1,200 to 1,500 mm annually. The heaviest rains typically occur in January and February.

The rainy season is crucial for construction activities but can lead also to challenges such as flooding, waterlogging, and erosion, especially in areas with inadequate drainage. Thus, this high rainfall cannot only be harvested to support construction activities but also requires effective drainage systems to prevent flooding and erosion. The hospital and surrounding areas need well-maintained drainage infrastructure to manage runoff,

* + 1. **Temperatures**

Mzuzu, including the area around Mzuzu Central hospital the proposed project site, experiences mild temperatures throughout the year due to its elevation, which is approximately 1,250 meters above sea level. Daytime Temperatures: Average daytime temperatures typically range from 18°C to 25°C, while nighttime temperatures are cooler, often dropping to between 10°C and 15°C.

Regarding seasonal variation, warm season and/or warmer months are between September to April. During this time, daytime temperatures can occasionally reach up to 27°C, but it generally remains mild. The cool Season, which is between May to August, sees lower temperatures, particularly at night, with occasional drops to 7°C.

* 1. **Biological Environment of the Project Area**
     1. **Flora**

The proposed project site is at Mzuzu Central Hospital which is an already existing public facility with extensive hospital infrastructure. With this fact, the sites’ green spaces are mainly landscaped grounds. These areas are typically planted with a variety of ornamental trees, grasses and shrubs, to provide aesthetic value and a calming environment for patients, staff, and visitors including providing outdoor patient waiting areas and staff relaxation spots. There are no tree species around the proposed site which are important in the hot season, helping to cool the environment and provide comfortable outdoor spaces.

* + 1. **Fauna - Wild animals and Livestock**

The project site is an existing hospital area, and hence is not rich in fauna diversity due to the current land use. During the transect walk, no wild animals and livestock were spotted at the site and literature reviews indicated no reported or known threatened or endangered species existing at the site. However, despite this, the possibility of existence of other fauna such as birds, reptiles and amphibians may not be ruled out Therefore, though there is a general understanding that the project will not have significant negative impacts or disturbance of wildlife and livestock, the developer should be on the lookout for some species of fauna which may exist at the site during implementation. Where other species are found, competent authority e.g. Department of Parks and wildlife should be informed to check the status of those species.

* 1. **Socio-Economic Environment of the Project Area.**

4.3.1 **Population**

Mzuzu Central hospital as a tertiary health care institution, serves on referral basis the Northern Region total population of approximately 2.3 million people where approximately 1.1 million (around 48% of the total population) are males and approximately 1.1 million (around 48% of the total population) are females (NSO, 2018). Mzuzu city on its own has the Total Population of 221,272 (with 49% being males and 51% females).

Mzuzu is the largest city in Malawi's Northern Region, with a population that has been steadily growing due to urbanization and migration from rural areas. The city serves as a regional hub, attracting people from surrounding districts. The population is relatively youthful, with a high percentage of children and young adults, which influences the demand for healthcare services, particularly pediatric care.

* + 1. **Economic Activities**

Mzuzu Central hospital is within Mzuzu city where residents engaged in small-scale farming, with Common crops include maize. Livestock farming is also prevalent. The reliance on agriculture, particularly subsistence farming, means that many families have limited financial resources, impacting their ability to afford healthcare services but relying on public Health facility.

Trade and Commerce is another economic activity in the city. Mzuzu is a commercial hub for the Northern Region, with vibrant markets, retail shops, and small businesses. The city’s economy benefits from trade with neighboring districts and regions. Informal employment is common, with many people engaged in small-scale trading and service provision. This economic structure often leads to income instability, affecting healthcare access and affordability.

Employment opportunities in the formal sector are limited, leading to high levels of underemployment and informal work. This economic environment points to the need of employing workers surrounding the project site, so that the project can improve employment status of the city.

* + 1. **Education**

Mzuzu and near the site to which the project site is located, hosts several educational institutions, including secondary schools (St. Peter's Secondary School, located approximately 1.5 kilometers away), vocational training centers, and Mzuzu University located over 3 kilometers away. Education levels are relatively high compared to other parts of the country, but disparities exist.

* + 1. **Healthcare Access and Infrastructure**

Mzuzu Central Hospital is the main referral hospital in the Northern Region, providing specialized services not available in smaller clinics and health centers. It serves not only the city’s residents but also those from surrounding rural areas.

Though the existing hospital facilities and operations have been assessed to comply with all EHS regulatory requirements with regards to being accessible by all including vulnerable groups (as it is all single storey), having appropriate waste management facilities and infection control mechanisms in place, no traces of asbestos, lead based paint of water supply pipes due to that the hospital is relatively new, and that other environmental liabilities such as soil contamination, transformers containing PCB equipment have not been detected, the hospital faces challenges related to overcrowding, resource limitations, and maintaining high standards of care in the face of increasing demand.

Table 4.1: Operational observations during site visit

|  |  |  |
| --- | --- | --- |
| Issue identified | Current status | Recommendation during operations |
| **Liquid waste:** | The facility is connected to a sewerage system with two oxidation ponds. During the site visit one pond was not working as such wastewater was directed only to one pond. There is no water quality monitoring data of the sewer system available. The hospital also does not have a permit for the discharge of treated water into the environment (Lunyangwa River). The hospital generates approximately 6,300 m3 of wastewater a month. | Conduct yearly comprehensive environmental audits of the facility to ensure they are in compliance wastewater treatment and disposal requirements  Assess compliance of their wastewater discharges with the applicable discharge.  Obtain permit from NWRA for the discharge of treated effluent into the environment  Conduct quarterly training of hospital personnel on waste management at the facility  Ensure regular maintenance of the wastewater system of the facility. |
| Health Care waste Management | There is a new incinerator installed in 2022 which is used for managing health care waste.  The incinerator also has a tall chimney for ensuring that emissions are dispersed at high levels for effective dispersion.  Waste segregation is inadequate.  Lack of records for amounts of waste of various types generated, treated, discharged etc. | Conduct yearly comprehensive environmental audits of the facility to ensure that it is meeting solid waste management standard for a Health care facility  Ensure the incinerator is well serviced  Ensure color labeled waste bins are provided for segregation of wastes  Conduct quarterly training of hospital personnel on waste management at the facility |
| General waste Management | General waste such as food waste, paper, plastics, construction wastes and demolition wastes in different streams such as rubble, glasses, steel, wood etc. is generated. The hospital generates approximately 13,600 kg/month of general waste/ month  The waste is collected in bins around the facility to a skip that is later taken by the City Council for disposal at designated site. However, the city council takes time to empty the skip and dispose the waste. | Conduct yearly comprehensive environmental audits of the facility to ensure that it is meeting solid waste management standard for a Health care facility  The hospital administration to always provides enough bins with adequate liners.  Administration to liaise with the council to ensure filled skip is emptied in time. |
| Water supply | The hospital uses approximately 9,000 m3 of water per month from the Northern Region Water Board. `  The rehabilitation activities will use about 1515 m3 of water.  The project during operations and maintenance will increase water usage. | The project will during construction use water from Lunyangwa river for the rehabilitation works.  During operation and maintenance, the hospital administration will conduct regular maintenance of the water supply system to reduce leakages and reduced problem of proper functioning toilets which will be maintained by the project.  The Hospital will also install water-efficient fixtures such as low-flow faucets and toilets to conserve water and Sensitize staff and hospital community on use of energy and water efficiently |
| Power supply | The hospital relies on ESCOM power. Approximately, the hospital uses 250667 kwh of electricity / month. There is also a diesel operated generator that used approximately 1000 L of diesel per month  The project will increase the amount of electricity used during operation and maintenance | During operations and maintenance phase, installation of efficient and energy saver technologies that are recommended during the construction phase should be maintained by the Hospital Administration. |

* + 1. **Language and Communication:**

The primary languages spoken in Mzuzu are Tumbuka and Chichewa, with English used in formal and educational settings. Effective communication between contractor and workers as well as the hospital staff is essential, especially for those with limited proficiency in English.

Language barriers can lead to misunderstandings and challenges in providing accurate instructions, thereby making translation services and multilingual staff valuable assets where necessary and required.

* + 1. **Transportation:**

Mzuzu including the project site is connected to other parts of Malawi by road, including the M1 road, making it accessible for construction materials and workers from elsewhere and from surrounding areas. Public transportation, including minibuses and taxis, is readily available.

* + 1. **Electricity and water supply**

The hospital depends on the city’s infrastructure for electricity and water (i.e. ESCOM and NRWB respectively). However, power outages and water supply issues sometimes can disrupt hospital operations, necessitating backup systems like generators and water storage by the contractor.

* + 1. **Sanitation and waste management**

Waste management is also a critical activity at the hospital and the city. Generally, handling of solid and liquid waste is the mandate of the city council. However, the hospital has in place institutional solid and liquid waste management systems, particularly in handling medical waste and wastewater, located within the hospitals land area and operated by the hospital to support its waste management activities. The hospital has a 500 kg/hour eco-friendly Scientico’s medical incinerator installed in 2022 and a sewerage system. The sewerage system has a total capacity of 30,744 M3 (has two wastewater ponds of 15,372 M3 each) and operates with combination of aerobic and anaerobic systems where sewage treatment occurs naturally without addition of chemicals.

These waste management facilities have adequate capacity to support the construction and operation of the newly constructed pediatric hospital sections. However, it may also be possible that the project activities may generate other streams of waste which cannot be handled by the available facilities at the hospital. In this case, the City council can be engaged to ensure that such waste especially from construction activities is properly disposed of to avoid environmental contamination and public health risks, while the project will also dredge the sewerage treatment ponds to increase its capacity and support the operations of the newly constructed pediatric hospital sections.

# PUBLIC AND STAKEHOLDER CONSULTATIONS

* 1. **General**

Public and stakeholder consultations with relevant institutions and affected communities are important and critical for designing and implementation of environmental and social safeguards associated with development project like Construction of OPD and Emergency sections of the proposed Mzuzu Central Hospital Pediatric Center in Mzuzu City, Mzimba District. As a principle, the guidelines for public consultation include, among others, a requirement of major elements of the consultation program should be timed to coincide with significant planning and decision-making activities in the project cycle.

During the preparation of this ESMP public consultations were conducted with Mzimba/ Mbelwa District Environment Sub-committee (DESC) on 14th August 2024 (following the site visit and meeting/ interviews with Mzuzu Central Hospital officials and staff / workers and community members passing by the site on 6th August 2024) to solicit their views and opinions that helped to identify potential positive and negative impacts associated with the project and suggesting suitable enhancement and mitigation measures respectively. In addition, public consultation process enabled the establishment and boosting of a communication channel between the local authorities, general public and the project proponents; and the concerns of the stakeholders to be known to the decision makers at an early phase of project development.

The issues covered during the consultations centered on the following key areas:

a) Challenges already existing in the area and the project can help address

b) Positive impacts anticipated from the project

c) How the positive impacts can be enhanced by the project

d) Risks anticipated if the project is implemented

e) Negative social impacts, construction and operation activities will cause and should be included in ESIA

f) If there are sensitive features existing in the area that the project may negatively affect

g) Activities that can likely threaten the environment to which the project will be implemented

h) Proposed interventions to be included in the ESMP to improve the environmental performance of the project

i) Labor issues- How best can this project ensure that more project workers are from the area.

j) Other issues that should be included in the ESMP

* 1. **Objectives**

Public and Stakeholder consultations were held with Mzuzu Central Hospital officials and District Environment Sub-committee (DESC) from Mzimba/Mbelwa District Council aimed to:

* Inform about and discuss the nature and scale of adverse impacts of the project on their livelihoods in a more transparent and direct manner and seek their participation in the project cycle.
* Give stakeholders a chance to have a say and express their views and concerns in the planning and implementation of the project that affects them directly or indirectly.
* Inform local authorities of the impacts, solicit their views on the project and discuss their share of the responsibility for the sound implementation and functioning of the overall project construction and operations activities.
  1. **Findings of public and Stakeholder consultations**

The findings of the Physical consultative meetings with Mzuzu Central Hospital Officials and Mzimba District council DESC that were conducted on 6th August 2024 and 14th August 2024 respectively, are presented in form of summary of the main issues that came out and are provided in Table 5-1. The table also summarizes how the issues have been incorporated into this ESMP. Appendix 2 shows the list of members that were consulted

Table 5-1: Summary of issues discussed, and comments raised by stakeholders and how was addressed

| **Stakeholder** | **Meeting Place** | **Date of Meeting** | **Objective of the meeting** | **Issues discussed** | **Inputs/ Comments made** | **How the issue was/has been addressed** |
| --- | --- | --- | --- | --- | --- | --- |
| Representatives of Hospital management, staff and community | Mzuzu Central Hospital premises | 6th August 2024 | To solicit input from the Hospital management about the benefits and negative impacts the project may bring and how to mitigate negative impacts. | Nature/ components of the project | The current Mzuzu Central Hospital pediatric unit is congested with low capacity to increased numbers of patients and hence, affecting access of the services to all who need the services of the unit. The project will help to address some of the problems the facility is facing. | has been consolidated into a positive impacts of Increased hospital capacity to accommodate more patients and reducing over-crowding at the existing unit and also the impact of Increased access to pediatric care for patients by reducing the physical and logistical barriers in the current setup, during operation |
| Environmental benefits the project will bring and enhancement measures | The project will improve the outlook and value of the hospital as it will have amongst the modern and beautiful pediatric units in the country | This has been consolidated as positive impacts of Improved aesthetic value of the hospital during operation |
|  |  |
| Socio-economic benefits of the project | People will get employed due to the implementation of the project. | This has been consolidated into an impact if creation of temporary employment at pre-construction and construction stages.  This also has been consolidated as creation of job opportunities for hospital workers during operation. |
| People selling their items outside the hospital will have more new customers inform of construction workers | This has been put as a positive impact of Increased business opportunities during construction |
| Socio-economic negative impacts the project will bring | Risks of injuries may emerge among workers during construction | This has been addressed as an impact of Physical Occupational safety and health risks, and Chemical Occupational safety and Health Risk during construction. |
| Public safety risk may be compromised especially due to construction vehicles not observing speed limits within hospital premises (along the access road to the construction site, there is guardian shelter) | This has been consolidated into negative impact of public safety and health risk during construction |
| Environmental negative impacts the project will bring | The works may lead to noise, generation of solid waste, and dust | These have been negative environmental impacts of noise and dust emissions during construction stage |
| Other considerations to be made in the project | If funds allow, the project can procure some equipment for the new unit |  |
|  | | | | | | |
| Mzimba DESC members | Mzimba District Council Water Office Board room | 14th August, 2024 | To brief the DESC members about the project and to solicit their inputs on the different impacts and how the impacts can be managed | Nature/ components of the project | The OPD and emergency sections of the Pediatric center construction at MCH will address the congestion problems the hospital is facing, improve the hospitals outlook and contribute to Infection Prevention Control. | This has been consolidated into a positive impacts of Improved aesthetic value of the hospital and Improved aesthetic value of the hospital during operation |
| Socio-economic benefits the project will bring | The project will create job opportunities to the surrounding communities | This has been included as a positive impact of creation of temporary jobs during the construction works |
| Business opportunities may increase due to increased new customers, who are construction workers | This has been included as a positive impact during the construction works |
| Upon employing members from nearby communities, they will tap skills from the experienced contractors and being able to take those skills to their communities even after the project | This has been consolidated into the impact of transfer of skills during construction stage |
| Environmental benefits the project will bring | The project will improve the outlook of the hospital | This has been consolidated into a positive impacts of Improved aesthetic appearance of the infrastructure during operation |
| Socio-economic negative impacts the project will bring | The construction works may bring occupational safety risks to workers especially working on heights and working with toxic chemicals like paints | This has been included as a negative impact of Physical and chemical occupational health and safety risks during the construction works |
|  |  |
| The implementation of the project may lead to public safety concerns especially since it is a busy hospital setting. So, construction vehicles have to be regulated | The issues have been consolidated into negative impacts of increased public health and safety impacts and mitigation measures have been suggested |
| Issues of child labour, sexual harassment, GBV and child marriages and increased defilement cases may emerge | These have been included as negative social impacts during the construction works |
| The implementation of the project may block foot paths used by community members | This has been consolidated as an impact during the construction works |
| Environmental negative impacts the project will bring | Dust emissions may emerge due to usage of cement and other dusty construction materials | Impact of increased dust emissions has been included as a negative impact during the construction works |
| Being a hospital, and that has patients admitted, issue of noise from construction works is of concern | The issue of noise has been included as a negative impact during the construction works |
| Solid waste may be generated due to construction waste and food waste from the workers | This has been included as a negative impact during construction works |
| Other considerations to be made in the project | Signage should be prioritized as a communication strategy during project implementation | This has been included as a mitigation measure for some of the impacts |
| GRM is needed for workers and the institution and workers should have code of conduct to avoid impacts of sexual exploitation, GBV, child marriage and disruption of other people’s marriages | Worker’s code of conduct has been attached to this ESMP and GRM structure for the project has been recommended |
| The Council should be fully engaged in the monitoring of the project including making sure issues of accountability are addressed. The council should be able to know what the amounts that have been spent and spending allocations | Other council officers have been included as responsible persons/ agencies in ESMMP monitoring |
|  |  |  |  | The contractor should obtain a sand permit from the council before commencement of construction works. |  |
| Additionally, the contractor should purchase construction materials from certified sellers in the project area vicinity and only go outside if the materials are not available. This will improve the cashflow of the area | This has been consolidated as the impact of increased business opportunities around the area during construction phase |

# ENVIRONMENTAL AND SOCIAL IMPACT IDENTIFICATION AND ANALYSIS

* 1. **Overview**

The proposed Construction and Operation and Maintenance of OPD and Emergency sections of the proposed Mzuzu Central Hospital Pediatric Center in Mzuzu City will have both positive and negative environmental and social impacts that lead to a variety of changes in the nearby biophysical and socio-economic environment. Through site visits and risk screening exercise in consultation with Government officials (see screening form in Appendix 1(a), consultations with key stakeholders and other affected and interested parties as well as expert knowledge, the anticipated impacts were identified and a summary of the potential beneficial as well as adverse impacts that may emanate due to the implementation of the proposed project and the respective mitigation and enhancement measures are discussed under this section. This Environmental and Social Management Plan (ESMP) is intended to ensure the significant negative impacts are minimized as much as possible while maximizing the positive benefits of the project. It also assists the proponent to manage the anticipated adverse environmental and social impacts associated with the project throughout the project implementation period. Thus, in response to the impacts identified under this section, the project will install measures to comply with the WB ESS4 measures on (i) Infrastructure and Equipment Design and Safety and (ii) Safety of Services etc.

* 1. **Description of Potential impacts and their mitigation/ enhancement measures**

In line with the objectives of the project, the potential positive impacts derived from the project will be generated. Similarly, negative impacts will also be generated. Some of the impacts and their respective mitigation/ enhancement measures include but not limited to

* + 1. **Positive Impacts**

* + - 1. **Planning / pre-construction stage**
  1. **Impact:** Creation of temporary jobs

**Cause and comment**: During the planning and design phase, the project is recruiting professionals such as ESIA consultants and designers etc. These are benefiting from providing their consultancy services to the project.

**Enhancement measure(s**):

* 1. Give priority to local Malawians, when recruiting people for the various project activities. Only when required skills are not locally available can the project consider importing human labour.
  2. Give equal opportunities for employment to both males and females.
     + 1. **Construction stage**
     1. **Impact:** Creation of temporary jobs

**Cause and comment:** During Construction, the proposed project will recruit about 80 skilled and unskilled men and women. The impact is positive and highly beneficial considering the high levels of unemployment in the country. The impact will occur throughout the construction period.

**Enhancement measures**

* 1. Give priority to nearby local communities for both skilled and unskilled workers' employment, with imported labour only be initiated when the needed skills are not locally available,
  2. Pay good wages/ salaries commensurate with Government rules and regulations.
  3. Give equal opportunities for employment to both males and females.
     1. **Impact:** Increased business opportunities

**Cause and Comment:** The potential impact is positive and socio- economic in nature. The impact is likely to be caused by increased economic activities e.g. small and medium enterprises around the project area in response to the demand for various goods such as food items, created by people working on the project site. People from local communities are likely to engage in small-scale businesses selling the demanded items and commodities.

**Enhancement measure:**

* 1. Increase space on the existing market to accommodate new entrants
     1. **Impact:** Increased skills transfer to local people

**Cause and Comment:** The potential impact is positive and socio- economic in nature. The impact is likely to be caused by the fact that some skilled workers engaged during construction may be migrant workers. As both the local and migrant workers are doing their job, there will likely be transfer of skills and expertise amongst them. Local workers will likely benefit from skills from migrant workers.

**Enhancement measure:**

* 1. Employ other skilled workers from the surrounding local communities.

1. Improved water quality due to pond desludging.

**Cause and Comment:** The dredging of the wastewater pond during the construction phase will help in the removal of pollutants in the wastewater and ensure that wastewater residency time is increased thereby improving the overall treatment process. This will result in improved water quality even in the receiving river system.

Enhancement measures

* The contractor will develop and implement a dredge management plan as part of the C-ESMP
* Undertake analysis of the wastewater composition in order to determine proper treatment and disposal options
* Dispose sludge in designated disposal areas in consultation with MEPA and Mzuzu City Council.

1. Reduced odor and nuisance due to desludging of wastewater pond.

**Cause and Comment:** The dredging of the wastewater pond during the construction phase will help in the removal of pollutants in the wastewater and ensure that wastewater residency time is increased thereby improving the overall treatment process. This will result in reduced odor and nuisance to the surrounding communities.

* The contractor will develop and implement a dredge management plan as part of the C-ESMP
* Undertake analysis of the wastewater composition in order to determine proper treatment and disposal options
* Dispose sludge in designated disposal areas in consultation with MEPA and Mzuzu City Council.
* Sensitize nearby community of dredging works as these may temporarily increase odor.
* Apply odor and bacterial killing chemicals such as chlorine during removal of sludge.
  + - 1. **Operations and maintenance Phase**
      2. **Impact:** Improved aesthetic value of the Hospital

**Cause and comment**: It is anticipated that after completion of construction works, the final structure will be beautiful. This anticipated beautiful infrastructure will complement or improve the outlook of the hospital.

**Enhancement measures:**

* 1. Implement activities as planned with experienced contractors.
  2. Maintain the infrastructure regularly for quality sustenance
  3. **Impact:** Increased hospital capacity to accommodate more patients and reduced overcrowding.

**Cause and comment**: It is anticipated that newly constructed Pediatric centers OPD and Emergency section will be bigger enough and will specialize in providing the services to the children, thereby changing from the current setup where there is general emergency and OPD sections for all people at the hospital. This will increase the hospital’s capacity to accommodate more patients and reduce overcrowding at the already existing OPD and Emergency sections.

**Enhancement measures:**

* 1. Recruit additional healthcare professionals (doctors, nurses, support staff) to match the expanded capacity and ensure timely care.
  2. Ensure sufficient medical supplies, equipment, and medications to meet the demands of a larger patient population.
  3. Establish regular maintenance schedules for the facilities to ensure continuous operation.

1. **Impact:** Improved infection prevention and control

**Cause and comment:** The construction of new and specialized facilities will reduce overcrowding of patients in one facility (both adults and children). This can help reduce infections that can spread due to overcrowding. This can contribute to increased infection prevention and control of the hospital.

**Enhancement measures**

1. Create separate entrances for emergency cases, general OPD visits, and infectious patients to prevent cross-contamination.
2. Designate separate waiting areas for different patient categories (e.g., suspected infections vs. general consultations) to prevent the mixing of patients.
3. Provide clear signage and information to guide patients efficiently through the facility, reducing confusion and gathering in crowded areas.
4. Provide staff members, construction workers and visitors with information on infection control policies and procedures.
5. Establish regular maintenance schedules for all sanitation facilities to prevent breakdowns and ensure continuous operation.
6. **Impact:** Increased access to pediatric care for patients by reducing the physical and logistical barriers in the current setup.

**Cause and comment:** With the current barriers of inadequate space, long waiting times, complicated navigation within the hospital, limited appointment availability, and the lack of specialized facilities for pediatric care, by constructing new facilities, the hospital can create a more efficient and patient-centered environment, ensuring that children receive timely and appropriate care. This will increase access to the specialized pediatric services by the people who could not have managed to access the same due to the limited capacity of the hospital.

**Enhancement measures:**

1. Implement a streamlined registration process that quickly directs patients to the appropriate care areas, reducing bottlenecks and wait times.
2. Construct facility entrances to facilitate easier access for patients with mobility challenges.
3. Hire and train additional pediatric specialists, nurses, and support staff to meet the increased demand for services in the new facilities, ensuring that care is delivered efficiently and effectively.
   * 1. **Potential Negative Impacts** 
        1. **Planning/ Pre-Construction phase**
     2. **Impact:** Blockage of footpath connecting the communities and main road

**Cause and comment:** Prior to commencing construction activities, the perimeter of the construction site will be fenced to restrict access. In fencing the perimeter of the construction site, other footpaths that community members use to pass across the hospital to the main road will be blocked.

**Mitigation measure(s):**

1. Relocate all affected footpath(s) before project commencement.
2. Install signage of designated new footpath(s)
3. Sensitize community about the proposed project
   * 1. **Impact: Increased Occupational Health and Safety risks during desludging**

**Cause and comment: During desludging workers may be exposed to OHS hazards. Before dredging activity of the wastewater treatment ponds, sampling of sludge/sediments in the wastewater lagoon will be necessary to determine the extent/level they are contaminated and by what parameters. This will allow for determination of how the sludge can be disposed of. If there is less adherence to national and international guidelines on sludge sampling, this activity can increase OHS risks to workers.**

**Mitigation measures**

* 1. Develop and implement a Dredging Management Plan as part of the C-ESMP
  2. Conduct risk assessment for the desludging process.
  3. Provide appropriate PPE to workers involved in desludging and sampling.
  4. Define procedures for safe sludge sampling, including collection, preservation, and transport to accredited laboratories.
  5. Specify analytical parameters, such as heavy metals, pathogens, and organic pollutants.
  6. Adhere to national and international guidelines for sludge sampling and disposal.
  7. Use environmental consultants to oversee sampling and analysis.
     + 1. **Construction stage**

**Impact:** Increased risk of soil erosion

**Cause and Comment:** The impact is likely to occur as a result of land clearing and excavations on proposed site for the construction of the proposed OPD and Emergency sections infrastructure. This problem can be worsened if the cleared area is very large in the sense that clearing is not restricted to species affected by construction activities and has been left without compaction to be affected by raindrop impact.

**Mitigation measures:**

* 1. Restrict land clearing and excavations only to spaces affected by construction activities
  2. Compact soils were necessary to stabilize the soils and reduce erosion. Back fill all excavations as practically soon as possible to reduce rainfall impact on the heaps of soils removed
  3. Landscape/ re-plant vegetation of indigenous species as soon as constructions phase is completed.

**Impact:** Increased generation of solid waste

**Cause and comment**: The construction works will generate considerable amount of solid waste which may include construction materials packaging, paint cans and food wastes from workers.

**Mitigation Measures:**

1. Provide adequate bins for waste collection with separation at source concept,
2. Implement waste management plans to be developed in Contractor ESMP and should include segregation, recycling, and proper disposal of construction waste.
3. Raise awareness and practice 4 Rs (Refuse/ Avoid, Reduce, Reuse and Recycle)
4. Prohibit littering inside offices and around the multi-purpose office complex.
5. Train workers and staff on proper waste segregation procedures, ensuring everyone understands the risks and responsibilities.
6. Set up secure, well-contained waste storage areas to prevent littering, contamination, and exposure to weather.
7. Dispose solid waste at designated waste disposal areas in the Mzuzu city dumpsite.

**Impact:** Increased dust emissions

**Cause and comment**: Construction works as well as delivery and offloading of construction materials e.g. bricks and cement may provoke dust emissions.

**Mitigation Measures:**

* 1. Suppress dust regularly using water method to minimize the spread of dust
  2. Provide appropriate masks as PPE to workers working in on very dusty activities e.g. excavations and offloading of cement and quarry etc....
  3. Use closed/covered trucks for transportation of construction materials.
  4. Reduce speed to 20km/ hour within the hospital premises
  5. Constantly monitor dust levels to be within acceptable limits

**Impact:** Increased noise pollution

**Cause and comment**: other construction works such as site excavations using machinery and fixing the roof as well as presence of construction workers at the site may increase ambient noise levels of the hospital remises and cause noise nuisance to the patients

**Mitigation Measures:**

* 1. Fence the construction site
  2. Use equipment with noise silencers
  3. Limit works to daytime to avoid disturbing patients at night.
  4. Avoid unnecessary movement of construction vehicles at the facility.
  5. Sensitize community in time of noisy activities, ensure machinery is serviced regularly.
  6. Constantly monitor noise levels to be within acceptable limits
  7. Prepare and implement noise management plan along with C-ESMP.

**Impact:** Increased generation of hazardous wastes.

**Cause and Comment:** Construction works will utilize materials such paints and glasses etc. This can result in generation of hazardous wastes such as paints cans and remains, broken glass, petroleum waste products etc. and/or creating hazardous environment.

**Mitigation measures:**

* 1. Substitute hazardous construction materials with nonhazardous alternatives
  2. Segregate scrap metals and glass from other waste streams to ensure safe handling.
  3. Secure storage and label all storage areas for hazardous wastes to minimize the risk of accidents, spills, or contamination.
  4. Dispose hazardous waste including waste removed from wastewater treatment pond at designated places and by a competent authority.

**Impact:** Increased risk of child labour

**Cause and Comment:** Contractor may employ children (less than 18 years) workers in order to cut costs. Children may also be employed to sell merchandise at the facility targeting the construction workers.

**Mitigation Measures:**

* 1. Employ only those aged 18 years and above as workers by checking their national IDs.
  2. Sensitize surrounding communities on child labour

**Impact:**Occupational safety and health risks

**Cause and comment:** Human error in the use of equipment, lack of safety measures e.g. Personal Protective Equipment and information during works, nature of work e.g. working on height, holes, trenches and plumbing may expose workers to accidents or compromise safety of the workers. Strict measures to occupational health and safety risks must be put in place and implemented to avoid accidents and occupational health related problems.

**Mitigation measures:**

* 1. Develop and implement Health and Safety Plan and include in C-ESMP
  2. Conduct risk assessment before commencing any works
  3. Conduct regular safety inspections to ensure maximum safety of workers.
  4. Enforce strict safety protocols and reporting mechanisms.
  5. Train all workers on proper use and handling of equipment.
  6. Always provide all workers with appropriate PPE and effective use of such.
  7. Install signage in all critical areas and indicating “Danger equipment”, slow down “Stop” etc.
  8. Provide First Aid Kit and Firefighting equipment.
  9. Provide safe working on height equipment e.g. scaffolds.
  10. Conduct regular safety Toolbox talks
  11. Use of competent workers for specialized works
  12. Use well-guarded equipment
  13. Ensure Good housekeeping practices to make work environments safe
  14. Monitor for health of the workers and other issues such as use of drugs or alcohol at the workplace.
  15. Maintain records and report all occupational incidents and accidents as well as diseases and other dangerous occurrences that could lead to accidents.

**Impact:** Risk of chemical exposure to workers and the public

**Cause and Comment**: Inhalation of dust and fumes from e.g. cement and paints during execution of construction works can lead to respiratory issues and diseases. Again, direct skin contact with hazardous chemicals like solvents, cement, and adhesives can cause skin irritation and chemical burns. Accidental ingestion of chemicals can also occur through contaminated food or hands, leading to poisoning and other serious health effects.

**Mitigation measures**

* + Replace hazardous chemicals such as paints and sealants or non-toxic alternatives where possible.
  + Provide regular training on the proper handling, storage, and disposal of hazardous chemicals.
  + Develop and enforce safe work practices, such as proper labeling of chemicals and implementing emergency procedures.
  + Store hazardous chemicals in labeled, secure containers and in designated storage areas to prevent accidental exposure and spills.
  + Provide suitable PPE such as gloves, respirators, protective clothing, and eye protection to workers handling hazardous chemicals.
  + Ensure the availability of first aid kits and trained personnel to provide immediate medical assistance in case of chemical exposure incidents.
  + Follow proper disposal procedures for hazardous chemicals to prevent environmental contamination and worker exposure.
  + Dispose hazardous chemicals in consultation with Mzuzu City Council and MEPA.

**Impact:** Increased Gender-Based Violence (GBV) and Sexual Exploitation and Abuse (SEA)including defilement

**Cause and comment:** The increased population due to workers at the hospital premises may increase indulgence of crimes such as raping, physical assault, sexual harassment, discrimination and use of provocative language etc. amongst workers and people at the hospital.

**Mitigation Measures:**

* 1. Develop and implement GBV/SEA prevention plan
  2. Sensitize workers and hospital community on GBV/SEA and harassment.
  3. Conduct thorough background checks on all workers and ensure that those with a history of sexual offenses are not employed on the project.
  4. Strengthen grievance redress mechanisms including reporting mechanisms for GBV/SEA and harassment.
  5. Ensure workers sign and adhere to code of conduct that prohibits GBV/SEA
  6. Put in a place a GRM committees having GBV/SEA champions
  7. Map out and make available referral and support systems for GBV/SEA survivors

**Impact:** Increased cases of theft

**Cause and Comment:** There can be an increased theft cases of building materials especially where wage payments are delayed by contractors.

**Mitigation Measures**:

* 1. Sensitize workers to the dangers and consequences of theft.
  2. Extend existing institutional security service to cover project site.
  3. Ensure workers sign and adhere to a code of conduct

**Impact:** Potential increase of water bills

**Cause and Comment:** Construction works will increase demand for water which is shared at the hospital facility and hence resulting in an increase in the bill for the water.

**Mitigation Measures:**

* 1. Develop and implement Water Resources Management Plan
  2. Use water from the nearby stream for construction purposes
  3. Agree on payment arrangements for water bills by the hospital and contractor
  4. Engage in other water conservation options during construction works to conserve water resources.

**Impact:** Risk of spread of HIV and AIDS and other communicable diseases

**Cause and Comment:** The spread ofHIV and AIDS and STIs may occur if the project employs migrant workers to the project site, living away from their families for extended periods. This mobility can disrupt stable relationships and increase the likelihood of engaging in risky sexual behaviours upon increased social interaction with other workers and communities.

**Mitigation measures**:

* 1. Develop and implement HIV and AIDS Workplace Policy.
  2. Sensitize workers on HIV and AIDS and STIs and other communicable diseases, including how it is transmitted, prevention methods, and the importance of getting tested.
  3. Provide and train workers on condoms use.
  4. Allow infected workers to access Anti-Retroviral Treatment (ART) from any health facilities of their choice; and
  5. Employ workers from the surrounding community to minimize promiscuity.

**Impact:** Risk of spread of COVID-19

**Cause and Comment:** Increased number of people at the project site as workers’ including contact of those with the infected if not taking appropriate preventive measures may increase risk of contracting COVID-19.

**Mitigation Measures:**

* 1. Conduct sensitizations COVID-19 symptoms and prevention to workers.
  2. Provide equipment to enhance hygiene i.e. water for washing hands, soap and sanitizers to be always made available at the work premises
  3. Adhere to Covid-19 measures as specified by the Government at that time.
  4. Make protective face masks available at the workplace for those potentially ill to wear to avoid spreading Covid-19.

**Impact:** Risk of Child marriages

**Cause and Comment:** The risk may occur if the project employs migrant workers.The presence of construction workers may increase the risk of child marriages as families might see it to gain financial benefits or security during economically stressful times. This impact can worsen if local communities see marriage as a protective measure against perceived threats from outsiders and if the construction workers are mostly migrant workers.

**Mitigation measures**

* 1. Conduct community awareness campaigns to educate families and workers about the negative impacts of child marriage and the benefits of keeping girls in school.
  2. Prioritize local community members in employment for construction activities to enhance economic stability and reduce the perceived need for child marriage.
  3. Facilitate signing of code of conduct by all workers before engagement as a worker with No to child marriage being among the requirements
  4. Sensitize on GRM and respective reporting mechanisms for individuals to report any suspected cases of child marriage.

**Impact:** Increased risk to public health and safety due to unsafe construction premises

**Cause and Comment**: The construction site that is not fenced may allow intruders and passersby to enter the premises. These may be unsuspecting community members, patients and guardians who may step into open pits and invade spaces with accumulations of hazardous materials thereby being exposed to accidents and contamination

**Mitigation Measures:**

* 1. Fence the construction site and ensure the gate is manned, to limit access.
  2. Put safety tape around all potentially dangerous spaces.
  3. Install signage to limit access to the construction site.
  4. Sensitize communities and hospital workers when work commences so that they avoid the place as well as notifying patients of the construction works.

**Impact:**  Increased risk to public safety due to vehicular traffic and trucks

**Cause and Comment:** The movement of construction vehicles through the community and carrying various construction materials and equipment and/or delivery of such e.g. sand, quarry stones and other equipment’s, may increase risk of traffic accidents in community. Additionally, the vehicles access road to the proposed site passes through the Guardian shelter, the movement of construction vehicles may expose guardians and children to safety risks. This may be perpetrated if the speeds of the construction vehicles may be high.

**Mitigation Measures:**

1. Construction contractor to prepare a material transport plan to address risk to public safety due to truck and vehicle traffic to and from the site
2. Identify and designate specific routes for construction vehicles to minimize their movement through the hospital premises, residential areas, schools, and other sensitive locations.
3. Conduct public awareness campaigns to inform the community at the hospital and surrounding community about the construction schedule, vehicle routes, and safety precautions to keep them informed.
4. Limit construction vehicle speeds to 20km/hour within the hospital premises and communities to avoid accidents.
5. Install speed bumps or rumble strips to slow down traffic within the hospital, residential Coordinate with Material Supplier on transportation regulations to meet the OHS requirements in ESS2

**Impact:** Increased Risk of spread of Cholera and other water borne diseases

**Cause and Comment:** increased risk of cholera at the Construction site may increase if access to clean drinking water and adequate and improved sanitation is not available. Public health interventions and specific measures to reduce the risk must be in place.

**Mitigation Measures:**

* 1. Sensitize communities and hospital workers on Cholera and other water borne diseases
  2. Provide access to safe and clean drinking water through improved water supply
  3. Build and ensure access to adequate and clean toilet facilities for all students, to avoid cholera outbreaks.
  4. Promote proper hygiene practices, such as handwashing with soap and water, particularly before eating and after using the toilet.

**Impact:** Increased risk of fire/ explosions

**Cause and comment**: During hospital construction projects, the risk of fire and/or explosions can increase due to various factors associated with construction activities, the presence of flammable materials, and interference with hospital operations. Construction workers may set up open fires for cooking at the construction site.

**Mitigation measures:**

1. Limit the number of flammable materials kept on-site, ensuring that only necessary quantities are available and ensure proper storage.
2. Prohibit open fires on the site by contractor personnel.
3. Provide fire assembly points during construction.
4. Incorporate fire prevention strategies into the overall construction management plan, addressing site-specific fire risks.
5. Provide firefighting equipment at the site such as fire extinguishers.
6. Construction contractor to coordinate with emergency response staff at hospital in terms of the hospital plans, procedures etc.

**Impact:** Potential for soil and ground water contamination by sludge

**Cause and comment**: During dredging of the wastewater treatment ponds, Improper handling of works and contaminated sludge could lead to further pollution, affecting surrounding ecosystems including soil and ground water sources.

**Mitigation Measures**

1. Contractor to prepare a detailed Dredge Management Plan to provide the details of the process, sludge handling and disposal as part of the C-ESMP
2. Conduct risk assessment for the desludging process.
3. Provide appropriate PPE to workers involved in desludging and sampling.
4. Establish emergency response protocols for accidental exposure.
5. Use analysis results to determine appropriate treatment methods (e.g., incineration, stabilization, or landfilling).
6. Conduct periodic monitoring to assess any changes in sludge contamination over time.
7. Dispose of sludge at designated disposal sites

20. Potential for exposure to contaminants to workers during dredging

**Cause and comment**: During dredging of the wastewater treatment ponds, Improper handling of works and contaminated sludge could lead to further pollution, affecting surrounding ecosystems including exposure to hazardous substances such as heavy metals, pathogens, and toxic chemicals by workers.

1. Contractor to prepare a detailed Dredge Management Plan to provide the details of the process, sludge handling and disposal as part of the C-ESMP
2. Conduct risk assessment for the desludging process.
3. Provide personal protective equipment (PPE) such as gloves, masks, and protective clothing.
4. Conduct training for workers on safe handling of hazardous materials.
5. Establish emergency response protocols for accidental exposure.
6. Use analysis results to determine appropriate treatment methods (e.g., incineration, stabilization, or landfilling).
7. Conduct periodic monitoring to assess any changes in sludge contamination over time.
8. Dispose of sludge at designated disposal sites.
   * + 1. **Operation and Maintenance stage**
   1. **Impact:** Increased vulnerabilities amongst the persons living with physical disabilities in accessing the facilities

**Cause and comment:** Access into the building may be challenging to persons living with physical disabilities if the structure is constructed with non-disability friendly features.

**Mitigation measure(s)**

* 1. Design, Construct and operate disability friendly infrastructure and facilities for easy access of all.
  2. **Impact:** Increased pressure on utilities provision

**Cause and Comment**: The new building will need to have water and electricity network. during operation and maintenance stage. This will increase energy and water demand and may increase pressure on the utilities and hence affecting supply especially if efficient equipment is not installed.

**Mitigation measures**

* 1. Procure and use energy efficient bulbs and equipment.
  2. Install water-efficient fixtures such as low-flow faucets and toilets to conserve water
  3. Sensitize staff and hospital community on use of energy and water efficiently.
  4. **Impact:** Increased generation and poor management of liquid waste

**Cause and Comment:** The operation and maintenance phase will generate hospital related liquid waste and /or wastewater. These will be generated from hospital operations as well as use of installed facilities e.g. latrines/ flushing of toilets which may increase sewage effluents. Though the hospital is connected to a sewer line which also passes near the site and reported to be enough for the new infrastructure, this could be worsened by the increased number of people at the hospital. Additionally, hospital waste will have to be segregated at source (by type i.e. infectious, chemical, pharmaceutical), then containment in leak-proof containers that are well labeled, then depending on type of waste, can either be disinfected (medical waste), neutralized of the chemicals (chemical waste) before discharged into the normal sewerage system or incinerated at the hospital’s incineration facility, whatever practical. separated and treated before release into the sewer system.

**Mitigation Measures**

* 1. Undertake maintenance of the sewage system at the hospital and dredging of the filled wastewater treatment ponds to be atleast 1-3 meters deep.
  2. Conduct yearly comprehensive environmental audits of the facility to ensure that it is meeting liquid waste management standard for a Health care facility.
  3. Segregate at source and disinfect /neutralize of the chemicals before discharged into the normal sewerage system
  4. Connect all sanitary facilities constructed to the hospital’s sewage facility, to channel all sanitary wastewater to the existing sewer line where it can be safely disposed or treated
  5. Conduct regular water quality monitoring of the Lunyangwa River to ensure that the wastewater discharged into the river meets water quality standards.
  6. comply with the WB ESS4 measures on (i) Emergency Preparedness and Response, and (ii) Management and Safety of Hazardous Materials
  7. Follow Good International Industry Practice guidance for hospital EHS management
  8. **Impact:** Increased risk of generation of solid waste

During the operation and maintenance phase, it is anticipated that solid waste will be generated from different sources such clearing dust from the floor, stationery, worn out office furniture, disposable water tumblers, used cartoons, and broken tiles among others. If left unattended, they may cause injuries to workers, visitors and customers.

**Mitigation measures**

1. Develop and implement waste management plan.
2. Prohibit littering inside offices and around the multi-purpose office complex.
3. Provide bins and must be well labeled.
4. Implement a waste policy of sorting, reducing, recycling and reusing of waste.
5. Remove and dispose of waste that cannot be recycled at council’s licensed dumpsite; and
6. Institute good housekeeping and operating practices by purchasing office materials, and suppliers that may be used for a specific period.
   1. **Impact:** Increased generation of health care waste

During the operation and maintenance phase, there will be an increase in the generation of health care waste from the new OPD and emergency wings.

Mitigation measures

1. Conduct yearly comprehensive environmental audits of the facility to ensure that it is meeting solid waste management standard for a Health care facility
2. Regularly monitor performance of equipment such as incinerators and carry out maintenance.
3. Segregate the health care waste into different streams as current practice
4. Provide sealable waste bags and cans for health care waste,
5. Identify and label waste bags and containers properly prior to removal.
6. Transport health care waste to storage areas on designated trolleys / carts, which should be cleaned and disinfected regularly.
7. Dispose the ash in the ashpit while waste that cannot be incinerated to be disposed at designated Mzuzu City Council disposal areas.
8. Develop and implement waste management plan that include health care waste
9. Comply with the Guidelines for Treatment and disposal methods for categories of health care waste (appendix 8).
   1. Air pollution and operational risks from incineration of wastes

**Cause and Comment**: during operation and maintenance phase, poor management and inadequate maintenance of the incinerator may result in incomplete combustion of the waste. This may result in pollution of the air.

**Mitigation Measures**

1. Sort the waste to ensure only combustible waste goes into incinerators.
2. Train staff on how to operate the incinerators.
3. Plant trees around the hospital area to help absorb emissions.
4. Regularly maintain the incinerator; and
5. Orienting staff to the Infection Control and Waste Management (ICWM) practices.
   1. **Impact:** Increased risk of fire and explosions

Electrical Hazards can aggravate the risk of fire and explosions especially during operation. This impact is especially critical in a healthcare setting, where vulnerable patients, medical equipment, and hazardous substances are present.

**Mitigation measures:**

1. Provide proper storage of flammable materials, ensuring that only necessary quantities are available.
2. Incorporate fire prevention strategies into the overall construction management plan, addressing site-specific fire risks.
3. Provide fire assembly points during the operation phase.
4. Ensure that all temporary and permanent electrical installations are carried out by certified professionals and meet safety standards.
5. Conduct regular inspections and maintenance of electrical systems to prevent overloads, short circuits, or other fire hazards.
6. Provide firefighting equipment at the site such as fire extinguishers.
   1. **Impact:** Increased resource gaps and operational deficiencies during O&M

**Cause and comment**: Inadequate staffing, systems, or budget allocation for EHS management can lead to operational inefficiencies and failure to comply with regulations. Lack of updated EHS procedures may exacerbate risks to patients, staff, and the environment.

**Mitigation measures**

1. Allocate dedicated EHS resources e.g. sufficient staffing, training, and budget for the expanded EHS requirements.
2. Engage external consultants to provide expertise in identifying risks and developing robust management systems.
3. Conduct yearly environmental audit of the operations at the hospital and implement corrective action plans
4. Periodically train staff in waste management, Infection Prevention and Control etc.
5. Conduct regular maintenance and supporting facilities such as the Incinerator and the wastewater management system at the hospital.
   1. **Environment and Social Impacts Analysis**

The potential environmental and social impacts were also analyzed for the basic significance ratings for identification of impacts which are key due to its likelihood, duration, extent and magnitude. The impact significance ratings were ranked using the criteria indicated in Table 6-1.

After identification of environmental and social impacts was carried out, the second step was to evaluate/ rank the significance of the impacts. The impacts were evaluated using the parameters of magnitude, significance, probability and duration of occurrence. The evaluation of the identified impacts was guided by careful assessment and judgment of the anticipated consequences regarding normal standards and was done by means of an Impact scoring matrix criterion as shown in Table 6.1.

The primary goal of implementing this methodology was to identify potential environmental issues and associated impacts from the proposed project and to assign a significance ranking to them. Issues or aspects were reviewed and evaluated against this significance criteria to identify and document interactions between activities and aspects, as well as resources and receptors, providing a detailed discussion of impacts. The impact significance analysis and their respective significance rankings are presented in Table 6-2 and 6-3 for positive and negative impacts respectively.

Table 6-1: Significance Ranking Criteria

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CRITERIA** | **SCORE 1** | **SCORE 2** | **SCORE 3** | **SCORE 4** | **SCORE 5** |
| **Impact Magnitude (M)**  The degree of alteration of the affected environmental receptor | Very low:  No impact on processes | Low:  Slight impact on processes | Medium:  Processes continue but in a modified way | High:  Processes temporarily cease | Very High:  Permanent cessation of processes |
| **Impact Extent (E)** The geographical extent of the impact on a given environmental receptor | Site: Site only | Local: Inside activity area | Regional: Outside activity area | National: National scope or level | International: Across borders or boundaries |
| **Impact Reversibility (R)** The ability of the environmental receptor to rehabilitate or restore after the activity has caused environmental change | Reversible: Recovery without construction |  | Recoverable: Recovery with construction |  | Irreversible: Not possible despite action |
| **Impact Duration (D)** The length of permanence of the impact on the environmental receptor | Immediate:  On impact | Short term:  0-5 years | Medium term: 5-15 years | Long term: Project life | Permanent: Indefinite |
| **Probability of Occurrence (P)** The likelihood of an impact occurring in the absence of pertinent environmental management measures or mitigation | Improbable | Low Probability  Impacts can occur but are controllable | Probable  The impact is likely to occur but can be controlled by effective measures | Highly Probability | Definite  Definitely to occur |
| **Significance (S)** is determined by combining the above criteria in the following formula: |  | | | | |
| **IMPACT SIGNIFICANCE RATING** | | | | | |
| **Total Score** | **4 to 15** | **16 to 30** | **31 to 60** | **61 to 80** | **81 to 100** |
| **Environmental Significance Rating (Negative (-))** | **Very low** | **Low** | **Moderate** | **High** | **Very High** |
| **Environmental Significance Rating (Positive (+))** | **Very low** | **Low** | **Moderate** | **High** | **Very High** |

**Table 6.2:** Significant Impact Scores for Positive Impacts

| **Impact** | | **Magnitude** | **Extent** | **Reversibility** | **Duration** | **Probability of occurrence** | **TOTAL SCORE** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **DURING PLANNING AND DESIGN** | | | | | | | |
| 1 | Creation of temporary jobs | 1 | 1 | 1 | 1 | 2 | **8** |
| **DURING CONSTRUCTION** | | | | | | | |
| 1 | Creation of temporary jobs | 4 | 2 | 3 | 2 | 2 | **22** |
| 2 | Increased business opportunities | 1 | 2 | 1 | 2 | 2 | **12** |
| 3 | Increased skills transfer to local people | 2 | 2 | 2 | 5 | 3 | **33** |
| **DURING OPERATION AND MAINTENANCE** | | | | | | | |
| 1 | Improved aesthetic value of the Hospital | 5 | 2 | 4 | 4 | 5 | **75** |
| 2 | Increased hospital’s capacity to accommodate more patients and reducing overcrowding. | 5 | 3 | 4 | 4 | 5 | **80** |
| 3 | Increased access to pediatric care for patients by reducing the physical and logistical barriers in the current setup. | 5 | 3 | 4 | 5 | 5 | **85** |
| 4 | Increased infection prevention and control | 4 | 3 | 4 | 4 | 4 | **60** |
| 5 | Improved water quality due to pond dredging | 4 | 4 | 4 | 4 | 4 | **60** |
| 6 | Reduced odor and nuisance due to pond dredging | 4 | 4 | 4 | 4 | 4 | **60** |

**Table 6.3:** Significant Impact Scores for Negative Impacts

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Impact** | | **Magnitude or extent** | **Extent** | **Reversibility** | **Duration** | **Probability of occurrence** | **TOTAL SCORE** |
| **PRE-CONSTRUCTION** | | | | | | | |
| 1 | Blockage of footpath connecting the communities and main road | -3 | -2 | -3 | -5 | -5 | **-65** |
| 2 | Increased Occupational Health and Safety risks during sludge sampling | -3 | -2 | -3 | -4 | -5 | **-60** |
| 3 | Reduced understanding of the new hospital infrastructure foot print leading to inefficiencies and resource use constraints at construction and operation | -3 | -2 | -3 | -4 | -4 | **-48** |
|  | | | | | | | |
| 1 | Increased risk of soil erosion | -2 | -2 | -3 | -2 | -3 | **-27** |
| 2 | Increased generation of solid waste | -3 | -2 | -3 | -2 | -5 | **-50** |
| 3 | Increased dust emissions | -3 | -2 | -3 | -2 | -5 | **-50** |
| 4 | Increased noise pollution | -3 | -2 | -3 | -2 | -5 | **-50** |
| 5 | Increased risk of generation of hazardous wastes | -3 | -2 | -3 | -2 | -5 | **-50** |
| 6 | Increased risk of child labour | -3 | -2 | -3 | -2 | -3 | **-30** |
| 7 | Occupational safety and health risks | -3 | -2 | -3 | -2 | -5 | **-50** |
| 8 | Risk of exposure to Chemical | -3 | -2 | -3 | -2 | -5 | **-50** |
| 9 | Increased risk of Gender-Based Violence (GBV) and Sexual Exploitation and Abuse (SEA) indluing defilement | -2 | -3 | -2 | -2 | -3 | **-30** |
| 10 | Increased cases of theft | -2 | -2 | -2 | -2 | -3 | **-24** |
| 11 | Potential increase of water bills | -3 | -3 | -3 | -2 | -4 | **-44** |
| 12 | Risk of spread of HIV and AIDS and STIs and other communicable diseases | -2 | -3 | -5 | -5 | -3 | **-45** |
| 13 | Increased Risk of Spread of COVID- 19 | -2 | -3 | -5 | -2 | -3 | **-36** |
| 14 | Risk of child marriage | -3 | -3 | -3 | -2 | -3 | **-33** |
| 15 | Increased risk to public health and safety due to unsafe construction site | -3 | -2 | -2 | -2 | -4 | **-36** |
| 16 | Increased risk to public safety due to vehicular traffic and trucks | -3 | -2 | -2 | -2 | -4 | **-36** |
| 17 | Increased Risk of Cholera and other water borne diseases: | -3 | -2 | -3 | -3 | -3 | **-33** |
| 18 | Increased risk of fire and | -3 | -2 | -3 | -5 | -3 | **-39** |
| 19 | potential for soil and ground water contamination by sludge | -3 | -2 | -3 | -5 | -5 | **-65** |
| 20 | Potential for exposure of contaminants to workers and public | -3 | -2 | -3 | -5 | -5 | **-65** |
| **DURING OPERATION AND MAINTENANCE** | | | | | | | |
| 1 | Increased vulnerabilities amongst the persons living with physical disabilities in accessing the facilities | -3 | -2 | -3 | -4 | -3 | **-36** |
| 2 | Increased pressure on utilities provision | -3 | -2 | -3 | -4 | -4 | **-48** |
| 3 | Increased generation of liquid waste | -2 | -2 | -3 | -4 | -3 | **-33** |
| 4. | Increase risk of Health care waste generation | -2 | -2 | -3 | -4 | -3 | **-33** |
| 5 | Increased risk of generation and management of solid waste | -2 | -2 | -3 | -4 | -3 | **-33** |
| 6 | Increased risk of fire and explosions | -2 | -2 | -3 | -4 | -3 | **-33** |
| 7 | Air pollution and operational risks from incineration of waste. | -3 | -2 | -3 | -4 | -5 | **-60** |
| 8 | Increased resource gaps | -3 | -3 | -3 | -4 | -5 | **-65** |

The tables above present individual and total scores for each impact of the proposed Mzuzu Central hospital pediatric centers OPD and Emergency sections construction project against the five attributes namely magnitude, Extent, significance, probability of occurrence and duration. More focus should be on the impacts with high total scores. All positive impacts are to be enhanced since they will contribute to the sustainability of the project. However, on overall, the Significance of negative impacts range between high and low with most of the impacts being moderate, and hence this ESMP has provided mitigation measures for the impacts.

# 

# ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLANS

* 1. **Overview**

This chapter presents the Environmental and social management plan and its associated monitoring plan comprising verifiable indicators, frequency of monitoring, responsible organizations for carrying out the monitoring and those for receiving the reports. Table 7-1 presents a combined Environmental and social management Plan and Environmental and Social Monitoring plan here termed Environmental and Social Management and Monitoring Plan (ESMMP) for the rehabilitation of selected sections at Kamuzu Central Hospital in Lilongwe.

7.2. Environmental and Social Management Plan (ESMP)

An Environmental and Social Management Plan (ESMP) part (in Table 7-1) stipulates actions that should be undertaken by relevant stakeholders including proponent, contractor, communities and government. The plan also guides the process of mitigating negative impacts that have been identified at all stages of the project cycle and enhances realization of the positive impacts of the project.

7.3. Environmental and Social Management and Monitoring Plan (ESMMP)

The Plan stipulates actions that should be undertaken by relevant stakeholders including proponent, contractor, communities and government. The plan also guides the process of mitigating negative impacts that have been identified at all stages of the project cycle and enhances realization of the positive impacts of the project.

The Environmental and Social Management and Monitoring Plan (ESMMP) part is vital tool in ensuring that the environmental and social management plan is implemented as planned. The monitoring plan (in Table 7-1) comprises verifiable indicators, frequency of monitoring, responsible organizations for carrying out the monitoring and those for receiving the reports. The ESMMP provides for monitoring to checking implementation of the enhancement and mitigation measures proposed in the ESMP.

**Table 7-1: Environmental and Social Management Plan (ESMP) and Monitoring Plan for proposed Construction of OPD and Emergency sections of the proposed Mzuzu Central Hospital Pediatric Center**

|  |  |  |  |  |  | **Responsibility** | |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Item** | **Potential Impact** | **Recommended Enhancement / Mitigation Measure** | **Performance Indicator** | **Target** | **Means of Verification** | **Enhancement and Mitigation Measures** | **Monitoring** | **Timeframe** | **Implementation Cost (MMK)** | **Monitoring Cost (MMK)** |
| **POSITIVE IMPACTS** | | | | | | | | | | |
| **PLANNING PHASE** | | | | | | | | | | |
| 1 | **Creation of temporary Jobs** | * Prioritize employment of Malawian consultants and Communities * Give equal opportunities for employment to both males and females. | Number of local consultants/ people employed (males versus Females). | 2 contracts given  to local  consultants | Employment records | MC-ERHSP Project management | MoH | Throughout project planning phase | N/A | N/A |
| **CONSTRUCTION/ CONSTRUCTION PHASE** | | | | | | | | | | |
| 1 | **Creation of temporary jobs** | * Give priority to local communities for both skilled and unskilled workers' employment, with all unskilled workers sourced from the surrounding local communities. * Pay good wages/ salaries commensurate with Government regulations. * Give equal opportunities for employment to both males and females. | Number of people employed | All unskilled laborers from project area;  40% of the labour force is women | Employment records | Contractors | MC-ERHSP Project | During Construction | N/A | N/A |
| 2 | **Increased Business Opportunities** | * Increase space on the existing market to accommodate new entrants | Size of space created for new entrants | At least area of market space created and available around the hospital | Market records | MCH management | MC-ERHSP Project | During Construction | NA | N/A |
| 3 | **Increased skills transfer to local people** | * Employ locals as among skilled workers. | % of local people employed in technical positions | 10 % of skilled personnel from the project area.  40% of skilled personnel to be women | Employment records | Contractor | MC-ERHSP project team | During Construction | NA | NA |
| **OPERATION AND MAINTENANCE PHASE** | | | | | | | | | | |
| 1 | **Improved aesthetic value of the hospital** | * + Implement activities as planned with experienced contractors.   + Maintain the infrastructure regularly for quality sustenance | Checking Plan against implementation  Maintenance schedule | 100% planned infrastructure and its amenities in place  Maintenance schedule in place | Visual inspection  Inspection of maintenance records | MCH Management, | MC-ERHSP project team | Before and during operation and maintenance | Part of Operation Costs | 500,000 |
| 2 | **Increased hospital capacity to accommodate more patients and reducing overcrowding.** | * + Recruit additional healthcare professionals (doctors, nurses, support staff) to match the expanded capacity and ensure timely care.   + Ensure sufficient medical supplies, equipment, and medications to meet the demands of a larger patient population.   + Establish regular maintenance schedules for the facilities to ensure continuous operation. | Number of Healthcare professionals and staff recruited at operation  Number of medicines and equipment procured to meet demand  Maintenance schedule in place | At least 5 Healthcare professionals and staff recruited  At least basic supporting equipment procured to support people of that section | Records and of staff recruitment  new equipment procured  Maintenance schedule in place and implemented | MCH Management, DHO | MoH | During operation and maintenance | Part of Operation costs | N/A |
| 3 | **Improved water quality due to pond dredging** | * + The contractor will develop and implement a dredge management plan as part of the C-ESMP   + Undertake analysis of the wastewater composition inorder to determine proper treatment and disposal options   + Dispose sludge in designated disposal areas in consultation with MEPA and Mzuzu City Council. | Quality of water in the nearby stream | All water quality parameters | Water quality results  Reports | MCH Management, DHO | MoH | During operation and maintenance | Part of Operation costs | N/A |
|  | **Reduced odor and nuisance due pond dredging** | * + The contractor will develop and implement a dredge management plan as part of the C-ESMP   + Undertake analysis of the wastewater composition in order to determine proper treatment and disposal options   + Dispose sludge in designated disposal areas.   + Sensitize nearby community of dredging works as these may temporarily increase odor.   + Apply odor and bacterial killing chemicals such as chlorine during removal of sludge. | Number of complaints on odor and nuisance | Zero complaints | Reports  Grievance register | MCH Management, DHO | MoH | During operation and maintenance | Part of Operation costs | N/A |
| 3 | **improved infection prevention and control** | * + Create separate entrances for emergency cases, general OPD visits, and infectious patients to prevent cross-contamination.   + Designate separate waiting areas for different patient categories (e.g., suspected infections vs. general consultations) to prevent the mixing of patients.   + Provide clear signage and information to guide patients efficiently through the facility, reducing confusion and gathering in crowded areas.   + Provide staff members, construction workers and visitors with information on infection control policies and procedures.   + Establish regular maintenance schedules for all sanitation facilities to prevent breakdowns and ensure continuous operation. | Separate entrances/ waiting areas in place with clear signage  Maintenance schedule in place | -All entrances and waiting areas properly labeled | Visual Inspection | Contractor; MCH Management | MC-ERHSP Project, | Before and during operation and maintenance | Part of Operational costs | 500,000 |
| 4 | **Increased access to pediatric care for patients by reducing the physical and logistical barriers in the current setup.** | * Implement a streamlined registration process that quickly directs patients to the appropriate care areas, reducing bottlenecks and wait times. * Construct facility entrances to facilitate easier access for patients with mobility challenges. * Hire and train additional pediatric specialists, nurses, and support staff to meet the increased demand for services in the new facilities, ensuring that care is delivered efficiently and effectively. | Innovative registration process in place  Disability friendly entrances in place  Specialized trainings conducted | At least 1 innovative registration process being implemented  Existence of disability friendly structures  At least 1 specialized training conducted | Inspection of Records of changes made in registration process and training records  Visual inspection infrastructure installed | Contractor; Hospital Management, | DHO | Before and during operation | Part of operational cost | NA |
| **NEGATIVE IMPACTS** | | | | | | | | | | |
| **PRE-CONSTRUCTION STAGE** | | | | | | | | | | |
| 1 | **Blockage of footpath connecting the communities and main road** | * + Relocate all affected footpath(s) before project commencement.   + Install signage of designated new footpath(s)   + Sensitize community about the proposed project | Footpaths blocked against newly created | All of blocked paths are relocated and communities are sensitized on the location of newly relocated footpaths | Visual Inspection | MCH management Contractor, | MC-ERHSP Project management, | Before and during Construction works | 2,000,000 | NA |
| 2 | **Increased Occupational Health and Safety risks during dredging and sludge sampling** | * + Develop and implement a Dredging Management Plan as part of the C-ESMP   + Conduct risk assessment for the desludging process.   + Provide appropriate PPE to workers involved in desludging and sampling.   + Define procedures for safe sludge sampling, including collection, preservation, and transport to accredited laboratories.   + Specify analytical parameters, such as heavy metals, pathogens, and organic pollutants.   + Adhere to national and international guidelines for sludge sampling and disposal.   + Use environmental consultants to oversee sampling and analysis. | EHS plan in place for sludge sampling and analysis  risk assessment in place | 0 incidences of lethal exposure to contamination in sludge | Inspection of international good practices versus implementation  Inspection of exposure reports/ records | Contractor | MC-ERHSP Project, MCH management; | Before construction | 2,000,000 | 500,000 |
| **CONSTRUCTION STAGE** | | | | | | | | | | |
| 1 | **Increased risk of soil erosion** | * + Soil erosion rates to be within the global average of 5 -12 tons/hectare/year or below (a global standard) to prevent significant soil loss during and after construction. Restrict land clearing and excavations only to spaces affected by construction activities and construct drainage where necessary.   + Compact soils where necessary to stabilize the soils   + Back fill all excavations as practically soon as possible   + Landscape/ re-plant vegetation of indigenous species as soon as constructions phase is completed. | Area of exposed soils | S0il erosion rates to be within global average of 5 -12 tons/hectare/year or below (a global standard) to prevent significant soil loss during and after construction. | Regular site inspection | Contractor | MC-ERHSP Project management, | Throughout construction | Project costs | 500,000 |
| 2 | **Increased generation of solid waste** | * + Provide adequate bins at the premises for waste collection and thereafter disposal to designated location   + Implement waste management plans that include segregation, recycling, and proper disposal of construction waste.   + Raise awareness and practice 4 Rs (Refuse/ Avoid, Reduce, Reuse and Recycle)   + Prohibit littering inside offices and around the multi-purpose office complex.   + Train workers and staff on proper waste segregation procedures, ensuring everyone understands the risks and responsibilities.   + Set up secure, well-contained waste storage areas to prevent littering, contamination, and exposure to weather.   + Dispose solid waste at designated waste disposal areas in the Mzuzu city dumpsite. | --Number of bins in place  -Percentage of construction waste properly segregated into categories  Percentage of waste that is disposed of in compliance with local regulations, | -Achieve a segregation rate of 90% or higher within the first three months of construction.  - At least one labelled bin is available for each waste stream  - 100% compliance with waste disposal regulations. | Waste audit reports, on-site waste segregation records,  -Number of labelled bins in place  -Waste collection and transportation logs, and disposal documentation | Contractor | MCH Management,  MC-ERHSP Project management, | During Construction | 500,000 | 500,000 |
| 3 | **Increased dust emissions** | * + Suppress dust regularly using water method and regular cleaning to minimize the spread of dust   + Provide PPE to workers.   + Use closed/covered trucks for transportation of construction materials   + Fence the construction site to contain dust   + Reduce speed to 20km/ hour within the hospital premises   + Constantly monitor dust to be within acceptable limits | -Number of complaints of not  Use of PPE  -Water suppression equipment visible  -Records of how construction materials are delivered on the site  Fence in place | 0 complaints on dust emissions  100 % of stockpiles and haulage vehicles carrying fine materials (e.g., sand, gravel, quarry dust and gravel covered and wetted where necessary  100% construction site fenced | Site Inspection  Random Interviews | Contractor | MC-ERHSP Project, MCH management; EDO; | During construction works | 1,000,000 | 500,000 |
| 4 | **Increased noise pollution** | * + Fence the construction site   + Use equipment with noise silencers   + Sensitize community on time of noisy activities   + Ensure machinery is serviced regularly   + Limit works to daytime to avoid disturbing patients at night.   + .   + Avoid unnecessary movement of construction vehicles at the facility.   + Constantly monitor noise to be within acceptable limits   + Develop and implement noise management plan | Existence of fence  Existence of equipment with noise silencers  Notices to surrounding community on time of conducting very noise activities. | 0 number of period when highest levels of noise are recorded (A notice should be issued out for every high noise level to be generated) | -Site Inspection  -Random interviews to workers and surrounding communities  -Notices issued for very high noise level activities | Contractor | MC-ERHSP Project, Hospital management | During Construction | Part of project cost | 500,000 |
| 5 | **Increased risk of generation of hazardous wastes.** | * + Develop and implement a waste management plan   + Substitute hazardous construction materials with nonhazardous alternatives   + .   + Segregate scrap metals and glass from other waste streams to ensure safe handling.   + Secure storage and label all storage areas for hazardous wastes to minimize the risk of accidents, spills, or contamination.   + Dispose hazardous wastes at designated places and by a competent authority. | Existence of designated and secure areas for storage of hazardous waste  Existence of plan for disposal of hazardous wastes | 100% hazardous waste managed and collected for eventual safe disposal | Visual Inspection  Waste disposal reports | Contractor | MC-ERHSP Project, MCH management; EDO;/ Mzuzu City Council | During Construction | 1,200,000 | 500,000 |
| 6 | **Increased risk of child labour** | * + Employ only those aged 18 years and above as workers by checking their national IDs.   + Sensitize surrounding communities on child labour | Employee Records  Number of sensitization meetings/materials on violence against children | 0 underage workers employed at the site | Inspection of records  Random Interviews | Contractor | MC-ERHSP Project, MCH management; District Labour Office, | During Construction | Part of the project | 500,000 |
| 7 | **Occupational safety and health risks** | * + Develop and implement Health and Safety Plans   + Conduct risk assessment before commencing any works   + Conduct regular safety inspections to ensure maximum safety of workers.   + Enforce strict safety protocols and reporting mechanisms.   + Train all workers on proper use and handling of equipment.   + Provide all workers with appropriate PPE and effective use of such at all times.   + Install signage in all critical areas and indicating “Danger equipment”, slow down “Stop” etc.   + Provide First Aid Kit and Firefighting equipment.   + Provide safe working on height equipment e.g. scaffolds.   + Conduct regular safety Toolbox talks   + Use of competent workers for specialized works   + Use well-guarded equipment   + Ensure Good housekeeping practices to make work environments safe   + Monitor for health of the workers and other issues such as use of drugs or alcohol at the workplace.   + Maintain records and report all occupational incidents and accidents as well as diseases and other dangerous occurrences that could lead to accidents. | Safety protocols in place including reporting mechanisms.  Number of workers trained on safety issues  Presence of warning signs and equipped First Aid kit  Records on PPE in use | 0 accidents occurrence and reported | Site inspection  Inspection of accident reports/ records | Contractor | MC-ERHSP Project, MCH management; District Labour office | During construction | 2,000,000 | 500,000 |
| 8 | **Risk of chemical exposure** | * + Replace hazardous chemicals such as paints and sealants or non-toxic alternatives where possible.   + Provide regular training on the proper handling, storage, and disposal of hazardous chemicals.   + Develop and enforce safe work practices, such as proper labeling of chemicals and implementing emergency procedures.   + Store hazardous chemicals in labeled, secure containers and in designated storage areas   + Provide suitable PPE   + Ensure the availability of first aid kits and trained personnel to provide immediate medical assistance   + Follow proper disposal procedures for hazardous chemicals   + Dispose hazardous chemicals in consultation with Mzuzu City Council and MEPA. | Safety protocols in place including reporting mechanisms.  Number of workers trained on safety issues  Presence of storage area of hazardous chemicals  Presence of equipped First Aid kit  Records on PPE in use | 0 chemical materials related accidents occurrence and reported | Site inspection  Inspection of accident reports/ records | Contractor | MC-ERHSP Project, MCH management | During construction | 1,000,000 | Part of costs for physical occupational safety and health risks |
| 9 | **Increased risk of Gender-Based Violence (GBV) and Sexual Exploitation and Abuse (SEA) including defilement** | * + Develop and implement GBV/SEA prevention plan   + Sensitize workers and hospital community on GBV/SEA and harassment.   + Conduct thorough background checks on all workers and ensure that those with a history of sexual offenses are not employed on the project.   + Strengthen grievance redress mechanisms including reporting mechanisms for GBV/SEA and harassment.   + Ensure workers sign and adhere to code of conduct that prohibits GBV/SEA   + Put in a place a GRM committees having GBV/SEA champions   + Map out and make available referral and support systems for GBV/SEA survivors | -Number of GBV /SEA sensitization meetings/materials in place  -Percentage of women employed.  -Number of GBV/SEA complaints registered and resolved | 0 incidence of gender-based violence and SEA involving workers | Inspection of records of GBV/SEA issues reported versus resolved | MCH management Contractor | District Gender Office, MC-ERHSP Project, | During construction | 1,200,000 | 500,000 |
| 10 | **Increased cases of theft** | * + Sensitize workers to the dangers and consequences of theft.   + Empower and utilize community policing.   + Extend existing security service to cover project site.   + Ensure workers sign and adhere to a code of conduct | Number of sensitization meetings/materials on theft issues  Reports of theft incidences  Records of involvement of existing security personnel | 0 incidences of theft reported involving construction workers | Random Interviews  Inspection of security records if they cover the project site | Contractor, MCH management, | MC-ERHSP Project, | During construction | 1,500,000 | 500,000 |
| 11 | **Potential increase of hospital bills on water utilities** | * + Develop and implement Water Resources Management Plan   + Use water from nearby River for construction purposes   + Agree on payment arrangements for water bills by the hospital and contractor   + Engage in other water conservation options during conservation works to save water | Water resources management plan in place  Water payment agreement in place  Water conservation measures in place | 100% of all water bills incurred during construction works are paid for by the contractor | Signed Water payment agreement | Contractor, Hospital management | DHO | During construction | N/A | N/A |
| 12 | **Risk of spread of HIV and AIDS and STIs and other communicable diseases** | * + Develop and implement HIV and AIDS Workplace Policy.   + Sensitize workers on HIV and AIDS and STIs and other communicable diseases, including how it is transmitted, prevention methods, and the importance of getting tested.   + Provide and train workers on condoms use.   + Allow infected workers to access Anti-Retroviral Treatment (ART) from any health facilities of their choice; and   + Employ workers from the surrounding sub-project site to minimize promiscuity. | Number of sensitization meetings/ signage available  Condoms distributed | 0 new cases of HIV and AIDS | Inspection of monthly progress reports and Health records | Contractor | MC-ERHSP Project, DHO | During construction | 1,200,000 | 500,000 |
| 13 | **Increased Risk of Spread of COVID- 19** | * + Conduct sensitizations COVID-19 symptoms and prevention to workers.   + Provide equipment to enhance hygiene i.e. water for washing hands, soap and sanitizer is made available at all time in the work premises   + Adhere to Covid-19 measures as specified by government.   + Make protective face masks available at the workplace for those potentially ill can wear to avoid Covid-19 spread. | Number of Awareness campaigns/ Signage available  Sanitary and protective materials distributed and in use  COVID-19 Policy in Place | 0 new cases of COVID-19 | Monthly progress reports and Inspection of health records | Contractor | MC-ERHSP Project, District Health Office, | During construction | 1,200,000 | 500,000 |
| 14 | **Increased risk of child marriage** | * + Conduct community awareness campaigns to on child marriage and the benefits of keeping girls in school.   + Prioritize local community members in employment to enhance economic stability and reduce the perceived need for child marriage.   + Facilitate signing of code of conduct by all workers before engagement as a worker with No to child marriage being among the requirements   + Sensitize on GRM and respective reporting mechanisms for reporting any suspected cases of child marriage. | Number of sensitization meetings/materials on child marriage and its respective GRM  Code of conduct signed  Employee records | 0 cases of child marriage reported | Inspection of records | Contractor | Hospital management; District Labour Office, | During Construction | 500,000 | 250,000 |
| 15 | **Increased risk to public health and safety due to unsafe Construction premises** | * + Fence the construction site and ensure the gate is manned to limit access.   + Put safety tape around all potentially dangerous spaces.   + Install signage to limit access.   + Sensitize communities, hospital workers when works commence so that they avoid the place as well as notifying patients of the works | Fence in place  Signage/ safety tape and sensitization messages in place in all potentially dangerous areas | 100% construction site is fenced, and signage/ warning signs put in place | Site inspection | Contractor | Hospital management  MC-ERHSP Project, | During construction works | 1, 500,000 | 500,000 |
| 16 | **Increased risk to public safety due to vehicular traffic and trucks** | * + Contractor to prepare a material transport plan to address risk to public safety due to truck and vehicle traffic   + Identify and designate specific routes for construction vehicles to minimize their movement through the hospital premises, residential areas, schools, and other sensitive locations.   + Conduct public awareness campaigns to inform the community at the hospital and surrounding community   + Limit construction vehicle speeds to 20km/hour within the hospital premises and communities   + Install speed bumps or rumble strips | Material transport plan in place including community awareness planned/ conducted before construction | 100% material transport plan implemented including community awareness | Inspection of records | Contractor | MC-ERHSP Project, MCH management | Before and during construction | 500,000 | 500,000 |
| 17 | **Increased Risk of spread of Cholera and other water borne diseases** | * + Sensitize communities and hospital workers on Cholera and other water borne diseases   + Provide access to safe and clean drinking and cooking water through improved water supply   + Build and ensure access to adequate and clean toilet facilities for all students, to avoid cholera outbreaks.   + Promote proper hygiene practices, such as handwashing with soap and water, particularly before eating and after using the toilet. | Existence of source of clean water for drinking and cooking  Existence of clean toilets  Existence of messages or materials to ensure proper hygiene among workers | 0 cases of Cholera reported | Monthly progress reports and Inspection of health records | Contractor | Hospital management  MC-ERHSP Project, | During construction | Part of project cost | 250,000 |
| 18 | **Increased risk of fire** | * + Prohibit open fires on the site by contractor personnel.   + Provide fire assembly points during construction.   + Limit the number of flammable materials kept on-site, ensuring that only necessary quantities are available.   + Incorporate fire prevention strategies into the overall construction management plan, addressing site-specific fire risks.   + Ensure that all temporary and permanent electrical installations are carried out by certified professionals and meet safety standards.   + Provide firefighting equipment at the site such as fire extinguishers.   + contractor to coordinate with emergency response staff at hospital in terms of the hospital plans, procedures etc. | Fire and explosion prevention strategies in place  100% of electrical installations are done by certified professionals and meeting safety standards. | 0 incidence of fire and explosions reported | Report on Fire and explosion prevention strategies  Electricals installation report | Contractor | Hospital management  MC-ERHSP Project, | During and after construction | Part of project costs | 500,000 |
| 19 | **Potential for soil and groundwater contamination by sludge** | * + Develop and implement a Dredging Management Plan as part of the C-ESMP   + Conduct risk assessment for the desludging process.   + Provide appropriate PPE to workers involved in desludging and sampling.   + Conduct training for workers on safe handling of hazardous materials.   + Establish emergency response protocols for accidental exposure.   + Use analysis results to determine appropriate treatment methods   + Conduct periodic monitoring to assess any changes in sludge contamination over time.   + Dispose of sludge at designated disposal facility. | Dredge Management Plan in place and 100% being implemented | 0 incidences of lethal exposure to contamination during dredging | Inspection of plan and international good practices versus implementation  Inspection of exposure reports/ records | Contractor | MC-ERHSP Project, MCH management; | Before construction | 2,000,000 | 500,000 |
| 20 | **Potential for exposure of contaminants to workers and public** | * + Contractor to prepare a detailed Dredge Management Plan to provide the details of the process, sludge handling and disposal as part of the C-ESMP   + Conduct risk assessment for the desludging process.   + Provide personal protective equipment (PPE) such as gloves, masks, and protective clothing.   + Conduct training for workers on safe handling of hazardous materials.   + Establish emergency response protocols for accidental exposure.   + Use analysis results to determine appropriate treatment methods (e.g., incineration, stabilization, or landfilling).   + Conduct periodic monitoring to assess any changes in sludge contamination over time.   + Dispose of sludge at designated disposal sites | Dredge Management Plan in place and 100% being implemented | 0 incidences of lethal exposure to contamination during dredging | Inspection of plan and international good practices versus implementation  Inspection of exposure reports/ records | Contractor | MC-ERHSP Project, MCH management; | Before construction | NA | NA |
| **OPERATION AND MAINTENANCE PHASE** | | | | | | | | | | |
| 1 | **Increased vulnerabilities amongst the persons living with physical disabilities in accessing the facilities** | * + Design, Construct and operate disability friendly infrastructure and facilities for easy access of all | Disability friendly features incorporated | 100% construction and operation of disability friendly infrastructure | Visual Inspection | Contractor  Hospital management | MC-ERHSP Project, | Before and during Operation | Part of project cost | 500,000 |
| 2 | **Increased pressure on utilities provision** | * + Procure and use energy efficient bulbs and equipment.   + Install water-efficient fixtures such as low-flow faucets and toilets to conserve water   + Sensitize staff and hospital community on use of energy and water efficiently | Energy efficient bulbs and water efficient fixtures installed | 100% installation of energy and water efficient equipment | Inspection of installations | Hospital management | MC-ERHSP Project | Before Operation | Part of project cost | 250,000 |
| 3 | **Increased generation and poor management of liquid waste** | * + Undertake regular dredging and maintenance of the sewage system at the hospital   + Conduct yearly comprehensive environmental audits of the wastewater management system   + Channel all wastewater to designated places where it can be safely disposed of or treated.   + Connect sanitary facilities constructed to the hospital’s sewage facility.   + The hospital conducts regular water quality monitoring of the Lunyangwa River to ensure that the wastewater discharged into the river meets water quality standards.   + Obtain a water discharge permit from National water resources authority (NWRA) to discharge treated sewage into the Lunyangwa River. | frequency of maintenance  percentage of sewage directed to sewer line  frequency of water monitoring  Permit from NWRA | All sewage directed to sewer line  Weekly water quality monitoring | Monitoring reports | Hospital Management | MoH | operation phase | Hospital operation costs | 250,000 |
| 4 | **Increased generation of solid waste** | * + Develop and implement waste management plan.   + Provide bins and must be well labeled.   + Implement a waste policy of sorting, reducing, recycling and reusing of waste.   + Remove and dispose of waste that cannot be recycled at council’s licensed dumpsite; and   + Institute good housekeeping and operating practices by purchasing office materials, and suppliers that may be used for a specific period. | Waste management plan in place  Number of waste bins available  Amount of waste recycled and dumped at Area 38 against those generated | 50% waste recycled  All remaining waste dumped at A38 dumpsite | Waste management records | Hospital Management | MoH | operation phase | Hospital operation costs | N/A |
| 5 | **Increased generation of health care waste** | * + Develop and implement Waste Management Plan that include Health care waste   + Conduct yearly comprehensive environmental audits of the wastewater management system   + Regularly monitor the performance of equipment such as the incinerator and carry out maintenance.   + Use the Guidelines for Treatment and disposal methods for categories of health care waste (appendix 8)   + Provide sealable waste bags and containers for health care waste,   + Identify and label waste bags and containers properly prior to removal.   + Transport health care waste to storage areas on designated trolleys / carts, which should be cleaned and disinfected regularly.   + Incinerate health care waste within the hospital facility.   + Remaining ash and waste that cannot be incinerated to be disposed at designated sites. | Availability of waste management plan  Presence of sealable waste bags  Amount of waste incinerated against health care waste generated | 90% HC waste incinerated | Records from Incineration of waste | Hospital Management | MoH | operation phase | Hospital operation costs | N/A |
| 6 | **Increased risk of fire and explosions** | * + Provide proper storage of flammable materials, ensuring that only necessary quantities are available.   + Incorporate fire prevention strategies into the overall construction management plan, addressing site-specific fire risks.   + Provide fire assembly points during the operation phase.   + Ensure that all temporary and permanent electrical installations are carried out by certified professionals and meet safety standards.   + Conduct regular inspections and maintenance of electrical systems to prevent overloads, short circuits, or other fire hazards.   + Provide firefighting equipment at the site such as fire extinguishers. | Proper storage for flammable materials  Fire and explosion prevention strategies in place  100% of electrical installations are done by certified professionals and meeting safety standards. | 0 incidence of fire and explosions reported | Fire records and incident reports  Electricals installation report | Hospital Management | MoH | operation phase | Hospital operation costs | N/A |
| **7** | **Air pollution and operational risks from incineration of wastes** | * + Sort the waste to ensure only combustible waste goes into incinerators.   + Train staff on how to operate the incinerators.   + Plant trees around the hospital area to help absorb emissions.   + Regularly maintain the incinerator; and   + Orienting staff to the Infection Control and Waste Management (ICWM) practices |  | Once a year | Reports  Site inspections and records | Hospital management, | MoH | operation phase | Hospital operation costs | N/A | |
| 8 | **Increased resource gaps and operational deficiencies** | * + Allocate dedicated EHS resources e.g. sufficient staffing, training, and budget for the expanded EHS requirements.   + Engage external consultants to provide expertise in identifying risks and developing robust management systems.   + Conduct yearly environmental audit of the operations at the hospital and implement corrective action plans   + Periodically train staff in waste management, Infection Prevention and Control etc.   + Conduct regular maintenance and supporting facilities such as the Incinerator and the wastewater management system at the hospital. | Budgets and resources allocated including EHS trainings  Management system in place | 0% increase in resource gaps compared to current situation | Inspection of performance management reports  Inspection of budget allocation on EHS | Hospital Management | MoH | operation phase | Hospital operation costs | N/A |
| **Total** | | | | |  |  |  |  | **20,000,000** | **12,000,000** |

* 1. **Implementation of ESMMP**

The ESMMP shall be implemented to address all activities that have been identified to have potentially significant impacts on the environment during project implementation and operation. The implementation of the project environment and social component will be overseen by different institutional arrangements. The players are indicated 7-2.

Table 7‑2: ESMMP Implementation Arrangement

| * Responsible Party | * Roles and Responsibilities |
| --- | --- |
| * Ministry of Health (MCH represents MoH) / PIU | * Custodian of the project * Provide support, oversight, and quality control to field staff working on environmental and social risk management. * Planning and implementation of ESMP. * Ensuring that the social and environmental protection and mitigation measures in the ESMP are incorporated in the Contractor Environmental and Social Management Plan * Supervise and monitor the progress of contractors' activities. * Provide guidance to construction teams in conducting subsequent monitoring and reporting and in undertaking corrective options. * Responsible for modifications to the ESMP when unforeseen changes are observed during implementation. * Ensure all necessary EHS terms and conditions are included in Contractor Contract and for Supervision Engineer ensure the submission of periodic environmental and social management and monitoring reports to the World Bank and notification to WB in case of ES Incident - refer to Project ESCP for requirement * Promote improved social and environmental performance through the effective use of management systems. * External communications with other implementing partners, government ministries and agencies, and non-government organisations on matters of mutual interest related to environmental management under the project development. * Ensure EHS activities and plans for the project are implemented |
| * Supervision Engineer | * Development of a monitoring tool or checklist based on all EHS requirements in the ESMP, C-ESMP, EHS terms and conditions in Construction Contract and guided by the project’s physical layout. * Develop a monitoring program for the works, targeting specific project working sites, material sites, sensitive environments, social areas, etc. * Prepare monthly site meetings to involve the Contractor, Client and Stakeholders. * Monthly reports on EHS compliance and performance in addition to continuous communications to the Contractor, Client, Authorities and Stakeholders as situations require. * The Consulting Engineer will convene monthly meetings for progress reporting by the Contractor and the supervision team. * To supervise implementation of EHS activities for the project |
| * The Contractor | * Customise the project ESMMP and generate a Construction Environmental and Social Management Plan as a tool to guide the implementation and monitoring of indicators. File a copy with the supervising Engineer. * Procure necessary equipment for environment measurements or engage some appropriate expert personnel for the activity in specific environment quality aspects, including air quality, noise, water, and soil quality, * Assign a EHS specialist to the project * Report any ES Incident - per project ESCP requirement * Monthly reporting throughout the project period. |
| * Mzuzu District/ Mzuzu City Council | * While the district council structures especially DESC has been involved in the ESMMP preparation, major responsibility in monitoring the implementation of the project and ensuring quality works lies with the implementing Hospital with only critical activities requiring involvement of the relevant officers from Mzimba district/ Mzuzu City council e.g. the Environment, labour, social welfare and public works, Physical planning officers. |

* 1. **Environmental and Social Management and Monitoring Plans implementation cost**

Implementation of ESMP activities as well as those of the monitoring plan will require financial resources. The consultant used professional judgement to calculate the amount of money to be set aside for meeting the cost of implementing those proposed mitigation measures as well as monitoring activities that are currently not included in the project cost. Based on the nature of the project the estimated budget for environmental and social management along with monitoring plans are estimated at about MMK32,000,000 (where MMK20,000,000 is the estimated cost for implementing enhancement and mitigation measures and MMK12,000,000 is the cost of implementing monitoring measures). However, other costs for certain items associated with environmental and social management and monitoring have been costed less as they will be an integral part of specific items incorporated in overall project implementation budget.

# CAPACITY DEVELOPMENT, TRAINING AND REPORTING

* 1. **Technical Assistance support for the implementation of safeguards**

The success of effective implementation of this ESMP will rest on the availability of technical staff and other relevant implementing parties. Thus, the design and implementation of technical capacity building program for implementing institution with the right skills and knowledge is unavoidable. This effective capacity building program could be through availing of the required resources and training of staff and all other parties involved in this ESMP implementation, including the contractor. Project implementing bodies need to understand inherent social and environmental issues and values of the proposed construction works at Mzuzu Central Hospital and be able to identify and manage impacts.

Given less familiarity on WB ESF by staff from the implementing institution and other relevant institutions and stakeholders directly and/or indirectly engaged in the implementation of the proposed MCH construction project and to ensure successful implementation of the Environmental and Social Standards, there is need for capacity building through planning and implementation of project capacity building program. It is also proposed to provide capacity building through technical assistance to the PIU and other relevant institutions during the implementation of this ESMP and other safeguards requirements over the project period. The technical assistance will provide the necessary technical support to the PIU in its work with contractors as well as other entities involved in the implementation of the ESMP.

Given the nature of construction activities, it is anticipated that safeguard technical assistance support and training will be provided at least 2 times (one on preconstruction phase and another on construction phase). An indicative training plan is indicated in Table 8-1. The WB safeguard specialists may participate in the capacity building activity, in the training activities if appropriate.

Other than administering training to staff from the implementing institution and other relevant institutions and stakeholders, the contractor will also be required to provide regular toolbox training to the workers. Toolbox training is aimed at equipping workers with the capacity to avoid noncompliance to ESMP and facilitating effective implementation of remedial measures in case an incident has happened e.g. an accident. The tentative training plan is presented in Table 8-1 and reporting form in Appendix 3(b).

Table 8‑1: Tentative Training Plan and Capacity Building Approach

| **Level** | **Responsibility Party** | **Audience** | **Topics / Themes** | **Estimated Cost (MK)** |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
| Contractor Level | Environmental Specialist | Supervision Engineer and Contractor Environmental and Social Expert, Contractor’s Staff | * Customizing the ESMP * Construction Environmental and Social Management Plan (CESMP) * Equipment Use for Environmental Measurements * Monthly Reporting * Compliance with Environmental and Social Standards * Need and how to conduct Toolbox talks * Waste management including 4Rs * Hazardous waste management on site * Fire drills * HIV/AIDS prevention and management * OHS- PPE, code of conduct etc. * Workers GRM | 2,000,000 |
| Workers level (Weekly Toolbox training) | Contractor Environmental and Safety Specialist | All project Workers | * Anticipated project impacts and mitigation measures at each stage defending on specific works * Waste management including 4Rs * Hazardous waste management on site * Fire drills * HIV/AIDS prevention and management * Grievance Redress Mechanism (GRM), Gender based Violence (GBV), Abuse of child labour, Child marriage, Defilement * Occupational Health and Safety measures including first Aid * Code of Conduct | Part of project costs |
| Operation and maintenance | Hospital management | Hospital staff | * Medical waste management * Solid waste management * Compliance to EHS measures * Infection prevention and control * Fire management * Energy and water management * Equipment management | 3,000,000 |

To ensure the effectiveness of the training and capacity-building plan, regular evaluations and monitoring will be conducted. This will involve:

1. Evaluate participants' knowledge before and after training sessions.
2. Collect feedback from participants to improve future training sessions.
3. Regularly review monitoring reports to ensure compliance and identify areas for improvement.
   1. **Overall ESMMP and Trainings Estimated Budget**

Table 8-2 below lists estimated cost items for the implementation for the ESMP, which have been included in the overall project budget.

Table 8‑2: Summary ESMMP Implementation Budget

| **SN** | **Activity/Cost Item** | **Potential Cost (MMK)** |
| --- | --- | --- |
| 1 | Trainings and Capacity Building | 5, 000,000 |
| 2 | Implementation of site-specific ESMPs and other site-specific plans including permits applications | 20,000,000 |
| 3 | ESMP implementation Monitoring/ Supervision costs including (Travel budget for supervision consultant/environmental and social staff site visits) | 120,000,000 |
|  | **Total** | **37,500,000** |

**8.3 Reporting Requirements**

The ESMP implementation progress reports should be prepared which summarize the results of all monitoring. The reports will give monitoring data in a standard format (Appendix 3(a)). Performance reports should emphasize any significant violations of contract provisions by the contractor or any failure to implement the requirements of the ESMP. Any significant incidents of environmental contamination should be summarized, along with actions taken to mitigate these and to prevent reoccurrence. Progress Reports should be submitted to MC-ERHSP Project management team, and other relevant institutions periodically during construction, on request. In case of follow up monitoring visit, a follow up form for reporting implementations of violations is also prepared and presented in Appendix 3(c).

Regardless of the reporting forms (see appendix 7 for Incidence reporting form) and periods, all accidents and incidents will be reported immediately. Notification will be given by the contractor to C-ERHSP Project, management team who will then report the incident to World Bank through the PIU within 48 hours of occurrence. Incidents to be reported will include but not limited to

* fatality
* serious injuries
* Spillage
* GBV/SEA incidents

The Incident report shall include.

* Date, time and place of the incident
* Description of the incident
* Type of injury or damage sustained.
* Person involved.
* Corrective action undertaken to reduce spread or damage.

# GRIEVANCE REDRESS MECHANISM (GRM) AND STAKEHOLDER ENGAGEMENT

* 1. **Grievance Redress Mechanism**

**9.1.1** General

Grievance redress mechanism (GRM) is designed because the proposed construction project for selected sections at MCH may affect the existing social balance at the institution and surrounding community. The purpose of a GRM is to establish a way for individuals, groups, or communities affected by the project activities to provide feedback, lodge complaints/grievances and have the grievances redressed.

Complaints relating to the proposed project's problems will be solved through negotiations to achieve consensus. A complaint will go through various stages before it can be referred to the court.

During consultations with stakeholders, it was reported that Mzimba district council has a district grievance redress mechanism committee (DGRC). However, there will be need for a worker (WGRC) and community grievance redress committee (CGRC) which can be accessed and used by hospital workers and community (hospital staff, patients and guardians the communities, community leaders) on the sub project.

The DGRC at Mzimba District Council can be utilized as an institution to handle grievances referred to by the IGRC. Representatives from project management and Institutional GRM will however participate in the DGRC to facilitate feedback processes. In case of failure to resolve a grievance at district level (DGRC), referral shall be made to the National Project Implementation Unit grievance redress committee (PIUGRC) as the highest committee for the project. Failure to resolve a grievance at PIUGRC level, then PAPs will be advised to seek further redress from the Courts.

**9.1.2** Grievance Redress Procedure

Following the GRM structure presented in Figure 9-1, the redress procedure at every will has 5 stages from when a grievance is first reported to when it is resolved. These stages are outlined below as follows.

**Stage 1: Complaint Uptake**

PAPs will present their complaints or grievances to the GRMC by filling in a form provided as appendix 5. A drop-in box will be provided at the hospital and community and/or any other agreed location in the community to facilitate easy uptake of grievances. A WhatsApp message phone number, toll free number or email address will also be agreed upon by stakeholders at the beginning of refurbishment works (probably during inception meetings) and provided to all stakeholders for grievances uptake.

**Stage 2: GRM Registry**

All grievances received will be entered into an accessible entering recording system as the GRM registry and shall be maintained at both community and district levels with chairpersons of the GRMCs at each of these levels as custodians.

**Stage 3: Assessment, Analysis and Response**

When a complaint is received by GRC, the GRM provides that a resolution be provided within 15 working days. Once complaints are received, the CGRC shall assess whether the complaint/grievance is related to the project or not. If not related, then the PAPS will be advised to lodge a complaint to appropriate Authorities. However, if the complaint is related to the project, it shall be directed to GRM process as shown in Figure 9-1.

**Stage 4: Resolution and Closure**

Where a resolution has been arrived at and the PAP accepts the resolution, the PAP shall be to sign the resolution and closure section in the Grievance Community Log and Resolution Form as attached. Two members of the GRC (Chairperson and Secretary) shall also be required to counter sign. If the grievance has not been resolved at GRC, it will be referred to District GRC and if the resolution is not reached at this level, the PAP has the option of seeking legal redress from civil courts.

**Stage 5: GRM Monitoring and Evaluation**

The GRM process will have to be monitored and evaluated to ensure the effectiveness of the process and that the complaints submitted and related to the project have been dully received the required attention. This will be possible by reviewing the copies of registers that the grievances were recorded by the GRC and how the complaints registered were resolved. The Mzimba district council will be required to take the leading role in collaboration with MC-ERHSP project management team. The monitoring will assist in tracking whether the GRM system is working efficiently and effectively and will inform the project to make any necessary adjustments. The evaluation will help to assess the impact of GRM in response to people’s complaints and whether the GRM principles were met or not during the project implementation. The visual representation of the grievance redress procedure is shown in Figure 9-1.

WGRC or CGRC record confirmation with complainant that the grievance is closed. If grievance cannot be close, return to stage 2 by another higher Committee (DGRC then PIUGRC) (Day 12-14)

**Stage 5**

**GRM Monitoring and Evaluation**

**Stage 4**

**Resolution and Closure**

WGRC or CGRC identify action and provide response to the complainant in writing (Day 10)

**Stage 3**

**Assessment, Analysis and Response**

WGRC or CGRC (depending on type of grievance) meet and assess the significance of the grievance, gather evidence and might require site visit and discussions with the stakeholders involved (Day 5-8)

WGRC and CGRC Representatives uptake and recording the grievances in either logbook for community grievances or workers grievances depending on type of complaint. (Day 1)

**Stage 2**

**GRM Registry**

PAP filling a form and drop-in box provided at the University and/or any other agreed location/ Calling toll free number, emailing or sending message by phone. (Day 1)

**Stage 1**

**Complaint Uptake**

Figure 9-1: GRM process for project of OPD and Emergency sections of Mzuzu Central hospital pediatric center

**9.1.3 Types of Grievances expected from the project.**

The project will receive any kind of grievances and complaints from both workers, hospital staff, patients/ guardians and communities. The types of grievances expected from the project are presented in Table 9-1.

Table 9-1: Expected community and work grievances

|  |  |
| --- | --- |
| **Community issues** | **Workers issues** |
| * Environmental issues: noise, dust, and competition for water with contractor * Social issues: sexual harassment, child labour, security concerns, GBV etc. * Employment issues for local community (Only recruiting migrant workers, recruitment based on corruption, dismissal from employment for unknown reasons etc.). * Compensations for injuries * Community safety | * Contract workers are unhappy about not having access to Personal Protective Equipment (PPE). * Workers whose contracts are not renewed complaint i.e. Recruitment and Contract Management issues * Workers without contracts (Working without contract with purposes of not fulfilling payment agreements and easy dismissal on unknown reasons etc.) * Lack of clarification to overtime pay * Sexual Harassment & GBV * Worker dismissal without been given a chance to be heard. Unfair dismissal * Criminal cases such as rape, defilement, stealing etc. |

# CONCLUSIONS AND RECOMMENDATIONS

* 1. **Conclusions**

This ESMP has presented the major guidelines that have to be followed for safe execution of the works during construction of pediatric OPD and ER at Mzuzu Central Hospital which is a sub project under Malawi COVID-19 Emergency Response and Health Systems Preparedness Project (C-ERHSPP). Though the proposed project will likely generate significant socio-economic benefits to the hospital, staff and students as well as local people around Mzuzu Central hospital and the country at large, negative environmental and social impacts that the project activities are likely to bring have also been established by this ESMP.

Following the identified potential impacts, mitigation and enhancement measures have also been identified to be implemented during the implementation of the project.

* 1. **Recommendations**

Further to identification of impacts and subsequent prescription of mitigation or enhancement measures, this ESMP recommends the following.

* 1. The developer should give environmental protection and social considerations the necessary attention during implementation of the project.
  2. The developer should adopt and implement all the recommendations and mitigation measures advanced in this ESMP and respective monitoring plan.
  3. The developer should ensure adequate provision of capacity building to all key stakeholders who will be directly involved in the implementation of the project’s ESMPs, as it is an integral part to ensuring quality safeguards implementation in the project.

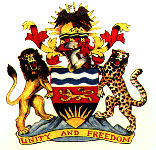
With these conditions fully met and implemented, the recommendation is for this project to be allowed to proceed.

# REFERENCES

1. Government of Malawi (2017) Environment Management Act. Ministry of Natural Resources, Lilongwe, Malawi
2. Government of Malawi (2013). Water Resources Act, Lilongwe, Malawi
3. Government of Malawi (2012). National HIV and AIDS Policy, Lilongwe, Malawi
4. Government of Malawi (2005) National Water Policy, Ministry of Irrigation and Water Development, Tikwere House, Lilongwe
5. Government of Malawi (2013). The Gender Equality Act. Ministry of Gender, Children, Disability and Social Welfare, Lilongwe, Malawi.
6. Government of Malawi (1997). The Occupation Safety Health and Welfare Act. Ministry of Labour, Youth, Sports and Manpower Development, Lilongwe, Malawi.
7. Government of Malawi (1948), Public Health Act, Ministry of Health, Malawi.
8. Government of Malawi (2011), Atomic Energy Act, 2011. Lilongwe: Government Printer.
9. Government of Malawi. (2013). Radiation Protection Regulations, 2013. Lilongwe: Government Printer.
10. Government of Malawi (2008). Environment Management (Waste Management and Sanitation) Regulations. Ministry of Natural Resources, Energy and Mining, Lilongwe, Malawi.
11. Government of Malawi. (1997). Guidelines for Environmental Impact Assessment. Lilongwe, Malawi
12. Malawi Bureau of Standards (2017), Catalogue of Malawi Standards. Blantyre, Malawi
13. National Statistical office (2018), Population and Housing Census report, Zomba, Malawi
14. The World Bank (2017), Environmental and Social Framework, 1818 H Street NW, Washington, DC 20433, USA.
15. https://www.statista.com/statistics/1124488/key-facts-wastewater-generation-globally/#:~:text=North%20America%20and,wastewater%20per%20year.

# Appendix 1(a): Environmental and Social Screening Form

**Environmental and Social Screening Form for Government Regulator**



Malawi Government

Ministry of Health

Malawi COVID-19 Emergency Response and Health Systems Preparedness Project (C-ERHSPP)

*(Guidelines: Site inspection of project site. The evaluation results to be a consensus of at least two officials)*

|  |  |
| --- | --- |
| **Sub Project Name:** Construction of OPD, Emergency sections of proposed Mzuzu Central Hospital Pediatric center | **District**: Mzimba |
| **Project Location:** *Mzuzu Central Hospital*  ***Area: Mzuzu City Council***  **Section:** *Mzuzu Central Hospital Pediatric center* | **Nature of Sub-Project**: Construction of OPD and Emergency sections of proposed Mzuzu Central Hospital Pediatric center**Size:** |
| **Names of Evaluators:**   1. **Mr. Peter Magombo** 2. **Mr. Yamikani Muronya** | **Date of Field Evaluation:**3rd May, 2023 |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Appraisal** | | **Type** | **Significance** | | | ***Potential Mitigation/enhancement Measures*** |
|  |  | **Yes** | **No** | **(+ve) or (-ve)** | **Low** | **medium** | **high** |
| **1.0** | **Environmental and Social Screening** |  |  |  |  |  |  |  |
|  | Will the project generate the following impacts |  |  |  |  |  |  |  |
| 1.1 | Loss of trees/vegetation |  | √ | -ve |  | √ |  | Replant vegetation after the works |
| 1.2 | Soil erosion/siltation in the area | √ | √ | -ve | √ |  |  | -Clear only land needed for construction and backfill the excavated areas |
| 1.3 | Dust emissions | √ |  | -ve | √ |  |  | -Wearing dust protective clothing |
| 1.4 | Solid and liquid wastes | √ |  | -ve | √ |  |  | -Designate waste collection site.  -Designate/ construct proper drainage system |
| 1.5 | Effluents | √ |  | -ve | √ |  |  | Channel wastewater to designated places |
| 1.6 | Nuisance esp. Noise and/or smell | √ |  | -ve | √ |  |  | Use modern equipment with silencers |
| 1.7 | Spread of HIV/Aids and other STIs | √ |  | -ve | √ |  |  | -Meetings and awareness with/ to communities and contractors  -Condom distribution |
| 1.8 | Marriage interferences | √ |  | -ve | √ |  |  | -Employ mostly workers from nearby community |
| 1.9 | Borrow pits and pools of stagnant water | √ |  | -ve | √ |  |  | backfill the excavated areas and borrow pits |
| 1.10 | Rubble/heaps of excavated soils | √ |  |  |  |  |  |  |
| 1.11 | Invasive tree species |  | √ |  |  |  |  |  |
| 1.12 | Damage of wildlife species and habitat |  | √ |  |  |  |  |  |
| 1.13 | Spread of water borne diseases e.g. Malaria, diarrhea |  | √ |  |  |  |  |  |
| 1.14 | Loss of soil fertility |  | √ |  |  |  |  |  |
| 1.15 | Increased use of agrochemicals (fertilizers & pesticides) |  | √ |  |  |  |  |  |
| 1.16 | Increased risk of injuries | √ |  | -ve |  | √ |  | Contractor to ensure workers wear appropriate PPE. |
| 1.17 | Contamination of water points | √ |  |  |  |  |  |  |
| 1.18 | Source of employment for local people and artisans | √ |  | +ve |  | √ |  | Contractor should prioritize hiring local people |
| 1.19 | Capacity building through skill development during construction | √ |  | +ve |  | √ |  | Contractor should prioritize hiring local people for them to benefit with experience |
| 1.20 | Acquisition of assets and equipment after commissioning |  | √ |  |  |  |  |  |
| 1.21 | Improved Socio-economic status | √ |  | +ve |  | √ |  | Contractor should hire local people |
| **2.0** | **Resettlement Screening** |  |  |  |  |  |  |  |
|  | Will the project generate the following impacts? |  |  |  |  |  |  |  |
| 2.1 | Loss of land to households |  | √ |  |  |  |  |  |
| 2.2 | Loss of properties –houses, structures |  | √ |  |  |  |  |  |
| 2.3 | Loss of trees by households |  | √ |  |  |  |  |  |
| 2.4 | Loss of crops by people |  | √ |  |  |  |  |  |
| 2.5 | Loss of access to river/forests/grazing land |  | √ |  |  |  |  |  |
| 2.6 | Loss of cultural site, graveyard land |  | √ |  |  |  |  |  |
| 2.7 | Conflicts over use of local water resources |  | √ |  |  |  |  |  |
| 2.8 | Disruption of important pathways, roads | √ |  | -ve |  | √ |  | Contractor with help of hospital to designate alternative routes with signage in place |
| 2.9 | Loss of communal facilities |  | √ |  |  |  |  |  |

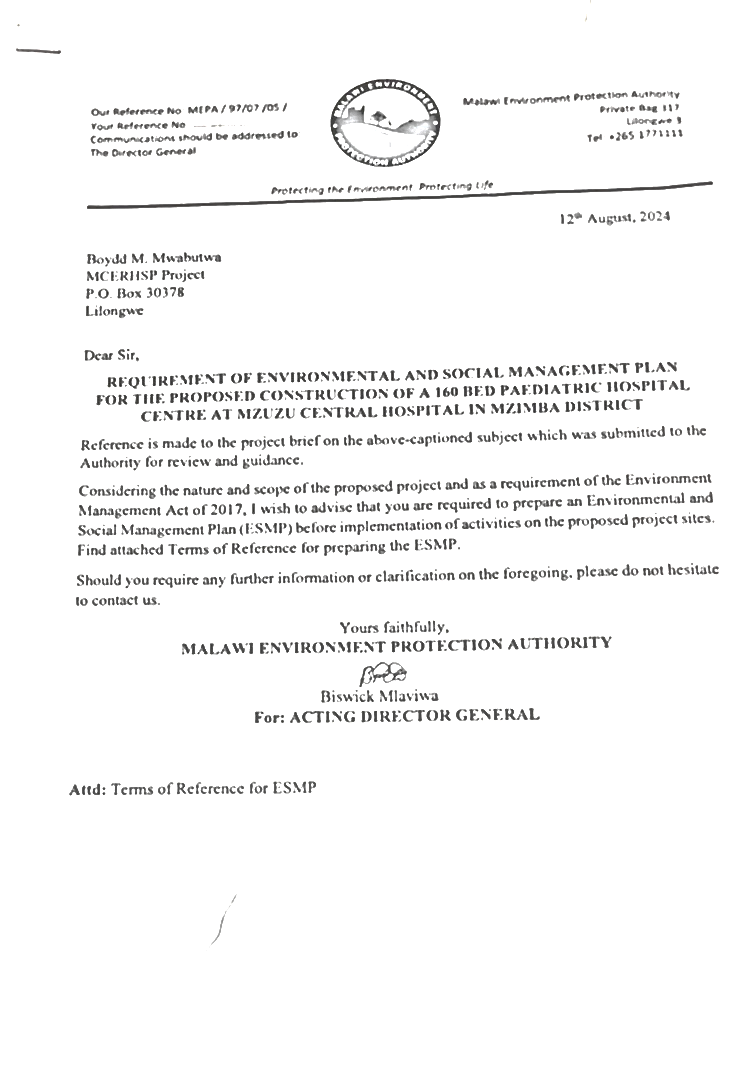
**Overall evaluation of Environmental, Social and Resettlement Screening Exercises**

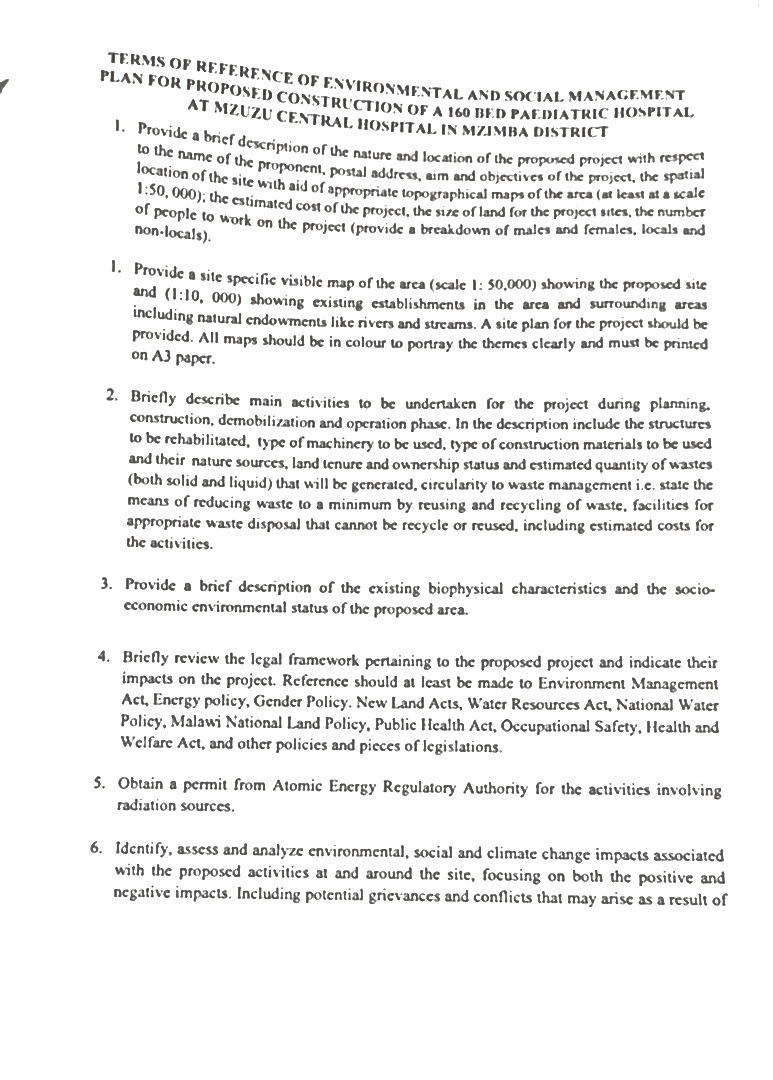
The results of the screening process would be either the proposed sub - projects would be exempted or subjected to further environmental, social and resettlement assessment. The basis of these options is listed in the table below:

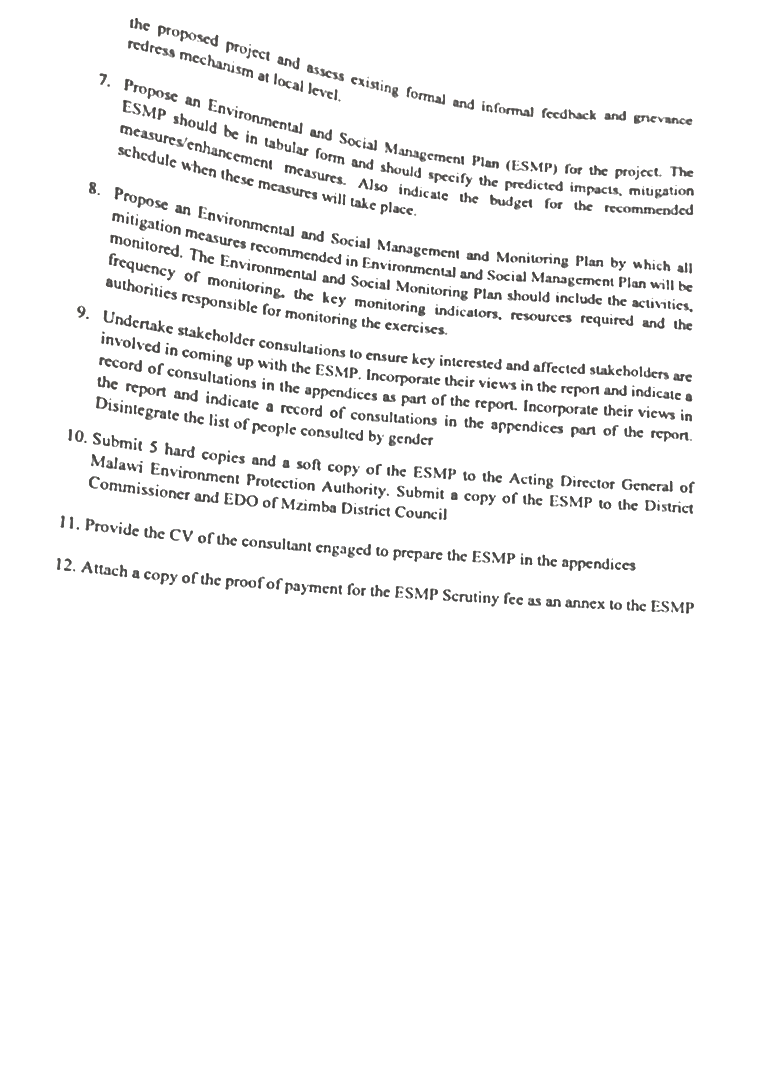
|  |  |  |  |
| --- | --- | --- | --- |
| **Review of Environmental and social Screening** | **Tick** | **Review Resettlement Screening** | **Tick** |
| 1. The project is cleared. No serious impacts. *(When all scores are “No” and Low in form)* |  | 1. The project is cleared. No serious social impact.  *(Where scores are all “No”, “Low-medium” in form)* | √ |
| 2. There is need for further assessment (ESMP/ESIA *(when some score are “Yes, and – Medium to High” in form)* | √ | 2. There is need for resettlement/compensation.  *(When some score are “Yes, High” in form* |  |
|  |  |  |  |
| **Endorsement by Environmental Officer** | | **Endorsement by Director of Planning and Development** | |
| Name: **Mr. Peter Magombo** | | Name: | |
| Signature:  Date: 04-05-2023 | | Signature:  Date: | |

**NOTES:**

# Appendix 1(b): MEPAs Determination on Requirement for an ESMP and ToRs







# Appendix 2: List of Members Consulted

**CONSULTATIONS ATTENDANCE SHEET FOR MZIMBA DISTRICT**

Place of meeting………Mzimba

Date of meeting ………14th August 2024

Stakeholders …Mzimba/ MMbelwa DESC……

|  |  |  |  |
| --- | --- | --- | --- |
| **No** | **Name** | **Designation & organization/Dept** | **Contact** |
| 1 | James Pelani | EDO | 0888554892/ 0999769395 |
| 2 | Kondwani Msukwa | Mbelwa DC | 0886676113 |
| 3 | Tiwonge Makhumula | Water development | 0888919202 |
| 4 | Christopher Melele | CSO Chair | 0995633777 |
| 5 | Edwin Mwafuliwa | Physical Planning | 0995681891 |
| 6 | Dr Angelo Mwabungulu | DMO (for DHS) Mbelwa DC | 0991688874 |
| 7 | Luke Kamanga | SAVO-MZ South agriculture | 0999044136 |
| 8 | Louis Moyo | PHSA- Mzuzu DHO | 0999628887 |
| 9 | Timothy Soko | Controller of Administration Services-MCH | 0999520869 |
| 10 | Chikondi Gaffar | MZCH | 0991282222 |

# Appendix 3: Suggested Forms for ESMP Reporting, Training and Follow-up

This annex contains three templates to be used in conjunction with monitoring and reporting and follow for ESMP implementation.

1. ESMP reporting form

| **Subproject title** | **Application received (date)** | **Field appraisal undertaken**  **(date if undertaken)** | **Application approved**  **(date if approved)** | **ESMP developed (yes or no)** | **Written warnings of violation of ESMP issued (yes/no)** | **Chance find procedures invoked**  **(yes or no)** |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

1. ESMP training form

| **Personnel** | **No. of people trained** | **Training received** |
| --- | --- | --- |
| Relevant staffs from different institutions, including from MoH |  |  |
| Safeguard specialists/officers |  |  |
| C-ERHSP Project |  |  |
| District focal points |  |  |
| Hospital staff |  |  |
| Community members etc. |  |  |

1. Follow up on previous recommendations

| **Recommendation** | **Date of recommendation** | **Action taken** | **Recommendation implemented (yes/no)** |
| --- | --- | --- | --- |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

# Appendix 4: Environmental and Social Rules for Contractors

The construction works of OPD and Emergency sections at Mzuzu Central Hospital Pediatric center can have impacts on the hospital environment, staff, patients and their guardians and surrounding community.

To ensure compliance with the Environmental and Social (ES) obligations under the Contract, the following rules will be strictly followed by the contractors and /or contractors shall submit Management Strategies and Implementation Plans (MSIPs)in the Bid documents followed by Contractor Environmental and Social Management Plan (CESMP) to help to manage the following key Environmental and Social (ES) risks during the rehabilitation works.

1. **Preparation of Contractor ESMP outlining Management Strategies and Implementation Plans (MSIPs) to help manage key Environmental and Social (ES) risks**

To ensure full consideration of EHS measures full implementation in the project, the Contractor shall prepare for inclusion into CESMP the following plans and update the list as required and from time to time.

* Sexual Exploitation and Abuse (SEA) prevention and response action plan
* Traffic Management Plan to ensure safety of local communities from construction traffic.
* Asbestos management plan
* Emergency response plan for natural hazards and other incidences that might occur e.g. fire
* Solid waste, hazardous waste and wastewater management plan
* Other plans deemed necessary

**Workers Code of Conduct**

Ensure all workers under my jurisdiction have signed code of conduct with respect to the agreeing to the following:

* Consenting to security background check.
* Carrying out his/her duties competently and diligently.
* Implementing measures to address environmental and social risks related to the Works, including the risks of sexual exploitation, sexual abuse and sexual harassment.
* Maintain a safe working environment including by ensuring that workplaces, machinery, equipment and processes under each person’s control are safe and without risk to health; wearing required personal protective equipment; using appropriate measures relating to chemical, physical and biological substances and agents; and following applicable emergency operating procedures.
* Treating women, children (persons under the age of 18), persons living with physical disabilities, patients and guardians with respect regardless of race, colour, language, religion, political or other opinion, national, ethnic or social origin, property, birth or other status.
* Not using language or behaviour towards men, women or children, patients and their guardians that is inappropriate, harassing, abusive, sexually provocative, demeaning or culturally inappropriate.
* Not participating in sexual activity with children, patients and guardians—including grooming or through digital media. Mistaken belief regarding the age of a child and consent from the child is not a defense.
* Not exchanging money, employment, goods, or services for sex, with patients, guardians and community members including sexual favours or other forms of humiliating, degrading or exploitative behaviour;
* Not having sexual interactions with members of the communities surrounding the workplace, and fellow workers that are not agreed to with full consent by all parties involved in the sexual act (see definition of consent above). This includes relationships involving the withholding, promise of actual provision of benefit (monetary or non-monetary) to community members in exchange for sex - such sexual activity is considered “non-consensual” within the scope of this Code.
* Attend trainings related to HIV/AIDS, GBV, SEA, occupational health and any other relevant courses on safety as requested by my employer.
* Report to the relevant committee any situation where I may have concerns or suspicions regarding acts of misconduct by a fellow worker, whether in my company or not, or any breaches of this code of conduct provided it is done in good faith.
* Refrain from and report any forms of corruption with regards to any activity to do with the project.
* With regard to children under the age of 18, do not invite unaccompanied children into my home, unless they are at immediate risk of injury or in physical danger.
* Not sleep close to unsupervised children unless absolutely necessary, in which case I must obtain my supervisor's permission, and ensure that another adult is present if possible.
* Refrain from physical punishment or discipline of children.
* Refrain from hiring children for domestic or other labour, 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 labour laws in relation to child labour.
* Refrain from any form of theft of assets and facilities including from surrounding communities.
* Remain in designated working area during working hours.
* Refrain from procession of alcohol and illegal drugs and other controlled substances in the workplace and being under influence of these substances on the job and during workings hours.
* Wear mandatory PPE at all times during work.
* Follow prescribed environmental occupation health and safety standards.
* Channel grievances through the established grievance redress mechanism.
* I understand that the onus is on me to use common sense and avoid actions or behaviours that could be construed as misconduct or breach of this code of conduct.

1. **Workplace Safety and Traffic Management implementation**

* Conduct safety education programs to promote awareness of construction works to workers, hospital staff, patients, guardians and community.
* Ensure free and unobstructed access to emergency services and for fire, police, and ambulances etc.
* Ensure free and unobstructed entry and exit points, providing additional staff training when alternative exits are designated, and maintaining and inspecting emergency escape routes to be used by construction workers in construction areas.
* Construct barriers between the places being refurbished to prevent dust from entering other hospital areas and suppress dust as necessary.
* Direct pedestrian traffic away from works site, provide awareness and signage and as required develop Traffic Management Plan.
* Develop and enforce storage, housekeeping, and debris removal practices that reduce that does not affect operations of the hospital.
* Provide additional fire-fighting equipment and train personnel in its use.
* Respect patient’s rights. Demonstrate respect for patients and staff, including privacy, and security.
* Implement prevention and control of infections for workers and visitors.
* Conduct risk assessment of susceptible worker’s locations in consultation with the hospital management.
* Control of noise and vibration.

**2. Protection of Water and other Public Services**

* The Contractor shall ensure that no public services are disrupted as a result of the execution of the construction works. In particular, the Contractor shall:
* Not interfere with supply or abstraction of water for public or private use; and shall not pollute any water resources (including groundwater).
* Not disrupt power supply or any other public or private services including footpaths and walkways without providing alternatives.
* Not discharge or deposit any waste, wastewater or any material into any waters or any grounds except with the permission of the appropriate regulatory authorities.
* Protect all water courses (including ditches, canals, drains and lakes) from pollution, siltation, flooding or erosion as a result of the execution of the works.
* Assume all responsibility to locate or to confirm the details and location of all utility services on or in the vicinity of the site.
* Assume responsibility for any damage and \or interference caused by him or his agents, directly or indirectly, arising from actions taken or a failure to take action to protect public or private utilities.
* Be responsible for full restoration of any damage caused and for restoration of services. Restoration shall be to the satisfaction of the client/client’s representative. The client/ client’s representative will ensure that any affected third party is content before confirming they are content with the restoration enacted by the contractor.
* Ensure that waste products shall be collected, removed and disposed of at a site approved by the District Council in a manner that will not cause pollution or nuisance. Not disposing of any surplus material on private land unless authorized in writing by the owner(s), authenticated before a notary public, and with previous authorization of the District Council.

**3. Control of Air Pollution**

* Open fires and burning of construction waste shall not be permitted.
* Dust- generating operations shall not be permitted to affect hospitals. Where dust generation is inevitable, appropriate measures such as use of water sprays and fencing shields or appropriate covering material shall be employed. All workers shall be protected from dust emissions by providing them with appropriate protective wear.
* All construction machinery, including all vehicles, shall be regularly maintained to ensure that no smoke or obnoxious gas is discharged to pollute the air and affect the public or property.

**4. Acquisition of Construction Material**

* Only licensed quarrying, sand mining and brick-making operations and sites shall be used as sources of construction materials.

**5**. **Control of Social Impacts**

* The Contractor shall coordinate with all the neighboring land users and respect their rights to a clean and safe environment. Written agreements with local landowners for temporary use of their sites or property shall be made and sites must be restored to original condition or conditions acceptable to the owner within an agreed time.
* Health and safety of workers shall be protected by providing basic emergency health and first aid facilities and awareness meetings aimed at the prevention of sexually transmitted diseases.
* Awareness meetings shall be conducted as a part of all construction employee orientation programs. Employees shall be provided with condoms for protection from STIs.
* The Contractor shall obtain all necessary written traffic control permissions
* including for use of flagmen, traffic cones or other devices such as barricades and/or lights which he must use to control traffic for safety of pedestrians,
* The Contractor shall neither stockpile nor store any construction materials; not park construction plants or vehicles in walkways, pedestal routes or driveways.
* Stockpiles of material shall be covered with tarpaulins or sprayed with water where these materials pose risks of dust to the public or people’s property.

**7. Noise Control and Regulation**

* The Contractor shall take all necessary measures to ensure that the operation of all mechanical equipment and construction processes on and off the site shall not cause any unnecessary or excessive noise to the public. In addition, the
* Contractor shall operate noisy equipment within government working times unless with prior arrangement and permission from the employer
* Vehicle, plant and equipment exhaust systems shall be maintained in good working order, as recommended by the manufacturers, to ensure that no noise is unnecessarily generated to inconvenience the public.
* Construction works and operations shall be scheduled to coincide with periods when people would least be affected by noise, having due regard for avoiding any noise disturbances to the hospital/ work site neighborhood.
* The contractor shall notify public (likely to be affected by the works) of impending construction operations and specify methods to receive and handle all public complaints.

1. **Environmental Monitoring**

* The Contractor shall be responsible for monitoring all his activities and ensuring that all environmental requirements and the above conditions are met at all times.
* Contractor shall also facilitate regular environmental, social and health; and safety monitoring by the Client, the Client’s representative or an independent monitor appointed by the Client, or any other national agency with a remit to inspect and monitor construction, environmental, social and health and safety performance.
* The contractor will immediately agree and implement a rectification plan to bring the contractor back into compliance where inspections, audits and monitoring identify issues that are not in compliance with the ESMP as included in the contract.

# Appendix 5: Grievance Redress Management Forms

1. Community Grievance Log & Resolution Form

**SECTION A: GENERAL INFORMATION Form Number …………………..**

District Name: ………………………………. TA……………………………………….……GVH……………….…………..…………

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Name of Project Location/ Catchment Area: | | | Name of Community/ Village: | | | | Reporting Dates: | |
| Name of Complainant | | | Complainant Sub Component: | | Household Identification: | | | Phone Number,  E-Mail: |
| **SECTION B: DETAILS OF THE GRIEVANCE** | | | | | | | | |
| Ref No. | Date of Grievance | Summary description of Grievance/Complaint | | Follow-up/Investigation | | | Resolution Made | |
| Date | | Person Assigned |
| G1 |  |  | |  | |  |  | |
| G2 |  |  | |  | |  |  | |
| G3 |  |  | |  | |  |  | |

Name of Reporting Officer: ………………………………………………………………….

**SECTION C: SUBMISSION OF GRIEVANCE**

If case is closed, GRM Committee members & complainant to sign below

GRM Committee Chair\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Name & Signature of Project Affected Person /Beneficiary\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

GRM Committee Secretary\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**SECTION D: REFERRAL OF CASES**

**Referred to DGRMC**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Ref No. | Date of Referral | Follow up / Investigation | | Summary of action undertaken |
| Date | Person Assigned |
| G1 |  |  | |  |
| G2 |  |  | |  |
| G3 |  |  | |  |

RECEIPT: SUBMISSION OF GRM Form number ………..

|  |  |
| --- | --- |
| Complaint: | |
| Household ID: | TA: |
| Districts: | Program: |
| Name of Complainant: | Reporting officer: |
| Case: - Closed { } - Referred { } | Signature of complainant: |

2. Workers’ Grievance Log & Resolution Form

**SECTION A: GENERAL INFORMATION Form Number …………………..**

District Name: ………………………………. TA……………………………………….……GVH……………….…………..…………

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Name of Project Location/ Catchment Area: | | | Name of Community/ Village: | | | | Reporting Dates: | |
| Name of Complainant | | | Complainant Subcomponent: | | Household Identification: | | | Phone Number,  E-Mail: |
| **SECTION B: DETAILS OF THE GRIEVANCE** | | | | | | | | |
| Ref No. | Date of Grievance | Summary description of Grievance/Complaint | | Follow-up/Investigation | | | Resolution Made | |
| Date | | Person Assigned |
| G1 |  |  | |  | |  |  | |
| G2 |  |  | |  | |  |  | |
| G3 |  |  | |  | |  |  | |

Name of Reporting Officer: ………………………………………………………………….

**SECTION C: SUBMISSION OF GRIEVANCE**

If case is closed, GRM Committee members & complainant to sign below

WGRM Committee Chair\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Name & Signature of Project Affected Person /Beneficiary\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

WGRM Committee Secretary\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**SECTION D: REFERRAL OF CASES**

**Referred to DGRMC**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Ref No. | Date of Referral | Follow up / Investigation | | Summary of action undertaken |
| Date | Person Assigned |
| G1 |  |  | |  |
| G2 |  |  | |  |
| G3 |  |  | |  |

RECEIPT: SUBMISSION OF GRM Form number ………..

|  |  |
| --- | --- |
| Complaint: | |
| PAP ID: | TA: |
| Districts: | Program: |
| Name of Complainant: | Reporting officer: |
| Case: - Closed { } - Referred { } | Signature of complainant: |

# Appendix 6: Resource Efficiency Measures (Use of Water)

**Purpose of Resource Efficiency measures (Use Water)**

These measures are project-specific and outlines actions focusing on the use of water during construction works. The purpose of these resource efficiency measures are to significantly contribute to sustainability and reduce environmental and social impacts due to use of water during construction works of the project. The measures will have to be implemented basing on the potential for the project to increase demand of water, and thereby increasing pressure on the availability of the resource at Mzuzu Central hospital.

**Scope of these Resource Efficiency measures (Use Water)**

These measures shall be applied during Construction of OPD and Emergency sections of Pediatric Center at Mzuzu Central hospital. These measures are applicable to works conducted by the contractor, including all works requiring supply of water construction works. This is due to the potential of construction activities to increase demand of piped water which MCH is supplied with, and the project’s construction activities may likely rely upon. The measures outline the considerations, actions, roles and responsibilities with respect to use of water during the works

**Efficiency measures (Use of Water)**

During construction works, upon the contractor requiring water for use in various activities and all water works, the following measures shall be taken:

**Exploring other sources of water for use in implementing the construction works**

Since the use of water supplied by LWB is confirmed for construction activities, the contractor therefore shall be responsible for striking an agreement with hospital management on the amount of water likely to be used and the payment arrangements of the bill. This agreement shall be binding and certification of full payment of bill by the Hospital will be the determining factor for the contractor to receive their final payment from the project after completion of works.

Other sources of water for construction works can also be considered by the contractor are as follows;

* Extracting water from surface water sources from the nearby river(s) within the vicinity
* Other water management options to conserve water resources are also suggested as follows.

1. Utilize rainwater harvesting systems to capture and store rainwater for construction works
2. Implement water-saving technologies such as low-flow faucets, toilets, and showerheads in sanitary rooms.
3. Implement leak detection and repair programs to promptly address any water leaks in infrastructure or equipment.
4. Encourage water conservation practices among workers through sensitizations.

# Appendix 7: Incidents Reporting Form

**FOR BANK AND BORROWER USE**

**Part B: To be completed by Borrower within 24 hours**

|  |
| --- |
| **B1: Incident Details** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Date of Incident:** | **Time:** | | **Date Reported to PIU:** | | **Date Reported to WB:** |
| **Reported to PIU by**: | | **Reported to WB by**: | | **Notification Type**: Email/’phone call/media notice/other | |
| **Full Name of Main Contractor**: | | | **Full Name of Subcontractor**: | | |

|  |
| --- |
| **B2**: **Type of incident (please check all that apply)**1 |
| Fatality  Lost Time Injury  Displacement Without Due Process  Child Labor Acts of Violence/Protest Disease Outbreaks  Forced Labor  Unexpected Impacts on heritage resources  Unexpected impacts on biodiversity resources  Environmental pollution incident  Dam failure  Other |

1See Annex 1 for definitions

|  |
| --- |
| **B3: Description/Narrative of Incident** |
| *Please replace text in italics with brief description, noting for example:*   1. *What is the incident?* 2. *What were the conditions or circumstances under which the incident occurred (if known)?* 3. *Are the basic facts of the incident clear and uncontested, or are there conflicting versions? What are those versions?* 4. *Is the incident still ongoing or is it contained?* 5. *Have any relevant authorities been informed?* |

|  |  |  |  |
| --- | --- | --- | --- |
| **B4: Actions taken to contain the incident** | | | |
| **Short Description of Action** | **Responsible Party** | **Expected Date** | **Status** |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
| **For incidents involving a contractor:** Have the works been suspended (for example, under GCC8.9 of Works Contract)? Yes ☐; No ☐; Trading name of Contractor (if different from B1):  Please attach a copy of the instruction suspending the works. | | | |

|  |
| --- |
| **B5: What support has been provided to affected people** |
|  |

**Annex 1: Incident Types**

The following are incident types to be reported using the environmental and social incident response process:

**Fatality**: Death of a person(s) that occurs within one year of an accident/incident, including from occupational disease/illness (e.g., from exposure to chemicals/toxins).

**Lost Time Injury**: Injury or occupational disease/illness (e.g., from exposure to chemicals/toxins) that results in a worker requiring 3 or more days off work, or an injury or release of substance (e.g., chemicals/toxins) that results in a member of the community needing medical treatment.

**Acts of Violence/Protest**: Any intentional use of physical force, threatened or actual, against oneself, another person, or against a group or community, that either results in or has a high likelihood of resulting in injury, death, psychological harm, deprivation to workers or project beneficiaries, or negatively affects the safe operation of a project worksite.

**Disease Outbreaks**: The occurrence of a disease in excess of normal expectancy of number of cases. Disease may be communicable or may be the result of unknown etiology.

**Displacement Without Due Process:** The permanent or temporary displacement against the will of individuals, families, and/or communities from the homes and/or land which they occupy without the provision of, and access to, appropriate forms of legal and other protection and/or in a manner that does not comply with an approved resettlement action plan.

**Child Labor:** An incident of child labor occurs: (i) when a child under the age of 14 (or a higher age for employment specified by national law) is employed or engaged in connection with a project, and/or (ii) when a child over the minimum age specified in (i) and under the age of 18 is employed or engaged in connection with a project in a manner that is likely to be hazardous or interfere with the child’s education or be harmful to the child’s health or physical, mental, spiritual, moral or social development.

**Forced Labor**: An incident of forced labor occurs when any work or service not voluntarily performed is exacted from an individual under threat of force or penalty in connection with a project, including any kind of involuntary or compulsory labor, such as indentured labor, bonded labor, or similar labor-contracting arrangements. This also includes incidents when trafficked persons are employed in connection with a project.

**Environmental pollution incident**: Exceedances of emission standards to land, water, or air (e.g., from chemicals/toxins) that have persisted for more than 24 hours or have resulted in harm to the environment.

**Other**: Any other incident or accident that may have a significant adverse effect on the environment, the affected communities, the public, or the workers, irrespective of whether harm had occurred on that occasion. Any repeated non-compliance or recurrent minor incidents which suggest systematic failures that the task team deems needing the attention of Bank management.

# Appendix 8: Guidelines for Treatment and disposal methods for categories of health care waste

|  |  |
| --- | --- |
| **Treatment and disposal methods for categories of health care waste** | |
| **Type of waste** | **Summary of treatment and disposal options / notes** |
| **Infectious waste:** Includes waste suspected to contain pathogens (e.g. bacteria, viruses, parasites, or fungi) in sufficient concentration or quantity  to cause disease in susceptible hosts. Includes pathological and anatomical material (e.g. tissues, organs, body parts, human fetuses, animal carcasses, blood, and other body fluids), clothes, dressings, equipment / instruments, and other items that may have come into contact with infectious materials. | **Waste Segregation Strategy**: Yellow or red colored bag / container marked “infectious” with international infectious symbol. Strong, leak proof plastic bag, or container capable of being autoclaved.    **Treatment**: Chemical disinfection; Safe burial on hospital premises; Sanitary landfill; Incineration)   * Highly infectious waste, such as cultures from lab work, should be sterilized using wet thermal treatment, such as autoclaving. * **Anatomical waste** should be treated using Incineration |
| **Sharps:** Includes needles, scalpels, blades, knives, infusion sets, saws, broken glass, and nails etc. | **Waste Segregation Strategy**: Yellow or red color code marked “Sharps”. Rigid, impermeable, puncture-proof container (e.g. steel or hard plastic) with cover. Sharps containers should be placed in a sealed, yellow bag labeled “infectious waste”.    **Treatment**: Chemical disinfection; Microwave irradiation; Safe burial on hospital premises; Incineration • Following incineration, residues should be landfilled.   * Sharps disinfected with chlorinated solutions should not be incinerated due to risk of generating POPs. |
| **Pharmaceutical waste:** Includes expired, unused, spoiled, and contaminated pharmaceutical products, drugs, vaccines, and sera that are no longer needed, including containers and other potentially contaminated materials (e.g. drug bottles vials, tubing etc.). | **Waste Segregation Strategy**: Black bag / container. Leak-proof plastic bag or container.  **Treatment**: Sanitary landfill; Discharge to sewer; Return expired drugs to supplier; Incineration  Safe burial on hospital premises as a last resort.   * Small quantities: Landfill disposal acceptable, however cytotoxic and narcotic drugs should not be landfilled. Discharge to sewer only for mild, liquid pharmaceuticals, not antibiotics or cytotoxic drugs, and into a large water flow. Incineration acceptable, provided pharmaceuticals do not exceed 1 percent of total waste to avoid hazardous air emissions. Intravenous fluids (e.g. salts, amino acids) should be landfilled or discharged to sewer. Ampoules should be crushed and disposed of with sharps. * Large quantities: Incineration at temperatures exceeding 1200 °C. Landfilling not recommended unless encapsulated in metal drums and groundwater contamination risk is minimal. |
| **Genotoxic / cytotoxic waste:** Genotoxic waste may have mutagenic, teratogenic, or carcinogenic properties, and typically arises from the feces, urine, and vomit of patients receiving cytostatic drugs, and from treatment with chemicals and radioactive materials. Cytotoxic drugs are commonly used in oncology and radiology departments as part of cancer treatments. | **Waste Segregation Strategy:** See above for “infectious waste”. Cytotoxic waste should be labeled “Cytotoxic waste”.  **Treatment**: Return expired drugs to supplier; Chemical degradation; Encapsulation; Inertization; Incineration  • Cytotoxic waste should not be landfilled or discharged to sewer systems.   * Incineration is preferred disposal option. Waste should be returned to supplier where incineration is not an option. Incineration should be undertaken at specific temperatures and time specifications for particular drugs. Most municipal or single chamber incinerators are not adequate for cytotoxic waste disposal. Open burning of waste is not acceptable. * Chemical degradation may be used for certain cytotoxic drugs – See Pruss et al. (1999) Annex 2 for details. * Encapsulation and inertization should be a last resort waste disposal option. |
| **Chemical waste:** Waste may be hazardous depending on the toxic, corrosive, flammable, reactive, and genotoxic properties. Chemical waste may be in solid, liquid, or gaseous form and is generated through use of chemicals during diagnostic / experimental work, cleaning, housekeeping, and disinfection. Chemicals typically include formaldehyde, photographic chemicals, halogenated and nonhalogenated solventsd, organic chemicals for cleaning / disinfecting, and various inorganic chemicals (e.g. acids and alkalis). | **Waste Segregation Strategy**: Black bag / container. Leak-proof plastic bag or container resistant to chemical corrosion effects.  **Treatment**: Return unused chemicals to supplier; Safe burial on hospital premises; Incineration  • Facilities should have permits for disposal of general chemical waste (e.g. sugars, amino acids, salts) to sewer systems.   * Small hazardous quantities: Pyrolytic incineration, or landfilling.   Large hazardous quantities: Transported to appropriate facilities for disposal, or returned to the original supplier using shipping arrangements that abide by the Basel Convention. Large quantities of chemical waste should not be encapsulated or landfilled. |
| **Radioactive waste:** Includes solid, liquid, and gaseous materials that have been contaminated with radionuclides. Radioactive waste originates from activities such as organ imaging, tumor localization, radiotherapy, and research / clinical laboratory procedures, among others, and may include glassware, syringes, solutions, and excreta from treated patients. | **Waste Segregation Strategy:** Lead box, labeled with the radioactive symbol.  **Treatment**: Radioactive waste should be managed according to national requirements and current guidelines from the International Atomic Energy Agency. IAEA (2003). Management of Waste from the Use of Radioactive Materials in Medicine, Industry and Research. IAEA Draft Safety Guide DS 160, 7 February 2003. |
| **Waste with high content of heavy metals:** Batteries, broken thermometers, blood pressure gauges, (e.g. mercury and cadmium content). | **Waste Segregation Strategy:** Waste containing heavy metals should be separated from general health care waste.  **Treatment**: Safe storage site designed for final disposal of hazardous waste.  • Waste should not be burned, incinerated, or landfilled. Transport to specialized facilities for metal recovery. |
| **Pressurized containers:** Includescontainers / cartridges / cylinders for nitrous oxide, ethylene oxide, oxygen, nitrogen, carbon dioxide, compressed air and other gases. | **Waste Segregation Strategy:** Pressurized containers should be separated from general health care waste.    **Treatment**: Recycling and reuse; Crushing followed by landfill   * Incineration is not an option due to explosion risks   Halogenated agents in liquid form should be disposed of as chemical waste, as above. |
| **General health care waste** (including food waste and paper, plastics, cardboard)**:** | **Waste Segregation Strategy**: Black bag / container. Halogenated plastics such as PVC should be separated from general health care facility waste to avoid disposal through incineration and associated hazardous air emissions from exhaust gases (e.g. hydrochloric acids and dioxins).    **Treatment:** Disposal as part of domestic waste. Food waste should be segregated and composted. Component wastes (e.g. paper, cardboard, recyclable plastics [PET, PE, PP], glass) should be segregated and sent for recycling. |
| **Source**: Safe Management of Wastes from Health-Care Activities. International Labor Organization (ILO), Eds. Pruss, A. Giroult, and P. Rushbrook (1999) **Notes:**   1. Small quantities only 2. Low-level infectious waste only 3. Low-level liquid waste only 4. Halogenated and nonhalogenated solvents (e.g. chloroform, TCE, acetone, methanol) are usually a laboratory-related waste stream for fixation and preservation of specimens in histology / pathology and for extractions in labs.   Note on incinerators. Pyrolytic and rotary kiln incinerators should be used. Use of single-chamber and drum / brick incinerators are not normally considered good practice, except in emergency situations as a last option. | |

Source: IFC/WBG (2007), Environmental, Health, and Safety Guidelines for Health Care Facilities.

# **Appendix 9: Monitoring Plan for the Operation & Maintenance (O&M) Environmental, Health, and Safety (EHS) Management System for Mzuzu Central Hospital Pediatric OPD and Emergency sections construction Project**

**Introduction**

A comprehensive monitoring plan is essential to ensure the Environmental, Health, and Safety (EHS) standards are upheld throughout the operational phase of the Mzuzu Central Hospital Pediatric OPD and Emergency sections Project. This monitoring plan will help identify potential issues related to environmental impacts, public health, and worker safety and provide guidelines for corrective actions. The following monitoring aspects and procedures are crucial:

**1. Water Quality and Wastewater Monitoring**

**Objective**: Ensure that water used at the hospital during construction works and discharged into the environment meets the required quality standards to protect human health and the environment.

**Monitoring Aspects:**

* Discharge Water Quality (from construction effluent and effluent at operation phase)

**Parameters to Monitor:**

* pH Level
* Total Suspended Solids (TSS)
* Chemical Oxygen Demand (COD)
* Biological Oxygen Demand (BOD)
* Ammonia (NH₃)
* Nitrates (NO₃)
* Heavy Metals (Lead, Mercury, Cadmium)
* Coliform Bacteria (E. Coli)
* Turbidity

**Monitoring Frequency:**

* **Water Discharge (weekly)** for all short-term contaminants except heavy metals
* **Quarterly**: For heavy metals and other long-term contaminants.
* Ensure that there is a valid permit for discharge of wastewater
* Keep records of wastewater monitoring results

**Method of Monitoring:**

* Use of **portable water testing kits** or **laboratory testing** for more complex analysis.
* **Routine sampling** at designated points within the hospital (inlet and discharge).

**2. Solid Waste Generation Monitoring**

**Objective**: Track and manage and keep records the generation of solid waste to ensure compliance with national waste management regulations and hospital-specific waste handling procedures.

**Monitoring Aspects:**

* Total Solid Waste Generation
* Waste Segregation Efficiency
* Waste Disposal Practices
* Waste incineration practices

**Parameters to Monitor:**

* Volume of Waste (measured by weight or volume)
* Waste Segregation Ratio (percentage of waste segregated into categories: recyclable, non-recyclable, hazardous, organic)
* Types of Waste (general, recyclables, hazardous, medical waste).

**Monitoring Frequency:**

* Weekly: Total waste generated.
* Monthly: Segregation efficiency.
* Quarterly: Review of waste disposal records and compliance with disposal guidelines.

**Method of Monitoring:**

* Manual tracking via waste logs or electronic records.
* Waste audits to track segregation and recycling rates.
* Monthly waste weighing at designated collection points.

**3. Hazardous Waste Generation Monitoring**

**Objective**: Monitor the generation and proper handling of hazardous waste to prevent its associated risks and ensure health safety.

**Monitoring Aspects:**

* Hazardous Waste Generation
* Handling & Storage Compliance
* Disposal Methods

**Parameters to Monitor:**

* Weight/Volume of Medical Waste (categorized into infectious, sharps, pharmaceutical, and non-infectious)
* Segregation Accuracy (separate infectious, sharps, and pharmaceutical waste)
* Proper Labeling and Packaging Compliance

**Monitoring Frequency:**

* Daily: Monitoring collection bins for medical waste segregation and volume.
* Weekly: Inspection of hazardous waste storage areas for safety and compliance.
* Monthly: Review of disposal records and disposal.

**Method of Monitoring:**

* Manual tracking using waste management records.
* Regular inspections of hazardous waste storage and disposal systems.
* Documentation of incinerator/ waste collection by competent authority logs and disposal receipts.

**4. Emissions Monitoring**

**Objective**: Ensure proper project implementation and monitor emissions to ensure compliance with health and environmental standards.

**Monitoring Aspects:**

* Emissions Monitoring of incinerator facility of the hospital and dust around the surroundings

**Parameters to Monitor:**

* Emissions (e.g., CO, NOₓ, SO₂, particulate matter, dioxins/furans) from incinerator
* Dust and Residual Ash (volume and handling and final disposal)

**Monitoring Frequency:**

* Monthly: Emissions testing for gases and particulate matter.

**Method of Monitoring:**

* Continuous monitoring of emissions (if available).
* Laboratory testing for dioxins/furans and other pollutants at exhaust outlets.

**5. Air Quality Monitoring**

**Objective**: Ensure that air quality within the hospital and surrounding areas meets regulatory and health standards, particularly to reduce exposure to harmful emissions.

**Monitoring Aspects:**

* **Indoor Air Quality** (hospital zones such as patient rooms, operating rooms)
* **Ambient Air Quality** (surrounding area)

**Parameters to Monitor:**

* Particulate Matter (PM10, PM2.5)
* Carbon Monoxide (CO)
* Nitrogen Dioxide (NO₂)
* Sulfur Dioxide (SO₂)
* Ozone (O₃)

**Monitoring Frequency:**

* **Weekly**: For indoor air quality in patient rooms and other sensitive areas.
* **Monthly**: For ambient air quality surrounding the hospital.

**Method of Monitoring:**

* **Air Quality Monitors** (fixed or portable for particulate matter and gases).
* **Grab sampling** and analysis by accredited laboratories.

**6. Worker Occupational Health & Safety (OHS) Monitoring**

**Objective**: Ensure worker health and safety by monitoring workplace conditions, particularly during the rehabilitation, operation, and maintenance phases.

**Monitoring Aspects:**

* Workplace Hazard Identification
* Personal Protective Equipment (PPE) Compliance
* Occupational Health Monitoring

**Parameters to Monitor:**

* Noise Levels (particularly in high-risk areas like the incinerator or construction zones)
* Airborne Contaminants (e.g., dust, vapors)
* Exposure to Hazardous Substances
* Workplace Accidents & Injuries

**Monitoring Frequency:**

* Daily: Workplace inspections to ensure adherence to OHS guidelines.
* Monthly: Review of accident and injury reports.

**Method of Monitoring:**

* Workplace safety audits and inspections.
* Noise level measurements using sound meters.
* Health and safety training sessions and PPE checks.

**Conclusion and Reporting**

* **Data Recording and Reporting**: All data from the monitoring activities must be recorded and reports should be submitted to SE monthly or quarterly.
* **Corrective Action**: Based on monitoring results, corrective actions should be implemented if any EHS standards are not met. The monitoring results will also serve as the basis for continuous improvement initiatives.
* **Stakeholder Engagement**: Regularly update stakeholders, including regulatory bodies, hospital staff, and local communities, on environmental and health performance.