ጤና ሚኒስቴር - ኢትዮጵያ
MINISTRY OF HEALTH-ETHIOPIA
የዜጎች ጤና ለሃገር ብልጽግና!
HEALTHIER CITIZENS FOR PROSPEROUS NATION!

Environmental and Social Management Plan (ESMP)
For
Construction and Renovation of AHARI Animal House, Bioequivalence and Incubation Centers

Health Emergency Preparedness, Response and Resilience Project (P180127)

Proponent: The Ethiopian Ministry of Heath with financial support of World Bank Group

Submitted to: Ethiopian Environmental Protection Authority

September, 2025

Addis Ababa, Ethiopia

Table of Contents

List of Abbreviations

AAEPA	Addis Ababa Environmental Protection Authority
AHRI	Armauer Hansen Research Institute
CoC	Code of Conduct
E&S	Environment and Social
EFDA	Ethiopian Food and Drug Authority
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESS	Environment and Social Standard
GBV	Gender-based violence
GM	Grant Management
GRM	Grievance Redress Mechanism
GTP	Growth and Transformation Plan
HEPRR	Health Emergency Preparedness, Response and Resilience
MoH	Ministry of Health
OHS	Occupational Health and Safety
PMU	Project Management Unit
PPE	Personal protective equipment
SEA	Sexual Exploitation and Abuse
SH	Sexual Harassment
WHO	World Health Organization

Executive Summary

This Environmental and Social Management Plan (ESMP) outlines the strategies and measures to prevent, minimize, mitigate, and manage potential environmental and social impacts associated with the construction of an Animal House and the renovation of a Bioequivalence Center and an Incubation Center within the Armauer Hansen Research Institute (AHRI) premises in Addis Ababa, Ethiopia. The project aims to enhance research capabilities, improve animal welfare, facilitate local pharmaceutical development, and foster innovation and commercialization of research outputs. This ESMP addresses potential impacts during both the construction and operation phases, ensuring compliance with relevant national policies, legal frameworks, and international best practices. Key areas of focus include waste management, occupational health and safety, community engagement, and environmental monitoring. The ESMP details institutional responsibilities, grievance redress mechanisms, and estimated costs for effective implementation and monitoring.

1. Introduction

Ethiopia is Africa's second-most populous country with a population of more than 126.5 million in 2023 (https://www.worldbank.org/en/country/ethiopia/overview). The COVID-19 pandemic, civil conflict and climate shocks including drought have severely impacted the wellbeing of Ethiopia's people. The shocks have exposed the continuous weaknesses of the health system to adjust it in responding to the shock while continuing the delivery of essential health services. This project will support impact full interventions at national and sub-national levels that could strongly leads to enhanced coordination among sectors at different level of government for improved HEPRR capacity and supports cross border collaboration with neighboring countries such as Sudan, South Sudan, Djibouti, Kenya, and Eritrea. The HEPRR Project is allocated with a total budget of 195 million USD which will be financed by the IDA. Among the project implementing institutes, the Armauer Hansen Research Institute (AHRI) is government biomedical research and development (R&D) institute established in 1977. The Institute has a network of national and international collaborators in peer reviewed grant projects, clinical trial partnerships, capacity building activities and long-term trainings and responsible to support eventual end-to-end manufacturing capabilities for vaccines and other biopharmaceuticals.

To attain the project aims, AHRI is undertaking crucial sub-projects involving the construction of Animal House block and the renovation of existing facilities to establish a state-of-the-art Bioequivalence Center and an Incubation Center. These developments are vital for advancing biomedical research, supporting the local pharmaceutical industry, and fostering innovation in Ethiopia and the wider African continent. Recognizing the potential environmental and social implications of such sub-project, this ESMP has been prepared to meet the requirements outlined in the ESMF for HEPRR Project. According to the environmental and social screening report for the Animal House construction and Bioequivalence and incubations centers renovation sub-projects are not expected to cause any land related impacts and the project's design and operational protocols are built upon WHO laboratory and medical regulation standards. The project`s environmental and social impacts are more likely to align with construction phase and are expected to be manageable. Therefore, the environmental and social risks of the project are categorized as Moderate and scheduled 2, requiring environmental and social management plan (ESMP) for the project. This ESMP is therefore prepared according to the E&S screening recommendation to ensure that all activities are conducted in an environmentally sound and socially responsible manner.

1.1. Objectives of the ESMP

1.1.1. General objective

The general objective of this ESMP is to identify and provide a framework for the effective management of environmental and social issues throughout the construction and operation phases of the Animal House building, Bioequivalence Center, and Incubation Center project at AHRI, thereby minimizing adverse impacts and enhancing positive outcomes.

1.1.2. Specific objectives

- To identify potential environmental and social impacts (both positive and negative) associated with the project activities.
- To propose feasible and cost-effective mitigation measures for identified adverse impacts.
- To ensure that the project comply with national environmental policies, legislation, and the World Bank's ESSs;
- To outline an environmental and social management and monitoring plan to track the effectiveness of mitigation measures.

- To define roles and responsibilities for the implementation and monitoring of the ESMP.
- To establish a clear grievance redress mechanism for addressing community and stakeholder concerns.
- To ensure compliance with relevant national environmental and social policies, legislation, and international best practices.
- To estimate the financial resources required for the effective implementation of the ESMP.

1.2. Scope of the ESMP

This ESMP addresses all phases of the project, from the design, which will integrate environmental and social considerations, through all construction activities including site preparation, the building of the Animal House, and the renovation of both the Bioequivalence and Incubation Centers. Furthermore, it encompasses the entirety of the operation phase, covering all day-to-day functions of the Animal House, Bioequivalence Center, and Incubation Center. The geographic scope of this ESMP is strictly limited to the existing AHRI premises where all project activities will be carried out.

1.3. Description of the Project

As part of its significant commitment to advancing biomedical research and pharmaceutical capabilities through the HEPRR Project, the Ministry of Health (MoH) is undertaking key developments at the AHRI premises. These initiatives, aligned with the HEPRR project sub-component 1.3, aim to support eventual end-to-end manufacturing capabilities for vaccines and other biopharmaceuticals. The planned activities include:

Animal House Renovation

This project involves renovating the existing big warehouse to repurpose for animal house facility that is crucial for enhancing the quality of animal-based biomedical and preclinical research. The facility will house various laboratory animals, such as mice, rats, rabbits, guinea pigs, and hamsters, under standardized conditions. This modernization will ensure optimal animal welfare and provide a stable environment essential for reproducible studies. By upgrading AHRI's currently antiquated animal breeding and housing systems, the project will significantly boost its capacity to supply high-quality laboratory animals to various research institutions, universities, and organizations across Ethiopia. Proper training for

personnel in animal care and research methodologies will be a core focus during the operational phase to maintain these high standards and no creation of transgenic animals in the scope of this.

Bioequivalence and Clinical Trial Center Renovation

This component focuses on renovating existing dedicated spaces within AHRI's recently constructed AHRI research infrastructure (building 2B+G+6) to establish a cutting-edge Bioequivalence (BE) and Clinical Trial (CT) study center. This facility will be located on the first floor of the AHRI Research Institute building Ethiopia currently lacks the necessary infrastructure for conducting BE studies, which forces pharmaceutical companies to rely on costly and time-consuming overseas facilities and delays the approval of locally produced generic medicines. The renovation will include acquiring advanced equipment and materials, ensuring optimal lighting, ventilation, and safety for participants, and efficiently optimizing space for personnel and activities. Furthermore, the renovation will integrate modern data management systems and Contract Research Organization (CRO) functions to streamline study processes and enhance regulatory compliance, ultimately bolstering the local pharmaceutical sector and enabling high-quality BE studies that meet global standards. It is important to note that during the operation of the BE and clinical trial centers, there will be no handling of genetic information, sale of genetic materials, or the creation of transgenic animals.

Incubation Center Renovation

This involves renovating existing space at AHRI to establish a functional In-Vitro Diagnostics (IVD) Incubation Center. This center is designed to support entrepreneurs and innovators, especially during the early stages of business development. It will provide essential resources such as co-working spaces, laboratory facilities, technological support, entrepreneurial skills training, and initial growth funds. The Incubation Center will be instrumental in commercializing research outputs from AHRI and other institutions, thereby fostering innovation, improving accuracy in diagnostics, and accelerating the development and implementation of new diagnostic assays for enhanced patient care. The establishment of this center directly supports Ethiopia's national science, technology, and innovation policy, which prioritizes building competitiveness through innovation, creating job opportunities, and catalyzing investment.

Laundry Block Construction

This involves the construction of new block to ensure that the block meet the necessary specifications for the newly acquired equipment, guaranteeing their safe installation and smooth functioning. Health research institutes must ensure that not only their research facilities but also their linen and clothing meet the highest standards of cleanliness. Achieving this necessitates a deep understanding of laundry concepts, equipment, and processes specifically tailored to the healthcare industry.

2. Policy, Legal and Institutional Framework of Environmental and Social Management

The construction of the Animal House and renovation of the Bioequivalence and Incubation Centers at AHRI are governed by a robust framework of national policies, legislation, and international standards, ensuring the project's adherence to environmental protection, public health, and social well-being.

2.1. The National Constitute and Legal Environmental and Social Policy

Ethiopia's commitment to sustainable development is deeply rooted in its legal and policy landscape:

- **The Constitution (1995):** Serves as the foundational document, embedding principles of **sustainable development** and **environmental rights**. Articles 43, 44, and 92 guarantee citizens' right to development and a clean, healthy environment, emphasizing that development projects must not harm the environment and requiring public consultation on policies and projects directly affecting communities. Furthermore, Article 40 declares **land and natural resources as common property**, protecting farmers' and pastoralists' access. Article 42 (Rights of Labor) mandates a **healthy and safe work environment**, obliging employers to implement necessary protective measures. Regional state constitutions echo these federal principles, stressing local governance over natural resources and environmental protection, alongside public consultation.
- **Environmental Policy of Ethiopia (1997):** This comprehensive policy aims to guide sustainable socio-economic development by conserving and utilizing natural, man-made, and cultural resources responsibly. It underscores the critical role of **Environmental Impact Assessment (EIA)** in considering human and natural environmental impacts, ensuring early integration into project design, mandating

public consultation, including mitigation and contingency plans, and requiring auditing and monitoring as legally binding elements.

- **Public Health Policy (1998) & Health Sector Development Programs (HSDP I-IV, 1997-2015):** These frameworks prioritize improving healthcare through democratization, decentralization, disease prevention, and ensuring accessibility. They emphasize **occupational health and safety** and the **development of environmental health**, relevant for managing health risks associated with the new facilities. The HSDPs, including the Health Extension Program (HEP), focused on expanding Primary Health Care (PHC) and addressed vulnerable groups, influencing the broader health context within which AHRI operates.
- **Health Sector Transformation Plan I & II (HSTP, 2015-2025):** Continuing the progress of HSDPs, HSTP I and II emphasize quality, equity, universal health coverage, and transformation across health service delivery, quality improvement, leadership, and health system capacity. HSTP II specifically enhances public health emergency management, health information systems, evidence-informed decision-making and regulatory systems, all directly relevant to the advanced research and diagnostic capabilities of the new AHRI centers.
- **FDRE National Occupational Safety and Health Policy and Strategy (2014):** This policy, mandated by Article 42(2) of the Constitution and international conventions (ILO No. 155), aims to prevent and minimize occupational hazards across all workplaces. It establishes that OSH services are basic worker rights, preventable, and require tripartite (government, employers, workers) and bipartite (employers, workers) cooperation. This is directly applicable to ensuring a safe working environment during both the construction and operation of the AHRI facilities.

2.2. Applicable Proclamations, Regulations, and Procedural Guidelines

Several proclamations and guidelines provide specific legal backing for this environmental and social management:

- **Environmental Impact Assessment Proclamation No. 299/2002:** This makes EIA mandatory for specific projects, serving as a critical tool for integrating environmental, economic, social, and cultural considerations into planning, ensuring transparency, public involvement, and mitigation of adverse impacts.

- **Environmental Pollution Control Proclamation No. 300/2002:** This aims to eliminate or mitigate pollution from development activities, protecting human health, biota, and environmental aesthetics. It covers pollution control, hazardous waste, chemical and radioactive substances, and municipal waste management.
- **Solid Waste Proclamation No. 513/2007:** Promotes community participation in solid waste management, requiring urban local governments to prepare action plans.
- **Hazardous Waste Management and Disposal Control Proclamation No. 1090/2018:** A recent and crucial legislation specifically addressing hazardous wastes. It aims to create a system for environmentally sound management and disposal, preventing harm to human and animal health, the environment, and biodiversity by controlling generation, storage, treatment, recycling, reuse, transportation, and disposal.
- **Food and Medicine Administration Proclamation No. 1112/2019:** This establishes a national legal framework for regulating food, medicine, medical devices, and other products. It sets stringent requirements for manufacturing, import, export, storage, and disposal, particularly emphasizing product quality, safety, efficacy, and Good Manufacturing Practices (GMP). Crucially, it mandates the safe disposal of expired, unusable, or unfit products without environmental contamination, with costs borne by the owner. This is directly applicable to the Bioequivalence and Incubation Centers' handling of pharmaceuticals and diagnostics.
- **Medicinal Waste Management and Disposal Directive (2011) & Guideline for Waste Handling and Disposal in Health Facilities (2006):** These provide specific guidance on the disposal of medicinal waste and overall waste handling in health facilities, protecting professionals from health hazards, raising awareness, and preventing environmental pollution.
- **Health and Safety Guidelines for Public Health Laboratories (2010):** Offers specific guidance on laboratory waste disinfection, handling, and disposal for public health laboratories.
- **Proclamation 1156/2019 - The Labor Law:** Repeals and updates previous labor laws, retaining key provisions while introducing improvements such as raising the minimum age for young workers to 15 and explicitly prohibiting sexual harassment or assault in the workplace to prevent Gender-Based Violence (GBV). Articles 92-93 outline employer and employee obligations regarding workplace safety, including the assignment of safety officers and the establishment of OSH committees, ensuring the

provision of protective equipment and proper hazard instruction. Ethiopia's ratification of numerous ILO conventions (including those on Forced Labor, Freedom of Association, Minimum Age, and OSH) further reinforces these commitments.

- **Proclamation No. 568/2008 (Rights to employment for Persons with Disabilities):** Promotes equal opportunities for persons with disabilities, requiring employers to provide appropriate work environments and affirmative measures, especially for women with disabilities.

2.3. World Bank Environmental and Social Standards

The project, supported through Investment Project Financing, must adhere to the World Bank's Environmental and Social Standards (ESS), designed to manage project risks and impacts systematically and proportionally. The Environmental and Social Management Framework (ESMF) serves as the instrument to satisfy ESS1: Assessment and Management of Environmental and Social Risks and Impacts. This standard is highly relevant as the project involves activities that could lead to environmental and health risks if not properly managed, such as hazardous waste generation from sample collection and analysis, and EHS risks from the construction and operation of new facilities. The overall environmental and social risk rating for the HEPRR project, including this component, is classified as "Substantial," necessitating a robust ESMP to identify, avoid, and mitigate potential risks.

Furthermore, **ESS2:** Labor and Working Conditions is directly applicable, as the project will involve various categories of workers, including AHRI/MoH staff, direct project hires (consultants, management staff), and contractor workers for civil works and facility operations. Potential risks include occupational health and safety hazards (physical, chemical, biological), exposure to infectious diseases and wastes, and social risks like Sexual Exploitation and Abuse/Sexual Harassment (SEA/SH), forced labor, and child labor. A Labor Management Plan (LMP) prepared for HEPRR Project specifically addresses and mitigate these risks, ensuring a safe and fair working environment.

ESS3: Resource Efficiency and Pollution Prevention and Management is crucial for minimizing the environmental footprint by promoting efficient use of energy, water, and materials in design and operation. This involves designing energy-efficient buildings, implementing water-saving technologies, and rigorously managing various forms of pollution, including hazardous and non-hazardous waste (animal waste, biomedical,

chemical, and potentially radioactive substances), air emissions (dust during construction, lab ventilation), and noise. A comprehensive Waste Management Plan, including a Hazardous Waste Management Plan, is essential to ensure environmentally sound treatment and disposal of all waste streams, adhering to international best practices for hazardous material handling and storage.

Concurrently, **ESS4:** Community Health and Safety is vital due to the project's urban location. This standard requires identifying and mitigating potential risks to surrounding communities throughout the project lifecycle, from construction impacts like traffic, noise, and dust to operational hazards such as the potential release of hazardous materials or disease transmission. The project must ensure the structural and operational safety of the facilities, implement robust Emergency Preparedness and Response Plans for incidents like chemical spills or biological containment breaches, manage traffic effectively, and specifically implement strict biosafety protocols and waste management to prevent zoonotic diseases or laboratory-acquired infections from impacting the community. The safe management of hazardous materials, including their transportation and disposal, is a critical shared concern between ESS3 and ESS4, ensuring no threat to public health.

2.4. Relevant EHS Guidelines (World Bank Group) for the Project

2.4.1. EHS General Guidelines

The EHS general guideline section 1 to 4 provides guidance on prevention and control of Environmental, Occupational health and safety, community health and safety, as well as on construction and decommissioning impacts that may occur during new restoration or modification of existing health care facilities. Section 1 of the guidelines covers air emission, wastewater quality, water and energy conservation, and hazardous material management. As some of the HEPRR subprojects consist of civil works, which will involve manual labor work activities, Section 2.0 of the EHS general guidance provides some appropriate strategies and recommendations useful to minimize occupational health and safety hazards. It describes the sources of hazards and recommended strategies for the prevention of risks associated with over-exertion, slips and falls, work in heights, struck by objects, and working in confined spaces and excavations in construction and decommissioning sites. Also, community health and safety aspects such as fire safety, traffic safety, transport of hazardous materials, and disease prevention are covered under Section 3 of the guidelines.

2.4.2. EHS Guidelines for Health Care Facilities (2007)

The EHS Guidelines for Health Care Facilities provide information relevant to the management of EHS issues associated with health care facilities (HCF) which includes a diverse range of facilities and activities involving general hospitals and small inpatient primary care hospitals. Ancillary activities may include medical laboratories and research facilities and blood banks and collection services. The guideline addresses waste management (including waste minimization, reuse, and recycling; waste segregation strategies; on-site handling, collection, transport and storage; transport to external facilities; and treatment and disposal options), air emissions, and wastewater discharges from HCFs as well as Occupational Health and Safety aspects for health workers and community health and safety issues. These are reviewed and applied in this ESMF as appropriate. The guideline also provides performance indicators and benchmarks on environmental performance (including emission and effluents guidelines, environmental monitoring, resources consumption, energy use, and waste generation).

2.4.3. EHS Guidelines for Pharmaceutical and Biotechnology Manufacturing (2007)

The EHS Guidelines for Pharmaceuticals and Biotechnology Manufacturing provide information relevant to pharmaceuticals and biotechnology manufacturing facilities. They cover the production of active pharmaceutical ingredients and secondary processing, including intermediates, formulation, blending, and packaging, and related activities research, including biotechnology research and production. The guideline provides industry-specific impacts and management recommendations. Potential environmental issues associated with pharmaceutical and biotechnology manufacturing projects covered include air emission, wastewater, solid and hazardous wastes, hazardous materials, threats to biodiversity, and bioethics. Also, the guideline provides facility-specific occupational health and safety hazards during construction and operation periods. Hazards covered during operation period include heat hazards, chemical hazards including fire and explosion hazards, noise, and process safety. Further, the guideline covers community health and safety issues in pharmaceutical and biotechnology industry. The guideline provides performance indicators and monitoring recommendations. These are also reviewed and applied in this ESMF as appropriate.

2.5. WHO Guidelines for laboratories, biosafety, and biomedical waste management

- The renovation of the BE and Incubation Centers will adhere to WHO biosafety guidelines for laboratory design, ensuring appropriate containment levels, ventilation

systems (e.g., laminar flow hoods, negative pressure rooms where necessary), decontamination facilities, and restricted access areas. This minimizes the risk of exposure to biological agents and hazardous chemicals.

- WHO guidelines will dictate the establishment of comprehensive biosafety protocols for handling, processing, and storing biological samples, reagents, and diagnostic kits within both centers. This includes detailed procedures for spill management, disinfection, and personal protective equipment (PPE) use.
- A critical aspect will be the development and implementation of a rigorous biomedical waste management plan in line with WHO guidelines, complementing Ethiopia's *Medicinal Waste Management and Disposal Directive (2011)* and *Guideline for Waste Handling and Disposal in Health Facilities (2006)*. This plan will cover the segregation, collection, storage, transport, treatment (e.g., autoclaving, incineration protocols), and environmentally sound disposal of all waste generated by the centers, specifically addressing potential infectious, chemical, and pharmaceutical waste streams.
- Adherence to these guidelines directly contributes to ESS4 (Community Health and Safety) by preventing the release of hazardous substances or infectious agents that could impact surrounding communities.

2.6. Good Laboratory Practice (GLP) and Good Clinical Practice (GCP) Guidelines

Bioequivalence Center:

- **GCP:** This is paramount for the BE Center, as it conducts clinical trials involving human subjects. GCP will govern every aspect of the BE studies, including informed consent processes, ethical review board (IRB/EC) approval, participant recruitment and monitoring, clinical sample collection, data recording, safety reporting, and overall study conduct. Adherence ensures the rights, safety, and well-being of volunteers, and the integrity and reliability of the clinical data. The EFDA has its own *Guideline for Bioequivalence Studies (EFDA/GDL/061)* and *Bioequivalence Center and Bioanalytical Laboratory Control Directive (Directive Number 1043/2025)*, which are explicitly aligned with GCP and GLP principles.
- **GLP:** Essential for the analytical phase of BE studies (e.g., measuring drug concentrations in biological samples). GLP will ensure the quality and integrity of all

non-clinical laboratory data generated, covering aspects like instrument calibration, reagent quality, sample stability, data documentation, and archiving.

Incubation Center:

- GLP: For the development and validation of In-Vitro Diagnostics (IVDs), GLP principles will be applied to ensure the quality and reliability of laboratory studies during product development and testing. This ensures that the diagnostic assays developed are robust, accurate, and meet regulatory standards, supporting their eventual commercialization.

3. Baseline Information of AHRI Animal House, BE & IC

3.1. Waste Management

Hazardous wastes: The hazardous waste generated during Clinical trial and Bioequivalence laboratory and animal house operation will be treated on site of collection or generated using the methods of autoclaving and chemical disinfection.

Non-Hazardous Waste: This waste will be disposed of similarly to domestic in municipal waste collection.

Infectious Wastes: (Items contaminated with animal carcasses, sharps, biological waste, chemical waste, pharmaceutical waste, culture wastes, and other infectious wastes): These wastes will be autoclaved at a temperature of 121°C for at least 20 minutes at the source.

Liquid Waste (infectious & chemical wastes): Collected infectious liquids will be treated using 5% sodium hypochlorite (NaOCl –bleach). The liquid chemical waste will be diluted/ neutralized and disposed to the sewer with water to central treatment plant.

Sharps: (Needles; syringes; scalpels; blades; glass, etc.) all used sharps will be placed in specific cardboard boxes called safety boxes and incinerated preferably in an appropriate double-chamber (>850°C) incinerator. AHRI has a standard modern incinerator that has a capacity of 100kg/hour.

Final Solid waste management Option: After on-site treatment, solid wastes will be transported to the Ecosteryl treatment system, which is currently under construction within the AHRI/ALERT compound. Once completed, the Ecosteryl solid waste treatment facility

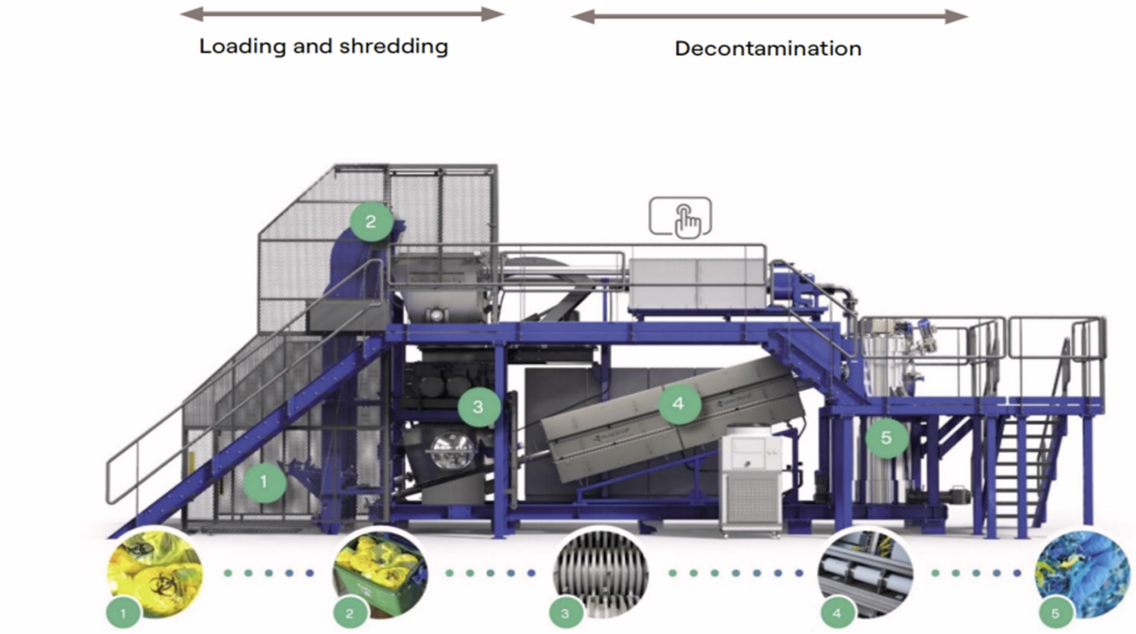
will have a total capacity of 500 kg/hr. This will be achieved through the operation of two Ecosteryl 250 units, each with a capacity of 250 kg/hr, and a single R-Steryl sorting system. This modern, eco-friendly solution for medical waste management integrates thermal treatment with mechanical processes. Unlike traditional incinerators, it operates at lower temperatures, which significantly reduces energy consumption and minimizes harmful emissions, thereby improving air quality and ensuring compliance with environmental regulations.

Ecosteryl 250 Treatment Process

The Ecosteryl 250 is a fully automated, continuous-flow system that uses a combination of shredding and microwave technology to effectively disinfect medical waste. The process follows these key steps:

1. **Weighing and Loading:**
    - Waste containers, such as wheelie bins, are placed on an automated loading system.
    - The system accurately records the weight of the loaded waste for tracking purposes.
    - An air treatment system is used in the loading hopper to create a vacuum, which prevents the release of dust and odors.
2. **Shredding:**
    - The waste is automatically fed into the machine's hopper.
    - A powerful, four-shaft industrial shredder reduces the waste volume by up to 80%.
    - A screen below the shredder ensures the processed waste is of a homogenous size (typically under 20mm in diameter).
    - The shredder is equipped with an anti-blocking device that automatically reverses the motors if a blockage occurs, ensuring continuous operation.
3. **Microwave Disinfection:**
    - The shredded waste is transferred via a spiral screw conveyor into a microwave heating tunnel.
    - The system utilizes patented "Box Beam" technology with multiple microwave generators to heat the waste to its core.
    - In less than three minutes, the waste reaches a temperature of approximately 100°C. An automated control system continuously monitors the temperature to ensure effective treatment.

4. **Holding and Disinfection:**
    - The heated waste is moved to a holding hopper or insulated screw conveyor where its temperature is maintained at around 100°C for approximately one hour.
    - This combination of time and temperature ensures a high level of disinfection, achieving a documented 6log10 reduction in microorganisms (99.9999% destruction).
5. **Final Output:**
    - At the end of the process, the treated waste exits the equipment.
    - The final product is dry, sterile, and unrecognizable, with a significantly reduced volume and weight, making it safe for handling and further processing.



1) **Weighing** (an automatic elevator device lifts the container and dumps it in the loading hopper)
2) **Loading** of medical waste (needles, cutters, sharps, plastics, ...)
3) **Shredding** (4 axes equipped with an anti-blocking system)
4) **Microwaves** (the waste is heated up to a temperature of 100°C (212°F) during 3 min)
5) **Decontamination** (the waste is maintained at 100°C (212°F) during 1 hour)

R-Steryl Sorting and Recycling Process

The R-Steryl system serves as an integral downstream component that complements the Ecosteryl machines. This system convert's decontaminated waste into a valuable resource, promoting a **circular economy**.

1. **Input from Ecosteryl:**
    - The dry, disinfected, and shredded waste from the Ecosteryl unit is automatically fed into the R-Steryl sorting center.
2. **Automated Sorting:**
    - The system uses advanced technologies like near-infrared (NIR) sensors and pneumatic and wind sifting to sort the waste.
    - These sensors identify different types of materials, primarily plastics and cardboard.
3. **Material Recovery:**
    - The sorted waste is separated into different fractions based on material type.
    - These recovered fractions, such as plastics, can be reprocessed and used as granules in the manufacturing industry. Other materials can be repurposed as refuse-derived fuel (RDF).
    - Any remaining, non-recoverable materials are separated for final disposal.

This proposed method ensures that all solid waste generated from AHRI's facilities is managed in an environmentally sound, safe, and sustainable manner, while also providing opportunities for resource recovery and recycling.

Backup Solid Waste Management Plan: Pyrolytic Incineration

As a crucial contingency measure, AHRI has installed a modern pyrolytic technology incinerator on-site. This system serves as a backup option for the Ecosteryl system, ensuring continuous and safe management of medical and pharmaceutical hazardous waste.

- Unlike traditional incinerators that use direct combustion, this system employs pyrolysis. This process involves heating waste at high temperatures (500°C–800°C) in a low-oxygen environment. This controlled thermal decomposition breaks down waste into a combustible gas and an inert solid residue (char), which minimizes the formation of toxic byproducts such as dioxins and furans.
- The system is equipped with advanced emission control mechanisms, including a secondary combustion chamber and a scrubbing system. This two-stage process ensures that any harmful gases are re-incinerated at higher temperatures (over

1,100°C) and then filtered, ensuring compliance with strict national and international emission standards.

- The incinerator has a treatment capacity of **100 kg/hr**, providing sufficient volume for managing waste during potential downtimes of the Ecosteryl system, or for specific waste types that may be better suited for incineration.
- The incinerator is specifically designed for the safe disposal of a wide range of hazardous medical and pharmaceutical wastes, including pathological waste, sharps, and expired medicines.

The installation of the pyrolytic incinerator is a vital component of AHRI's overall waste management strategy. It ensures operational resilience and provides a reliable solution for waste disposal, even in unforeseen circumstances. This dual-technology approach—combining the sustainable, resource-recovering Ecosteryl system with a high-efficiency, compliant pyrolytic incinerator—demonstrates a robust and comprehensive commitment to environmental stewardship and public health safety.

Fly Ash and Bottom Ash Management

The management of solid byproducts from the pyrolytic incinerator, specifically fly ash and bottom ash, is a critical component of AHRI's overall waste management strategy. These residues are considered hazardous and require careful handling and disposal to prevent environmental contamination.

Current Management Method: Secured Ash Pit

AHRI has established a secure, on-site concrete ash pit for the disposal of these incinerator byproducts. This pit is specifically designed to meet environmental safety standards and is currently in use.

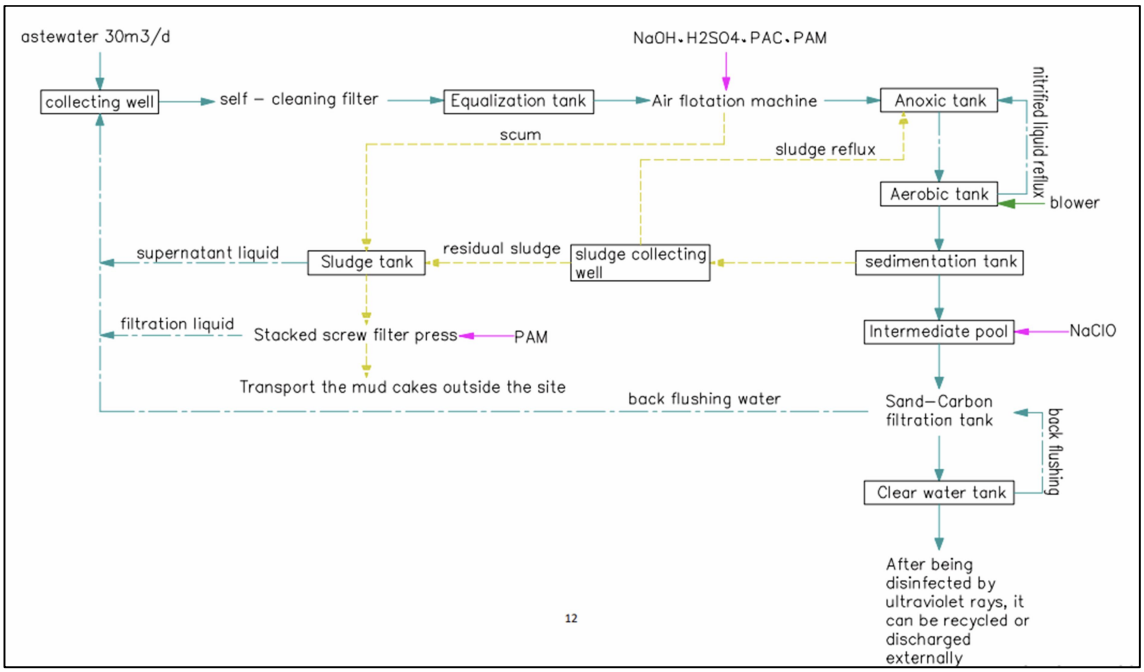
- During the design and construction of the ash pit, all necessary precautions were taken to prevent groundwater and soil contamination. The pit is fully sealed with a concrete lining, acting as a barrier to contain the ash and prevent the leaching of substances into the surrounding soil and water table.
- The ash pit is fully fenced to prevent unauthorized access by personnel, animals, or the public.

Final Liquid Waste Management: Following on-site primary treatment, all liquid wastes generated from the AHRI Animal House, Bioequivalence, and Clinical Trial Centers will be directed to a central wastewater treatment plant (WWTP). This state-of-the-art facility is currently in the procurement stage under the management of UNOPS.

The planned WWTP is designed to treat the diverse characteristics of liquid wastes generated by the proposed renovation and construction projects, including infectious, heavy metals, organic solvents, antibiotics and chemical reagents. Its final design is configured to meet and exceed the effluent discharge criteria set by the Ethiopian Environmental Protection Authority (EPA), the World Bank Group's Environmental, Health, and Safety (WBG EHS) Guidelines, and the World Health Organization (WHO).

The selected treatment process is a multi-stage system designed for high-efficiency purification and is detailed in the following process flow:

Grid Collection Well → Equalization Tank → Dissolved Air Flotation Machine → AO (MBBR) → Sedimentation Tank → Intermediate Tank → Sand Filtration/Carbon Filtration → Clear Water Tank → Ultraviolet Disinfection → Reuse.



AHRI Wastewater Treatment Plant Process Flow Diagram

Heavy metals treatment of the WWTP: In addition to on-site treatment in the centers, the central Wastewater Treatment Plant (WWTP) incorporates a robust pre-treatment process to manage heavy metals and suspended solids (SS) before the biochemical treatment stage. This process utilizes a three-grid reaction tank system followed by an air flotation unit.

Three-Grid Reaction Tanks

This initial stage is designed to precipitate heavy metals, prepare the wastewater for subsequent treatment, and handle fluctuations in water quality and quantity. The process within the tanks is as follows:

- **First Grid:** The pH of the wastewater is adjusted to 12 to effectively precipitate heavy metals.
- **Second Grid:** The pH is adjusted to 8.5, and polyaluminum chloride (PAC) is added to initiate coagulation.
- **Third Grid:** Polyacrylamide (PAM) is added to promote flocculation, forming larger, settleable particles from the suspended solids.

This three-stage process significantly reduces the SS content in the wastewater, provides preliminary reduction of Chemical Oxygen Demand (COD), and lowers the biological toxicity, thereby ensuring the wastewater is optimally prepared for the subsequent biochemical treatment.

Air Flotation Unit

Following the reaction tanks, the wastewater flows into the Air Flotation Unit. This physical-chemical treatment device is highly effective at removing suspended solids, as well as some pollutants like COD and heavy metals. Given the expected concentrations of heavy metals and SS in the influent, this unit will play a critical role in pollutant reduction.

The air flotation unit is a key component for ensuring the stable operation of the entire WWTP. Its design allows it to handle shock loads in water quality and quantity, providing a consistent and cleaner effluent for the biochemical treatment stage. The effluent flows by gravity to the anoxic tank, while the scum (the separated solids) flows by gravity to a sludge thickening tank for further processing.

Precipitated Heavy Metal Sludge Management procedures: Precipitated heavy metal sludge is characterized as a hazardous waste due to its toxicity (specifically the characteristic of toxicity, as confirmed by TCLP testing). Its management must focus on stabilization, strict containment, regulatory compliance, and minimizing environmental liability.

Phase 1: On-Site Preparation and Characterization

No.	Procedure	Details
1	Source Segregation	Ensure the sludge containing heavy metals is segregated at the source from all non-hazardous solid waste, non-hazardous sludge, and liquid effluents. Prevents contamination of non-hazardous streams, reducing overall disposal volume and cost.
2	Precipitation & Dewatering	The heavy metal solution must undergo a chemical precipitation process (pH adjustment, hydroxide, or sulfide precipitation) to convert soluble metals into insoluble solids. This is followed by a robust dewatering process to achieve a high-solids filter cake (typically >25% solids). The resulting material must be handled as a solid waste, not a liquid or semi-liquid. The liquid separated from the heavy metal solids (filter cake) during the dewatering stage will be collected in a dedicated, sealed holding tank. This collected filtrate will be sent back to the central Wastewater Treatment Plant system for further treatment.

3	Hazardous Waste Characterization	The final dewatered sludge must be tested using the Toxicity Characteristic Leaching Procedure (TCLP), as required internationally and typically referenced by national standards. This test confirms the heavy metal concentration and ensures the waste is correctly classified under the relevant Ethiopian regulations (Proclamation No. 1090/2018).
4	Containerization	The precipitated heavy metal sludge (filter cake) must be transferred immediately into appropriate, UN-rated, and corrosion-resistant containers (poly-lined steel drums or specialized industrial bags/totes). The sludge is usually handled as a solid cake in drums/totes, not a liquid in a tanker, after dewatering. Containers must be sealed and structurally sound.
5	Labeling and Inventory	Each container must be clearly and indelibly labeled with: "HAZARDOUS WASTE" in Amharic and English, the chemical name of the major heavy metal constituents, the date of accumulation, and the appropriate hazard pictogram. Maintain an accurate on-site inventory log specifying the type, quantity, and location of each container.

Phase 2: Storage and Compliance

No.	Procedure	Details
6	Secure Storage Area	Store the labeled containers in a designated Hazardous Waste Accumulation Area that is secured, covered from weather, clearly marked, and equipped with secondary containment capable of holding 110% of the volume of the largest container or 10% of the total volume stored, whichever is greater, to prevent spillage from reaching the environment.
7	Regulatory Compliance (Ethiopia)	Ensure all management and disposal activities strictly adhere to the requirements outlined in: Proclamation No. 1090/2018 (Hazardous Waste Management and Disposal Control Proclamation) and the former EFMHACA Medicines Waste Management and Disposal Directive, 2011. Specific permit requirements for the generation and storage of this type of waste must be obtained from the Ethiopian Environmental Protection Authority.
8	Final Treatment (Stabilization/Solidification)	The waste filter cake, generated from the dewatering process, is immediately transferred to a designated area for dewatering process, is immediately transferred to a designated area for stabilization/solidification treatment. This process (mixing with cement or lime)chemically binds the heavy metals and ensure they cannot leach out, meeting Land Disposal Restriction standards and satisfying the prerequisites for final landfill acceptance. This critical step occurs prior to containerization to ensure all waste is fully rendered non-leachable before being packaged and manifested for off-site transportation.

Phase 3: Off-Site Disposal

No.	Procedure	Details
9	Selection of Licensed Transporter	Only utilize a waste transportation company that is officially licensed and permitted by the relevant Ethiopian regulatory body (Ethiopian Environmental Protection Authority) to handle and transport hazardous

		materials.
10	Manifest System (Cradle-to-Grave)	A Hazardous Waste Manifest (tracking document) must be initiated and completed for every shipment. This document legally transfers custody and responsibility of the waste from the generator to the transporter, and finally to the disposal facility. The generator retains responsibility for the waste ("cradle-to-grave") and must receive a signed copy of the Manifest from the disposal facility to confirm proper receipt and disposal.
11	Disposal Site Selection	The final disposal must occur at a facility that is a licensed and engineered Hazardous Waste Landfill permitted to accept stabilized heavy metal sludge. Disposal at a standard municipal landfill is strictly prohibited. The chosen facility must demonstrate proper lining systems, leachate management, and monitoring programs.
12	Record Keeping	Maintain all records for a minimum statutory period (typically three to five years). This includes waste analysis results (TCLP), transport manifests, employee training logs, and regulatory reports. This documentation is essential for regulatory audits and demonstrating due diligence in environmental management.

3.2. Baseline Status of Water, Sanitation, and Hygiene (WASH) Facilities

The AHRI currently operates with an established WASH infrastructure that supports its existing research and administrative activities. The water supply is sourced from the Addis Ababa Water and Sewerage Authority (AAWSA), supplemented by an on-site borewell, and stored in reservoirs to ensure a consistent supply for laboratory processes, general use, and sanitation.

Existing sanitation facilities, including toilets and hand-washing stations, are located throughout the campus to serve the current staff, researchers, and visitors. These facilities are maintained through a regular cleaning schedule. The institute's wastewater is treated onsite using different technics and connected into septic tanks and the domestic waste discharged into the municipal sewer system. Hygiene practices are generally in line with institutional health and safety protocols.

The existing WASH facilities are adequate for the current and future operations of the institute and currently no indication for limitations and gaps considering the scale and nature of the new renovations and development project.

4. Environmental and Social Impacts and Mitigation Measures

This section identifies both beneficial and adverse environmental and social impacts associated with the project and proposes corresponding mitigation measures.

4.1. Project Beneficial Impacts

The project is expected to generate significant beneficial environmental and social impacts:

Enhanced Biomedical Research Capacity

The repurposed Animal House will provide a standardized and modern facility for animal-based research, crucial for understanding diseases and developing treatments, ultimately improving human and animal health outcomes in Ethiopia and beyond.

Improved Animal Welfare

Modernization of the Animal House facilities will ensure better living conditions, care, and ethical treatment of laboratory animals, aligning with international best practices.

Increased Access to Affordable Medicines

The establishment of a Bioequivalence Center will enable local pharmaceutical companies to conduct BE studies in Ethiopia, accelerating the approval of locally produced generic medicines and making essential drugs more accessible and affordable for the population.

Economic Development and Competitiveness

The BE Center will enhance the competitiveness of the Ethiopian pharmaceutical industry, facilitating its compliance with international standards and enabling market expansion.

Fostering Innovation and Entrepreneurship

The Incubation Center will provide critical support (space, equipment, technological, and entrepreneurial skills) to start-ups and innovators, particularly in the IVD sector. This will spur the commercialization of research outputs, create new businesses, and generate employment opportunities.

Job Creation

The construction phase will create temporary employment opportunities for skilled and unskilled labor. The operational phase will create permanent jobs for researchers, animal care technicians, laboratory personnel, administrators, and support staff.

Knowledge Transfer and Capacity Building

The project will facilitate knowledge transfer in specialized areas such as animal husbandry, bioequivalence studies, and incubation management, contributing to the development of a highly skilled workforce.

Reduced Reliance on External Facilities

The BE Center will significantly reduce Ethiopia's reliance on costly and time-intensive overseas facilities for bioequivalence studies, saving foreign exchange and fostering self-reliance.

Contribution to National Development Goals

The project aligns with national priorities for health, science and technology, and economic development, contributing to the country's overall progress.

4.2. Potential Environmental and Social Impacts and mitigation measures

The Bioequivalence (BE) and Incubation Centers' renovations will be undertaken within the existing AHRI new research and laboratory building, specifically on the first and fifth floors, in Kolefe Sub-city near Ayer Tena Area, Addis Ababa. Similarly, the Animal House construction will also be confined to the existing AHRI premises. This co-location within an established institutional boundary significantly minimizes environmental and social risks, as it eliminates concerns related to land use changes, community displacement, and major new infrastructure development.

A key mitigating factor for the project's overall environmental and social footprint is its inherent design to comply with stringent international standards. This includes adherence to World Health Organization (WHO) requirements for laboratories, biosafety, and biomedical waste management, as well as GLP and GCP Guidelines. This proactive approach ensures that both construction and operational phases incorporate robust waste management protocols, advanced safety measures, and built-in controls to minimize emissions, resource consumption, and workplace hazards. By prioritizing compliance with these global best practices, the project is designed to inherently manage and minimize potential risks, leading to an expected "moderate risk" classification for its environmental and social impact.

Table 1: Environmental and Social Management Plan

Potential environmental &social impacts	Proposed mitigation measures	Responsible for implementing the mitigation measures	Time Horizon	Indicative Budget for implementation (ETB)
Pre-Construction Phase				
Poor planning – which will impacts • AHRI staff and ALERT hospital those seeking services • Temporary loss of access to services such as water telephones and electricity due to possible damage during construction/renovation works • Damage to utilities, roads, buildings within AHRI premises	- Plan pre-construction activities shall be done early to identify suitable rooms or adjoining buildings into which patients or service areas can be relocated with minimal inconvenience. - Pre-construction survey and documentation of all the potential activities with ES considerations - Careful planning and execution of all construction and renovation activities - Protection of existing utilities. - Provide alternative routes and passages with adequate and appropriate directional signs for the AHRI/ALERT Community. - Shifting of the services area to other floors/blocks of the AHRI to give full services. - Advance relocation information shall be shared with all staffs & users for their planning and mental preparedness. - Identify and divert locations water pipes, telephone and electric cables that may be temporal loss during construction/renovation and relocate equipment's to a room reasonably away from renovation activities -	MoH & AHRI	Pre-Construction/ Renovation Phase	65,000.00
Design fault	During design consider the standard requirements indicated in WBG EHS guideline, OSH laboratory safety guidance and WHO laboratory bio-safety manual 3rd Edition which includes: - Adequate spaces for woks and staff	MoH & AHRI	Pre-Construction/ Renovation Phase	85,000.00

Potential environmental &social impacts	Proposed mitigation measures	Responsible for implementing the mitigation measures	Time Horizon	Indicative Budget for implementation (ETB)
	- Accessible to people with disability and others with special needs - Infectious diseases and occupational health hazards prevention and control systems - Emergency management systems - Waste disposal systems The project design is environmentally friendly and has an HVAC system installed in accordance with the WHO standards. The primary function of the HVAC system is to stabilize the laboratory animals' macro-environment (the room) and micro-environment (the cage), and maintain a comfortable and healthy work environment for personnel.			
Construction phase				
Negative impact				
Impact on AHRI staff and ALERT hospital seeking services	- To minimize community disturbance due to disruption of AHRI & ALERT Hospital routine services, AHRI should communicate with its staff, ALERT Hospital and nearby residents in advance about construction & renovation works and they should take steps to reduce noise and dust emissions. - Plan pre-construction activities shall be done early to identify suitable rooms or adjoining buildings into which patients or service areas can be relocated with minimal inconvenience, especially to patients under intensive care. - Shifting of the services area to other floors/blocks of the AHRI to give full services for the community.	Construction Contractor, AHRI	Construction/ Renovation Phase	35,000.00

Potential environmental &social impacts	Proposed mitigation measures	Responsible for implementing the mitigation measures	Time Horizon	Indicative Budget for implementation (ETB)
	- Advance relocation information shall be shared with the affected staffs & nearby residents for their planning and mental preparedness. - Contractors shall work closely and harmoniously with facility administrators to find practical ways to minimize social cost of temporary disruption of services. - A grievance mechanism to address complaints from nearby residents & ALERT Hospital community shall be in place and awareness promoted. -			
Temporary loss of access to services such as water telephones and electricity due to possible damage by contractor	- Identify and divert locations water pipes, telephone and electric cables before construction/renovation and relocate equipment's to a room reasonably away from renovation activities	- Construction Contractor - AHRI - MOH	During Renovation/ Construction Phase	150,000.00
Air pollution: movement of vehicles and machineries from and to construction sites will re-suspend dust and release exhaust gases causing air quality to deteriorate.	Applying Dust suppression techniques as recommended in WBG EHS guideline - Regularly spray water to suppress the re-suspension of dust during construction, - Conduct regular maintenance and servicing of construction vehicles and machineries to minimize air pollution - Minimize unnecessary idling of running diesel engines of machineries, vehicles and equipments - Conduct regular maintenance and servicing of construction - Limit the speed of vehicle movements to minimize dust. - Drivers should be instructed on the benefits of driving practices that reduce both the risk of	- Construction/Renovation/Contractor	During Renovation/ Construction Phase	120,000.00

Potential environmental &social impacts	Proposed mitigation measures	Responsible for implementing the mitigation measures	Time Horizon	Indicative Budget for implementation (ETB)
	accidents and fuel consumption and driving within safe speed limits - Provide dust masks (PPE) to workers.			
Noise & vibration disturbances due to movement of machinery, vehicle movement, construction activities.	- Planning activities in consultation with local communities - Construction activities during night time would be avoided. - Use of personal protective clothing (PPE) like hearing protection on construction crew. - No discretionary use of noisy machinery within 50 m of residential areas and near institutions or use of manual labor in these sections. - Good maintenance and proper operation of construction machinery. - Use well-maintained, quieter equipment. - Provide ear protection (PPE) to workers. - Erect temporary noise barriers if sensitive receptors are nearby.	- Construction/Renovation/Contractor	During Renovation/ Construction Phase	85,000.00
Impact of improper construction and demolition waste management - Generation of construction debris (concrete, metal, wood, packaging), general waste.	- Provide solid waste collection & Segregation at appropriate location of the project site - Properly segregate and dispose wastes to encourage reuse and recycling of some useful waste materials. - Waste must be collected from the site at least once in 24 hours and when temporarily kept on site it must be covered to minimize nuisance odour and vermin. - Wastes have to be properly transported and disposed to officially permitted by the concerned local authorities and properly managed site. - Never dispose used oil and filters to the ground, use	- Construction/Renovation work Contractor - MOH/AHRI	During Renovation/ Construction Phase	86,000.00

Potential environmental &social impacts	Proposed mitigation measures	Responsible for implementing the mitigation measures	Time Horizon	Indicative Budget for implementation (ETB)
	leak proof containers			
Impacts from Occupational Health & Safety (OHS) hazards	**Mitigation measures for physical hazards** - Scan the workplace for existing and potential hazards before work begins and take appropriate controls. Be aware that conditions can change constantly, - Orientation would be provided to all construction workers on safe work practices and guidelines and ensure that they adhere to them. - Training on incidences handling and prevention would be provided to workers. - Regular drills would constantly follow on various possible incidences. - Use of signage to warn staff and/ or visitors that are not involved in construction activities of dangerous places. - Safety supervision of works would be done regularly to ensure that safety conditions are met - Evacuation procedures will be developed to handle emergency situations. - Provide and use appropriate personnel protective equipment (PPE) to all workers. - All electrical installations and equipment would be inspected and tested regularly, including earthing/ grounding systems. - Circuit-breakers and earth-fault-interrupters would be installed - All laboratory electrical equipment would be earthed /grounded, Disconnect equipment attached to high-	- Construction/Renovation work Contractor - MOH/AHRI	During Renovation/ Construction Phase	57,000.00

Potential environmental &social impacts	Proposed mitigation measures	Responsible for implementing the mitigation measures	Time Horizon	Indicative Budget for implementation (ETB)
	voltage or high- amperage power sources - Never place flammable liquids in a household refrigerator. **Safety Measures for Working at Height** - Before any work at height is undertaken, a thorough risk assessment will be carried out to identify and assess the risks involved. - The right equipment will always be used when working at height. This includes ladders, scaffolding, and personal fall protection equipment. All equipment will be properly inspected and maintained before use. - Workers will always follow safe work practices when working at height. This includes using the correct ladder technique, not overreaching, and wearing the appropriate personal protective equipment. - Workers will always be supervised when working at height. This will help to ensure that they are following safe work practices and that the correct equipment is being used. **Chemical Hazards Mitigation Measures** - Ensure materials are of high quality and comply with safety standards. - Designate secure and well-ventilated storage areas, away from sensitive areas and with restricted access. - Maintain accurate records of all chemicals and hazardous materials, including quantities, locations, and expiration dates.			

Potential environmental &social impacts	Proposed mitigation measures	Responsible for implementing the mitigation measures	Time Horizon	Indicative Budget for implementation (ETB)
	- Train all workers on the safe handling, use, and storage of chemicals and hazardous materials and emergency response procedures and conduct regular drills to ensure preparedness. - Provide workers with necessary PPE, such as gloves, masks, and eye protection. - Establish clear procedures for handling, using, and disposing of chemicals and hazardous materials. - Clearly label all containers with the name of the material, its hazards, and safety precautions. - Ensure proper clean-up and closure upon completion of work. - Conduct periodic inspections of storage facilities, handling practices, and waste disposal procedures. **Biological Hazards Mitigation Measures** - Provide workers with necessary PPE, including gloves, masks and eye protection. - Implement safe handling and disposal procedures for sharps (needles, scalpels, etc.) using sharps containers. - Equip the project sites with spill kits, and conduct regular drills to ensure preparedness for spills, exposures, and other incidents involving biological hazards. - Inspect storage facilities, handling practices, and waste disposal procedures. **Fire Hazards Mitigation Measures** - Store flammables away from ignition sources and oxidizing materials. - Arrange natural or passive floor and ceiling level ventilation			

Potential environmental &social impacts	Proposed mitigation measures	Responsible for implementing the mitigation measures	Time Horizon	Indicative Budget for implementation (ETB)
	- Avail and equip fire extinguishing devices - Define and label fire hazards areas to warn of special rules (e.g. prohibition in use of smoking materials, cellular phones, or other potential spark generating equipment) - Provide specific training in handling of flammable materials, and in fire prevention - Avail full first aid kit at the construction site - Establish an Emergency Assembly point at the intersection points which will be labelled at site and Evacuation route designated on the Project Area map			
Impact from traffic accidents due to moving construction equipment	- Planning & segregating the location of vehicle traffic, machine operation, & walking areas, and controlling vehicle traffic through the use of one-way traffic routes, - Establishment of speed limits, and on-site trained flag people wearing high-visibility vests or outer clothing covering to direct traffic - Adopt best transport safety practices - Provide on-site training to drivers, machine operators, and traffic controller about traffic accident Employee safe traffic control measures - Inform AHARI & ALERT communities (regularly during scheduled traffic movement) about traffic schedule and related risks, especially those affecting pedestrian movement. - Install signage, fencing, and other physical barriers to restrict unauthorized movement, entry and reduce potential hazards to the public.	- Construction/Renovation work Contractor	During Renovation/ Construction Phase	28,000.00
Impact on social service caused by disruption of AHRI routine	- Construction activities would be carried out during the day time	- Renovation work Contractor	During	25,000.00

Potential environmental &social impacts	Proposed mitigation measures	Responsible for implementing the mitigation measures	Time Horizon	Indicative Budget for implementation (ETB)
services	- Plan pre-construction activities early to identify suitable rooms or adjoining buildings into which the sample collection can be carried out with minimal inconvenience - The AHRI administration should carefully plan maintenance works and they should communicate with staff and patients in advance about any disruptions that will occur and shifting of the services area are recommended	- MOH/AHRI	Renovation/ Construction Phase	
Labor disputes over terms and conditions of employment. Including poor labor management practices.	- All project workers, direct, contracted and others should have the right to organize. - Develop and operationalize grievance management mechanism for project workers to promptly address their workplace grievance. - Contactor shall provide induction training to all permanent/ temporary works on terms & conditions of employment.	- Renovation work Contractor -Contract/ site EHS manager	During Renovation/ Construction Phase	48,000.00
Impacts from gender-based violence and child labor	- Give priority for women in the employment of skilled and casual laborers - Provision and availability of separate sanitation facilities for women, the provision of women friendly safety equipment and materials, - Contract document for workers should incorporate measures to be taken against those workers who commit GBV and sexual harassment. - Establish a standard code of conduct to be produced by the client and signed by all workers including subcontract workers. - As part of prevention, provide orientation on SEA/SH and signing of code of conduct by	- Construction/Renovation work Contractor - MOH/AHRI	During Renovation/ Construction Phase	65,000.00

Potential environmental &social impacts	Proposed mitigation measures	Responsible for implementing the mitigation measures	Time Horizon	Indicative Budget for implementation (ETB)
	subproject workers - Take appropriate actions on workers violating the CoC; - Ensure that no child is employed on site in accordance with national labour laws; Contractors shall stick to ≥ 18 years of age requirement. - Ensure that any child abuse attempts or practices including sexual offenses among contractors' workers are promptly reported to the police - The Contract must follow strict measures against the employment of children - In the contract document must clearly stipulate that it is against the law to employ under age children - If the contractor is found employing children below the legally required age, he/she should be penalized and compensate the child. - Regular monitoring should be conducted to ensure that no child labour is used in the construction work - Ensure provision and enforcement of all relevant labour laws, regulations, tools and contractual agreements (Employment Act, OSH Act, Workers' compensation, Labour Unions Act etc.) in all workplaces - Empower and facilitate Labour Inspection Function to monitor implementation of relevant policies and legal instruments - Require each worker on site to sign a Code of Conduct. - Strengthen workers' respect to local cultures through engaging them in community interaction trainings.			

Potential environmental &social impacts	Proposed mitigation measures	Responsible for implementing the mitigation measures	Time Horizon	Indicative Budget for implementation (ETB)
	- Disminating messages related to GBV and SH, as well as GBV referral services			
Risks of SEA/SH and Other Forms of GBV	- Foster a safe, respectful, inclusive, and open working environment. - Ensure adequate, well-lit sanitation and washing facilities, with separate arrangements for men and women. - Raise awareness on SEA/SH risks among project and health facility staff. - Promote women's participation in leadership roles - Strengthen treatment and referral pathways for SEA/SH survivors, ensuring access to confidential psychosocial support and protection against retaliation. - Provide training on SEA\SH and GBV prevention, and response protocols to all workers.	- Renovation work Contractor -		
Community health and safety risks: Spread of HIV and other contagious diseases due to human contact among the construction work force.	- As part of the induction process for new employees and workers provide training for all workers on the transmission routes and common symptoms of communicable diseases. - Conduct awareness raising & Sensitization activities among workers on transmission, prevention of HIV/AIDS and other contagious diseases. - Distribute condoms and create awareness on the transmission mechanisms of contagious diseases. - Distribution of face masks, sanitizers, condoms and IEC materials and hand washes, for free of workers and local people around.	- Renovation work Contractor - Contractor	During Renovation/ Construction Phase	25,000.00

Potential environmental &social impacts	Proposed mitigation measures	Responsible for implementing the mitigation measures	Time Horizon	Indicative Budget for implementation (ETB)
Total Cost for Construction Period				**799,000.00**
Operation phase				
Waste Management (Biological, Chemical, Animal Carcasses, Sharps) - Contamination, infection risk, environmental pollution.	- Strict segregation at source into labeled, appropriate containers. - Proper storage in designated, secure, temperature-controlled areas. - Use of autoclaves/sterilization for infectious waste. - Incineration for biological waste. - Regular training for all staff on waste handling, storage, and disposal protocols. - Maintain detailed waste manifests and disposal records.	- AHRI Facility Managers (Animal House, BE, Incubation), - Lab Supervisors, - Waste Management Team	During Operation	105,000.00
Wastewater Discharge (Laboratory, Animal House) - Contamination of municipal sewer system, environmental pollution.	- On-site pre-treatment of laboratory wastewater (pH neutralization, heavy metal removal) as per laboratory waste onsite treatment standards. - Connect with AHRI central Wastewater treatment - Regular monitoring of wastewater effluent quality. - Water-efficient practices. - No direct discharge of untreated biological waste.	AHRI Facility Managers, Lab Supervisors, Maintenance Team	During Operation	100,000.00
Potential Threats to Biodiversity The primary threat to biodiversity during the operational phase stems from the project's planned utilization of biological organisms for research purposes. This includes: - The project will involve handling, utilizing, and potentially modifying genetic	- Strict Bio-containment Protocols: research and laboratory activities that involving genetic resources and biological organisms will be conducted under strict bio-containment protocols that meet international biosafety standards (follow WHO Laboratory Biosafety Manual). - Onsite Waste Management: ensure the safe collection, storage, and disposal of all biological and chemical waste generated by the laboratories. This	AHRI Facility Managers, Maintenance Team, Lab Supervisors	During Operation	64,000.00

Potential environmental &social impacts	Proposed mitigation measures	Responsible for implementing the mitigation measures	Time Horizon	Indicative Budget for implementation (ETB)
resources from microorganisms (viruses and bacteria) within the vaccine research and development center. Without strict containment and handling protocols, there is a risk of accidental release of these biological materials, which could potentially impact local ecosystems. - As discussed in other sections, the project's wastewater could contain biological agents or chemicals that, if not properly treated, could contaminate local water sources and negatively impact aquatic biodiversity.	includes the use of autoclaves for sterilizing biohazardous waste before central WWTP and adherence to national and international guidelines for managing hazardous materials. - Wastewater Treatment: The WWTP is designed with a pre-treatment process to neutralize any biological or chemical contaminants, as well as an air flotation unit to remove suspended solids, ensuring that the effluent meets regulatory standards before discharge. - Training and Capacity Building: All personnel involved in research will receive rigorous and continuous training on biosafety, biosecurity, and waste management protocols. This will ensure that all staff members are aware of the risks and are capable of following procedures to prevent environmental contamination.			
Air Emissions (Fume Hoods, Ventilation) - Release of fumes, odors, allergens, pathogens.	- Regular maintenance and certification of fume hoods and biosafety cabinets. - Installation and regular replacement of HEPA filters in ventilation systems. - Proper design and functioning of animal house ventilation to manage odors and allergens.	AHRI Facility Managers, Maintenance Team, Lab Supervisors	During Operation	18,000.00
Noise Pollution (Equipment Operation) - disturbance to staff, research animals, adjacent areas.	- Use of low-noise equipment where feasible. - Regular equipment maintenance. - Proper insulation of noisy equipment rooms. - Provide hearing protection for staff in noisy areas.	AHRI Facility Managers, Maintenance Team	During Operation	8.000.00
Energy Consumption - High	- Install energy-efficient lighting (LEDs) and HVAC	AHRI Facility	During	10,000.00

Potential environmental &social impacts	Proposed mitigation measures	Responsible for implementing the mitigation measures	Time Horizon	Indicative Budget for implementation (ETB)
electricity consumption, carbon footprint.	systems. - Optimize building insulation to reduce heating/cooling demands.- Implement energy management systems to monitor and control energy usage. - Promote energy-saving practices among staff (switching off lights and equipment when not in use). - Explore renewable energy options (solar panels) for supplementary power.	Managers, Maintenance Team	Operation	
Water Consumption - high water usage, strain on resources.	- Install water-efficient fixtures (low-flow faucets, toilets). - Implement water recycling systems where feasible (for non-potable uses in the animal house, after appropriate treatment). - Regularly inspect for and repair leaks. - Promote water conservation awareness among staff.	AHRI Facility Managers, Maintenance Team	During Operation	10,000.00
Chemical Spills (Laboratories)	- Store chemicals in clearly labeled containers, compatible groups, and secure areas with secondary containment. - Develop and implement a chemical spill response plan, including spill kits and trained personnel. - Provide appropriate PPE for handling chemicals. - Ensure adequate ventilation in chemical storage and handling areas.	AHRI Facility Managers, Lab Supervisors,	During Operation	10,000.00
Animal Welfare (Animal House) - Poor living conditions, stress, unethical treatment.	- Adhere strictly to international animal welfare guidelines (Guide for the Care and Use of Laboratory Animals, 2011). - Ensure appropriate housing, nutrition, environmental enrichment, and veterinary care. - Establish an Institutional Animal Care and Use	Animal House Manager, Researchers	During Operation	15,000.00

Potential environmental &social impacts	Proposed mitigation measures	Responsible for implementing the mitigation measures	Time Horizon	Indicative Budget for implementation (ETB)
	Committee or equivalent body to oversee ethical conduct of animal experiments. - Provide ongoing training for animal care staff and researchers on animal handling and welfare.			
Bio-security Risks (Animal House, Bioequivalence, Incubation Centers) - accidental release of pathogens, contamination, cross-contamination.	- Implement strict access control to all facilities, especially the Animal House and Bioequivalence Center. - Establish clear protocols for personnel entry/exit, including showering and change of clothes. - Implement disinfection and sterilization procedures for equipment and facilities. - Develop and implement a disease surveillance and control program for the animal colony.	AHRI Facility Managers, Lab Supervisors, Biosafety Officer	During Operation	15,000.00
Occupational Health & Safety (OHS) risks exposure to biological agents, chemicals, sharps: Workers are at risk of exposure to infectious pathogens, hazardous chemicals, and sharps during laboratory and clinical activities..	- Implement OHS management systems, including detailed risk assessments and hazard identification protocols specific to each lab & clinical area. - Provide appropriate PPE (lab coats, gloves, safety glasses, respirators, hearing protection) and ensure its proper use. - Provide regular safety training for all personnel, including emergency procedures (fire, chemical spills, biological exposures). - Ensure availability and accessibility of emergency showers, eyewash stations, and first-aid kits. - Maintain well-ventilated workspaces and proper ergonomic setups. - Implement clear protocols for handling hazardous materials, sharps, and biological agents. - Regular health monitoring for staff who are rountinely exposed to specific biological or chemical	AHRI OHS Officer, Facility Managers, Lab Supervisors	During Operation	25,000.00

Potential environmental &social impacts	Proposed mitigation measures	Responsible for implementing the mitigation measures	Time Horizon	Indicative Budget for implementation (ETB)
	hazards.			
OHS risk - Inadequate Ventilation and Lighting: Rooms and workspaces may have inadequate ventilation, leading to poor air quality and potential buildup of chemical fumes or biological aerosols. Inadequate lighting can increase the risk of accidents and eye strain.	- Ensure Adequate Ventilation: All renovated rooms and workspaces will be equipped with adequate and verified ventilation systems, including fume hoods and biosafety cabinets following WHO standards, to maintain safe air quality. These systems will be regularly inspected and maintained. - Provide Adequate Lighting: Ensure all workspaces have sufficient and well-distributed lighting to prevent accidents and minimize eye fatigue. This includes task-specific lighting for precision work.	AHRI OHS Officer, Facility Managers, Lab Supervisors	During Operation	18,000.00
OHS Risks - Lack of Adequate Training or Neglect of Safety Guidelines: Inadequate training or a failure to follow safety precautions can lead to accidents, improper handling of materials, and unsafe work practices.	- Mandatory Safety Training: Provide mandatory and recurring safety training for all personnel, including new hires. This training will cover site-specific risks, emergency procedures (fire, chemical spills, biological exposures), and all safety guidelines. - Enforce Safety Culture: Promote a strong safety culture through regular reminders, safety meetings, and clear consequences for neglecting safety precautions. - Establish Emergency Procedures: Ensure all personnel are trained on specific emergency procedures, and that these procedures are clearly communicated and posted in all relevant areas.	AHRI OHS Officer, Facility Managers, Lab Supervisors	During Operation	12,000.00
OHS Risks - Misuse of Equipment and Materials: Equipment and materials may be used for functions they are not designed for, leading to equipment failure, accidents, and	- Develop Standard Operating Procedures (SOPs): Create and post clear Standard Operating Procedures (SOPs) for the proper use of all equipment and materials. - Training on Equipment: All staff must be trained and	AHRI OHS Officer, Facility Managers, Lab Supervisors	During Operation	10,000.00

Potential environmental &social impacts	Proposed mitigation measures	Responsible for implementing the mitigation measures	Time Horizon	Indicative Budget for implementation (ETB)
injuries.	authorized to use specific equipment - Regular Equipment Maintenance: Implement a preventative maintenance schedule for all equipment to ensure it is in good working order and a logbook is maintained.			
OHS Risks - Ergonomic Hazards and Accidents: Poor workspace design, repetitive tasks, and cluttered areas can lead to ergonomic injuries, slips, trips, and falls.	- Maintain Ergonomic Setups: Ensure all workspaces have proper ergonomic setups, including adjustable chairs, workbenches, and equipment placement to minimize strain. - Implement Good Housekeeping: Establish and enforce a strict good housekeeping policy to keep all walkways, floors, and workspaces clear of clutter and spills. - Ensure Accessibility to Safety Equipment: Ensure emergency showers, eyewash stations, and first-aid kits are readily available, accessible, and clearly marked in all relevant areas.	AHRI OHS Officer, Facility Managers, Lab Supervisors	During Operation	25,000.00
OHS Risks - Lack of Safety Signage: The absence of safety signage can lead to confusion and increased risk, especially in areas with specific hazards.	- Implement Clear Signage: Install clear, legible, and internationally recognized safety signage in all specific areas. This includes signs for biohazard zones, chemical storage, fire extinguishers, emergency exits, and mandatory PPE areas. - Maintain Signage: Regularly inspect and maintain all signage to ensure it is visible and in good condition.	AHRI OHS Officer, Facility Managers, Lab Supervisors	During Operation	10,000.00
Public Health Risks - Spread of diseases, chemical exposure, and contamination if controls fail.	- Strict adherence to all biosafety and biosecurity protocols. - Proper waste management and wastewater treatment. - Emergency preparedness and response plans for spills/releases. - Regular monitoring of environmental parameters to	AHRI Management, Biosafety Officer, Facility Managers	During Operation	10,000.00

Potential environmental &social impacts	Proposed mitigation measures	Responsible for implementing the mitigation measures	Time Horizon	Indicative Budget for implementation (ETB)
	ensure no off-site impacts.			
Social Acceptability & Community Relations - negative perception, complaints, conflicts.	- Maintain open and transparent communication with stakeholders. - Responsive Grievance Redress Mechanism. - Regular updates on project operations and benefits. - Engage with local communities on relevant issues.	AHRI ESMP Focal Point, Communications Officer	During Operation	10,000.00
Ethical Considerations (Bioequivalence, Animal House) - Unethical research practices, failure to adhere to the standards animal welfare, leading to inhumane treatment, inadequate living conditions, or unnecessary suffering during animal care or research.	- Strict adherence to Good Clinical Practice (GCP) for human studies (Bioequivalence). - Strict adherence to animal welfare guidelines and IACUC oversight for animal research. - All animal handlers and researchers will receive comprehensive and recurring training on humane animal handling, husbandry, and ethical protocols. - Veterinarian or qualified animal care technician will be on staff to monitor the health and welfare of all animals. - Data privacy and confidentiality. - Implement a robust data management system that complies with international standards for data privacy. - All clinical and laboratory staff must undergo mandatory training on data privacy, confidentiality, and secure handling of sensitive patient information	AHRI Management, Ethical Review Boards (IRB, IACUC), Researchers	During Operation	8,000.00
Total Cost for Operation Phase				**419,000.00**

5. Environmental and Social management Monitoring Plan

The overall objective of environmental and social monitoring is to qualitatively and quantitatively measure effectiveness of mitigation measures, and develop appropriate responses to incompliances with Project standards, and emerging environmental and social issues. Monitoring will be carried out to ensure that all renovation activities and mitigation measures comply with the national legislation and the World Bank; responsible bodies meet their commitments and requirements of this ESMP in terms of periodical audits and reporting. The main objectives of developing a monitoring program and defining parameters are to;

- Ensure that all mitigation measures are properly implemented ,
- Measure effectiveness of the mitigation measures,
- Provide mechanisms for taking timely action when unexpected environmental and social incidents are encountered, and
- Identify training requirements at all levels of the organizational structure.

5.1. Institutional and Implementation Arrangement for the ESMP

Effective implementation of this ESMP requires clear roles, responsibilities, and collaborative efforts among various stakeholders.

5.1.1. The Ministry of Health - Ethiopia

The Ministry of Health (MoH), as the supervising body for AHRI, holds ultimate oversight responsibility for the project. Its role includes:

- Providing overall policy direction and formally endorsing the ESMP to ensure alignment with national health and environmental strategies.
- Ensuring that adequate budget is allocated by AHRI for the implementation of the ESMP.
- Providing strategic support and guidance to AHRI regarding project implementation and problem resolution related to environmental and social aspects.
- Facilitating coordination with other relevant ministries and agencies as needed.
- Incorporate all ESMP requirements into tender documents and contracts for construction and ensure contractors comply with the ESMP.

The MOH - Health Infrastructure Lead Executive Office (HILEO):

- Ensure the ESMP is integrated into all project activities and contracts of the project construction.
- Monitoring implementation of mitigation actions by contractors
- Coordinating and providing training and capacity building where planned
- Enforce occupational health and safety in workplaces in line with its mandates, roles and responsibilities.
- Conduct monitoring and on-site audits to verify implementation of the C-ESMP and ESMP and report on findings to the WBG.
- Follow up the implementation of all activities stipulated in the C-ESMP and ESMP report of the project.

5.1.2. Armauer Hansen Research Institute (AHRI)

AHRI is the primary implementing agency and bears the direct responsibility for the successful execution of this ESMP. Key responsibilities include:

- Ensuring the project is implemented in accordance with the ESMP, design specifications, and relevant national and international standards.
- **ESMP Implementation and Compliance:**
    - Designate a qualified individual or team responsible for overseeing all environmental and social aspects of the project during operation phase of the project. This focal point will:
        - Regularly monitor and report on ESMP implementation during operation phase.
        - Act as the primary contact for environmental and social issues.
        - Liaise with relevant authorities (AAEPA, EFDA, etc.).
        - Manage the Grievance Redress Mechanism.
        - Oversee training and awareness programs.
    - Allocate sufficient financial, human, and technical resources for ESMP implementation, including monitoring equipment, PPE, and training.
    - Conduct regular internal monitoring, collect data, and prepare periodic reports on ESMP performance.
    - Provide necessary training for AHRI staff on environmental and social management, OHS, waste handling, and emergency response.
    - Maintain effective communication with project-affected persons, local communities, and regulatory bodies.

- Manage the budget allocated for ESMP activities.

- **Facility-Specific Management:**
  - **Animal House Manager:** Responsible for daily oversight of animal welfare, biosafety, waste management (animal waste), and OHS within the Animal House.
  - **Bioequivalence & Clinical Trial Centers Manager/Director:** Responsible for ensuring compliance with GCP, GLP, ethical guidelines, OHS, and waste management within the BE Center.
  - **Incubation Center Manager/Director:** Responsible for environmental and social aspects within the incubation center, including shared lab facilities, waste management, and OHS for tenants.
  - **Biosafety Officer:** Responsible for developing and implementing biosafety and biosecurity protocols across all relevant facilities, conducting risk assessments, and training staff.

5.1.3. Addis Ababa Environmental Protection Authority

The Addis Ababa Environmental Protection Authority (AAEPA) is the primary regulatory body at the city level responsible for overseeing environmental protection. Its roles include:

- Reviewing the submitted ESMP and providing formal approval, potentially with specific conditions.
- Conducting periodic inspections of the project site and facilities to ensure compliance with the ESMP, national environmental laws, and permit conditions.
- Taking appropriate enforcement actions in case of non-compliance.
- Providing technical guidance and support to AHRI on environmental management best practices.

5.1.4. Other Relevant Institutions/Agencies

- **Ethiopian Food and Drug Authority (EFDA):** Provides regulatory oversight for pharmaceuticals and diagnostics. Will be involved in ensuring the Bioequivalence Center and IVD Incubation Center meet national and international standards for Good Laboratory Practice (GLP) and Good Clinical Practice (GCP).
- **Local Administration(Woreda/Sub-city):** Relevant for local community engagement, grievance redress at the community level, and coordination on local services.

- **Local Police/Security Services:** For matters related to site security and public order during construction.
- **Water and Sewerage Authority:** For connections to water supply and municipal sewerage systems and ensuring discharge compliance.

5.2. Implementation Flow

1. **AHRI's ES Safeguard Focal Point** oversees overall ESMP implementation, coordination, and reporting during the operation phase.
2. **Contractors** are responsible for implementing ESMP measures during the construction phase, as per their contractual obligations, under the supervision of the Site Engineer.

Detail Role and Responsibilities of the Contractor:

→ The Contractor is required to fulfil the commitments as set out in this C-ESMP and ESMP report and also to ensure that its sub- contractors fulfil the C-ESMP. This includes the following:

- ☛ Implement all the mitigation measures drawn for environmental and social impacts and report on findings to the MOH/HILEO.
- ☛ Communicate any environmental issues (including incidence and accidents at construction site) and incidents to the MOH/HILEO immediately.

→ All employees of the Contractor are responsible for the implementation of this C-ESMP and ESIA report environmental and social safeguarding activities. Contractor's environmental and social safeguard expert is responsible for monitoring and implementation of all the safeguard activities at the site. Contractor's site supervisors and engineers are responsible for overseeing the sub-Contractors performance with respect to environmental and social management and implementation of this C-ESMP and project ESIA.

→ Provide continuous Training: the contractor will provide induction training to all its employees and sub-contractor personnel working on the construction of sub-project before early works start. This Induction Training shall be conducted for all new workers, also if they join the construction site later during construction activities. The goal of the training is for contractor employees and sub-contractors personnel to understand:

- ☛ The mitigation measures included in this C-ESMP and how it will be implemented on site including responsibilities;

- ☛ The sensitivities of the area (if any) in which the sub-project will be constructed;
- ☛ Occupational Health and Safety rules at the construction site (e.g. personal protective equipment, rules of conduct, first aid);
- ☛ The Project's Grievance Mechanism and the basic worker's rights
- ☛ How to deal with enquiries/ questions/ grievances by the public/ local stakeholders;
- ☛ Interaction rules with the people living close to the construction site (Code of Conduct) and how to deal with unauthorized visitors to the site;
- ☛ How to deal with unforeseen incidents/ emergency situations;
- ☛ The roles and responsibilities within the PIA, the Contractors, sub-Contractors and workers with respect to environmental and social issues;

→ Site induction shall be given also to all visitors and recorded in visitor induction register.

→ Contractor's site supervisors and engineers will give tool box talks to operatives on key issues such as spill response and waste management, on a basis of one per month and as near miss trends are identified.

→ Operatives attending the tool box talks will be required to sign an attendance register. The register together withtopics raised during the meeting should be kept on site as the record of toolbox talk.

→ The contractor's E & S Safeguard expert keeps records of the training sessions. The training will be repeated as needed during the construction activities.

→ Follow and implement the guidelines stipulated in the ESIA report: The Environment, Health and Safety (EHS) Guidelines contain performance levels and measures for development of industrial projects that are considered to be achievable in new facilities at reasonable costs by existing technology.

3. **AHRI's Facility Managers, Lab Supervisors, and specific** are responsible for implementing ESMP measures during the operation phase within their respective domains.
4. **Grievance Redress Mechanism (GRM)** operates in parallel to address stakeholder concerns.
5. **Monitoring and Reporting** are continuous processes, with findings informing adaptive management measures.

5.3. Communication and Engagement Strategy

The ESMP has identified potential social risks during the operation phase, including service disruptions, risks to social acceptability, and negative community perceptions. To proactively mitigate these risks and ensure positive engagement, the project commits to implementing a systematic Communication and Engagement Strategy.

The Communication and Engagement Strategy is designed to:

- Systematically engage with project stakeholders.
- Regularly update the public and key services on project activities.
- Foster a proactive and positive relationship with the surrounding community.

The following actions (Table 2) detail the clear responsibilities and timelines for the implementation of this strategy.

Table 2: Communication and Engagement Strategy (CES) for the Operation Phase

Strategy Component	Action Items	Responsibility	Timeline / Frequency
Formalize Communication Channels	Establish a dedicated communication focal point/contact line (phone, email) for community and stakeholder inquiries related to AHRI's operational activities.	AHRI E&S Focal Point	Complete before start of Operation Phase
Proactive Information Sharing	Develop and disseminate periodic public updates on operational activities, key achievements, safety protocols, and measures to manage potential operational risks.	AHRI Management / E&S Team	Quarterly (during Operation Phase)
Social Acceptability and Feedback	Conduct periodic, targeted consultation meetings with key local stakeholders (local administration, adjacent facility management, community representatives) to proactively gather feedback, address negative perceptions, and confirm the social acceptability of the facilities.	AHRI E&S Focal Point	Semi-annually (during Operation Phase)
Grievance Mechanism Promotion	Regularly promote awareness of the GRM to ensure all stakeholders, including the surrounding community, know how to submit confidential complaints and receive timely feedback.	AHRI E&S Focal Point	Ongoing, with awareness campaigns conducted Annually

Table 3: Environmental and social risks mitigation measures implementation and Monitoring Plan

Impact and Mitigation/Enhancement commitments	Desired Outcomes	Monitoring Indicators	Time	Responsibility	Estimated Costs (ETB)	Capacity Building Requirements
Renovation/Construction Phase						
Impact of construction and demolition waste						
Wastes will be properly segregated and separated to encourage recycling	Records of proper waste disposal indicating quantities dumped and location of the dumping site. Amount of waste disposedminimized by reuse	Proportion of construction and demolition of waste dumped in designated area (Target 100%)	Daily	AHRI &MOH	8,000.00	None
Waste will be picked off the site every day andif not it will be covered to minimize nuisance odor and vermin.	Hazardous waste separated from non-hazardous waste on site and each waste stream disposed of according to Ethiopian HCWM requirements in designated sites	Presence of color coded/labeled container for segregation of hazardous and non-hazardous wastes Number of times a wastepicked per day	Daily	AHRI & MOH	8,000.00	None
Impacts from OHS						
Ensuring safe work practices after orientationhas been given	Occupational safety will be maintained	Proportion of workers who participated in orientation training (at least 95% of the workers should take the orientation)	Biannually	AHRI &MOH	5,000.00	Required

Training and awareness creation on incidence handling, prevention and potential emergency	Maintains minimum work hazards	Proportion of workers who got training on incidence handling, prevention and potential emergency Documentation of recordsof training and Impromptu interviewswith workers on occupation health safety emergency response	daily	AHRI, MOH	4,000.00	Required
Use of signage to warn staff and/ or visitors that are not involved in renovation activities of dangerous places	Minimize occupation health safety risk on construction workers andthe public	Availability of appropriatesafety signage on-site	daily	MOH	2,000.00	None
Safety supervision of works would be done regularly to ensure that safety conditions are met while any deviation from safety regulations is immediately reclaimed following the best practices regarding safety at work equipment	Ensures that safety conditions are meet	Presence of safety engineer on-site	daily	MOH	1,000.00	None
Develop evacuation procedures to handle emergency situations	Minimize occupation health and safety risk on construction workers	Presence of Emergency Response PreparednessnPlan	pre-construction	MOH	5,000.00	None
Provide appropriate personnel protective equipment (PPE) to all workers	Minimize occupation health and safety risk on construction workers	Proportion of workers wearing appropriate PPE	daily	MOH	2,000.00	None
All electrical installations and equipment wouldbe inspected and tested regularly including earthing/ground systems	Minimize occupation health and safety risk on construction workers	Number of electrical incidents or near-misses reported.	Renovation/ Constructio n period	AHRI, MOH	12,000.00	None

Specialized refrigerators would be used when storing chemicals that have explosion potential	Minimize occupation health and safety risk on construction workers	Record of explosive chemical stored in a specialized refrigerator consistently	Renovation/ Constructio n period	AHRI, MOH & Contractor	1,000.00	None
Impact from Chemical hazards						
Provision of secured and well-ventilated storage areas, away from sensitive areas and with restricted access; and maintain accurate records of all chemicals and hazardous materials, including quantities, locations, and expiration dates.	Minimize occupation health and safety risk on construction workers	Number of chemical spills reported and response actions taken.	Renovation/ Constructio n period	AHRI, MOH & Contractor	1,000.00	None
Impact from Biological Hazards						
Provide workers with necessary PPE, Implement safe handling and disposal procedures for biological hazard materials.	Minimize occupation health and safety risk on construction workers	Number of health screenings for biological exposure conducted quarterly	Renovation/ Construction period	AHRI, MOH & Contractor	1,000.00	None
Impact from Fire Hazards						
Provide workers with necessary PPE, Implement safe safety procedures in all activities	Minimize occupation health and safety risk on construction workers	Number of fire drills conducted and compliance with safety procedures.	Renovation/ Construction period	AHRI, MOH & Contractor	1,000.00	None
Impact from traffic accidents						
Ensure drivers respect traffic laws and obeyspeed limits	No road accident by project traffic	Number of accident occurs ineach month of construction duration (should be zero)	Renovation/ Construction period	AHRI, MOH & Contractor	2,000.00	None
Ensure that vehicles are regularly maintained to minimize potentially serious accidents	No road accident due to poor mechanical conditions of projectvehicles	Number of accident occurs in each month of construction duration (Should be nil)	Renovation/ Construction period	AHRI, MOH & Contractor	1,000.00	None

Employ safe traffic control measures, including temporary road signs , flag persons to warn of dangerous conditions and children crossings,	No road accident byproject traffic	Number of accident occurs in each month of construction duration (Should be nil)	Renovation/ Construction period	AHRI, MOH & Contractor	2,000.00	Required
Impact on air quality						
Dust screens or nets in windows, doorways and ventilator will be deployed where demolition orother dusty renovation/construction activities are occurring	No excessive dust emissions noted outside construction areas	Number of complaints received due to excessive dust from construction areas (Zero compliant recommended)	Renovation/ Constructio n period	AHRI, MOH & Contractor	1,000.00	None
Ensure good housekeeping and clean construction operations where, among other necessary actions, dust would be quickly sweptoff cement floors and collected in covered containers	Minimize dust and exhaust emissions	Cleaned operation area including cement floor to minimize dust (in M^2) (Target: all working area should be cleaned regularly) No complaints of trucks reckless driving from communities along roadsused by project vehicles	Renovation/ Constructio n period	AHRI, MOH & Contractor	1,000.00	None
To minimize indoor dust, portable extraction systems, water sprays or other practical methods are applied	Minimize dust levels	Number of activities conducted by the contractor to minimize dust nuisance per day	during renovation/C onstruction work	AHRI, MOH & Contractor	1,000.00	None
Trucks would be covered during haulage of construction materials and would be diverted away from sensitive areas of the AHRI	No material spills on roads during haulage to sites	Number of waste trucks properly load and covered with sheet to prevent spill during transport	during renovation/C onstruction work	AHRI, MOH & Contractor	1,000.00	None
Impact of noise and vibration						

Construction workers will be aware of the sensitive nature of workplaces they are operating in and advised to limit verbal noise or other forms of noise. For example, metallic objects or tools can be passed on to a colleague rather than dropping or throwing them with loud bangs	No excessive noise from workers	Number of complaints received due to noise during construction Proportion of days with above the maximum recommended level of noise (in db).	during renovation/Construction work	AHRI, MOH & Contractor	Included in project cost	Training Required
All heavy duty immovable equipment will be fitted with mufflers or placed in enclosures to minimize disrupting ambient noise levels	Construction activities generate permissible levelsof noise	proportion of heavy duty immovable equipment fitted with mufflers or place in enclosures	during renovation/Construction work	AHRI, MOH	Included in project cost	None
Contractor will ensure that equipment is properly maintained and fitted with mufflers	Construction activities generate permissible levelsof noise	Number of equipment properly maintained and fitted with mufflers	during renovation/Construction work	AHRI, MOH	Included in project cost	None
Where possible, contractors would cordon off areas under construction with noise absorbing materials, for example, plywood rather than ironsheets	Keeps noise level down	Utilization of ply wood or other noise absorbing materials for cordon off areas under construction	during renovation/Construction work	AHRI, MOH	Included in project cost	None
Contractor ensures noise levels emanating from machinery, vehicles and noisy construction activities are kept at a minimum	Safety, health and protection of people in the nearby buildings	Proportion of days in which noise level below the maximum recommended is recorded Number of complain received from patients, visitors and staffs about noise during construction	during renovation/Construction work	AHRI, MOH	Included in project cost	None
Avoidance risks associated with waste from demolition activities	No risks associated with waste from demolition activities	The demolished wastes should be appropriately managed and covered with a temporary seal during the demolition works.	Before the operational /construction phase	AHRI, MOH	Included in project cost	

Impact on social service caused by disruption of services						
Plan pre-construction activities early to identify suitable rooms or adjoining buildings into which the services can be carried out with minimal inconvenience	Service relocated to a conducive room(s) with minimal interference of samplecollection services. Shifting of the service area	Number of complaints received about servicedelivery (Should be zero)	Pre-renovation period	AHRI, MOH	Included in project cost	None
Child labor and GBV/SEA/SH						
	No risk of child labour or SEA/SH	- Number of training session provided to staff on GBV/SH and CoC. - Number of workers those who signed CoC violation - Number of CoC-violating workers and action taken - Proportion of workers recruited according to national labour law. - Number of child abuse or sexual offense practices reported to police office	during renovation/Construction work	AHRI, MOH	15,000.00	
Operation Phase						
Impacts from OHS						
All workers to be provided with appropriate PPE against exposure to infectious pathogens, hazardous chemicals and ionizing radiation in accordance with recognized international safety standards and guidelines.	Minimal work-relatedinjuries or infections	Number of healthcare staff wear appropriate PPE according to IPC practices	During the renovation/Construction work	AHRI, MOH	5,000.00	None

Orientation for all staff would be given on safe work practices and guidelines and ensure that they adhere to it. Training would be conducted on incident handling and prevent manage. This would involve proper handling of electricity, water etc. and sensitization on various modes ofescape, conduct and responsibility during such incidences.	Minimize occupation health safety risk on staff	Number of staff oriented on safety practices and guidelines	during renovation/ Constructio n work	AHRI & MOH	15,000.00	none
Regular drills would constantly follow on various possible incidences. This will test the response of the involved stakeholders. Such drills will keep them alert and they will become more responsive to in the case of incidences	Staff preparedness to combat possible incidences	Number of drills conducted	during renovation/Co nstruction work	AHRI & MOH	2,000.00	None
Use signage to warn staff and/ or visitors that are not involved in AHRI work of dangerous places	Public and other staff safety	Presence of appropriate and clear signage in and around laboratory facility	during renovation/Co nstruction work	AHRI, MOH	1,000.00	None

OHS - Exposure to Biological Agents, Chemicals, and Sharps:	Minimized exposure risk for personnel; compliant handling and disposal of hazardous materials; zero preventable incidents/exposures.	- PPE Compliance Rate: % of staff observed correctly using required PPE. - Incident/Exposure Reports: Number of biological/chemical exposures or sharps injuries. - Training Completion Rates: % of relevant staff completing required OHS training. - Waste Segregation Audits: Scores from audits of hazardous waste segregation and disposal. - Health Monitoring Records: Documentation of staff health checks (where applicable).	- Daily/Weekly: PPE use, protocol adherence. - Monthly: Waste segregation audits. - Quarterly: Training completion & effectiveness. - Annually: Health monitoring review.	MOH	3,000	None

OHS - Inadequate Ventilation and Lighting:	Safe air quality and comfortable working conditions; reduced risk of respiratory issues, eye strain, and accidents due to poor visibility.	- Ventilation System Logs: Records of maintenance, calibration, and performance checks for fume hoods, biosafety cabinets, and general HVAC. - Air Quality Monitoring: Results of periodic air quality tests (if applicable). - Lighting Lux Levels: Measurements of illumination in key workspaces. - Staff Feedback: Surveys or direct reports on air quality and lighting comfort.	- Monthly: Ventilation system checks. - Quarterly: Lighting level checks. - Annually: Comprehensive system performance review & calibration.	AHRI/MOH	2,000.00	None
OHS - Lack of Adequate Training or Neglect of Safety Guidelines:	Competent and safety-aware workforce; consistent adherence to safety protocols; effective response during emergencies.	- Training Attendance & Assessment Records: Documentation of participation and understanding. - Safety Violation Reports: Number of observed non-compliance incidents. - Incident Investigation Reports: Root cause analysis identifying training gaps or behavioral issues.	- Monthly: Safety culture observations. - Quarterly: Training effectiveness review. - Annually: Comprehensive safety audit.	AHRI/MOH	2,500.00	None

OHS - Misuse of Equipment and Materials	Safe and correct use of all equipment; minimized equipment-related accidents and breakdowns.	- SOP Adherence Checks: Regular checks on proper equipment usage according to SOPs. - Equipment Maintenance Logs: Records of inspections, servicing, and repairs. - Equipment-Related Incident Reports: Number of accidents or near-misses involving equipment. - Training Records: Verification of staff competence for specific machinery.	- Weekly: SOP adherence. - Monthly: Maintenance checks. Annually: Operator competence review.	AHRI/MOH	2,000.00	MOH
OHS - Ergonomic Hazards and Accidents:	Reduced ergonomic injuries; safe and clear workspaces; prompt response to minor injuries.	- Ergonomic Assessment Reports: Results of workstation evaluations. - Housekeeping Inspection Scores: Regular audit scores for cleanliness and organization. - Accident Reports: Number of slips, trips, falls, or ergonomic-related injuries. - First-Aid Kit & Emergency Equipment Logs: Records of inspections and functionality checks.	- Monthly: Housekeeping inspections, first-aid/emergency equipment checks. - Quarterly: Ergonomic reviews. Annually: Comprehensive safety audit	AHRI/MOH	2,000.00	None

OHS - Lack of Safety Signage:	Clear communication of hazards and safety instructions; enhanced awareness and compliance.	- Signage Inspection Reports: Documentation of signage presence, condition, and legibility. - Staff Awareness Surveys: Assessment of staff's understanding of signage meanings. - Audit Findings: Observations on the adequacy and placement of signage.	- Monthly: Signage inspection. Annually: Comprehens ive review.	AHRI/M OH	6,000.00	None
Gender based violence impacts						
Conduct continued sensitization and awareness raising to AHRI staff and contractor workers on prevention of GBV	Awareness creation	Number of staff trained	during renovation/Co nstruction work	AHRI/MO H	6,000.00	Yes
Strengthen the Gender and women department of AHRI to address GBV cases when it occurs	Strengthened office of GBV	Amount of technical and materials provided to Gender & Women department at AHRI. Focus on multi-sectoral coordination, implementing prevention measures. Strengthening collaboration with other institutions.	Whenever necessary	AHRI/MO H	-	Yes
Risks associated with waste management within the AHRI during Operation phase						
All waste bags would in-place and intact at the end of transportation	Designated pathways forwaste transportation	Available routes in place	daily	AHRI/MO H	4,000.00	None

Carts, trolley, or containers, used for the transportation of infectious waste would not be used for the transportation of any other material	Have separated trolley & carts for sharps, infectious & infectious waste transportation	Availability of color-coded Carts, trolley or containers for each type of wastes	daily	AHRI/MOH	4,000.00	None
Waste bags would be placed in containers (e.g. cardboard boxes or wheeled, rigid, lidded plasticor galvanized bins), before being placed directly into the transportation vehicle	Maintained secondary containment	Presence of appropriate secondary barrier	daily	MOH	-	Yes
The collected waste will not be left even temporarily anywhere other than at the designated storage room	Wastes stored only at designated storage area	Presence of wastes other than designated place	daily	MOH	-	None
Containers would be covered with lids duringstorage and transport.	Waste storage and transportation	Availability of waste storage and transportation bin with lid	daily	MOH	-	None
Transport staff would wear adequate personal protective equipment (PPE)	Regular use of PPE by waste transport staff	Proportion of waste collectors wear appropriate PPE	daily	MOH	-	None
Education and training would be provided to all waste transport workers	Trained waste handlers	Number of trained waste handlers	biannually	MOH	-	None
Risk of Improper Final Disposal (Hazardous/Infectious Waste)	All wastes must be disposed of via licensed and permitted off-site facilities, tracked by a formal chain of custody system.	Number of disposals with complete, signed manifests (by waste type: infectious, sharps, chemical/hazardous) received from the disposal contractor.	Whenever necessary	/AHRI/MOH	-	None
Potential Threats to Biodiversity	Trained laboratory workers	Number of trained laboratory workers	biannually	MOH	-	None

Laboratory activities implementing under bio-containment protocols	Available bio-containment protocols	Availability & utilization of bio-containment protocols	daily	MOH	-	None
Safe collection, storage, and disposal of all biological and chemical waste generated by the laboratories	Wastes collected, stored, & disposed only at designated storage area	Presence of wastes other than designated place	daily	MOH	-	None
Training & Capacity building would be provided to all laboratory workers						
Total cost for Monitoring of the ESMP					**126,500.00**	

6. Grievance Readdress Mechanism

A clear and accessible Grievance Redress Mechanism (GRM) will be established to receive and facilitate the resolution of concerns and grievances from project-affected persons (PAPs), including local communities, AHRI staff, and contractors' workers. The GRM aims to address issues promptly and transparently, fostering good relations between the project and its stakeholders.

Principles of the GRM:

- **Accessibility:** Easy for PAPs to access without cost or fear of retribution.
- **Transparency:** Clear process known to all stakeholders.
- **Responsiveness:** Timely acknowledgment and resolution of grievances.
- **Fairness:** Impartial and objective consideration of all grievances.
- **Confidentiality:** Protection of the identity of complainants, especially in sensitive cases like GBV/SEA.
- **Empowerment:** Allowing complainants to feel heard and participate in the resolution process.

GRM Structure and Process:

Step 1: Receipt of Grievance

- Grievances can be submitted through various channels:
    - **In-person:** To the AHRI ESMP Focal Point, Site Engineer (during construction), or Facility Managers (during operation).
    - **Written:** Via suggestion boxes at AHRI reception, dedicated email address, or formal letter.
    - **Phone:** To a designated project phone number (managed by ESMP Focal Point).
    - **Community Representatives:** Via local community leaders or AHRI staff who interact with the community.
- All grievances will be logged in a **Grievance Register** immediately upon receipt. The register will include:
    - Date of receipt.
    - Name and contact details of the complainant (if provided, with consent for contact).
    - Nature of the grievance.
    - Date of acknowledgement.

Step 2: Acknowledgment and Initial Assessment

- The AHRI ESMP Focal Point will acknowledge receipt of the grievance within **3 working days**.
- The ESMP Focal Point will conduct an initial assessment to determine the nature and urgency of the grievance.
- For sensitive grievances (e.g., GBV/SEA), immediate referral to appropriate support services (e.g., counseling, medical care) will be prioritized, and a survivor-centered approach ensuring confidentiality will be adopted. A separate, confidential protocol for GBV/SEA grievances will be in place.

Step 3: Investigation and Action

- The ESMP Focal Point, in consultation with relevant AHRI departments (HR, Security, Facility Management, Lab Supervisors) and the contractor (during construction), will investigate the grievance.
- **During Construction/Renovation Phase**

The contractor should establish a separate GM Committee for project workers. The committee is an ad hoc formed from the Contractor representatives, workers representative and AHRI EHS focal. The Contractor will have the primary responsibility for managing workplace grievances for its own workforce. The AHRI/MOH will function as a second GM for unresolved grievances and as a mechanism to prevent retaliation. This may involve site visits, interviews with relevant parties, and review of documentation. A proposed resolution or action plan will be developed within **10 working days** of the initial assessment.

Step 4: Resolution and Communication

- The proposed resolution will be communicated to the complainant.
- If the complainant agrees, the resolution will be implemented.
- The resolution and its implementation will be documented in the Grievance Register.
- The grievance will be considered closed upon satisfactory resolution.

Step 5: Appeal and Escalation

- If the complainant is not satisfied with the proposed resolution or the outcome, they can appeal to a higher authority within AHRI (e.g., AHRI Director General or a designated grievance committee) within **5 working days** of receiving the initial resolution.
- The higher authority will review the case and communicate a final decision within **15 working days**.

- If the complainant remains unsatisfied, they can pursue external legal or administrative remedies as per national laws (e.g., AAEPA, relevant courts). This external option will be communicated to them.

Specific Considerations for GBV/SEA Grievances:

- A separate, confidential, and survivor-centered GBV/SEA protocol will be in place.
- GBV/SEA grievances will be handled by specifically trained personnel (preferably female) outside the general GRM if the complainant prefers.
- Emphasis will be on providing immediate support to the survivor (medical, psychological, legal) and ensuring their safety and confidentiality, rather than immediate investigation for disciplinary action (which can follow only with informed consent of the survivor and if it does not put them at further risk).
- The GRM will clearly link to external specialized GBV/SEA support services.

Monitoring and Reporting:

- The ESMP Focal Point will maintain the Grievance Register and prepare monthly summaries of grievances received, status, and resolution.
- These summaries will be submitted to AHRI Management and incorporated into the overall ESMP monitoring reports.
- An annual review of the GRM effectiveness will be conducted.

Publicity:

- Information about the GRM, including contact details and procedures, will be widely disseminated through posters at the construction site, AHRI premises, community notice boards, and during community meetings.
- The project will ensure that the GRM is easily understandable, including for non-literate individuals.

7. Monitoring the implementation of ESMP

Monitoring is a continuous process to ensure that environmental and social management measures are effectively implemented and achieve their intended outcomes. It involves tracking progress, identifying deviations, and informing adaptive management.

7.1. Internal Monitoring

Internal monitoring will be conducted by AHRI's ESMP Focal Point, Site Engineer (during construction), Facility Managers (during operation), and relevant departmental heads.

- **Daily/Weekly Checks:**

    - **Construction Phase:** Visual checks for dust suppression, waste segregation, and proper storage of materials, worker PPE usage, safety signage, site cleanliness, and traffic flow.
    - **Operation Phase:** Visual checks for waste segregation in labs/animal house, cleanliness of facilities, functionality of basic equipment, and adherence to access control.
- **Monthly Reviews:**
    - Review of waste generation and disposal records (including hazardous waste manifests).
    - Review of OHS incident reports and accident statistics.
    - Review of grievance log and resolution status.
    - Verification of maintenance records for equipment (e.g., vehicles, HVAC, fume hoods).
    - Check for availability and condition of PPE, first-aid kits, and spill kits.
- **Quarterly Reviews:**
    - Comprehensive site inspections by the AHRI ESMP Focal Point and relevant technical staff.
    - Review of environmental monitoring data (e.g., wastewater quality, air quality if measured).
    - Assessment of overall ESMP compliance and effectiveness.
    - Identification of emerging issues and formulation of corrective actions.

7.2. Monitoring Parameters and Indicators

The monitoring parameters and indicators are detailed in Environmental and Social Management Plan Matrix and Monitoring Plan Matrix. Key indicators include:

- **Quantitative Indicators:** Volume of waste generated/disposed, water/energy consumption, air pollutant concentrations, noise levels, number of OHS incidents, number of grievances.
- **Qualitative Indicators:** Effectiveness of waste segregation, proper PPE usage, community satisfaction, adherence to animal welfare standards, implementation of biosafety protocols.

7.3. Reporting

- **Internal Reports:**

- **Weekly Reports:** By Site Engineer (construction) and Facility Managers (operation) to the AHRI ESMP Focal Point.
- **Monthly Reports:** By the AHRI ESMP Focal Point to AHRI Management, summarizing monitoring findings, issues, and corrective actions.
- **Quarterly Reports:** Comprehensive reports from the AHRI ESMP Focal Point to AHRI Management, including data analysis, trend assessment, and recommendations.

- **External Reports:**
  - **Annual ESMP Performance Reports:** Prepared by AHRI and submitted to MoH. These reports will detail the overall performance of the ESMP, compliance status, challenges, and future plans.
  - **Quarterly Reports:** ESMP performance quarterly reports will be prepared by MoH and send to the World Bank.

7.4. Adaptive Management

Monitoring results will serve as a feedback mechanism for adaptive management. If monitoring indicates that mitigation measures are not effective or new unforeseen impacts arise, the ESMP will be reviewed and updated accordingly. Corrective actions will be promptly implemented to address any identified non-compliance or environmental/social issues. This iterative process ensures that the ESMP remains a living document that adapts to the evolving needs of the project and its environment.

8. Costs for Implementing ESMP

The costs associated with Environmental and Social (E&S) management activities during the construction phase shall be borne by the contractor. Responsibility for E&S management during the operation phase lies with the AHARI, with associated costs considered as estimates subject to revision during implementation. Additionally, the costs related to monitoring E&S performance are to be covered by the AHARI and are expected to primarily include expenses for fuel and consultation workshops.

The estimated cost for implementing mitigation measures during the construction phase is 666,000.00 for all renovation and construction period, whereas the projected Environmental and Social (E&S) management expenditure for the operational phase is anticipated at birr 344,000.00 per annual. The cumulative management cost encompassing all project phases' amounts to birr

1,010,000.00 with an additional allocation of birr 107,000 earmarked for annual monitoring and evaluation of E&S implementation performance.

Annex 1: Codes of Conduct for Contractors and the SEA/SH Prevention and Response Action Plan

To build a system for SEA/SH risk prevention and mitigation, the project must:

- Have all employees of contractors (including sub-contractors), supervising Engineers and other consultants with a footprint on the ground in the project area sign workers codes of conduct (CoCs);
- Have an effective SEA/SH Action Plan so that workers understand behavior expectations and policies, as well as an effective Grievance Mechanism (GM). This Action Plan should include training and communication. It should also include plans to make the project-affected community aware of the CoC the project staff have just signed; and
- As part of the SEA/SH Action Plan, define accountability and response protocols, which set out the procedures followed for holding individuals accountable and penalizing staff that have violated SEA/SH policies.

Codes of Conduct from Standard Procurement Document

Note to the Employer:

The following minimum requirements shall not be modified*. The Employer may add additional requirements to address identified issues, informed by relevant environmental and social assessment.*

The types of issues identified could include risks associated with: labor influx, spread of communicable diseases, Sexual Exploitation and Sexual Abuse (SEA) *etc.*

Code of Conduct for Contractor's Personnel (ES) Form

Note to the Bidder:

The minimum content of the Code of Conduct form as set out by the Employer shall not be substantially modified. However, the Bidder may add requirements as appropriate, including to take into account Contract-specific issues/risks.

The Bidder shall initial and submit the Code of Conduct form as part of its bid.

Code of Conduct for Contractor's Personnel

We are the Contractor, [enter name of Contractor]. We have signed a contract with [enter name of Employer] for [enter description of the Works]. These Works will be carried out at [enter the Site and other locations where the Works will be carried out]. Our contract requires us to implement measures to address environmental and social risks related to the Works, including the risks of sexual exploitation, sexual abuse and sexual harassment.

This Code of Conduct is part of our measures to deal with environmental and social risks related to the Works. It applies to all our staff, labourers and other employees at the Works Site or other places where the Works are being carried out. It also applies to the personnel of each subcontractor and any other personnel assisting us in the execution of the Works. All such persons are referred to as "Contractor's Personnel" and are subject to this Code of Conduct.

This Code of Conduct identifies the behavior that we require from all Contractors' Personnel.

Our workplace is an environment where unsafe, offensive, abusive or violent behavior will not be tolerated and where all persons should feel comfortable raising issues or concerns without fear of retaliation

REQUIRED CONDUCT

Contractor's Personnel shall:

1. carry out his/her duties competently and diligently;
2. comply with this Code of Conduct and all applicable laws, regulations and other requirements, including requirements to protect the health, safety and well-being of other Contractor's Personnel and any other person;
3. maintain a safe working environment including by:
    a. ensuring that workplaces, machinery, equipment and processes under each person's control are safe and without risk to health;
    b. wearing required personal protective equipment;
    c. using appropriate measures relating to chemical, physical and biological substances and agents; and
    d. following applicable emergency operating procedures.
4. report work situations that he/she believes are not safe or healthy and remove himself/herself from a work situation which he/she reasonably believes presents an imminent and serious danger to his/her life or health;
5. treat other people with respect, and not discriminate against specific groups such as women, people with disabilities, migrant workers or children;
6. not engage in Sexual Harassment, which means unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature with other Contractor's or Employer's Personnel;
7. not engage in Sexual Exploitation, which means any actual or attempted abuse of position of vulnerability, differential power or trust, for sexual purposes, including, but not limited to, profiting monetarily, socially or politically from the sexual exploitation of another;
8. not engage in Sexual Abuse, which means the actual or threatened physical intrusion of a sexual nature, whether by force or under unequal or coercive conditions;
9. not engage in any form of sexual activity with individuals under the age of 18, except in case of pre-existing marriage;
10. complete relevant training courses that will be provided related to the environmental and social aspects of the Contract, including on health and safety matters, Sexual Exploitation and Abuse (SEA), and Sexual Harassment (SH);
11. report violations of this Code of Conduct; and

12. Not retaliate against any person who reports violations of this Code of Conduct, whether to us or the Employer, or who makes use of the grievance mechanism for Contractor's Personnel or the project's Grievance Redress Mechanism.

RAISING CONCERNS

If any person observes behavior that he/she believes may represent a violation of this Code of Conduct, or that otherwise concerns him/her, he/she should raise the issue promptly. This can be done in either of the following ways:

1. Contact [enter name of the Contractor's Social Expert with relevant experience in handling sexual exploitation, sexual abuse and sexual harassment cases, or if such person is not required under the Contract, another individual designated by the Contractor to handle these matters] in writing at this address [ ] or by telephone at [ ] or in person at [ ]; or 2.
2. Call [ ] to reach the Contractor's hotline (if any) and leave a message.

The person's identity will be kept confidential, unless reporting of allegations is mandated by the country law. Anonymous complaints or allegations may also be submitted and will be given all due and appropriate consideration. We take seriously all reports of possible misconduct and will investigate and take appropriate action. We will provide warm referrals to service providers that may help support the person who experienced the alleged incident, as appropriate.

There will be no retaliation against any person who raises a concern in good faith about any behavior prohibited by this Code of Conduct. Such retaliation would be a violation of this Code of Conduct.

CONSEQUENCES OF VIOLATING THE CODE OF CONDUCT

Any violation of this Code of Conduct by Contractor's Personnel may result in serious consequences, up to and including termination and possible referral to legal authorities.

FOR CONTRACTOR'S PERSONNEL:

I have received a copy of this Code of Conduct written in a language that I comprehend. I understand that if I have any questions about this Code of Conduct, I can contact [enter name of Contractor's contact person(s) with relevant experience] requesting an explanation.

Name of Contractor's Personnel: _____

Signature: _____

Date: (day month year): _____

Countersignature of authorized representative of the Contractor:

Signature: _____

Date: (day month year): _____

Annex 2: Construction Site Safety Requirement Checklist

Project Information

- Project Name: _____
- Project Location: _____
- Project Manager: _____

- Date: _____

Safety Checklist

Safety Measure	Yes	No	N/A	Comments
Personal Protective Equipment available & used	☐	☐	☐	
Clear walkways and exits	☐	☐	☐	
Proper signage displayed	☐	☐	☐	
Fire extinguishers accessible	☐	☐	☐	
First aid kits available	☐	☐	☐	
Emergency contact numbers visible	☐	☐	☐	
Equipment inspected and maintained	☐	☐	☐	
Safe storage of materials	☐	☐	☐	
Scaffolding secured	☐	☐	☐	
Tools and equipment properly stored	☐	☐	☐	
Adequate lighting provided	☐	☐	☐	
Chemical hazards labeled	☐	☐	☐	
Fall protection in place	☐	☐	☐	
Electrical safety measures implemented	☐	☐	☐	

Incident Reporting

- Incident Description: _____
- Date and Time: _____
- Location: _____
- Persons Involved: _____
- Immediate Actions Taken: _____

Signatures

- Inspector's Signature: _____
- Date: _____
- Project Manager's Signature: _____
- Date: _____

Annex 3: Incident Report Form

The following report form is to be completed by the responsible PIU within 24 hours in the case of an incident:

Part B of ESIRT- To be completed by Borrower within 24 hours

B1: Incident Details			
Date of Incident:	**Time:**	**Date Reported to PIU:**	**Date Reported toWB:**
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)			
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 ☐			
B3: Description/Narrative of Incident			
• *What was the incident?* • *What were the conditions or circumstances under which the incident occurred (if known)?* • *Are the basic facts of the incident clear and uncontested, or are there conflicting versions? What are those versions?* • *Is the incident still on-going or is it contained?* • *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 under Contract GCC8.9? Yes ☐; No ☐; Name of Contractor:			
B5: What support has been provided to affected people?			

	Visitors' Induction Attendance Sheet			
No.	Name:	PPE Required	Sign:	Date

Annex 4: Grievance Redress Mechanism Formats

Complaint Registration (Form 1)

1. Full Name of Complainant/Organization:
2. Full Address of Complainant/Organization:
    - Region _____
    - Woreda _____
3. Contact Information of Complainant:
    - Cell phone _____
    - Home phone _____
    - Office phone _____
    - Email (if any) _____
4. Nature of the Complaint/Problem/Request/Comment/Suggestion:
5. Proposed Solution/Recommendation/Suggestion/Request/Comment:
6. Description of the Complaint:
    - How _____
    - What _____
    - Where _____
    - When _____
7. Supporting Documents Attached:
8. Received By:
    - Full Name _____
    - Signature _____
    - Date _____
    - Time _____

Decision-Making Form (Form 2)

File Reference No.: _____ Date: _____

1. Date of Complaint: _____
2. Summary: _____
3. Summary of the Complaint: _____
4. Name/Title of Complainant:
    - Name _____
    - Title _____

5. Proposed Decision: _____
6. Name of Decision-Maker:
    - Name _____
    - Title _____
7. Approval/Rejection:
    - Approved/Rejected _____
    - Signature _____
    - Date _____

Decisions Registration Log (Form 3)

No.	Complainant/Petitioner's Name	Complaint/Petition Summary	Decision	Remarks

Work Plan Implementation Follow-up (Form 4)

File Reference No.: _____ Date: _____

No.	Work Plan/Activity	Start Date	End Date	Person Responsible	Monitoring and Evaluation	Remarks
					Indicator	
					Progress	
					Date	
					Decision	

Appointment Form (Form 5)

1. Full Name and Title of Complainant/Petitioner:

   Title: _____
2. Summary of Complaint/Petition:
3. Appointment Date: _____ Time: _____
4. Name of Person Receiving Complaint/Petition:

   Name: _____

   Title: _____

   Signature: _____ Date: _____

Annex III: Screening report on Laboratory Animal house facility Environmental and social screening

Armauer Hansen Research Institute

Screening report on

Laboratory Animal house facility Environmental and social screening

March, 2025

AHRI, Addis Ababa

1. Introduction

Animal experiment is an important part of biomedical research with the aim to understand the nature of human and animal disease and to develop effective and safe treatment. The use of laboratory animals has helped to improve health, prolong life and reduce suffering in man and also in domestic animals.

Animal-based biomedical and preclinical research is very essential to develop /repurpose tool and biopharmaceutical that can be useful to prevent, diagnose, treat, and cure diseases and there by improve human lives in Africa including Ethiopia. In order to carry out this type of research aiming to save and improve these countries lives, researchers in Ethiopia require a well standardized laboratory animal house facility and laboratory breeds. Facilities for laboratory animals involved in research, teaching, and testing must be conducive to the welfare and safety of the animals, facilitate optimal animal care practice, and provide an appropriately appointed and safe work place for personnel and, in the case of research and testing, establish a stable environment that will contribute to the reproducibility of studies.

In Ethiopia, the Aremauer Hansen Research Institute (AHRI) is the only institute in the country that bred different lab animals and uses these animals for different research studies in the country. In addition, the institute distributes these animals to different research institutions, universities and organizations. Mice, Rat, Rabbit, guinea pig and hamster are the most important laboratory animals bred in the institute. However, the production system of those animals, housing, and facilities are still antiquated compared to other countries. To fill these gaps and produce laboratory animals scientifically approach, renovation of each laboratory house, facility and services are of paramount importance. To attain this, Aremauer Hansen Research Institute (AHRI) is supported by World Bank and will improve the overall facilities of laboratory animals in the country within one year. Those who use animals in experiments must therefore be properly trained in methods appropriate for the species used. It is the responsibility of each research facility to develop educational programs for animal-care providers and the research staff.

2. ES Screening form

I. Screening Template for Potential Environmental and Social Issues

This form is to be used by the E&S risk management specialists of the AHRI and World Bank Unit (WBU) and other partner and beneficiary institutions to screen for the potential environmental and social risks and impacts of a proposed subproject. Sub project refers to the set of activities derived from the Health Emergency prevention, preparedness, response and resilience (HEPRR) Component and sub-component activities including technical assistance studies and consultancies for which support through investment project financing is sought by the client. Subproject E&S measures therefore apply to HCF where investments will be made. It will help the AHRI and MoH WB and partner institutions E&S specialists in identifying the relevant Environmental and Social Standards (ESS), establishing an appropriate E&S risk rating for these subprojects and specifying the type of environmental and social assessment required, including specific instruments/plans. Use of this form will allow the AHRI and MoH, WB to form an initial view of the potential risks and impacts of a subproject. *It is not a substitute for project-specific E&S assessments or specific mitigation plans.*

A note on *Considerations and Tools for ES Screening and Risk Rating* is included in this Annex to assist the process.

Subproject Name	AHRI Laboratory Animal house Renovation
Subproject Location	Addis Ababa, AHRI Head Office(ALERT AHRI health village)
Subproject Proponent	MoH/ AHRI
Estimated Investment	1,000,000.00
Start/Completion Date	

Subproject eligibility check:

Subproject eligibility/ exclusion criteria question	**Yes**	**No**
1. Will the subproject involve activities that may cause long term, permanent and/or irreversible impacts (e.g. loss of major natural habitat)?		√
2. Will the subproject involve construction in environmentally sensitive areas such as National Parks, fragile ecosystems, and wildlife reserve?		√
3. Will the project activities have a high probability of causing serious adverse effects to human health and/or the environment?		√
4. Will the subproject involve activities that may have significant adverse social impacts and may give rise to significant social conflict?		√
5. Will the project activities involve significant land acquisition, forced eviction and involuntary physical displacement?		√
6. Will the project activities impact known cultural heritage sites including sites that are important to local communities?		√
7. Will the subproject involve Type 1 TAs that support preparation of future infrastructure		√

Subproject eligibility/ exclusion criteria question	Yes	No
investment projects?		
If any of the above questions are answered as "Yes", the proposed subproject is not eligible for financing under this ERP.		

Questions	Answer		ESS relevance	Due diligence / Actions
	Yes	No		
Does the subproject have any potential existing Environmental and Social liabilities and risks at the existing facilities/locations that will be part of the subproject?	√		ESS 1	Environnemental Audit/Due Diligence Audit
Does the subproject involve civil works including new construction, expansion, upgrading or rehabilitation of healthcare facilities and/or waste management facilities? Could climate change or extreme weather adversely impact the project?	√		ESS1	ESIA/ESMP, SEP
Does the subproject involve land acquisition and/or restrictions on land use?		√	ESS5	
Does the subproject involve acquisition of assets for quarantine, isolation, or medical treatment purposes?		√	ESS5	
Is the subproject associated with any external waste management facilities such as a sanitary landfill, incinerator, or wastewater treatment plant for healthcare waste disposal?	√		ESS3	ESIA/ESMP, SEP
Is there a sound regulatory framework and institutional capacity in place for healthcare facility infection control and healthcare waste management?	√		ESS1	ESIA/ESMP, SEP
Does the subproject have an adequate system in place (capacity, processes, and management) to address waste?	√			
Does the subproject involve recruitment of workers including direct, contracted, primary supply, and/or community workers?	√		ESS2	LMP, SEP
Does the subproject have appropriate OHS procedures in place, and an adequate supply of PPE (where necessary)?	√			
Does the subproject have a GRM in place, to which all workers have access, designed to respond quickly and effectively?	√			
Does the subproject involve trans boundary transportation (including Potentially infected specimens may be transported from healthcare facilities to testing laboratories, and transboundary) of specimen, samples, infectious and hazardous materials?		√	ESS3	ESIA/ESMP, SEP
Does the subproject involve use of security or military personnel during construction and/or operation of healthcare facilities and related activities?		√	ESS4	ESIA/ESMP, SEP

Is the subproject located within or in the vicinity of any ecologically sensitive areas?		√	ESS6	ESIA/ESMP, SEP
Are there any indigenous groups (meeting specified ESS7 criteria) present in the subproject area and are they likely to be affected by the proposed subproject negatively or positively?		√	ESS7	
Is the subproject located within or in the vicinity of any known cultural heritage sites?		√	ESS8	ESIA/ESMP, SEP
Does the project area present considerable Gender-Based Violence (GBV) and Sexual Exploitation and Abuse (SEA) risk?		√	ESS1	ESIA/ESMP, SEP
Does the subproject carry risk that disadvantaged and vulnerable groups may have inequitable access to project benefits?		√	ESS1	ESIA/ESMP, SEP

Categorization & Recommendations: After compiling the above, determine which risk category the subproject falls under based on the environmental categories High, Substantial, Moderate and Low risk. If the subproject falls under "Substantial, Moderate or low" risk categories, proceed to identify the category of the subproject (i.e. Schedule I, II or III) based on the National EIA procedural guideline issued by the Federal Environment, Forest and Climate Change Commission.

a. World Bank ESF Categorization

	High Risk	HEPRR subproject highly unlikely to fall under "High Risk" rating. In the unlikely event that subproject falls under "High Risk" the Environmental and social Assessment should be conducted in accordance with the World Bank Environmental and Social Standards (ESSs).
	Substantial Risk	HEPRR subproject highly unlikely to fall under "Substantial Risk" rating. In the unlikely event that subproject falls under "Substantial Risk" the Environmental and social Assessment of the subproject should be conducted in accordance with National law and any requirements of the ESSs that the Bank deems relevant to such subprojects
√	Moderate Risk	Environmental and social Assessment of the subproject should be conducted in accordance with National law and any requirements of the ESSs that the Bank deems relevant to such subprojects.
	Low Risk	Environmental and social Assessment of the subproject should be conducted in accordance with National law and any requirements of the ESSs that the Bank deems relevant to such subprojects. Sub project is not subject to environmental assessment as no potential impacts are anticipated.

***Place tick in applicable box**

b. National EIA Procedural Guideline (2003) Categorization

	Schedule 1	Some HEPRR subproject likely to fall under "Schedule-I" Category. In the event that subproject falls under "Schedule-I" the subproject is to be fed into the standard ESIA process determined by the Federal or Regional EPAs

√	Schedule 2	Subproject will require a partial/preliminary ESIA and will necessitate the preparation of preliminary ESIA / ESMP.
	Schedule III	Subproject is not subject to environmental assessment as no potential impacts are anticipated.

Reviewer:	
Name:	
Signature:	

***Place tick in applicable box**

3. Conclusion

The AHRI Animal house Renovation project is not expected to cause any land related impacts and the project's design and operational protocols are built upon WHO laboratory and medical regulation standards for Laboratory animal house , ensuring both efficiency and quality. This regulatory compliance to standards minimizes operational phase impacts, leading to responsible and manageable operational process.

The project`s environmental and social impacts are more likely to align with construction phase and are expected to be manageable. Therefore, the environmental and social risks of the project are categorized as Moderate and scheduled 2, requiring only environmental and social management plan (ESMP) for the project.

Annex IV: Screening report on Sterilization and Laundry Rooms

Armauer Hansen Research Institute

Screening report on

Sterilization and Laundry Rooms Environmental and social screening

March, 2025

AHRI, Addis Ababa

Introduction

In the complex and demanding environment of healthcare, maintaining a hygienic and efficient laundry process is of utmost importance. Health research institutes must ensure that not only their research facilities but also their linen and clothing meet the highest standards of cleanliness. Achieving this necessitates a deep understanding of laundry concepts, equipment, and processes specifically tailored to the healthcare industry.

Although the building of Armauer Hansen Research Institute is new, certain rooms, namely the sterilization and laundry rooms, require significant modifications. The purpose of these renovations is to repurpose these spaces so that they can house the newly procured, largescale machinery. These machines require specialized handling and installation, and the renovation aims to provide an optimal environment for their operation.

The objective of the renovation is to ensure that the rooms meet the necessary specifications for the newly acquired equipment, guaranteeing their safe installation and smooth functioning. The laundry room, in particular, will need substantial modifications to accommodate the washing and drying machines as well as the ironing machines.

This renovation is crucial for the successful installation and operation of the new equipment in the sterilization and laundry rooms. With the proposed upgrades below, the rooms will be transformed into functional, efficient spaces that meet the specifications of the newly procured machinery. The project will be completed in a timely manner, ensuring minimal disruption to daily operations.

Thus this is why Environmental and social screening is needed to mitigate the potential adverse impacts properly

ES Screening form

II. Screening Template for Potential Environmental and Social Issues

This form is to be used by the E&S risk management specialists of the AHRI and World Bank Unit (WBU) and other partner and beneficiary institutions to screen for the potential environmental and social risks and impacts of a proposed subproject. Sub project refers to the set of activities derived from the Health Emergency prevention, preparedness, response and resilience (HEPRR) Component and sub-component activities including technical assistance studies and consultancies for which support through investment project financing is sought by the client. Subproject E&S measures therefore apply to HCF where investments will be made. It will help the AHRI and MoH GMU and partner institutions E&S specialists in identifying the relevant Environmental and Social Standards (ESS), establishing an appropriate E&S risk rating for these subprojects and specifying the type of environmental and social assessment required, including specific instruments/plans. Use of this form will allow the AHRI and MoH GMU to form an initial view of the potential risks and impacts of a subproject. *It is not a substitute for project-specific E&S assessments or specific mitigation plans.*

A note on *Considerations and Tools for ES Screening and Risk Rating* is included in this Annex to assist the process.

Subproject Name	AHRI Laundry house Renovation
Subproject Location	Addis Ababa, AHRI Head Office(ALERT AHRI health village)
Subproject Proponent	MoH/ AHRI
Estimated Investment	1,000,000.00
Start/Completion Date	

Subproject eligibility check:

Subproject eligibility/ exclusion criteria question	**Yes**	**No**
1. Will the subproject involve activities that may cause long term, permanent and/or irreversible impacts (e.g. loss of major natural habitat)?		√
2. Will the subproject involve construction in environmentally sensitive areas such as National Parks, fragile ecosystems, and wildlife reserve?		√
3. Will the project activities have a high probability of causing serious adverse effects to human health and/or the environment?		√
4. Will the subproject involve activities that may have significant adverse social impacts and may give rise to significant social conflict?		√
5. Will the project activities involve significant land acquisition, forced eviction and involuntary		√

physical displacement?		
6. Will the project activities impact known cultural heritage sites including sites that are important to local communities?		√
7. Will the subproject involve Type 1 TAs that support preparation of future infrastructure investment projects?		√
If any of the above questions are answered as "Yes", the proposed subproject is not eligible for financing under this ERP.		

Questions	Answer		ESS relevance	Due diligence / Actions
	Yes	No		
Does the subproject have any potential existing Environmental and Social liabilities and risks at the existing facilities/locations that will be part of the subproject?	√		ESS 1	Environnementa l Audit/Due Diligence Audit
Does the subproject involve civil works including new construction, expansion, upgrading or rehabilitation of healthcare facilities and/or waste management facilities? Could climate change or extreme weather adversely impact the project?	√		ESS1	ESIA/ESMP, SEP
Does the subproject involve land acquisition and/or restrictions on land use?		√	ESS5	
Does the subproject involve acquisition of assets for quarantine, isolation, or medical treatment purposes?		√	ESS5	
Is the subproject associated with any external waste management facilities such as a sanitary landfill, incinerator, or wastewater treatment plant for healthcare waste disposal?	√		ESS3	ESIA/ESMP, SEP
Is there a sound regulatory framework and institutional capacity in place for healthcare facility infection control and healthcare waste management?	√		ESS1	ESIA/ESMP, SEP
Does the subproject have an adequate system in place (capacity, processes, and management) to address waste?	√			
Does the subproject involve recruitment of workers including direct, contracted, primary supply, and/or community workers?	√		ESS2	LMP, SEP
Does the subproject have appropriate OHS procedures in place, and an adequate supply of PPE (where necessary)?	√			
Does the subproject have a GRM in place, to which all workers have access, designed to respond quickly and effectively?	√			

Does the subproject involve trans boundary transportation (including Potentially infected specimens may be transported from healthcare facilities to testing laboratories, and transboundary) of specimen, samples, infectious and hazardous materials?		√	ESS3	ESIA/ESMP, SEP
Does the subproject involve use of security or military personnel during construction and/or operation of healthcare facilities and related activities?		√	ESS4	ESIA/ESMP, SEP
Is the subproject located within or in the vicinity of any ecologically sensitive areas?		√	ESS6	ESIA/ESMP, SEP
Are there any indigenous groups (meeting specified ESS7 criteria) present in the subproject area and are they likely to be affected by the proposed subproject negatively or positively?		√	ESS7	
Is the subproject located within or in the vicinity of any known cultural heritage sites?		√	ESS8	ESIA/ESMP, SEP
Does the project area present considerable Gender-Based Violence (GBV) and Sexual Exploitation and Abuse (SEA) risk?		√	ESS1	ESIA/ESMP, SEP
Does the subproject carry risk that disadvantaged and vulnerable groups may have inequitable access to project benefits?		√	ESS1	ESIA/ESMP, SEP

Categorization & Recommendations: After compiling the above, determine which risk category the subproject falls under based on the environmental categories High, Substantial, Moderate and Low risk. If the subproject falls under "Substantial, Moderate or low" risk categories, proceed to identify the category of the subproject (i.e. Schedule I, II or III) based on the National EIA procedural guideline issued by the Federal Environment, Forest and Climate Change Commission.

b. World Bank ESF Categorization

	High Risk	HEPRR subproject highly unlikely to fall under "High Risk" rating. In the unlikely event that subproject falls under "High Risk" the Environmental and social Assessment should be conducted in accordance with the World Bank Environmental and Social Standards (ESSs).
	Substantial Risk	HEPRR subproject highly unlikely to fall under "Substantial Risk" rating. In the unlikely event that subproject falls under "Substantial Risk" the Environmental and social Assessment of the subproject should be conducted in accordance with National law and any requirements of the ESSs that the Bank deems relevant to such subprojects
√	Moderate Risk	Environmental and social Assessment of the subproject should be conducted in accordance with National law and any requirements of the ESSs that the Bank deems relevant to such subprojects.

	Low Risk	Environmental and social Assessment of the subproject should be conducted in accordance with National law and any requirements of the ESSs that the Bank deems relevant to such subprojects. Sub project is not subject to environmental assessment as no potential impacts are anticipated.

***Place tick in applicable box**

b. National EIA Procedural Guideline (2003) Categorization

	Schedule 1	Some HEPRR subproject likely to fall under "Schedule-I" Category. In the event that subproject falls under "Schedule-I" the subproject is to be fed into the standard ESIA process determined by the Federal or Regional EPAs
√	Schedule 2	Subproject will require a partial/preliminary ESIA and will necessitate the preparation of preliminary ESIA / ESMP.
	Schedule III	Subproject is not subject to environmental assessment as no potential impacts are anticipated.

***Place tick in applicable box**

Reviewer:	
Name:	
Signature:	

Conclusion

The AHRI Sterilization and Laundry Renovation project is not expected to cause any land related impacts and the project's design and operational protocols are built upon WHO laboratory and medical regulation standards for Laundery room, ensuring both efficiency and quality. This regulatory compliance to standards minimizes operational phase impacts, leading to responsible and manageable operational process.

The project`s environmental and social impacts are more likely to align with construction phase and are expected to be manageable. Therefore, the environmental and social risks of the project are categorized as Moderate and scheduled 2, requiring only environmental and social management plan (ESMP) for the project.

Annex V: Screening report on Renovation and finishing works for establishment of a Bioequivalence (BE) center

Environmental and Social Screening Report for Renovation and finishing works for establishment of a Bioequivalence (BE) center

March, 2025

Addis Ababa, AHRI

Introduction

Ethiopia currently lacks the infrastructure for conducting bioequivalence (BE) studies; this could force pharmaceutical companies to rely on costly and time-intensive overseas facilities. This gap delays the approval of locally produced generic medicines, limiting access to affordable treatments for the population. Additionally, the absence of such a facility hinders the competitiveness of the Ethiopian pharmaceutical industry, preventing it from meeting international standards and expanding into global markets. Establishing a BE study center would broadly enhance local capacity for pharmaceutical research and innovation beyond tackling immediate gaps.

Establishing a BE center requires the acquisition of advanced equipment and materials to meet international standards for clinical testing and bio analysis. The BE centers should be kept clean or easy to clean and should have adequate lighting, ventilation and ensure adequate safety for the participants. The center should have sufficient space to accommodate the personnel and activities required to perform the studies. Though AHRI with its recently built clinical research infrastructure has dedicated spaces for BE center facilities, renovating this dedicated infrastructure towards fitting the purpose for a state-of-the-art clinical and laboratory facilities becomes necessary. Additionally, the renovations enable to keep the standard workflow including integration of modern data management systems and CRO (Contract research organization) functions that will streamline study processes and enhance regulatory compliance. These investments will create a robust infrastructure to facilitate high-quality BE studies of global standard beyond supporting the local pharmaceutical sector.

The main objective of the project is to renovate available building space for establishment of a bioequivalence study center at AHRI.

ES Screening form

III. Screening Template for Potential Environmental and Social Issues

This form is to be used by the E&S risk management specialists of AHRI and Grant Management Unit (GMU) and other partner and beneficiary institutions to screen for the potential environmental and social risks and impacts of a proposed subproject. Sub project refers to the set of activities derived from the HEPRR Component and sub-component activities including technical assistance studies and consultancies for which support through investment project financing is sought by the client. Subproject E&S measures therefore apply to AHRI new building Clinical trial and Bioequivalence center where investments will be made. It will help the AHRI and MoH GMU and partner institutions E&S specialists in identifying the relevant Environmental and Social Standards (ESS), establishing an appropriate E&S risk rating for these subprojects and specifying the type of environmental and social assessment required, including specific instruments/plans. Use of this form will allow the AHRI and MoH GMU to form an initial view of the potential risks and impacts of a subproject***. It is not a substitute for project-specific E&S assessments or specific mitigation plans.***

A note on *Considerations and Tools for ES Screening and Risk Rating* is included in this Annex to assist the process.

Subproject Name	Bioequivalence and clinical trial renovation
Subproject Location	Addis Ababa, Alert/AHRI Premises
Subproject Proponent	AHRI / MoH/ Clinical Trials Directorate
Estimated Investment	198,100USD
Start/Completion Date	Dec 2024/March 2025

Subproject eligibility check:

Subproject eligibility/ exclusion criteria question	**Yes**	**No**
1. Will the subproject involve activities that may cause long term, permanent and/or irreversible impacts (e.g. loss of major natural habitat)?		√
2. Will the subproject involve construction in environmentally sensitive areas such as National Parks, fragile ecosystems, and wildlife reserve?		√
3. Will the project activities have a high probability of causing serious adverse effects to human health and/or the environment?		√
4. Will the subproject involve activities that may have significant adverse social impacts and may give rise to significant social conflict?		√
5. Will the project activities involve significant land acquisition, forced eviction and involuntary physical displacement?		√
6. Will the project activities impact known cultural heritage sites including sites that are important		√

Subproject eligibility/ exclusion criteria question	Yes	No
to local communities?		
7. Will the subproject involve Type 1 TAs that support preparation of future infrastructure investment projects?		√
If any of the above questions are answered as "Yes", the proposed subproject is not eligible for financing under this ERP.		

Questions	Answer		ESS relevance	Due diligence / Actions
	Yes	No		
Does the subproject have any potential existing Environmental and Social liabilities and risks at the existing facilities/locations that will be part of the subproject?	√		ESS 1	Environnementa l Audit/Due Diligence Audit
Does the subproject involve civil works including new construction, expansion, upgrading or rehabilitation of healthcare facilities and/or waste management facilities? Could climate change or extreme weather adversely impact the project?	√		ESS1	ESIA/ESMP, SEP
Does the subproject involve land acquisition and/or restrictions on land use?		√	ESS5	
Does the subproject involve acquisition of assets for quarantine, isolation, or medical treatment purposes?		√	ESS5	
Is the subproject associated with any external waste management facilities such as a sanitary landfill, incinerator, or wastewater treatment plant for healthcare waste disposal?	√		ESS3	ESIA/ESMP, SEP
Is there a sound regulatory framework and institutional capacity in place for healthcare facility infection control and healthcare waste management?	√		ESS1	ESIA/ESMP, SEP
Does the subproject have an adequate system in place (capacity, processes, and management) to address waste?	√			
Does the subproject involve recruitment of workers including direct, contracted, primary supply, and/or community workers?	√		ESS2	LMP, SEP
Does the subproject have appropriated OHS procedures in place, and an adequate supply of PPE (where necessary)?	√			
Does the subproject have a GRM in place, to which all workers have access, designed to respond quickly and effectively?	√			

Does the subproject involve trans boundary transportation (including Potentially infected specimens may be transported from healthcare facilities to testing laboratories, and transboundary) of specimen, samples, infectious and hazardous materials?		√	ESS3	ESIA/ESMP, SEP
Does the subproject involve use of security or military personnel during construction and/or operation of healthcare facilities and related activities?		√	ESS4	ESIA/ESMP, SEP
Is the subproject located within or in the vicinity of any ecologically sensitive areas?		√	ESS6	ESIA/ESMP, SEP
Are there any indigenous groups (meeting specified ESS7 criteria) present in the subproject area and are they likely to be affected by the proposed subproject negatively or positively?		√	ESS7	
Is the subproject located within or in the vicinity of any known cultural heritage sites?		√	ESS8	ESIA/ESMP, SEP
Does the project area present considerable Gender-Based Violence (GBV) and Sexual Exploitation and Abuse (SEA) risk?		√	ESS1	ESIA/ESMP, SEP
Does the subproject carry risk that disadvantaged and vulnerable groups may have inequitable access to project benefits?		√	ESS1	ESIA/ESMP, SEP

Categorization & Recommendations: After compiling the above, determine which risk category the subproject falls under based on the environmental categories High, Substantial, Moderate and Low risk. If the subproject falls under "Substantial, Moderate or low" risk categories, proceed to identify the category of the subproject (i.e. Schedule I, II or III) based on the National EIA procedural guideline issued by the Federal Environment, Forest and Climate Change Commission.

c. World Bank ESF Categorization

	High Risk	HEPRR subproject highly unlikely to fall under "High Risk" rating. In the unlikely event that subproject falls under "High Risk" the Environmental and social Assessment should be conducted in accordance with the World Bank Environmental and Social Standards (ESSs).
	Substantial Risk	HEPRR subproject highly unlikely to fall under "Substantial Risk" rating. In the unlikely event that subproject falls under "Substantial Risk" the Environmental and social Assessment of the subproject should be conducted in accordance with National law and any requirements of the ESSs that the Bank deems relevant to such subprojects
√	Moderate Risk	Environmental and social Assessment of the subproject should be conducted in accordance with National law and any requirements of the ESSs that the Bank deems relevant to such subprojects.

	Low Risk	Environmental and social Assessment of the subproject should be conducted in accordance with National law and any requirements of the ESSs that the Bank deems relevant to such subprojects. Sub project is not subject to environmental assessment as no potential impacts are anticipated.

***Place tick in applicable box**

b. National EIA Procedural Guideline (2003) Categorization

	Schedule 1	Some HEPRR subproject likely to fall under "Schedule-I" Category. In the event that subproject falls under "Schedule-I" the subproject is to be fed into the standard ESIA process determined by the Federal or Regional EPAs
√	Schedule 2	Subproject will require a partial/preliminary ESIA and will necessitate the preparation of preliminary ESIA / ESMP.
	Schedule III	Subproject is not subject to environmental assessment as no potential impacts are anticipated.

Reviewer:	
Name:	
Signature:	

***Place tick in applicable box**

Conclusion

The Bioequivalence and clinical trial Renovation project is not expected to cause any land related impacts and the project's design and operational protocols are built, ensuring both efficiency and quality. This regulatory compliance to standards minimizes operational phase impacts, leading to responsible and manageable operational process. The project`s environmental and social impacts are more likely to align with construction phase and are expected to be manageable. Therefore, the environmental and social risks of the project are categorized as Moderate and scheduled 2, requiring only environmental and social management plan (ESMP) for the project.

Screening Report Approval Letter from EPA

በኮልፌ ቀራንዮ ክፍለ ከተማ አስተዳደር የአካባቢ ጥበቃ ጽ/ቤት
KOLFE KERANYO SUB-CITY ADMINSTRATION
ENVIRONMENTAL PROTECTION OFFICE

ቁጥር:-ኮል/ስጥ/02-27/04/-4024

ቀን 01/12/2017 ዓ.ም

ለአርማወር ሐንሰን ምርምር ኢንስቲትዩት
አዲስ አበባ

ጉዳዩ:- የቀረበ የአካባቢ ተጽእኖ ልየታ/ Screening/ ሪፖርት ተቀባይነት ያገኘ ስለመሆኑ ማሳወቅ ይመለከታል።

ከላይ በርዕሱ እንደተጠቀሰዉ መ/ቤታችሁ በቁጥር አህሪ/07348/0028/17 በቀን 27/11/17 በተጻፈ ደብዳቤ በግቢያችሁ ውስጥ ተገንብቶ በሚገኘዉ ህንጻ ላይ ለምርመር ስራ የሚውሉ አራት ፕሮጀክቶችን አስመልክቶ ያቀረባችሁትን የአካባቢና ማህበረሰብ ተጽእኖ ልየታ ሪፖርት ተገምግሞ እንድናጸድቅላችሁ መጠየቃችሁ ይታወሳል።

በዚሁ መሰረት ለምርምር ስራዉ ያዘጋጃችኋቸዉን አራቱን ፕሮጀክቶች ማለትም:-

1ኛ. Laboratory animal house facility

2ኛ. Sterilization and Laundry Rooms

3ኛ. Establishing an incubation center for In-vitro Diagnostic (IVD) and Assays (Immuno molecular diagnostic) Research and Development and Small-scale production Project

4ኛ. Renovation and finishing work for establishing Bioequivalence (BE) center.

የተሰኙ ፕሮጀክቶች የአካባቢ ተፅዕኖ ግምገማ አስመልክቶ በአገሪቱ (አዋጅ ቁጥር 229/1995) እና አዲስ አበባ ከተማ (ደንብ ቁጥር 21/2006) የወጡ ህጎችን እንዲሁም ተያያዥ ጋይድላይኖችን በመጠቀም የቀረበውን ሰነድና በመስክ ጉብኝት ጭምር ለመገም ተሞክሯል። በዚህም መሰረት አራቱም የአካባቢ እና ማህባራዊ ተፅዕኖ ልየታ ሪፖረቶች የቀረበላቸዉ ፕሮጀክቶቹ ስራ ላይ ቢዉሉ አሁን ባለዉ ሁኔታ የጎላ ማህበራዊና አካባቢያዊ ተፅዕኖ ላይኖራቸዉ ይችላል የሚል እምነት በመያዝ ለአራቱም ፕሮጀክቶች ያቀረባችሁት ሰነዶች የፀደቁ መሆኑን እያሳወቅን በፕሮጀክቶቹ ትግበራ ወቅት ጉዳት ልደርስበት የሚችል የማህበረሰብ ወይም የአካባቢ ክፍል ከተከሰተ ኃላፊነቱ ሙሉ ለሙሉ የተቋሙ መሆኑን በመገንዘብ እንዲሁም በልየታ ሪፖርቱ ላይ እንደተመላከተው በእያንዳንዱ ንዑሳን ፕሮጀክቶች ትግበራ ወቅት የአካባቢ እና ማህበራዊ ተፅዕኖዎች አያያዝ በእቅዱ መሰረት ተግባራዊ እንዲደረግ በጥብቅ እያሳሰብን በቀጣይም ስለአፈጻጸሙ ጽ/ቤታችን ተገቢዉን ክትትል እና ቁጥጥር የሚያደርግ መሆኑን እንገልጻለን።

ከሰላምታ ጋር

☎ 011 8-69-95-13 E-mail ....

"ውብና ፅዱ የሆነች አካባቢን እንፍጠር "