Ministry of Innovation and Technology

Eastern Africa Regional Digital Integration Project

(EARDIP-SOP-II) (P180931)

Environmental and Social Management Plan (ESMP) for

the Supply and Implementation of Wireless Networks for Higher Education Institutions

Prepared by EARDIP Environmental and Social Risk Management Team

March 2025
Addis Ababa, Ethiopia

Record of Revision

Rev. No.	Status	Description of Revision	Rev. Date
00	Draft	Circulated for comments	March 2025
01	Draft	The WB Comments	March 2025
02	Final	Incorporating the WB Comments	April 2025

Acronyms

EARDIP	Eastern Africa Regional Digital Integration Project
EHS	Environmental Health and Safety
EPA	Environmental Protection Authority
ESIA	Environmental and Social Impact Assessments
ESMP	Environmental and Social Management Plan
ESS	Environmental and Social Standard
FDRE	Federal Democratic Republic of Ethiopia
GBV	Gender-Based Violence
GRM	Grievances Redress Mechanism
ICT	Information Communication Technology
IDA	International Development Association
IFC	International Financial Corporation
PIUs	Project Implementation Units
VAC	Violence Against Children
M&E	Monitoring and Evaluation
SEA	Sexual Exploitation and Abuse
SOP-I	Series of Project One
SOP-II	Series of Project Two

Table of Contents

List of tables

Executive Summary

The report presents an Environmental and Social Management Plan (ESMP) for the supply and implementation of wireless networks for higher education institutions in Ethiopia, particularly in conflict affected regions of Amhara, Tigray and Oromia (see subsection 5.1 for details on the specific locations of the identified universities). The purpose of the ESMP is to identify sensitive environmental and social components (biophysical and socioeconomic) that are likely to be affected by the implementation of the proposed sub-project, evaluate potential adverse impacts, and prepare mitigation plans and recommendations to minimize adverse impacts and enhance beneficial impacts. The methodologies applied during the study were review of relevant documents, direct physical observation at the subproject sites, stakeholder engagement at all levels, impact analysis, choosing mitigation and enhancement measures using different optimization tools, and developing management and monitoring plans. These were aligned with the requirements of the country's ESMP guideline and the WB Environmental and Social Standards (ESSs).

The structure of the report includes introduction, objective, scope, methodology, nature of the subprojects, applicable laws and regulations, impact analysis and mitigation measures, evaluation of environmental and social impacts, environmental and social management and monitoring plans, conclusions and recommendations, references and appendix.

The ESMP proposes mitigation measures for all the adverse impacts identified and evaluated. The necessary costs are included in the ESMP, Environmental and Social Monitoring/Inspection Plan, and capacity building with designated responsibility, monitoring method, schedule and estimated budget. Thus, the total estimated budget for ESMP of the supply and implementation of wireless networks for higher education institutions is birr 9,726,150. Of this total, birr 3,849,000, 5,250,000, and 627,150 is allocated for Environmental and Social Management Plan (ESMP), Environmental and Social Monitoring Plan/ Inspection plan and capacity building, respectively.

Finally, it was concluded that, if the recommended mitigation measures are properly implemented, potential benefits can be optimized, and the adverse impacts can be minimized. Therefore, there are no conditions that restricts the subproject’s implementation.

1. Introduction

1.1 Overview

Wireless network for higher education institutions is one of the activities planned under the subcomponent 3.2 of regional research and education networks and training for digital skills. Seven public higher learning institutions will be installed with a campus-wide wireless network under this component.

The wireless network will involve the installation of technical equipment such as indoor and outdoor access points, wireless controllers, and access switches in the university campus including dormitories, libraries, academic staff offices, student common areas, and outdoor gathering spaces. Those universities have basic infrastructure in wireless technology. However, some intervention is required to rehabilitate the infrastructure damaged by conflict and enhance the internet service availability on campus, particularly in the female dormitory, to facilitate access to educational materials and services. This will be complemented by minor installation works including drilling and installation of wireless equipment. Therefore, to address the challenges of internet access in higher education institutions, the contractor will supply and install the necessary infrastructure to enable the provision of wireless network connections and consequently access to internet services.

This Environmental and Social Management Plan (ESMP) consists of a set of enhancement/ mitigation, monitoring, and institutional measures to be taken during the subproject's design, construction, and operation stages to address adverse environmental and social impacts effectively using mitigation hierarchy, either by eliminating, minimising, mitigating, compensating/offsetting, or reducing them to acceptable levels. The plan also includes the actions needed for the implementation of these measures. The ESMP has been prepared to guide contractor(s) in developing the contractor's ESMP comprehensively.

1.2 Nature of the Subproject

Wireless network for higher education institutions is one of the activities planned under the subcomponent of regional research and education networks and training for digital skills. Eight public higher learning institutions will install campus-wide wireless networks under this subcomponent. Please refer to Table 1 for the list of institutions.

The wireless network will involve the installation of technical equipment such as indoor and outdoor access points, wireless controllers, and access switches in the university campus including dormitories, libraries, academic staff offices, student common areas, and outdoor gathering spaces. Those universities have basic infrastructure in wireless technology. However, some intervention is required to rehabilitate the infrastructure damaged by conflict and enhance the internet service availability on campus, particularly in the female dormitory, to facilitate access to educational materials and services. This will be complemented by minor installation works including drilling and installation of wireless equipment.

Therefore, to address the challenges of internet access in higher education institutions, the contractor will supply and install the necessary infrastructure to enable the provision of wireless network connections and consequently access to internet services.

Campus wireless network connection will involve the installation of access points indoors as well as outdoors. The scope of work will be different for different sites depending on the existing infrastructure. Most connectivity activities will involve the extension of fiber cables from the main landing point to the various site buildings including dormitories, libraries, academic staff offices, student common areas, and outdoor gathering spaces on the campuses. The wireless network installation activities will include excavation of the ground to lay fiber cable within the campus, drilling holes in walls to move LAN cables inside buildings and across different rooms, mounting of trucking and piping to contain the LAN cables on walls within the buildings and Mounting boxes containing switches that lead to access points for wireless connection.

Accordingly, this ESMP is prepared in line with the Ethiopia's ESIA regulations, as well as the objectives and requirements of the relevant World Bank (WB) Environmental and Social Standards (ESS)[1], to enhance and mitigate the adverse impacts due to the implementation of the Wireless network for higher education institutions.

2. Objective of the Study

2.1 General Objective

The fundamental objective of the environmental and social management plan is to ensure that the project is environmentally sound and socially acceptable and hence contributes to the development of environmental and social functions of the universities' community.

2.2 Specific Objectives

Based on the general objective, the specific objectives are:

- Identification of sensitive environmental and social components is likely affected by the implementation of the sub-projects and related activities.
- Identification, prediction, and synthesis of the potential environmental and social impacts associated with the subproject implementation.
- To prepare the environmental and social management and monitoring/ inspection plan for mitigating adverse impacts of the subproject.
- To estimate the environmental and social costs for mitigating the adverse impacts.

3. Scope the study

The scope of the ESMP Study included but was not limited to the following areas:

- To identify the type, nature, and scale of the subproject.
- To determine the development may result in environmental and social impacts.
- To propose mitigation and monitoring measures to address adverse impacts.
- To evaluate the existing institutional capacity to manage the recommendations for implementing the ESMP.

4. Methodology of the Study

The Environmental and Social Management Plan for the supply and implementation of wireless networks for higher education institutions was prepared after an environmental and social screening was conducted for each subproject. It has been prepared in line with the requirements of the project's ESMF and the methodologies indicated below.

[1] ESS1, ESS2, ESS3, ESS4, ESS6, ESS10

4.1 Documents review

Review of relevant documents including the Project Appraisal Document (PAD), Project Implementation Manual (PIM), the Environmental and Social Management Framework (ESMF), and request for bids documents for the supply and implementation of wireless networks for higher education institutions, the project screening report, and the national policies and international experiences were conducted to identify the impacts due to the execution the proposed sub-projects activities.

4.2 Direct Physical Observation

Physical observation was held to assess the baseline environmental and social conditions of the sub-project site, and to identify sensitive environmental and social components that are likely to be significantly affected by the implementation of the proposed subproject.

4.3 Stakeholders Engagement

Discussions were held with key government offices at the regional level including Innovation and Technology institutions, Women and Social Affairs the bureaus, regional EPA, and universities' representatives (President's office, ICT department heads, and experts). The discussion was aimed to provide information on the activities that will be involved in the sub-project and their opinion was taken accordingly.

4.4 Impact Analysis

Collected data and information from all sources were categorized and analysed to describe the existing situations of the sub-project areas and assess positive and adverse impacts. Finally, feasible enhancement for positive impacts and mitigation measures to eliminate or minimize the adverse impacts were recommended.

4.5 Report Structure

Concise ESMP containing all essential parts and protocols addressing Introduction, Objective, Scope, Methodology, Nature of the project, Applicable Laws and Regulations, Impact Analysis and Mitigation Measures, Evaluation of Environmental and Social Impacts, Environmental and Social Management and Monitoring Plan, Conclusion and Recommendation, References and Appendix.

5. Description of the subproject

5.1 Location

The proposed subproject is planned to be implemented in regions affected by conflict and have significant damage to their internal campus networks and these include a) Mekelle University b) Adigirat University c) Raya University d) Aksum University e) Mekdela Amba University f) Woldiya University g) Wollo University and h) Borena University. The geographic location of each university is depicted in the table below.

Table 1. List of Universities and their Geographical Coordinate Points

S/N	Universities	Geographic Coordinate Points (GCPs)	
		Latitude (X)	Longitude (Y)
1	Mekelle University	13.483086	39.485263
2	Adigrat University	14.256098	39.465702
3	Raya University	12.800464	39.540830
4	Aksum University	14.108755	38.711069
5	Mekdela Amba University	10.985462	39.263175
6	Woldia University	11.804721	39.600027
7	Wollo University	11.177615	39.616729
8	Borena University	4.908851	38.153909

5.2 About the Universities

All the selected eight universities boast active student populations enrolled in diverse academic departments, ranging from undergraduate programs to postgraduate studies. Here's a breakdown of the student body at each university:

1. **Mekele University**
   - **Active Students:** 11,630
   - **Description:** As one of the largest universities in the region, Mekele University offers a wide range of undergraduate and postgraduate programs. The institution has a diverse student body and a significant number of female students residing in dormitories.
2. **Adigrat University**
   - **Active Students:** 4,176
   - **Description:** Adigrat University is known for its comprehensive academic programs and vibrant campus life. The university serves a moderate student population and has dedicated female dormitories that require enhanced network access.
3. **Raya University**
   - **Active Students:** 879
   - **Description:** A smaller institution, Raya University offers specialized programs and caters to a close-knit academic community. The university here are in urgent need of improved wireless connectivity due to previous infrastructure damage.
4. **Axum University**
   - **Active Students:** 5,227
   - **Description:** Located in a historically significant area, Axum University balances traditional and modern educational approaches. The campus includes several female dormitories that will benefit from upgraded wireless networks.
5. **Mekdela Amba University**
   - **Active Students:** 6,167
   - **Description:** Mekedela Amba University serves a substantial number of students across various disciplines. Enhanced wireless network coverage in the uniervsity

as well in female dormitories is essential to support the academic needs of its student population.

6. **Woldiya University**
    - **Active Students:** 5,327
    - **Description:** Woldiya University prides itself on its dynamic academic environment. The university's campus is a focal point for the wireless network upgrade, aiming to improve students' access to online learning resources.
7. **Wollo University**
    - Active Students:10,867
    - **Description:** As one of the larger institutions, Wollo University offers a diverse range of programs and has a significant student population. Providing a reliable wireless network in the university is crucial to maintaining the university's commitment to educational excellence.
8. **Borana University**
    - **Active Students:** 1,421
    - **Description:** Borana University, with its smaller student body, focuses on providing quality education in a more intimate setting. The university is in critical need of improved wireless connectivity to support the academic needs of its students.

By establishing a reliable wireless network with a focus on female dormitories, this project aims to achieve the following benefits:

- Enhance educational opportunities for female students by providing access to online resources.
- Bridge the digital divide and promote gender equity in education.
- Facilitate communication and collaboration within the universities.

6. Applicable Laws and Regulations

This Environmental and Social management plan of the wireless network installation sub-project activities was conducted with due consideration of the following legal frameworks.

6.1 Environmental Policy of Ethiopia (1997)

This policy provides a framework for sustainable development; ensuring environmental considerations are integrated into development projects. It promotes responsible use of natural resources, pollution control, and environmental impact assessments.

6.2 Environmental and Social Impact Assessment Proclamation (299/2002)

This law mandates that projects with potential environmental impacts undergo Environmental and Social Impact Assessments (ESIA). It ensures that risks are identified and mitigated before implementation.

6.3 Guideline for Environmental and Social Management Plan (2022)

The guidelines were developed to give directions on the structure and effective or correct implementation of the Environmental and Social Management Plan (ESMP). The guideline depicts the necessary measures for the preparation of an Environmental and Social Management Plan (ESMP) for proposed subproject in Ethiopia and the institutional arrangements for the implementation of ESMPs.

6.4 FDRE National Occupational Safety and Health Policy and Strategy (2014)

This policy aims to promote workplace safety and protect workers' health. It establishes guidelines for risk assessment, hazard prevention, and compliance monitoring in various industries, including technology projects.

6.5 Environmental and Social Impact Assessment Procedural Guidelines Series (2003)

These guidelines provide detailed procedures for conducting ESIAs, outlining how projects should assess and mitigate environmental risks.

6.6 Labor Proclamation (1156/2019)

This proclamation provides various statements on working conditions and occupational health and safety conditions. The proclamation obliges that an employer should take the necessary measures to adequately safeguard the health and safety of the workers.

6.7 Electrical and Electronic Waste Management and Disposal Council of Ministers Regulations (425/2018)

This regulation aims to establish a framework for the environmentally sound management of electrical and electronic waste (e-waste), including its handling, collection, transportation, recycling, and safe disposal.

6.8 Pollution Control Proclamation (300/2002)

This law sets pollution control measures to prevent environmental degradation. It is relevant to the project's data center and electronic infrastructure.

6.9 Solid Waste Management Proclamation (513/2007)

The Proclamation promotes community participation to overcome the adverse effects from the disposal of waste and to enhance benefits resulting from solid waste. The provisions in the Proclamation require the preparation of solid waste management action plans by respective urban local governments and project activities that produce solid waste.

6.10 Hazardous Waste Management and Disposal Control Proclamation No.1090/2018

The main objectives of the proclamation are to create a system for the environmentally sound management and disposal of hazardous waste; and to prevent damage to human or animal health, the environment, biodiversity, and property due to the mismanagement of hazardous waste.

6.11 The World Bank Environmental and Social Frameworks (2018)

This framework provides environmental and social standards for projects funded by the World Bank, ensuring sustainable development, stakeholder engagement, and human rights protections.

7. Impact Assessment

The preparation of the Environmental and Social Management Plan is used to ensure that the sub-project activities comply with the Environmental and Social Standards of the World Bank and the national environmental regulations of Ethiopia. The potential environmental and social impacts that may be caused during the preparation, implementation, operations, and maintenance phases of the proposed subprojects. The risks associated with subprojects under the wireless network for higher education sub-component are limited, reversible, and site-specific.

The PIU safeguard team conducted an initial screening of the proposed subproject to decide on the level of environmental and social impact to be carried out concerning the national legislative requirements (ESIA Proclamation no. 299/2002) and the major Environmental and Social (E&S) risks of the sub-project identified during the screening is fall under Schedule III".

The environmental and social standards that have been triggered by this subproject are ESS1, ESS2, ESS3, ESS4, and ESS10. Consistent with the requirement of ESS1 (Assessment and Management of Environmental and Social Risks and Impacts) Each site location(s) environmental and social risks and impacts were assessed using the WB screening checklist. The result of the assessment shows that expected impacts are from low to moderate and can easily be mitigated through specific environmental and social management plan.

7.1 Analysis of Positive Impacts

Wireless network installation in educational institutions provides numerous benefits specifically for female students

The potential positive impacts due to the implementation of the sub-projects are:

a) Free and high-speed internet connectivity

Educational institutions will have improved and high-speed internet access through the campus wireless connectivity.

b) Enhanced Access to Online Resources

Students will be able to use the wireless network to research educational content for the enrichment of their learning experience and the advancement of their knowledge base and skill. In addition to that, it will enhance the learning process and contribute towards the advancement of individual education standards.

c) Create employment opportunities

Skilled and unskilled local labour will be hired for the construction and operational phases.

d) Generate business opportunities

Local material suppliers and traders within the areas where civil works will be implemented will benefit from these opportunities.

e) Encouraging Digital Literacy

The implementation of the subproject will empower female students by providing them with tools that enhance their educational outcomes through sharing educational documents, working on group projects in real-time and communicating with peers and teachers via various online platforms.

Hence, enhancement and maintenance of the positive impacts are important during the lifespan of the proposed subprojects.

7.2 Analysis of Adverse Impacts

Potential project impacts were identified through environmental and social screening of the project sites. Assessment of the impacts considered the size of the area to be affected by "type, reversibility, extent, nature, magnitude and significance" of the impacts.

7.2.1 Biophysical Impacts

A. Loss of trees/ tree branches

The installation of wireless network fiber cables will require some land clearing, which may lead to the loss of trees or branches. However, these activities will be within small areas and linear lines, therefore, the loss of vegetation is expected to be minimal.

B. Solid Waste Generation and Disposal

Waste is produced from the materials used in installation and their packaging material, and other general waste is produced by the workers on the site.

C. Generation of e-waste

The installation of wireless networks at higher education institutions may generate electronic waste during the construction, operation and maintenance of infrastructures. The e-waste contains hazardous materials such as lead, mercury, and cadmium that can leach into the environment if not disposed of properly.

D. Land Pollution

Pollution of spillage of oils and fuel products from construction machinery, and the operation of generators, may cause contamination of land.

E. Dust emissions

Drilling for wireless equipment installation and digging for fiber cable installation can generate dust in the project area. Furthermore, vehicle movement and speeding during the delivery of equipment and materials to sites can also contribute to dust in the environment in short-term, temporary, and limited in scope.

F. Noise pollution

The proposed project activities are anticipated to have minimal impact on noise and vibration levels in the implementation area. Noise sources during installation include drilling, mounting access points, digging for fiber cables, power generators, and work vehicles. These activities are described as limited in scope, intermittent, temporary, and localized, resulting in a minimal overall negative impact.

7.2.2 Socioeconomic Impacts

Occupational health and safety impacts encountered during construction and operation may include exposure to electrical risks, cuts, as well as the potential for trips and falls.

A. Accidents from working in elevated areas

Ladders and elevated platforms used for mounting access points can pose physical hazards to workers who may accidentally fall from heights.

B. Accidents from power tools (drilling machines)
Mounting of access points on the building walls will involve the use of drilling machines which may pose a potential risk of injury to workers.

C. Exposed to electricity
Employees may face the risk of injury due to electric shocks (working on live equipment or encountering exposed cables).

D. Communicable Diseases
There is a potential risk of transmitting HIV/ AIDS if employees participate in sexual relations with the local community.

D. Preferential recruitment, worker harassment, and marginalization
Workers may experience preferential treatment, harassment, and marginalization in the workplace because of gender and other social disparities.

E. Child labour
The recruitment of children under the age of 18 during the construction of the wireless network is a potential risk and considered Violence against children (VAC). It is not allowed to employ underage children to be engaged in casual tasks at the project work sites.

F. Sexual Exploitation and Abuse (SEA) including harassment
Workers may face sexual exploitation and abuse in return for favours or employment advantages.

G. Gender Based Violence (GBV) and Violence Against Children (VAC)
The mitigation measures for each adverse impact are identified under the management plan of this report.

8. Evaluation of Environmental and Social Impacts

Evaluation and ranking of impacts are the critical stages of the ESIA and or ESMP process. Here, the impacts identified are evaluated to determine their significance by using parameters like **"Type, Reversibility, Extent, Nature, Magnitude and Significance"** of impacts. The summary of the impact and the associated consequences for the Implementation of Supply and Implementation of Wireless Networks for Higher Education Institutions is provided in table 2 below.

Table 2. Evaluation of Environmental and Social Impacts

S/N	Potential Impacts	Type		Reversibility		Impact Extent		Nature		Magnitude	Significance
		Beneficial	Adverse	Reversible	Irreversible	Local	Trans-	Temporary	Permanent		
1	**Positive Impacts**										
1.1	Free and high-speed internet connectivity	x				x	x		x	Very high	Very high
1.2	Enhanced Access to Online Resources	x			x	x	x		x	Very high	Very high
1.3	Create employment opportunities	x			x	x	x		x	High	High
1.4	Generate business opportunities	x			x	x		x	x	High	High
1.5	Encouraging Digital Literacy	x			x	x	x	x	x	High	High
2	**Adverse Impacts**										
2.1	**Biophysical Environment**										
2.1.1	Loss of trees/ tree branches		x	x	x	x		x	x	Very low	Very low
2.1.2	Solid Waste Generation and Disposal		x	x		x		x	x	High	High
2.1.3	Generation of e-waste			x		x	x	x	x	High	High
2.1.4	Land Pollution		x	x		x		x		Low	Low
2.1.5	Dust emissions		x	x		x		x		Low very	Very low
2.1.6	Noise pollution		x	x		x		x		Low	Low
2.2	**Socioeconomic Environment**										
2.2.1	Accidents from working in elevated heights		x	x	x	x	x	x	x	High	High
2.2.2	Accidents from power tools (drilling machines)		x	x	x	x		x	x	Low	low
2.2.3	Exposed to electricity		x	x	x	x		x	x	Low	Low
2.2.4	Communicable diseases		x	x		x	x	x		High	High
2.2.5	Preferential recruitment, worker harassment, and marginalization		x	x		x		x		Low	Low
2.2.6	Child labor		x		x	x		x		Low	Low
2.2.7	Sexual Exploitation, Abuse (SEA) & harassment		x	x	x	x		x	x	High	High
2.2.8	Gender-Based Violence (GBV) and Violence Against Children (VAC)		x	x	x	x	x	x	x	High	High

9. Environmental and Social Management Plan

The Environmental and Social Management Plan is an instrument that guides the proponent in mitigating the adverse impacts that arise due to the implementation of the project. It outlines the potential adverse impacts, mitigation measures to address the impacts, those that are responsible for undertaking measures, the monitorable indicators of mitigation measures, and where possible the added costs of undertaking such measures. ESMP is a crucial tool as it gives the benchmarks for the compliance of a project with the set environmental standards spelled out by the WB and the Federal EPA. Future environmental and social audits will strive to determine whether the proponent implemented the ESMP or not. The proponent should therefore consult and involve professional and technical experts during the designing, construction and operational phases of the project. It should be noted that a well-formulated ESMP will ultimately enhance and strengthen the project implementation by reducing conflicts and avoiding crises. The total estimated cost to implement the ESMP will be birr 4,299,000 as depicted in the table below.

Table 3: Environmental and Social Management Plan

Environmental and Social issues	Proposed Mitigation and Enhancement Measures	Responsible Institution	Monitoring method and parameters	Schedule for implementation of mitigation measures	Estimated Cost (Birr)
Loss of trees/ tree branches	• Limit vegetation clearing and excavation activities to the specified areas and avoid unnecessary removal of vegetation. • Provide sufficient oversight to prevent the unnecessary removal of trees. • Plant trees within the area to replace the lost vegetation cover.	Contractor	• physical observation,	• Design • Construction • Decommissioning	145,000
Generation of waste	• Provide appropriate waste containers at every work site	Contractor	Physical observation/ assessment of solid waste status on and around the project area	Commencement Construction Operation	500,000
	• Aware workers to avoid littering and dumping wastes in designated waste containers.				120,000
	• Reduce waste by reusing some of the packaging material.				134,000
	• Discard waste material in approved disposal areas.				500,000
Noise and Vibration	• Conduct the installation activities during normal working hours.	Contractor	• Random site inspection • Review of filed grievances Review of timesheets of workers	Design Construction Operation	200,000
	• Reduce noise and vibration impacts during construction. • Avoid vehicle movements at night.				
	• Provide earplugs or muffs for the workers in noisy areas			Construction	100,000
	• Inform the campus community about noise where necessary.			Commencement	80,000
Generation of e-waste	• Store the e-waste in secure containers until a disposal site is identified,	Contractor	Site visit	Construction Operation	200,000

Environmental and Social issues	Proposed Mitigation and Enhancement Measures	Responsible Institution	Monitoring method and parameters	Schedule for implementation of mitigation measures	Estimated Cost (Birr)
	• Implement waste management plan			Decommissioning	200,000
Air emissions	• Regularly maintain and service vehicles. • Use fewer polluting fuels. • Use emission control techniques.	Contractor	Physical observation, Auditing	Construction Operation	250,000
Pollution to land from diesel and oil spills	• Dispose of waste oil and oil-contaminated soils in place allowed to do so	Contractor	Physical observation	Construction Operation	120,000
Child labour	• Not employ or engage a child under the age of 14 unless the national law specifies a higher age (the minimum age). • All employees must have genuine identification to prove that they are 18 years old and above.	Contractor	Check recruitment files Visual inspection Discussion with workers	Recruitment/ commencement Construction	50,000
Community health and safety	• Develop and implement OHS management plan • Provide PPE (Dust masks, goggles, gloves, harnesses, overalls, and safety boots) for workers. • Report incidents and accidents occurring at the workplace to the contractor • Ensure all H&S-related incidents on site are recorded and followed properly.	Contractor OHS expert	• Random site inspection • Check incident/accident records	Commencement Construction Operation	400,000
Accidents from working at heights	• Secure elevated work areas, platforms, and ladders to prevent accidental falls. • Use well-maintained platforms and ladders and train operators in their use.	Contractor	• Random site inspection • Check incident/acci	Construction Operation	100,000

Environmental and Social issues	Proposed Mitigation and Enhancement Measures	Responsible Institution	Monitoring method and parameters	Schedule for implementation of mitigation measures	Estimated Cost (Birr)
	• Provide protective equipment to workers including harnesses, helmets, and safety boots.		dent records		
Accidents from power tools (drilling machines)	• Ensure only trained or skilled personnel carry out the activities. • Ensure safe and well-maintained equipment is used. • Ensure workers are adequately supervised during work activities.	Contractor	• Random site inspection • Check incident/accident records	Construction Operation	100,000
Exposed to electricity	• Ensuring workers to have proper equipment	Contractor	Check accidents/ injuries occurred	Construction	100,000
Dust and particulate matter emission	• Provide dust masks to workers and ensure they use them. • Spray water on dusty areas regularly to suppress the dust • Rehabilitate sites after construction works.	Contractor	• Visual inspection	Construction Operation	100,000
Communicable disease	• Promote awareness creation and education campaigns concerning HIV/ AIDS, distributing condoms • Consistent with the national HIV multi-sector approach, devise mechanisms to empower local administrations to develop advocacy for improved access to HIV counselling and testing. • Initiate and coordinate distribution of anti-retrieval treatments at nearest health center, etc. and promote systematic blood test and treatment activities, etc.	Contractor	• Assessment of health status of project workers through test, discussion	Construction Operation	100,000

Environmental and Social issues	Proposed Mitigation and Enhancement Measures	Responsible Institution	Monitoring method and parameters	Schedule for implementation of mitigation measures	Estimated Cost (Birr)
Sexual exploitation and abuse	• Aware workers of the Codes of Conduct and enforce their use. • Ensure that all employees sign the Workers' Code of Conduct	Contractor	Assessment of SE/A	commencement Construction Operation	150,000
Gender-Based Violence (GBV) and Violence Against Children (VAC)	• Implement a GBV, SEA/SH Action Plan		Assessment of violences	Commencement Construction Operation	50,000
	• Aware communities of GBV and VAC risks of the project before implementation of the project.		Assessment of violences	Commencement construction Operation	150,000
	• Sensitize the community on the grievance redress mechanism (GRM) before the implementation of the project.				
	• Ensure that Codes of Conduct are signed and understood by all contractor staff;				
Total ESMP Cost					**3,849,000**

10. Environmental and Social Monitoring/ Inspection Plan

The monitoring/ inspection plan will be designed to assess the effectiveness of the Environmental and social management plan. The monitoring frequencies and parameters for each issue will be indicated. Periodic monitoring and assessment of remedial action on mitigation measures of the Environment and Social management plan will be carried out. Accordingly, operation of the subproject will be managed and monitored by the environmental and social management team/ focal points/ contractor social experts, with monthly, Quartey, six-month, and annual performances reported to the PIU and the concerned regulatory organ.

Periodical monitoring will be made to:

- Decide whether the performances comply with environmental and social rules and regulations as well as the planned activities.
- Ensure the effectiveness of the planned preventive and corrective environmental and social management plans.
- Take corrective measures based on the environmental and social monitoring findings, conclusions, and recommendations.
- Recommend future follow-up and environmental and social monitoring plans, etc.
- Stick to the policies, guidelines, and other laws that are pertinent to the environment and social aspects of the subproject.

The monitoring plan for this subproject should be implemented to address all activities that have been identified to have potential impacts on the environment, during normal operations and upset conditions.

Monitoring frequency should be sufficient to provide representative data for the parameter being monitored. Monitoring should be conducted by E&S focal points, PIU E&S and gender specialists following monitoring and record-keeping procedures. Monitoring data should be analysed and reviewed at regular intervals and compared with the operating standards of the EPA and the WB so that any necessary corrective actions can be taken. The major types of monitoring include:

- **Baseline Monitoring**: the measurement of environmental and social parameters during a representative pre-project period to determine the nature and ranges of natural variation and where possible to establish the process of change.
- **Impact/effect Monitoring**: it involves the measurement of parameters (performance indicators) during project construction and operation to detect and quantify environmental and social change that may have occurred because of the subproject.
- **Mitigation Monitoring**: it aims to determine the suitability and effectiveness of mitigation and enhancement measures designed to minimize the adverse impacts of the subproject.

The monitoring program should describe briefly the phase of subproject activity, responsible institution and means of monitoring, frequency of monitoring and other activities and estimated cost.

The monitoring activities may be conducted during the design, construction, operation, and maintenance phases of the project, as indicated in table 4 below.

Table 4: Environmental and Social Monitoring/ Inspection Plan

Impacts	Proposed Mitigation/ Enhancement Measures	Responsibility for monitoring	Means of monitoring	Monitoring frequency	Cost (ETB)
Loss of trees	Limit vegetation clearing and excavation activities to the specified areas indicated in the designs to avoid unnecessary loss of vegetation.	Contractor PIU	Visual Inspection	Design Construction Operation	200,000
	Provide sufficient oversight to prevent the unnecessary removal of trees.			Decommissioning	100,000
	When trees are lost, replace them by planting new trees				300,000
Generation of waste	Provide appropriate waste containers at every work site	Contractor Site Supervisor PIU	Visual inspection	Commencement	200,000
	Aware workers are to avoid littering and dump wastes in designated waste receptacles			Construction Operation	300,000
	Reduce waste by reusing some of the packaging material.				500,000
	Discard waste material in approved disposal areas.				100,000
Noise and vibration	As much as possible, carry out the construction and installation activities during normal working hours.	Contractor Site Supervisor PIU	Random site visit Discussion with workers	Design Construction Operation	350,000
	Provide earplugs or muffs for the workers in noisy areas;				
	Adhere to normal hours of operation and schedule noisy tasks for periods of low occupancy near the project sites.				
Generation of e-waste	Store the e-waste in secure containers until a disposal site is identified,	Contractor Site Supervisor PIU	Random inspection on e-waste disposal Check e-waste management plan implementation	Construction Operation Decommissioning	300,000
Air emissions from delivery vehicle exhausts	Regularly maintain and service vehicles.	Contractor Site Supervisor PIU	Supervise vehicle service records	Construction	500,000
	Use emission control techniques				

Pollution to land from diesel and oil spills	Maintain/service vehicles and machinery regularly as recommended by the dealers; Dispose of waste oil and oil-contaminated soils in approved disposal areas, in collaboration with the Local Authority.	Contractor Site Supervisor PIU	Site visit	Construction Operation	250,000
Child labour	All employees must have genuine identification to prove that they are 18 years old and above.	Contractor Site Supervisor PIU	Check recruitment files Visual inspection Discussion with workers	Construction	200,000
Gender Based Violence (GBV) and Violence	Aware communities of GBV and VAC risks of the project before implementation of the project and the grievance redress mechanism (GRM)before implementation of the project Ensure that Codes of Conduct are signed and understood by all contractor staff.	Contractor Site Supervisor PIU	No. of records on GBV issues No. of GBV issues resolved	Design Construction Operation	250,000
Occupational safety and health impacts	Contractor develops and implements an OHS management plan. Provide PPE (Dust masks, goggles, gloves, harnesses, overalls, and safety boots) for workers. Report incidents and accidents occurring at the workplace	Contractor Site Supervisor PIU	Arrange meeting with project workers	Construction operation	250,000
Accidents from working at heights	Secure elevated work areas, platforms, and ladders to prevent accidental fall. Use certified and well-maintained platforms and ladders and train operators in their use. Provide protective wear to workers including harnesses, helmets, and safety boots.	Contractor Site Supervisor PIU	Random site inspection Check incident/accident records	Construction Operation	100,000
Accidents from power tools	Ensure that only trained or skilled personnel carry out the work.	Contractor Site Supervisor	Random site inspection	Construction operation	100,000

(drilling machines)	Ensure workers are adequately supervised during work activities.	PIU	Check incident/accident records		
Dust emission	Provide dust masks to workers and ensure they use them. Spray water to dusty areas regularly to suppress the dust. Rehabilitate sites after construction works;	Contractor Site Supervisor PIU	Random site visit Discussion with workers	Construction operation Decommissioning	50,000
Exposed to electricity	Ensuring workers to have proper equipment	Contractor Site Supervisor PIU	Check accidents/ injuries occurred	Construction Operation Decommissioning	1**00,000**
Spread of HIV and AIDS	Employ local people as much as possible. Provide civic awareness on unplanned pregnancies, STIs, and HIV and AIDS to workers and the communities;	Contractor Site Supervisor PIU	Discussion with workers No. of workers aware about HIV Regular test	Construction Operation	150,000
Sexual exploitation and abuse (SE/A)	Aware the workers of the Codes of Conduct and enforce to use them Ensure that all employees sign the Workers' Code conduct.	Contractor Site Supervisor PIU	Signed Code of Conduct Grievance register	Construction	200,000
Gender Based Violence (GBV) and Violence Against Children (VAC)	Aware communities on GBV, VAC risks and GRM prior to implementation of the project. Ensure that Codes of Conduct are signed and understood by all contractor employees.		No**.** of employees trained No. of risks registered No. of risks solved	Construction Operation	250,000
Audit	Internal Audits	PIU MoE-EthRNet	Physical observation Performance report review Discussion with campus community	Operation	500,000
	Total				5,250,000

10.1 Role and Responsibilities

The following parties are required for the successful implementation of the ESMP.

10.1.1 The PIU

The PIU and MoE-EthERNet will be responsible for the overall implementation, administration, and enforcement of the ESMP through:

- Be liable/accountable, to the relevant authority, for any contravention / non-compliance by any Contractor under their supervision, and
- Carrying out regular internal monitoring quarterly and conduct a yearly environmental and social audit.
- Advise on GRM setup and functioning, monitor compliance with the ESMP and ESS, facilitate training, and prepare reports on E&S performance.

10.1.2 Regulatory organizations

The respective Environmental Protection Authority, Women and Social Affairs Bureau, Health Offices and other relevant institutions are responsible for ensuring the ESMP implementation through:

- Inspecting, monitoring and auditing the proper implementation of the subproject,
- Give technical and administrative assistant, feedback, and enforce the legal measures for not complying.

10.2 Budget and Reporting Mechanism

10.2.1 Environmental and Social Cost

The Environmental and Social Management Plan, Environmental and Social Monitoring Plan, and Training need a budget to mitigate adverse impacts as indicated in the management plan (Table 3), monitoring plan (Table 4), and training (Table 5).

10.2.2 Training Budget

Training is needed for stakeholders who will undertake environmental and social issues.

Table 5: Training Budget

No.	Item	No. of trainers	No. of trainees	No. days	Cost
1	Trainer's fee	3	-	10	32,500
2	Seminar and training at Project Site	2 (facilitator)	50	10	338,000
3	Project staff training	3	20	5	74,750
4	Community awareness creation at the local level	3	60	2	81,900
5	Preparation of training materials	-	-		100,000
Total		**11**	**130**		**627,150**

10.2.4 Budget Summary

The total cost of all Environmental and management accomplishments is indicated below.

Table 6: Total Cost

No.	**Description**	**Cost (Birr)**
1	Management Plan	**3**,849,000
2	Monitoring Plan	5,250,000
3	Training	627,150
Total		**9,726,150**

10.2.5 Reporting Mechanism

A system of reporting the subproject's environmental and social achievement is essential. The Environmental and Social Management Unit (ESMU) of the subproject is expected to have all necessary records of the subproject. Based on the data collected, the following reports are expected.

Quarterly Site Inspection Report

Environmental and social monitoring of site activities must be undertaken, and the findings are reported with the quarterly activities report. The Quarterly Inspections Report (QIR) must include:

- Description of the planned environmental and social management activities.
- Summary of environmental and social performance for the quarter.
- Summary of environmental and social actions taken.
- Identified new unforeseen environmental and social concerns and recommended actions,
- Amendments to the planned Environmental and Social Management Plan or any other required plans.

In addition, environmental and social issues must be reported and discussed on the quarterly progress reports and meetings. Any unresolved concern shall be carried over to the next reporting period until the issue has been resolved. This allows addressing environmental and social aspects of the subproject.

Site Environmental and social Management Plan Report

The site environmental and social management plan report provides information on how the planned environmental and social measures were adopted at the site and gives their performances. The development of these plan forms the basis for continued improvement of environmental and social performance.

Record Keeping and Reporting

A complete set to handle and manage data and information generated from the management plan and other monitoring activities will be established. Therefore, the Environmental and Social Management Unit (ESMU) must have all necessary records of significant environmental and social matters, including monitoring data, environmental and social audits of the subproject. An annual summary of the information must be reported and distributed to essential bodies.

10.2.6 Auditing Services

Environmental and social Audit is tools used by management to systematically and periodically evaluate the performance of the Environmental and Social Management System (ESMS), procedures and equipment. All the subproject facilities shall be regularly audited once the operation commences. This audit shall check the prediction of the Environmental and social Assessment Report and assess the general performance of the subproject to ensure that environmental standards are maintained, and the project policies and environmental and social management guidelines are strictly maintained.

11. Stakeholder Consultations and Grievance Redress Mechanism (GRM)

11.1 Stakeholder Consultation

11.1.1 Approach and Methods

Below is a summary of the approaches during the stakeholder consultation.

- **Communication and briefing about the subproject**

Before engaging in stakeholder consultations, participants were briefed on the nature, scope, magnitude and potential beneficial and adverse biophysical and socioeconomic impacts of the proposed subproject.

- **Focused Group Discussions**

Stakeholders were further consulted through Focus Group Discussions (FGDs), where different groups were interviewed. The FGD groups included regional level (Innovation and Technology, Women and Social Affairs, and EPA) and University level (President's office, ICT department heads, and Gender representative). The views and recommendations expressed during the consultation meetings were incorporated in the ESMP. Generally, the result of the participation showed support for the proposed subproject.

11.1.2 Summary of Key Findings from Stakeholder Consultations

consultations have been conducted with relevant stakeholders from the regional EPA, Innovation and Technology Office, Women and Social Affairs, and the university community (IT department, gender, and others) were participated in the consultation.

The views and concerns raised by participants are summarised as follows:

- This wireless network sub-project will resolve the inadequate connectivity and the compromised digital infrastructure damaged by the conflict.
- Will expand the wireless service at the institutions, mainly focusing on the female dormitory.
- Improve the quality of education and research at the institutions by providing access to digital educational materials and services via the network.

Despite potential positive biophysical and socioeconomic impacts, participants raised their concern on the adverse impacts of the sub-project. Some of them are:

- About waste generation and methods of disposal during construction and operation.
- Fears that with the increase in population, there would be an increase in the spread of HIV and AIDS, teenage pregnancies, drug and alcohol abuse.
- Procedures followed to express dissatisfaction with the project or any complaint.
- The proposed subproject will deploy workers which could lead to socio-cultural diversification and cultural contamination.
- Participants inquired whether there will be employment opportunities and what would be the criteria for gaining access to such opportunities.
- Questions concerning potential air and sound pollution arising from excessive noise and vibration also arose from participants
- They enquired further installation of the wireless network for the surrounding schools and regional offices.

Accordingly, responses were given that:
The team informed stakeholders that the ESMP will incorporate waste management system.

- During the subproject implementation, different strategies will be used to avoid any kind of pollution. Waste also will be handled, transported and disposed properly.
- The project put in place a workers' COC to manage the relationship with the communities.
- A strong and accessible Grievance Redress Mechanism established at different levels. However, for this sub-project, universities will use existing GRCs to receive and address grievances where feasible.
- The subproject will be using up to date technologies to reduce noise and vibrations and further mitigation/ enhancement measures will be recommended in the ESMP.
- The local community have incorporated and recruited if the subproject required any labor.
- The contactor must maintain issues ranging from recruitment, dismissal, hours of work, non-discrimination, child labour, fair remuneration and grievance management.

11.2 Grievances Redressing Mechanism related to the subproject

Grievance Redress Mechanisms (GRMs) can be an effective tool for the early identification, assessment, and resolution of complaints related to the sub-projects. It is a way to receive, assess or review and resolve complaints that may arise from the wireless network installation sub-project activities.

The PIU established a strong and accessible Grievance Redress Mechanism at different levels (from Federal, regional to woreda levels). This subproject will be executed within the university premises; consequently, any grievances related to the subproject will be managed through the existing Grievance Redressal Committees (GRCs) at each university. Each university designated a focal person to work in collaboration with the current/existing grievance redress committee to resolve any complaints related to the sub-project implementation.

The grievance remains unresolved at this stage; it will be escalated to the project implementation unit within the Ministry of Innovation and Technology.

12. Conclusion and Recommendations

12.1 Conclusion

This report presents an Environmental and Social Management Plan (ESMP) for the supply and implementation of wireless networks at higher education institutions located at Amhara, Tigray and Oromia regional states. The purpose of the ESMP is to identify sensitive environmental and social components that are likely to be affected by the implementation of the subproject, evaluate the potential impacts of the subproject, and prepare mitigation plans and recommendations regarding measures that will minimize adverse impacts while enhancing beneficial impacts. The methodologies used include data collection and review of documents, field observations, stakeholder consultations, impact analysis, choice of mitigation and enhancement measures using different optimization tools, and developing environmental protection, monitoring, and management plans in accordance with the requirements of the country's ESMP guideline and the WB ESSs.

12.2 Recommendation

These following recommendations have been forwarded:

- The ESMP for the sub-project must be implemented with an appropriate budget allocation, and
- Maximum care should be taken in disposing of solid and liquid wastes during installation, and operation of the sub-project, and proper waste management practices ((including e-wastes) must be adhered to.

13. References

MInT (2024), Environmental and Social Screening for Supply and Implementation of Wireless Networks for Higher Education Institutions, Addis Ababa

MInT (2023), Environmental and Social Management Framework for Eastern Africa Regional Digital Integration Project (REARDIP SOP-2), Addis Ababa, Ethiopia.

EPA (2022), Environmental and Social Management Plan Guideline, Addis Ababa

EPA (2000), Environmental Impact Assessment Guideline, Addis Ababa,

FDRE (2002), Federal Democratic Republic of Ethiopia: Environmental Impact Assessment Proclamation. Proclamation No 299/2002. Addis Ababa.

FDRE (2000), Federal Democratic Republic of Ethiopia: Environmental Pollution Control Proclamation. Proclamation No 300/2002, Addis Ababa.

FDRE (April 1997), Federal Democratic Republic of Ethiopia: Environmental Policy of Ethiopia, Addis Ababa.

FDRE (1995), Constitution of the Federal Democratic Republic of Ethiopia Proclamation No.1/1995, Addis Ababa.