Ministry of Innovation and Technology

Environmental and Social Management Plan (ESMP) for:

The sub-Project of Procurement, Delivery, and Installation of Network Equipment to support points of Presence and Caches in Ethiopia for EthERNet

Ethiopia Digital Foundation Project EDFP)

Office of Project Implanting Unit (PIU)

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Acronyms

ESMP	Environmental and Social Management Plan
LACP	Link Aggregation Control Protocol
MoE	Ministry of Education
NAT	Network Address Translation
NREN	Ethiopia's National Research and Education Network
OER	Open educational resources
PDO	Project Development Objective
PIU	Project Implementation Unit
PoP	Points of presence
STP	Spanning Tree Protocol
TVET	Technical and Vocational Training Institute

1. Introduction

1.1 project Background

Ethiopia is in the Horn of Africa and is a land-locked country with an area of 1.1 million km^2. Ethiopian population is estimated to be over 100 million, with annual population growth rate of 2.5 percent. Ethiopia is experiencing profound political and economic change. The country has been experiencing rapid and stable economic growth over the past decade. GDP grew at an annual rate of 10% between 2007 and 2017, leading to a 61 percent increase in per capita GDP. The Home-grown Economic Reform Agenda, launched in September 2019, outlines macroeconomic, structural and sectoral reforms for job creation, poverty reduction, and inclusive growth. While the GoE sets its vision to transform Ethiopia from a largely agrarian low-income country to an industrialized lower-middle-income country by 2030, the initiative gives special emphasis to sectors such as agriculture, manufacturing, mining, tourism, and information and communication technology (ICT). Ethiopia lags in key digital indicators compared to its peers. In a country of more than 100 million people where 40 percent are aged under 15, internet use/access was a meager 18.6 percent at the end of 2017. Mobile phone use and ownership in Ethiopia (SIM cards per 100 inhabitants) stands at around 44 percent in mid- 2020. The digital divide within Ethiopia is equally apparent as the disparities with its neighbours. Lack of availability, affordability, and low quality of broadband connectivity is particularly significant among socially vulnerable populations, including children and elderly, women, disabled, low-income, and rural populations. The Ethiopia Digital Foundations Project (EDFP) is intended to develop Ethiopia's digital economy. It will enable its citizens, businesses and government to reap digital dividends in the form of faster growth, lower transaction costs, more jobs and greater efficiency. It will support the necessary steps to introduce market competition, private sector participation, foreign investment and independent sector regulation. The country must also expand and strengthen its basic digital infrastructure, especially the Fiber network and mobile broadband, towards achieving the African Union goal of universal affordable and quality broadband access by 2030. The Ethiopia Digital Foundation Project is a five years project (2021 to 2026) financed by the World Bank Group with a total amount of 200 million USD (IDA Credit).

1.2 The sub-Project description and Locations

The Procurement, Delivery, and Installation of Network Equipment to support points of Presence and Caches in Ethiopia for EthERNet sub-project (here after the EthERNet Project), will be implemented in partnership with EthERNet, Ethiopia's National Research and Education Network (NREN), part of the Ministry of Education (MoE). The organization currently connects some 50 universities, out of a total of around 200 universities. Further, of the roughly 1,500 TVETs in Ethiopia, only 25 are currently connected. Under the project, it is anticipated to connect an additional 49 universities and 30 TVETs, as well as upgrade data centers and routers. As a member of the UbuntuNet Alliance, EthERNet can access low-cost international connectivity, academic content, and training opportunities as part of the Africa Connect 3 initiative, which is supported by the EU. This will allow EthERNet and the universities in the consortium to access low-cost connectivity, open educational resources (OER) online content as well as training.

This project involves a significant investment in hardware such as servers, routers, switch boards, storage devices, and other networking equipment. It also uses software such as operating systems, database management systems, security software, and application software. Most importantly, it includes data centers, power supply systems, cooling systems, and network connectivity. The sub-project involves the procurement, delivery, and installation of network equipment to establish points of presence (PoPs), caches, and to upgrade data centers and aggregation centers for EthERNet, providing last-mile connectivity to 50 universities and 30 TVET institution.

It is also a core component of the Ethiopian Education and Research Network (EthERNet) development under the Ethiopian Digital Foundation Project (EDFP). It involves strengthening the national education and research digital infrastructure by improving network capacity and performance at various strategic locations with a cost of 1.3 Mil $. The sub-project specifically targets the enhancement of connectivity and content delivery through:

- Establishing or upgrading Points of Presence (PoPs) in strategic locations.
- Installing content catching servers to local stores and deliver frequently accessed data.
- Supporting improved bandwidth, reduced latency, and more reliable internet service for higher education and research institutions across Ethiopia.

And then, the sub-project supports the broader EDFP objective of improving digital services in education, research, and government operations.

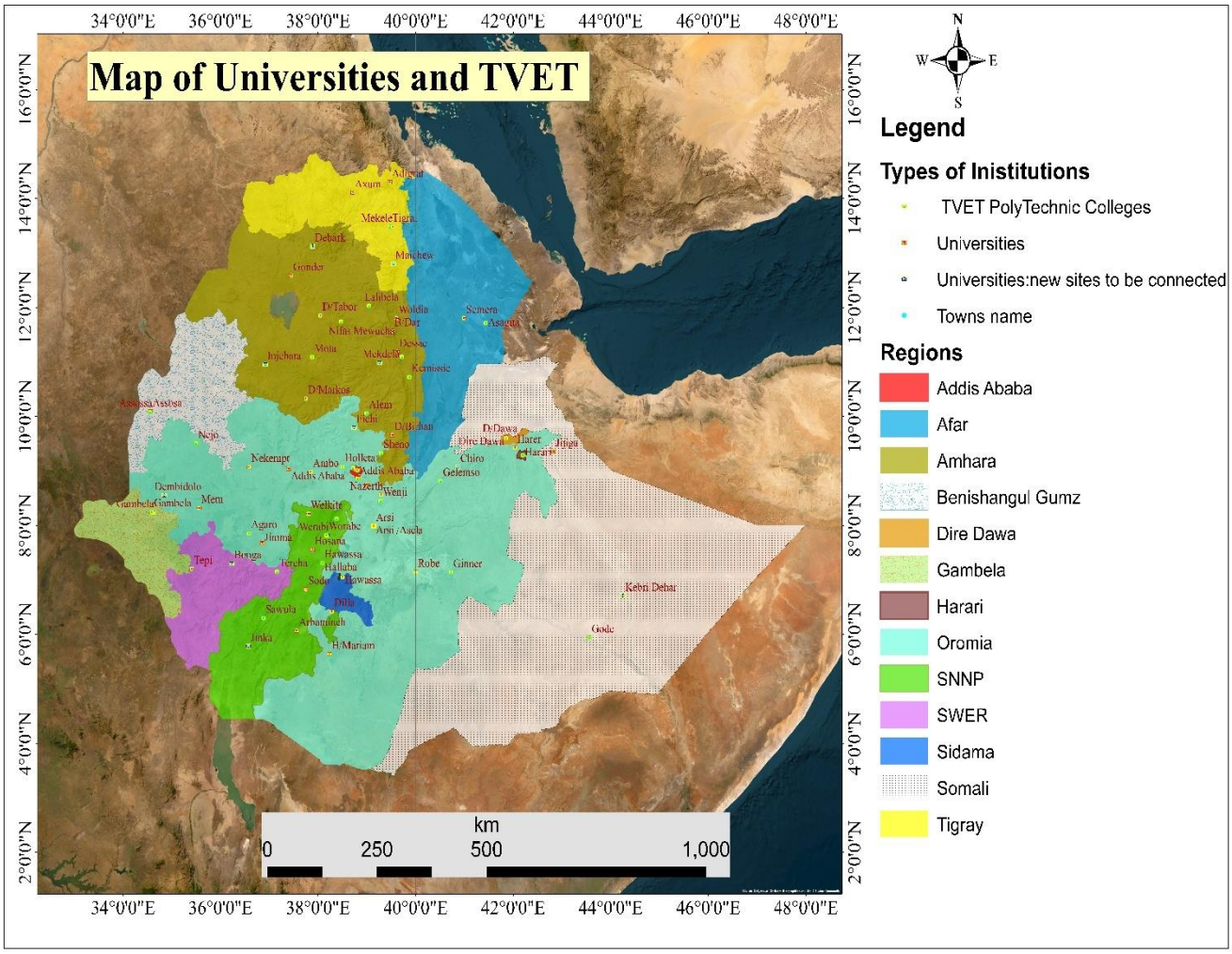

Figure 1 Sub-project's Locations

2. Main Phases of the sub-project and Activities under each phase

2.1 Planning and Preparation Phase

- **Needs Assessment:**

Identify suitable locations for PoPs and cache installations.

Assess existing infrastructure at targeted universities, TVETs, and regional hubs.

- **Site Surveys and Feasibility Studies:**

Technical si te surveys to determine installation requirements.

Assess power availability, cooling, security, and physical space.

- **Stakeholder Engagement:**

Consult with universities, MoE, EthERNet, and regional IT teams.

- **Procurement Planning:**

Prepare technical specifications for network equipment (routers, switches, cache servers, etc.).

Develop bid documents in compliance with World Bank and national procurement guidelines.

2.2 Procurement Phase

- **Tendering Process:**

Announce tenders and manage the bidding process.

Conduct technical and financial evaluations of suppliers.

- **Contract Awarding:**

Select qualified vendors.

Finalize contracts for equipment supply, delivery, and installation.

- **Quality Assurance Planning:**
    - Define standards and inspection methods for received equipment.

2.3. Delivery Phase

- **Logistics Coordination:**

Coordinate transportation of network equipment to designated PoP and cache locations.

- **Customs Clearance:**

Handle import and clearance procedures (if equipment is imported).

- **Inventory Management:**

Receive and log all equipment at storage or project warehouses.

2.4. Installation and Configuration Phase

- **Infrastructure Setup:**

Prepare server rooms (racks, power, cooling, grounding, etc.).

- **Hardware Installation:**

Install routers, switches, and catching servers.

Mount and connect all network hardware properly.

- **Software Configuration:**

Configure routing, IP addressing, security settings, and cache software.

- **Integration with Existing Network:**
    - Connect new equipment with EthERNet's core and regional networks.

- Perform compatibility testing.

2.5 Testing and Commissioning Phase

- **Functional Testing:**

Verify proper operation of equipment.

Conduct bandwidth and latency tests.

- **User Acceptance Testing (UAT):**

Involve EthERNet/NIC and university IT teams in verifying system readiness.

- **Final Handover:**

Provide documentation and hand over operational systems to EthERNet.

2.6. Training and Capacity Building Phase

- **Technical Training:**

Train IT staff at universities and regional centers on equipment operation and maintenance.

- **Operational Support:**
  - Offer initial operational support and troubleshooting.

2.7 Monitoring and Evaluation Phase

- **Post-Implementation Review:**

Evaluate sub-project performance against KPIs.

- **Maintenance Planning:**

Schedule routine maintenance and define SLAs with vendors.

- **Impact Assessment:**

Assess impact on network speed, reliability, and user satisfaction.

3. Significance of the ESMP Preparation

The Ethiopia Digital Foundation Project (EDFP), funded by the World Bank, aims to strengthen the digital ecosystem across Ethiopia. The Project Development Objective (PDO) for the Ethiopia Digital Foundations Project is to increase the inclusiveness and affordability of digital services and digital job creation in Ethiopia. It is intended to lay the building blocks to develop Ethiopia's digital economy. The Project is believed to create an enabling environment for digital innovation, economic growth, and greater access to information.

While the projects are essential for the development of the country's digital foundation, it must comply with the World Bank's and National Environmental and Social safeguard laws and

regulations for sustainable development reducing adverse environmental impacts and increasing beneficial ones.

As part of the project, the last-mile Ethernet connectivity will be extended to 50 universities and 30 TVET/polytechnic institutions across the country. This includes the procurement, delivery, and installation of networking equipment as well as upgrades to data centers and aggregation centers.

The implementation of such infrastructure across educational institutions, especially in remote and underdeveloped regions, presents significant social and Environmental development opportunities. However, it may also involve social and Environmental risks and adverse impacts if not carefully managed. The Environmental and Social Management Plan (ESMP) outlined herein is designed in alignment with the Terms of Reference (ToR) and the World Bank's Environmental and Social Framework (ESF).

Based on the review of the environmental and social screening report for the aforementioned project, the project was classified as a low-risk category by the EEPA and preparation of an Environmental and Social Management Plan (ESMP) was recommended. The recommendation was issued as per Ethiopia's Environmental Impact Assessment Proclamation No. 299/2002; Ethiopia's Environmental Impact Assessment Guideline (2020) and the World Bank's Environmental and Social Standards (ESSs) to preclude or propose mitigation actions for any environmental and social impacts that can occur during pre-construction, construction and implementation periods of the project under consideration.

4. Objective of the ESMP

It is understood that any project has environmental and social impacts of different magnitudes. The EthERNet project was considered to have Moderate environmental risk. Accordingly, the overall objective of this ESMP is to guide the contactor and the PIU follow strict guidelines in this ESMP and avoid any environmental, social and gender risks that may come out of the project.

The ESMP provides a clear and practical guidance to the PIU in addressing possible environmental, social and gender impacts and risks and integrating an environmental and social due diligence procedures in the various development stages of the subproject.

The ESMP has, at least, the following objectives:

- Identify and assess environmental and social risks and impacts for each subproject phase.
- Provide mitigation measures to address adverse environmental and social effects.
- Define roles, responsibilities, budgets, and schedules for mitigation.
- Ensure stakeholder engagement and grievance redress mechanisms.
- Integrate labor management and occupational health and safety measures.
- To use appropriate mitigation strategies to reduce noise, dust, emission, disturbance from traffic etc.
- To reduce water and environmental pollution as a result of e-waste.
- To provide maximum safety to construction personnel and nearby communities
- To develop a design that incorporates environmental and social safeguards
- To provide mitigation measures to all expected environmental degradation
- To prevent and reduce the negative environmental and social impacts of the project by implementable mitigation measures, to be carried out by the contractor.
- To follow rules and regulation of the country to reduce e-waste, fostering circular economy and the green legacy of Ethiopia.
- To safeguard community's cultural heritages, protected areas, and amenities to the maximum possible.
- To show a clear direction of decommissioning program at the end of the project lifetime.

5. Methodologies

- Legal framework reviews,
- Document reviews
- Internet access
- Interviews
- Secondary data

6. Environmental and Social Legal Frameworks

6.1 Ethiopian Environmental and Social Legal Frameworks

6.1.1 Environmental Laws and Guidelines

Table 1 Environmental Laws and Guidelines

Law/Policy	Year	Purpose
Proclamation No. 299/2002 – Environmental Impact Assessment (EIA)	2002	Mandates EIA for projects with potential environmental and social impacts.
EIA Guidelines	2020	Provides steps for preparing EIA and ESMPs, stakeholder engagement, and screening criteria.
Proclamation No. 300/2002 – Environmental Pollution Control	2002	Regulates prevention and control of pollution from waste, emissions, and hazardous substances.
Proclamation No. 513/2007 – Solid Waste Management	2007	Promotes proper solid and hazardous waste management practices.
Proclamation No. 655/2009 – Biosafety Proclamation	2009	Protects biodiversity from genetically modified organisms (GMOs) and similar risks.
Environmental Policy of Ethiopia	1997	Lays down the national policy framework for environmental protection and sustainable development.
Proclamation No. 1065/2017 – Climate Resilient Green Economy (CRGE) Implementation	2017	Supports Ethiopia's green development strategy.

6.1.2 Social and Labor-Related Laws

Table 2 Ethiopian Social Legal frameworks

Law/Policy	Purpose
Labor Proclamation No. 1156/2019	Regulates employment conditions, occupational safety and health, and workers' rights.
Proclamation No. 1102/2018 – Gender Equality and Women's Rights	Promotes gender inclusion in development.
Constitution of the Federal Democratic Republic of Ethiopia (1995)	Articles 44, 91, and 92 provide rights to a clean environment, protection of cultural heritage, and sustainable development.
Land Administration and Use Proclamation No. 456/2005	Regulates land tenure, administration, and compensation for land use.
Proclamation No. 590/2008 – Expropriation of Land for Public Purposes	Covers procedures and compensation related to land acquisition.
Public Health Proclamation No. 200/2000	Addresses health risks from development and promotes public welfare.

6.2 World Bank Environmental and Social Framework (ESF)

The World Bank's ESF applies to all projects funded after October 2018 and includes **10 Environmental and Social Standards (ESS)** that borrowers must comply with:

6.2.1 World Bank Environmental and Social Standards (ESS)

Table 3 World Bank's Environmental and Social Standards (ESSs) that Apply to the Activities Being Considered

ESS Number	Title	Focus
ESS1	Assessment and Management of Environmental and Social Risks and Impacts	Overall E&S impact identification, assessment, and management.
ESS2	Labor and Working Conditions	Working conditions, occupational health & safety, and protection of workers.
ESS3	Resource Efficiency and Pollution Prevention and Management	Efficient use of resources (energy, water, raw materials), pollution prevention, and e-waste management.
ESS4	Community Health and Safety	Safety of local communities, emergency response, infrastructure safety.
ESS5	Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	Avoiding or minimizing displacement, fair compensation.
ESS6	Biodiversity Conservation and Sustainable Management of Living Natural Resources	Avoiding harm to ecosystems, habitats, and species.
ESS7	Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	Engagement and benefits sharing with indigenous/traditional communities.
ESS8	Cultural Heritage	Protection of tangible and intangible cultural heritage.
ESS9	Financial Intermediaries	No financial intermediary will be involved.
ESS10	Stakeholder Engagement and Information Disclosure	Inclusive consultation, communication, and grievance redress.

6.3 Other relevant World Bank policies and tools:

- World Bank Group Environmental, Health, and Safety (EHS) Guidelines
- Climate and Disaster Risk Screening Tool
- Gender Strategy (2016–2023)
- Access to Information Policy

7. Summarized Biophysical Background Baseline data and

The general description of the biophysical, social, and economic backgrounds of the areas covered in the EthERNet sub-project, based on the universities and TVET colleges listed in the documents.

7.1 The Ecological Background zones of Ethiopia

They range from highland plateaus to lowland arid areas:

- **Highlands (e.g., Amhara, Tigray, Oromia highlands)**:

  Climate: Temperate with moderate rainfall (June–September).

  Topography: Mountainous and rugged terrain; vulnerable to erosion.

  Soil: Fertile but degraded in some areas due to overuse.

  Natural hazards: Landslides, occasional droughts.

- **Lowlands (e.g., Afar, Somali, Gambella)**:

  Climate: Hot and arid or semi-arid with lower rainfall.

  Vegetation: Sparse grasslands, acacia woodland, or savannah.

  Natural hazards: Floods, heatwaves, and potential earthquakes (e.g., Afar Rift).

- **Southern areas (e.g., SNNPR, SWER, Sidama)**:

  Climate: Tropical to subtropical.

  Biodiversity: High known for endemic species and rich forest cover.

  Agricultural potential: Suitable for cash crops like coffee, spices, and fruits

7.2 Social Background

The project locations reflect **Ethiopia's rich ethnic, linguistic, and cultural diversity**:

- **Languages spoken**: Amharic, Afaan Oromo, Tigrinya, Somali, Sidama, and many more.
- **Cultural practices**: Vary widely—many areas have strong traditional governance and communal decision-making.
- **Education**:
  - Universities serve as major centers for regional development and capacity building.
  - TVET colleges support vocational skills aligned with local economies.
- **Gender and equity**:
  - Rural areas often show **limited female participation** in ICT and education.

- ❖ Some communities may be underrepresented or marginalized (e.g., pastoralists in Afar or Somali).

- **Urban vs. Rural**:
  - ❖ Institutions in **Addis Ababa, Bahir Dar, Hawassa**, etc., are in urbanized centers.
  - ❖ Many TVETs and new universities are in **semi-urban or rural** locations with limited infrastructure.

7.3 Economic Background

- **Urban hubs (e.g., Addis Ababa, Hawassa, Dire Dawa)**:
  - ❖ Higher GDP contribution, better digital access, and growing tech and service sectors.
  - ❖ Diverse economies with access to skilled labor.
- **Agrarian regions (e.g., Amhara, Oromia, SNNPR)**:
  - ❖ Predominantly agriculture-based economies (cereals, livestock, horticulture).
  - ❖ Emerging small enterprises and cooperative businesses.
- **Pastoral and lowland regions (e.g., Afar, Somali, Gambella)**:
  - ❖ Economy based on **livestock, trade, and limited agriculture**.
  - ❖ Infrastructure development is minimal, digital access is very limited.
- **Employment Opportunities**:
  - ❖ ICT expansion is expected to create jobs in installation, maintenance, education, and entrepreneurship.
  - ❖ TVET institutions enhance technical skills for local labor markets.

7.4 Summarized Environmental, Social, and Economic Profile of the EthERNet Sub-Project Locations

The baseline assessment outlines the environmental (biophysical), social, and economic characteristics of the Ethiopian regions hosting universities and TVET institutions included in the EthERNet sub-project. The data helps in understanding context-specific risks, opportunities, and considerations for effective implementation of the Environmental and Social Management Plan (ESMP). Where relevant, map references and demographic data have been integrated.

7.4.1. Amhara Region

Universities: Debre Birhan, Bahir Dar, Debre Markos, Debre Tabor, Wollo, Gondar, Woldia, Injibara*, Debark*, Mekidela Amba*

TVETs: Kemissie, Almaz Bem (Alem), Mota, Lalibela, Nifas Mewucha, Sekota, Kombolcha

- **Biophysical:** Highland terrain with elevations above 2,000 meters; temperate climate with moderate to heavy rainfall (June–September); prone to erosion and deforestation. Rich in water resources including Lake Tana and the Blue Nile.
- **Social:** Predominantly Amhara ethnic group, speaking Amharic; high population density; urban-rural divide in education and healthcare.
- **Economic:** Agriculture-driven economy (teff, wheat, barley); significant government and donor investment in rural electrification and digital inclusion.

7.4.2. Oromia Region

Universities: Ambo, Adama, Haromaya, Jimma, Wollega, Meda Welabu, Metu, Bule Hora, Debre Zeit Defence, Dembi Dolo*, Oda Bultum*, Arsi*, Selale*

TVETs: Agaro, Nejo, Wonji, Gelemso, Ginner, Sheno, Shashemene, Holleta

- **Biophysical:** Diverse topography—ranging from highlands (Jimma, Fiche) to lowlands (Metu, Bule Hora); fertile soils; rivers like Awash and Gibe provide irrigation and hydro potential.
- **Social:** Predominantly Oromo ethnic group; Afaan Oromo widely spoken; education access varies across zones.
- **Economic:** Coffee, livestock, maize production; strong cooperative sectors; high potential for green energy and ICT scale-up.

7.4.3. SNNPR, Central Ethiopia, Southwest Ethiopia Regions & Sidama

Universities: Arbaminch, Dilla, Wachemo, Wolayita Sodo, Mizan Tepi, Welkite, Jinka*, Bonga*, Werabe*

TVETs: Hallaba, Sawula, Tercha, Butajira, Worabe, Hawassa (Sidama)

- **Biophysical:** Ecologically diverse ranging from forested zones to lakes (e.g., Lake Abaya, Lake Hawassa); suitable for highland fruits and root crops.
- **Social:** Over 50 ethnic groups including Sidama, Wolayta, Gurage, Hadiya, Sheka; high cultural diversity necessitates multi-language engagement.
- **Economic:** Coffee and spice production hubs; Hawassa Industrial Park drives local employment; low digital access in rural areas.

7.4.4. Tigray Region

Universities: Adigrat, Axum, Mekelle, Raya*

TVETs: Tigray PTC

- **Biophysical:** Highland region with sparse rainfall; rugged terrain; prone to drought; limited vegetation.
- **Social:** Tigrayan ethnic group; Tigrinya language; recent conflict has affected institutional functionality and displaced populations.
- **Economic:** Farming (sorghum, barley); mining potential; reconstruction phase necessitates ICT expansion and energy restoration.

7.4.5. Addis Ababa (City Administration)

Universities: Addis Ababa University, Civil Service, Kotebe, AA Science & Technology, Ethiopian Institute of Architecture

TVETs: G. Wingate, Akaki

- **Biophysical:** Central highland location at ~2,400 meters elevation; temperate weather year-round.
- **Social:** Multicultural urban center; hub of tertiary education and skilled labor.
- **Economic:** Ethiopia's economic and digital epicenter; high-tech startups, government services, and robust fiber infrastructure.

7.4.6. Somali Region

Universities: Jijiga, Kebri Dehar*

TVETs: Gode TVET

- **Biophysical:** Hot, arid lowland climate; minimal water resources; pastoral landscapes dominate.
- **Social:** Somali-speaking communities; nomadic lifestyle in rural zones; infrastructure gaps are significant.

- **Economic:** Livestock trade, mobile commerce; vulnerability to droughts; ICT investment crucial for resilience.

7.4.7. Afar Region

University: Semera

TVETs: Adadale (Asagita)

- **Biophysical:** Desert lowlands; part of the East African Rift Valley; seismic and volcanic risks; prone to flash floods.
- **Social:** Afar ethnic group; pastoralist society with mobility challenges.
- **Economic:** Salt mining, livestock herding; minimal access to digital services or formal education.

7.4.8. Benishangul-Gumuz Region

University: Assossa

TVETs: Assossa

- **Biophysical:** Forested and hilly; presence of rivers including Blue Nile tributaries.
- **Social:** Gumuz, Berta, and other minorities; low literacy and limited-service provision.
- **Economic:** Sesame and maize farming; hydropower potential; remote access affects connectivity.

7.4.9. Gambella Region

University: Gambella*

TVETs: Openo

- **Biophysical:** Lowland tropical; Nile River basin; flooding common during rainy seasons.
- **Social:** Nuer, Anuak communities; hosting large refugee populations from South Sudan.
- **Economic:** Subsistence agriculture; limited employment outside aid and informal trade.

7.4.10. Dire Dawa (City Administration)

University: Dire Dawa

TVETs: Dire Dawa PTC

- **Biophysical:** Semi-arid region; located at the base of the Chercher Mountains.
- **Social:** Ethnically mixed urban area; Amharic, Oromiffa, and Somali languages.
- **Economic:** Strategic logistics hub; expanding industrial base; moderate digital inclusion.

7.4.11. Harari Region

TVETs: Harar PTC

- **Biophysical:** Urbanized highland with good climate.
- **Social:** Harari and Oromo communities; historical and cultural heritage.
- **Economic:** Reliant on tourism, trade, and artisan sectors; digital infrastructure is expanding.

Note: Institutions marked with an asterisk (*) are newly established or under expansion and may require greater infrastructural support and community engagement.This is a **baseline environmental and social profiles** for the universities and TVET colleges listed in the document, grouped by key indicators. This serves as a current-state snapshot useful for the Environmental and Social Management Plan (ESMP).

7.5 Brief Environmental and Social Baseline for Universities and TVET Colleges (EthERNet Project)

7.5.1 Environmental Baseline

Table 4 Environmental Baseline[1]

Indicator	Current Status
Geographic Location	Institutions are spread across Ethiopia's diverse ecological zones: highlands (e.g., Gondar, Mekelle), lowlands (e.g., Gambella, Assosa), and urban centers (e.g., Addis Ababa, Dire Dawa).
Land Use and Ecosystems	Campuses in rural and semi-urban areas often coexist with agricultural land or forested areas.
Climate Risk Exposure	Some areas are prone to drought (Afar, Somali), flooding (Gambella), or landslides (SNNPR highlands). Environmental safeguards must be tailored accordingly.
Waste Management	Limited infrastructure for solid waste, hazardous material, or e-waste handling. Most institutions lack formal recycling or disposal systems for ICT equipment.
Air & Noise Pollution	Generally low in rural areas, but moderate in urban centers. Construction and trenching for fiber installation may temporarily increase dust and noise.
Water & Sanitation	Urban universities mostly rely on piped water systems, but rural TVETs often depend on wells or boreholes, which may face seasonal shortages or contamination risks.

[1]

7.5.2 Social Baseline

Table 5 Social Baseline

Indicator	Current Status
Demographics	High student populations with ethnic diversity. Gender disparity is improving but still notable in some regions. Many campuses have staff and students from across the country.
Social Services	Basic services available on campuses: student dormitories, clinics, and cafeterias. Rural institutions may lack reliable electricity, internet, or transport access.
Community Relations	Generally positive, with universities seen as community anchors. However, new projects must engage local communities to avoid misunderstandings, especially where land or disruption may occur.
Security and Conflict	Institutions in Tigray (e.g., Mekelle, Axum, Adigrat), western Oromia (e.g., Dembi Dolo), and some Amhara towns may face risks from regional instability. Planning should include conflict-sensitive approaches.
Infrastructure Access	Most urban institutions are better connected by road and telecom services, while rural TVETs and universities often have limited infrastructure and digital access.
Inclusion of Vulnerable Groups	Facilities for students with disabilities are often lacking. Gender-sensitive dorms and safety protocols are improving but not yet universal. Awareness and infrastructure upgrades are needed.

8. Environmental and Social risks of the EthERNet sub-Project its Analysis

8.1 The Environmental and Social risks of the EthERNet sub-Project

The Ethernet Project extends over about 80 educational institutions located far apart from each other. Accordingly, the sites are distributed throughout the country and all routes and destinations should be considered in the plan. Table below shows the most critical environmental and social issues to be considered.

Risk/Impact Analysis Matrix for the **Ethernet Sub-Projects under the Ethiopian Digital Foundation Project (EDFP)**, categorized by project phase (Design, Construction/Installation, Operation), with each activity assessed based on **likelihood, impact, and overall risk level (Low, Medium, High)**.

Risk Level Definitions:

- **Low (L)**: Minor impact, infrequent, manageable with standard procedures.
- **Medium (M)**: Moderate impact, likely to occur, needs targeted mitigation.

- **High (H)**: Significant impact or high likelihood, needs strong controls and regular monitoring.

8.1.1 Social Risks of Ethernet Sub-Projects

❖ **Labor and Working Conditions**

- Short-term contracts for labor may **exclude social protections**, fair wages, or appropriate work conditions.
- Risks of **child labor**, especially in remote or unregulated areas, and **gender-based exclusion** from job opportunities could arise without proactive safeguards.
- Inadequate Occupational Health and Safety (OHS) training increases the risk of **injuries and fatalities** among workers.

❖ **Community and Institutional Disruption**

- Activities during academic hours may disrupt **teaching-learning processes**, especially where equipment is installed near classrooms or laboratories.
- Workers interacting with students and staff pose risks of **social tension or misconduct** if not managed through codes of conduct.

❖ **Traffic and Access Risks**

- Movement of vehicles for equipment delivery or cable trenching may cause **congestion** and pose **accident risks** in university or TVET environments.
- **Pedestrian safety**, particularly for students, may be compromised during the construction phase.

❖ **Cultural and Gender Sensitivity**

- Communication or interactions with campus communities without consideration of **language, gender, or cultural norms** may lead to **social conflict** or non-acceptance of the project.
- Female students and staff may face **exclusion from consultation processes** if sessions are not gender-inclusive.

❖ **Grievance Redress Gaps**

- Without an effective **Grievance Redress Mechanism (GRM)**, complaints about noise, dust, disruption, or harassment may go unresolved, escalating dissatisfaction or legal issues.

e) Occupational Health Hazards: Workers may be exposed to hazardous materials (e.g., lead solder, insulation chemicals) or electrical risks during installation.

8.1.2 Cross-Cutting and Long-Term Risks

❖ **Institutional Capacity Gaps**

- Universities and implementing bodies may lack adequate **environmental and social management capacity**, leading to **non-compliance** with mitigation measures or reporting obligations.

❖ **Sustainability and Maintenance**

- Without ongoing **training and capacity building**, installed Ethernet infrastructure may degrade due to **poor maintenance or misuse**, wasting investment and leaving digital service gaps.

❖ **Equity and Digital Divide**

- If implementation focuses on better-resourced institutions, **rural or underserved universities** may be left behind, widening the **digital divide** and reducing national equity goals.

Conclusion

The environmental and social risks of Ethernet sub-projects are moderate but manageable with proper planning, supervision, and community engagement. Key mitigation strategies include developing and enforcing ESCOPs (Environmental and Social Codes of Practice), strengthening grievance redress mechanisms, providing OHS and environmental training, and ensuring inclusive consultation and monitoring. Systematic implementation of the ESMP will help ensure that Ethernet sub-projects achieve their transformative digital objectives without compromising environmental and social integrity.

8.2 Possible Environmental Impacts during the different phases

Construction Phase

Negative Environmental Impacts:

- Air & Noise Pollution: From old vehicles/machinery; disturbs schools, hospitals.
- Soil Erosion: Due to trenching, excavation, and tower installation.
- Water Contamination: From improper disposal of construction materials.

Positive Impacts:

- Employment Opportunities: Short-term local employment.
- Skills Development: Workers gain construction-related experience.
- Community Engagement Opportunity: Awareness raising and consultation.

B. Implementation (Operational) Phase

Negative Environmental Impacts:

- Increased Energy Use: Powering Ethernet equipment and data centers.
- Electronic Waste Generation: From equipment upgrades/failure.
- EMI: Potential disturbance to nearby devices.
- Transport Emissions: Continued equipment/personnel movement.

Positive Impacts:

- Digital Access Expansion: Improved learning and institutional connectivity.
- Long-Term Productivity Gains: Enhanced communication and services.
- Gender & Inclusion Potential: If proactively managed, may empower women and disadvantaged groups.

C. Decommissioning Phase

Negative Environmental Impacts:

- E-waste Hazards: Improper disposal leads to pollution, health risks.
- Toxic Component Exposure: Lead, mercury, etc. harm soil, water, health.
- Resource Wastage: Lack of recycling or material recovery.

Positive Impacts:

- Recycling Opportunity: Material recovery and resource efficiency.
- System Upgrade: Replacing obsolete systems improves performance and sustainability.

Table 6 ES Risk/Impact Analysis Table

Phase	Activity	Potential Risk/Impact	Likelihood	Impact	Risk Level	Suggested Mitigation
Design & Planning	Site selection, network layout planning	Impact on heritage, trees, or inaccessible areas	Low	low	low	Site surveys; stakeholder engagement; universal access design
	Procurement planning	Use of non-compliant suppliers, outdated/e-waste-prone tech	low	low	low	Include EHS criteria in procurement policy
	Stakeholder consultation	Exclusion of vulnerable groups, gender imbalance	low	Low	Low	Inclusive planning workshops, GRM
Construction / Installation	Equipment transportation	Traffic congestion, dust, and noise	Low	Low	Medium	Route planning, off-peak delivery, vehicle maintenance
	Cable trenching, drilling	Dust, noise, disruption to classes, utility damage	Medium	Medium	Medium	Dust control, signage, barrier fencing, schedule during breaks
	Wall mounting, equipment installation	Minor damage to infrastructure, fall risk, electric shock	Medium	Medium	Medium	Use skilled labor, proper tools, PPE
	Waste generation (packaging, old equipment)	Unmanaged e-waste or solid waste	Low	Low	Low	Segregate and properly dispose of waste, work with licensed collectors
	Worker safety	Electrocution, fall, injury during installation	Low	Low	Low	Safety induction, PPE, supervision, insurance

Phase	Activity	Potential Risk/Impact	Likelihood	Impact	Risk Level	Suggested Mitigation
	Labor conditions	Exploitation, lack of contracts or fair pay	Low	low	low	Enforce labor standards, site audits
Operation & Maintenance p	Network operation	Energy use, overheating of switches	Low	Low	Low	Use energy-efficient devices, ensure cooling/ventilation
	Routine maintenance	Injury during work, fall risk, tripping on cables	Low	Low	Low	Regular inspection, use SOPs, signage during maintenance
	Equipment upgrade or disposal	Improper e-waste handling	Medium	Medium	Medium	Partner with certified e-waste recyclers, asset inventory system

9. Environmental and Social Risks/Impacts Analysis by Project Phase

Environmental and Social Risk Analysis for Ethernet Sub-Projects, structured **by project phases** and including the **severity level** (Low, Moderate, High, Critical):

Table 7 Environmental and Social Risk Analysis by Project Phase – Ethernet Sub-Project

Phase	Risk Category	Specific Risk	Severity Level	Justification
1. Planning/Design	Environmental	Improper site selection impacting sensitive ecosystems	low	Potential if planning ignores local biodiversity or protected zones
	Environmental	Inadequate integration of energy-efficient designs (cooling, power use)	Moderate	Could lead to long-term energy inefficiency and carbon footprint
	Social	Lack of stakeholder consultation	Moderate	Could result in resistance or conflicts with local communities

Phase	Risk Category	Specific Risk	Severity Level	Justification
	Social	Exclusion of vulnerable groups in planning (e.g., women, disabled)	Moderate	May result in inequality and lack of inclusiveness in benefits
	Social	Land access issues (temporary use, easements)	Moderate	Could delay implementation and lead to compensation conflicts
2. Pre-Construction	Environmental	Site clearance leading to vegetation loss	Low	Generally small footprint, but still relevant
	Environmental	Improper handling of hazardous materials (e.g., battery backups)	Moderate	Could cause soil/water contamination
	Social	Labor influx causing social tension	Moderate	Especially in smaller or rural communities
	Social	Inadequate disclosure of project details	Moderate	Can create mistrust in affected communities
3. Construction/Installation	Environmental	Noise, dust, and waste generation	Moderate	Typical of civil works but manageable with mitigation
	Environmental	Improper waste handling (e.g., cable reels, packaging)	High	Could create visual pollution and localized contamination
	Environmental	Oil spills or leakages from machinery	Moderate	Risk of soil or surface water pollution
	Social	Short-term contracts excluding benefits	High	Violates fair labor standards
	Social	Child labor or unsafe working conditions	Critical	High legal, ethical, and reputational consequences
	Social	Occupational health and safety	moderate	Construction and ICT works are

Phase	Risk Category	Specific Risk	Severity Level	Justification
		risks (electrical hazard, ergonomic strain)		physically intensive and risky
4. Operations	Environmental	Energy inefficiency during data or network operations	Moderate	Ongoing emissions and resource consumption
	Environmental	E-waste accumulation from obsolete equipment	moderate	Poor management could lead to serious pollution
	Social	Cybersecurity breaches (social risk via data misuse)	moderate	Risks to individual privacy and institutional integrity
	Social	Inequitable access to network services	low	Could marginalize remote institutions or users
5. Decommissioning	Environmental	E-waste generation (e.g., servers, cables, switches)	moderate	Toxic materials, high volume of waste
	Environmental	Poor recycling or disposal practices	moderate	Can harm soil, water, and air quality
	Social	Job loss or income instability for support staff	Moderate	Social tension unless transitions are planned
	Social	Inadequate stakeholder engagement on equipment removal or site restoration	low	May result in disputes or dissatisfaction

10. The Environmental and Social Monitoring plan

Monitoring Plan for the Environmental and Social Management Plan (ESMP) of the Ethernet Sub-Projects, organized by phase. The monitoring plan includes What to Monitor, Indicators, Monitoring, Frequency/Schedule, Responsible Body and Role/Responsibility. This monitoring plan ensures that each environmental and social risk is actively tracked with assigned responsibilities and measurable indicators.

Table 8 Environmental and Social Monitoring Plan

Project Phase	What to Monitor (Issue)	Indicators	Schedule/Frequency	Responsible Body	Roles/Responsibilities
Construction	Dust, noise, and air pollution	Dust levels, noise dB levels, emission certificates	Weekly, during peak activities	Contractor, Environmental Safeguard Unit	Implement dust suppression, regular machine maintenance, air quality checks
	Waste handling and soil/water contamination	Proper waste segregation, storage sites, absence of spills	Weekly	Contractor, Environment Officer	Ensure no hazardous waste leakage; ensure proper storage and labeling
	Occupational Health and Safety (OHS) compliance	PPE use, safety training records, incident reports	Bi-weekly	Contractor, OHS Officer, PIU	Train workers, report incidents, enforce PPE and toolbox talks
	Traffic & pedestrian safety	Traffic signs, safe walkways, no. of incidents	Weekly	Contractor, Traffic Coordinator	Provide barriers, coordinate delivery schedules, report pedestrian concerns
	Labor rights & conditions	Valid contracts, wages paid, working hours	Monthly	Contractor, Social Safeguard Officer	Review labor documents, ensure fair treatment and working conditions
	Community disruption	No. of grievances received/respo	Monthly	Contractor, Grievance	Maintain GRM logbook, resolve

Project Phase	What to Monitor (Issue)	Indicators	Schedule/Frequency	Responsible Body	Roles/Responsibilities
	& grievance handling	nded, disruption logs		Officer, PIU	issues within timeline
	Gender and inclusion in consultation	% of women participants, feedback collected	Before and after consultations	Social Officer, Gender Focal Person	Ensure gender-sensitive communication and inclusive meeting schedules
Implementation	Energy use and emissions	Monthly electricity use records, GHG estimates	Quarterly	Implementing Institution, IT/Admin Dept.	Track electricity use, apply efficiency measures
	Electronic waste generation	No. of equipment disposed, disposal method	Semi-annually	IT Dept., Environmental Officer	Maintain e-waste log, arrange for safe disposal/recycling
	Equipment interference (EMI)	Complaints from users, technical fault logs	Monthly	IT Dept., Contractor	Test equipment, resolve interference issues
	Institutional equity in rollout	No. of rural institutions covered	Bi-annually	MoE/Project Coordination Unit (PCU)	Ensure phased rollout considers underserved institutions
	Maintenance and sustainability	No. of O&M personnel trained, maintenance logs	Bi-annually	PIU, University Admin/IT	Provide continuous training, audit maintenance plans
Decommissioning	Safe disposal of e-waste	Disposal records, certified recyclers used	At decommissioning	Contractor, Environment Officer, EPA	Follow e-waste SOPs, document disposal, ensure authorized recyclers involved
	Worker safety during dismantling	Use of PPE, injury reports	Daily during dismantling	Contractor, Safety Officer	Conduct daily briefings, enforce safety protocols

Project Phase	What to Monitor (Issue)	Indicators	Schedule/Frequency	Responsible Body	Roles/Responsibilities
	Recyclable material recovery	% of materials recycled vs disposed	End of decommissioning	Contractor, PIU	Segregate materials, prioritize resource recovery
	Community impact during dismantling	No. of complaints, access issues	Weekly during dismantling	Contractor, Social Officer	Notify stakeholders, maintain safety and order during dismantling

11. Cost Estimates for Environmental & Social Management and Monitoring Plan

Cost Estimate Table for the Environmental and Social (ES) Management and Monitoring Plan of the Ethernet Sub-Projects. It covers Environmental and social mitigation measures, Monitoring activities, Training and capacity building, Grievance management, E-waste handling and Health and safety provisions

Table 9 Cost Estimates for ES Management and Monitoring Plan

No.	Activity/Item	Unit	Qty	Unit Cost (USD)	Total Cost (USD)	Remarks
A. Environmental Management						
1	Dust suppression (water spraying, covers)	Month	3	500	1,500	Includes water tanker, site cover materials
2	Waste handling facilities (bins, signage, segregation tools)	Lump sum/site	1	800	800	Includes hazardous and non-hazardous containers
3	Soil and water protection (bunding, lining)	Lump sum	1	700	700	For temporary construction-phase protection
4	EMI testing and compliance setup	Activity	1	600	600	Equipment and technician costs

No.	Activity/Item	Unit	Qty	Unit Cost (USD)	Total Cost (USD)	Remarks
5	E-waste disposal (through licensed vendors)	Lot	1	1,000	1,000	Disposal or recycling service per site
Subtotal A					**4,600**	
B. Social Risk Management						
6	Worker OHS PPE kits (helmets, vests, gloves, etc.)	Worker	15	50	750	For temporary workers during construction
7	Code of conduct preparation & training	Session	2	300	600	Includes printing, briefing materials, facilitator
8	Traffic safety signs and barriers	Set	1	500	500	Installation around pedestrian areas
9	Stakeholder & gender-sensitive consultations	Session	2	400	800	With community and institutional reps
10	Grievance Redress Mechanism setup (logbooks, hotline, etc.)	Lump sum	1	600	600	Tools and hotline installation
Subtotal B					**3,250**	
C. Monitoring and Evaluation						
11	Environmental monitoring (dust, noise, water quality)	Monthly visit	3	500	1,500	Includes sampling kits, lab testing, transport
12	Social monitoring (labor, traffic, consultations)	Monthly visit	3	400	1,200	Includes stakeholder interviews, site audits
13	Monitoring report preparation	Report	3	300	900	Quarterly environmental & social report
Subtotal C					**3,600**	
D. Capacity Building and Training						
14	Training on ESMP, OHS, and e-waste for site personnel	Session	2	600	1,200	Includes trainer fee, handouts, venue

No.	Activity/Item	Unit	Qty	Unit Cost (USD)	Total Cost (USD)	Remarks
15	Refresher training on grievance handling and documentation	Session	1	500	500	For social safeguard team and GRM focal
Subtotal D					**1,700**	
E. Contingency (10%)					**1,305**	
TOTAL ESTIMATED COST					**14,455**	

12. Capacity Building and Training Plan

This is for Strengthen the capacity of project stakeholders in ESMP implementation, Improve understanding of environmental and social safeguards, and Ensure compliance with World Bank's and Ethiopian environmental regulations.

Capacity Development Indicators are % of trained staff per topic, Feedback from training evaluations, Number of safety incidents po st-training, Functioning GRM usage levels, Compliance score from internal audits

The Target Groups are PIU Staff (MoE), Contractors and Site Engineers, Local Authorities, TVET/University Facility Managers and Environmental and Social Safeguards Officers

Table 10 Capacity Building and Training Plan

Topic	Content Description	Target Audience	Method	Timing/Frequency	Responsibility
ESMP Overview and Compliance	Roles, responsibilities, legal and donor requirements	PIU, Contractors	Workshop/Seminar	Prior to construction & annually	MoE PIU + Consultant
Environmental Monitoring Techniques	Air, noise, waste monitoring methods and tools	Environmental Officers	Practical field training	Quarterly	Environmental Consultant

Topic	Content Description	Target Audience	Method	Timing/Frequency	Responsibility
Social Safeguards and GRM	Worker rights, grievance handling, gender sensitivity	Social Officers, Contractors	Interactive session	Semi-annually	Social Consultant
OHS and Ergonomics	Safe installation practices, lifting techniques, PPE use	Workers, Safety Officers	On-site demo + booklet	Quarterly	Safety Specialist
E-waste and General Waste Management	Collection, handling, recycling, disposal practices	Technicians, IT staff, Facility Managers	Video + Practical Session	Annually	MoE ICT Division
Emergency Preparedness & Response	Fire safety, evacuation, electrical hazard response	All Site Staff	Drill exercise + poster	Bi-annually	Contractor + Local Fire Service
Biodiversity and Cultural Heritage Protection	Minimizing disturbance, Chance Finds Procedure	Site Engineers, Contractors	Seminar + poster	Before construction begins	MoE + Heritage Authority

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12. Annexes

12.1 Plan of different tols

- **Annex 1 Environmental and Social Codes of Practice (ESCOPs)**
- **Annex 2 E-Waste Management Plan**
- **Annex 3 Waste Management Plan**
- **Annex 4 Contractor Compliance Monitoring Plan**
- **Annex 5 Traffic & Labor Management Plan Delivery Phase of Ethernet S-Projects**
- **Annex 6 Annex Labor Management**
- **Annex 7 Security Management Plan for Ethernet Sub-Projects – EDFP**
- **Annex 8 Occupational Health and Safety (OHS)**
- **Annex 9 Grievance Redress Framework (GRF) for Ethernet Sub-Projects – EDFP**

Annex 1. Environmental and Social Codes of Practice (ESCOPs)

The ESCOPs provide practical guidance to ensure that Ethernet sub-projects are implemented in an environmentally and socially responsible manner. The practices are tailored for installation of Ethernet infrastructure, such as cabling, routers, and server hardware at universities and TVET institutions. These codes address potential adverse impacts during planning, installation, operation, and decommissioning phases.

Key areas covered:

- Site selection and preparation
- Labor and working conditions
- Community health and safety
- Dust and noise control
- Hazardous and non-hazardous waste handling
- Occupational Health and Safety (OHS)
- Traffic and access management
- Grievance redress and stakeholder communication

Summery of the plan

ESCOP Category	Practice	Responsible Party	Monitoring Indicators
Site Selection	Avoid ecologically or socially sensitive sites	Project Planner	Site screening reports
Dust & Noise Control	Water spraying and noise shielding during installation	Contractor	Dust levels, complaints log
OHS Measures	Provide PPEs, training on electrical hazards	Contractor / Institution	Incident reports, training logs
Labor Conditions	Comply with national labor laws, prohibit child labor	Contractor	Worker contracts, age records
Community Safety	Inform local communities, install signs/barriers	Institution / Contractor	Meeting minutes, signage checks
Solid Waste	Segregate and dispose according to local regulations	Contractor / Institution	Waste logs, disposal receipts
Grievance Redress	Provide suggestion boxes, hotline	Institution	Grievance log, resolution reports

Annex 2 E-Waste Management Plan

Ethernet installations generate electronic waste (e-waste) such as used routers, cables, switches, and packaging of ICT equipment. The E-Waste Management Plan ensures that these are handled responsibly to prevent environmental contamination and promote reuse/recycling.

Objectives:

- Promote safe collection, storage, and disposal of obsolete ICT components.
- Enhance awareness among technical staff on handling e-waste.
- Partner with licensed e-waste recyclers for disposal.

Key actions:

- Inventory of obsolete/damaged electronic items.
- Designated storage areas for e-waste.
- Training for ICT teams on e-waste risks and handling.
- Contracts with authorized recyclers (e.g., Recyplast, EKT Trade).

Summery of the plan

Component	Action	Responsible Party	Monitoring Tool
Inventory	Maintain log of damaged/outdated electronics	ICT Technician	E-waste inventory sheet
Storage	Store in covered, ventilated e-waste room	Institution Facility Head	Visual inspection report
Training	Conduct awareness sessions for staff	Project Coordinator	Attendance logs
Disposal	Contract certified recyclers	Procurement Team	Disposal certificates
Recordkeeping	Maintain disposal and collection records	Institution Admin	Disposal logbook

Annex 3 Waste Management Plan

Apart from e-waste, Ethernet sub-projects generate packaging materials (plastics, cardboard), installation waste (cable cuttings, screws), and general office waste. A Waste Management Plan provides systematic guidance for waste reduction, segregation, collection, and disposal.

Goals:

- Minimize waste generation.
- Encourage waste segregation at source.
- Ensure safe disposal via licensed service providers.

Activities include:

- Waste categorization (general, recyclable, hazardous).
- Placement of labeled bins for segregation.
- Schedule for waste collection.
- Training custodians on waste handling.

Summery of the plan

Waste Type	Source	Handling Procedure	Responsible Party	Monitoring Tool
Plastic Wrappings	Equipment packaging	Collect in labeled bins, recycle	Site Supervisor	Daily waste checklist
Cardboard	Packaging	Flatten and store for re-use/recycling	Storekeeper	Reuse/recycle log
Cable Cuttings	Installation process	Collect and store for recycling	Technician	Waste bag records
General Waste	Day-to-day operations	Collected by municipal waste service	Cleaner / Facility Head	Collection records
Hazardous Waste	Batteries, toner cartridges	Store separately, dispose through licensed firm	Procurement / Environmental Officer	Disposal manifests

Annex 4 Contractor Compliance Monitoring Plan

It is the process of ensuring that contractors (i.e., companies or individuals hired to carry out specific tasks or construction works) are following all applicable **legal, contractual, environmental, social, safety, and quality standards** as outlined in their agreement or contract.

❖ Purpose of Contractor Compliance Monitorin, it is to ensure that:

- Contractors **meet the performance, safety, and environmental standards** of the project.
- There is **accountability** and **transparency** in project implementation.
- Projects comply with **laws, regulations**, and **donor requirements** (e.g., World Bank, African Development Bank).

Table 11 Aspect of Monitoring and its involvment

Aspect	What It Involves
Environmental compliance	Proper waste disposal, pollution control, resource use, dust/noise control
Social compliance	Community engagement, grievance handling, avoiding child/forced labor
Health and Safety (OHS)	Use of PPE, safe working conditions, risk mitigation
Labor standards	Wages, working hours, employment terms, equal opportunity
Contractual performance	Meeting deadlines, specifications, and quality requirements
Ethical conduct	Anti-corruption, transparency, fair practices

❖ It is done by:

- **Client (e.g., government agency or donor project office)**
- **Supervising consultants**
- **Independent environmental and social auditors**
- **Monitoring and Evaluation (M&E) teams**

❖ Time of application

- **Before works start (pre-construction)**
- **During construction**
- **After completion (post-construction or defects liability period)**

❖ Monitoring Tools and Methods

- Site inspections
- Checklists and audit reports
- Worker and community interviews
- Grievance redress system tracking
- Photographic evidence
- Environmental and safety logs

❖ Benefits

- Prevents legal or reputational risks
- Improves project outcomes and sustainability
- Promotes ethical, safe, and inclusive development:

Annex 5 Traffic & Labor Management Plan – Delivery Phase of Ethernet S-Projects

1. Introduction

This plan outlines procedures and mitigation measures to manage labor influx and traffic-related risks during the delivery (transportation and logistics) phase of the Ethernet sub-projects. The plan ensures safe, coordinated, and environmentally and socially responsible handling of goods and workforce movements.

2. Objectives

- Ensure the safe and efficient delivery of equipment and materials to project sites.
- Manage risks associated with labor deployment and local traffic disruption.
- Minimize impacts on community safety, environment, and local infrastructure.
- Ensure compliance with national traffic regulations and labor laws.

3. Scope

This plan applies to all transportation, delivery logistics, and labor engagement during the delivery phase of:

- Modular Data Centers
- Upgraded Data Centers
- Smart Communication Rooms
- Ethernet service infrastructure for universities and TVETs

4. Traffic Management

4.1. Key Risks

Risk	Potential Impact
Increased vehicular movement	Road congestion, safety risks to the public
Movement through populated areas	Disruption to local life, accidents
Poor road conditions	Delays, damage to equipment
Lack of signage or route planning	Accidents and confusion

4.2. Mitigation Measures

- Conduct **Route Assessments** prior to dispatch.
- Schedule deliveries during **non-peak hours**.
- Use **trained and licensed drivers**.
- Provide **escort vehicles** where necessary.
- Install **temporary warning signs** in high-risk areas.

- Ensure all vehicles are **well-maintained** and carry spill kits for emergencies.
- Coordinate with **local traffic police** and community leaders.

Annex 6 Annex Labor Management

5. Labor Management

5.1. Key Risks

Risk	Potential Impact
Labor influx to delivery areas	Community tension, overburdening local services
Untrained or informal labor	Occupational injuries, project delays
Poor labor conditions	Legal and reputational risks

5.2. Mitigation Measures

- Ensure workers are **contracted formally** with clear terms of reference.
- Provide **orientation on occupational health and safety**, including ergonomics for loaders/unloaders.
- Maintain a **labor registry** including origin, role, and contact info.
- Ensure **accommodation, transport, and sanitation** are provided where necessary.
- Enforce a **Code of Conduct** addressing behavior, non-discrimination, and gender sensitivity.
- Avoid child labor and forced labor in line with Ethiopian law and World Bank standards.

6. Community Engagement

- Inform communities **in advance** about delivery schedules and potential disturbances.
- Use **notice boards**, **local radio**, or **community meetings**.
- Maintain **open channels for grievances**, aligned with the project GRM.

7. Monitoring and Reporting

8. Roles and Responsibilities

Role	Responsibility
Project Manager	Overall coordination and compliance
Transport Manager	Route planning, driver management
Site Engineer	Delivery site readiness
HSE Officer	Safety compliance and training
Social Officer	Community liaison and labor monitoring

9. Emergency Preparedness

- Prepare a **contingency plan** for accidents, spills, or road closures.
- Ensure emergency contacts and **first aid kits** are available with drivers.
- Inform **local health and safety authorities** about major movements.

Would you like this plan tailored into a **tabular format** or turned into a **PowerPoint presentation** for stakeholder briefing?

Annex 7 Security Management Plan for Ethernet Sub-Projects – EDFP

1. Introduction

This Security Management Plan (SMP) is designed to ensure the protection of personnel, assets, infrastructure, and data during the implementation and operation of Ethernet sub-projects across universities and TVET institutions under the Ethiopian Digital Foundation Project (EDFP).

2. Objectives

- Safeguard physical Ethernet infrastructure.
- Protect digital data and network systems from cyber threats.
- Ensure personnel and contractor safety and security.
- Establish protocols for threat prevention, response, and recovery.

3. Scope

This plan applies to all stakeholders, including contractors, engineers, ICT staff, and administrators involved in:

- Installation of Ethernet cables, routers, switches, and server rooms.
- Maintenance of Ethernet infrastructure.
- Operation of digital communication systems in universities and TVETs.

4. Risk Assessment

Security Risk Category	Identified Risks	Impact	Likelihood	Mitigation Measures
Physical Security	Theft/vandalism of equipment	High	Medium	Secure storerooms, fencing, guards, tracking inventory
Cybersecurity	Hacking, malware, data breach	High	High	Firewalls, antivirus, access control, awareness training
Personnel Security	Unauthorized access by outsiders	Medium	High	ID badges, biometric controls, visitor logbooks
Information Security	Leakage of confidential info	High	Medium	Encryption, role-based access, policy enforcement
Operational Security	Sabotage or misconfiguration	Medium	Low	SOPs, restricted admin rights, incident response plan

5. Security Strategies and Procedures

5.1 Physical Security

- Secure storage for all ICT equipment during and after installation.
- Employ local security guards at high-risk locations.

- Install CCTV and motion sensors in server and communication rooms.
- Fence sensitive infrastructure areas.

5.2 Cybersecurity

- Implement firewalls, intrusion detection/prevention systems (IDS/IPS).
- Regularly update antivirus and anti-malware software.
- Restrict administrative access to trained personnel only.
- Conduct penetration testing before commissioning.

5.3 Personnel & Access Control

- Issue access badges to authorized personnel.
- Maintain visitor registration and control systems.
- Train staff on access protocols and incident reporting.
- Implement role-based digital access policies.

5.4 Information Protection

- Encrypt sensitive data (both at rest and in transit).
- Regular data backup and storage in secure offsite/cloud location.
- Secure configuration of switches and routers (e.g., disable unused ports).
- Prohibit sharing of credentials; enforce password policies.

5.5 Incident Management

- Designate Security Response Teams at each institution.
- Establish and communicate incident reporting procedures.
- Maintain a Security Incident Register.
- Perform post-incident reviews to improve protocols.

6. Roles and Responsibilities

Entity	Responsibilities
Project Implementing Unit (PIU)	Oversight, monitoring, and enforcement of the SMP
Contractors	Secure transport, installation, and reporting of incidents
Institutional ICT Units	Local implementation of access and cybersecurity protocols
Local Security Personnel	Physical protection, surveillance, emergency response
MoE IT Directorate	Policy development, system audit, and technical guidance

7. Monitoring and Reporting

- **Weekly Security Logs** to be maintained at each institution.
- **Quarterly Security Assessments** to review compliance and incidents.

- Use of checklists for installation and operational phases.
- Reports submitted to PIU and World Bank Safeguards Team as needed.

8. Budget and Resources

A budget line should be allocated for:

- Security equipment (CCTV, locks, access systems)
- Cybersecurity tools and licenses
- Training of staff and guards
- Emergency response tools and backups

9. Training and Awareness

- Conduct mandatory training for project staff on:
  - Cyber hygiene
  - Incident handling
  - Equipment handling and inventory protocols
- Include awareness sessions for institutional staff and students.

10. Review and Update

This plan shall be reviewed:

- Annually
- After any major security breach
- When expanding the Ethernet network or adding new digital services

Annex 8 Occupational Health and Safety (OHS)

Occupational Health and Safety (OHS) issues—including **ergonomic-related risks**—can be categorized and addressed under **Environmental and Social Risks** for the **Ethernet Sub-Projects** of the Ethiopian Digital Foundation Project (EDFP).

❖ Integration of Occupational Health and Safety (OHS) into Environmental and Social Risk Categories for Ethernet Sub-Projects

Category	Risk/Issue	Sub-Project Activities Involved	Risk Level	Mitigation Measures
Social Risk	**Occupational Health & Safety Risks (General)** - Exposure to electrical hazards - Trips and falls, working at heights, etc.	Installation of Ethernet cabling, smart rooms, and data systems	Medium–High	- Provide Personal Protective Equipment (PPE) - Train workers on safety practices - Conduct site inductions
Social Risk	**Ergonomic Risks** - Prolonged sitting/awkward postures - Repetitive motion during cabling or ICT setup	ICT room setup, configuration of devices, data center maintenance	Medium	- Use adjustable workstations - Schedule task rotation and breaks - Provide ergonomic tools/furniture
Social Risk	**Psychosocial Risks** - Work pressure, long shifts, job stress during deadlines or large-scale installations	All phases, particularly construction and testing	Medium	- Encourage communication and feedback - Avoid excessive overtime - Provide access to mental health support
Environmental Risk	**Chemical and Physical Hazards** - Exposure to dust, fumes (from soldering or construction), noise, and poor air quality	Building cabling ducts, server room installations	Low–Medium	- Ensure proper ventilation - Use noise control measures - Provide masks and protective equipment
Social Risk	**Inadequate Emergency Response Preparedness** - Lack of first aid kits, fire	All physical work sites	High	- Develop and train teams on site-specific emergency plans - Install alarms and fire extinguishers

Category	Risk/Issue	Sub-Project Activities Involved	Risk Level	Mitigation Measures
	safety, and evacuation procedures			

❖ **Reporting and Management**

- **Include OHS performance in monitoring reports**, tracked quarterly across sub-projects.
- **Establish a designated OHS Focal Person** at each major site (Data Centers, TVETs, Universities).
- **Integrate ergonomic risk assessments** in procurement and setup stages, especially for equipment-heavy environments like smart communication rooms and data centers.

❖ **Recommendations for Integration**

1. **OHS elements** should be **mainstreamed under the Social Management Plan** for the Ethernet sub-project.
2. Ergonomic issues are best **framed under occupational health**, which is part of social safeguards, but can also influence environmental conditions (air, lighting, noise).
3. Include **ergonomics training sessions** during worker induction and provide **monitoring checklists** for common ergonomic risks.
4. Update the **Environmental and Social Management Plan (ESMP)** to reflect specific ergonomic and OHS risks per activity.

Annex 9 Grievance Redress Framework (GRF) for Ethernet Sub-Projects – EDFP

This is to Ensure that concerns and complaints from project-affected persons (PAPs) and other stakeholders are addressed promptly, transparently, and effectively, Minimize project risks and delays by proactively managing grievances andStrengthen stakeholder trust and engagement.

. Types of Grievances

Category	Examples
Environmental	Dust, noise, waste disposal, e-waste handling, emissions, vegetation loss
Social	Land use/access issues, labor influx, disrespectful behavior, GBV/SEA/SH
Health and Safety	Construction risks, poor signage, inadequate PPE, unsafe practices
Economic	Livelihood disruption, property damage, business interference
Labor-related	Worker rights, wages, working conditions, unfair dismissal
Community Disruption	Traffic issues, access obstruction, cultural heritage interference
Information Disclosure/Engagement	Lack of consultation, misinformation, exclusion from decision-making
Service-related	Connectivity delays, quality of service issues post-implementation

3. Grievance Redress Mechanism (GRM) Structure

Level	Structure/Responsible Body	Roles
Level 1: Site-level	Contractor's Focal Person & Community Liaison Officer (CLO)	Receive, record, and attempt to resolve grievances locally within 7 days
Level 2: Institutional	University/TVET GRM Committee (with social/environmental experts)	Review unresolved grievances within 14 days, escalate as needed
Level 3: Regional/National	EDFP PIU GRM Desk at MoE/MCIT with Environment & Social Specialists	Final decision within 21 days; refer legal matters to judiciary if necessary

4. Grievance Handling Procedures

Step	Description
Step 1: Submission	Grievance lodged verbally, in writing, via suggestion box, email, phone, or community meetings
Step 2: Acknowledgment	Acknowledged within **2 working days** with a unique reference number
Step 3: Assessment	Review and classify grievance (minor, serious, urgent, legal, etc.)
Step 4: Resolution	Investigate and propose resolution at appropriate level; involve stakeholders in solution
Step 5: Feedback	Complainant is informed of the outcome and given opportunity to accept or reject the resolution
Step 6: Escalation	If unsatisfied, grievance is escalated to higher-level GRM
Step 7: Closure	Documented once resolved; agreement signed if required

5. Feedback Mechanisms

- **Hotlines and Toll-Free Numbers**
- **Suggestion/Complaint Boxes** at TVETs, universities, and project sites
- **Community Liaison Officers (CLOs)** available for face-to-face interaction
- **Quarterly Stakeholder Forums** to gather feedback
- **Digital Platform (GRM app/portal)** – if feasible, integrate into MoE or MCIT web-sites

6. Monitoring and Reporting of Grievances

Activity	Responsible Entity	Frequency
Grievance Log Maintenance	Site-level GRM focal person	Ongoing
Monthly Summary Reports	Contractors and institutions	Monthly
Aggregated GRM Dashboard	EDFP PIU (MoE/MCIT E&S Specialists)	Quarterly
Public Disclosure of GRM Data	Included in project newsletters/website	Bi-annually
Independent GRM Audit	Third-party monitoring	Annually

Key Indicators:

- Number and types of grievances received
- Time taken to resolve grievances
- Percentage of resolved vs. unresolved cases
- Repeat complainants
- Community satisfaction level with grievance handling

7. Special Considerations

- **Gender-Sensitive GRM**: Female GRM focal points, safe and confidential reporting of GBV/SEA/SH
- **Anonymous Complaints**: Allowed and investigated to the extent possible
- **Accessibility**: Mechanism must be inclusive for vulnerable groups, including persons with disabilities

8. Capacity Building

- Training for GRM focal persons at each university, TVET, and contractor team
- Awareness-raising sessions for communities and workers on how to use the GRM

Summarized Grievance Redress Mechanism (GRM) for the Ethernet Subproject under the Ethiopian Digital Foundation Project (EDFP), based on the sub project phases:

1. Pre-Construction Phase

Purpose: Prevent grievances through early stakeholder engagement and planning.

Key GRM Actions:

Awareness Creation: Inform communities and institutions (e.g., universities, TVETs) about the project and the GRM system.

Establish GRM Committees: Set up local grievance redress committees (LGRCs) at woreda/kebele levels and institutional GRM focal points.

Information Dissemination: Share contact details (e.g., hotline, suggestion boxes, emails) through public meetings and notices.

Baseline Data Collection: Identify potential social and environmental concerns (land access, disruption, etc.).

2. Construction Phase

Purpose: Address grievances from civil works and physical disturbances.

Key GRM Actions:

Receive Complaints: Channels include physical offices, phone lines, community representatives, and digital tools.

Register Complaints: All grievances logged into a GRM registry with date, location, type of grievance, and affected party.

Assess and Investigate: Rapid assessment (within 3–7 days) by the responsible GRM unit.

Resolve or Escalate:

Local Level: Immediate resolution by contractor or site supervisor for minor issues.

Institutional Level: Unresolved cases elevated to regional or central project office.

Response Time: Feedback provided within 14 days.

Monitoring: Monthly reports on grievance trends and resolution effectiveness.

3. Operation Phase

Purpose: Manage grievances during Ethernet service delivery and infrastructure usage.

Key GRM Actions:

Continued Accessibility: Maintain GRM tools (online, phone, in-person) at connected institutions.

Service-Related Complaints: Address issues like service disruption, safety concerns, or maintenance lapses.

Capacity Building: Train institutional ICT officers and grievance focal points on GRM roles.

Follow-up: Periodic satisfaction surveys and review of complaint resolutions.

Cross-cutting GRM Features

Transparency: Regular disclosure of grievance data without personal details.

Inclusivity: Accessible to all stakeholders, including women, persons with disabilities, and marginalized groups.

Documentation: GRM performance included in ESHS and monitoring reports submitted to the World Bank.

Appeal Mechanism: Escalation to courts or independent ombudsman if unresolved at project level.

12.2 Lists of the 50 Universities and 30 TVETs

No.	List of Universities	Regions	Cities
1	Debre Birhan University	Amhara	D/Birhan
2	Adigrat University	Tigray	Adigrat
3	Ambo University	Oromia	Ambo
4	Arbaminch University	SNNPR	Arbaminch
5	Assossa University	Benishangul	Assosa
6	Axum University	Tigray	Axum
7	Bahir Dar University	Amhara	B/Dar
8	Institute of Technology	Addis Ababa	Addis Ababa
9	Addis Ababa University	Addis Ababa	Addis Ababa
10	Civil service University	Addis Ababa	Addis Ababa
11	Kotebe University	Addis Ababa	Addis Ababa
12	AA science and technology	Addis Ababa	Addis Ababa
13	Ethiopian Institute of Architecture & Building	Addis Ababa	Addis Ababa
14	Dire Dawa University	Dire Dawa	D/Dawa
15	Debre Markos University	Amhara	D/Markos
16	Debre Tabor University	Amhara	D/Tabor
17	Debre Zeit Defence University	Oromia	Debrezeit
18	Wollo University	Amhara	Dessie
20	Dilla University	SNNPR	Dilla
20	Gondar University	Amhara	Gonder
21	Bule Horra University	Oromia	H/Mariam
22	Haromaya University	Oromia	Harer
23	Hawassa University	Sidama	Hawassa
24	Wachemo University	SNNPR	Hosana
25	Jijga University	Somali	Jijiga
26	Jimma University	Oromia	Jimma

27	Mekelle University	Tigray	Mekele
28	Metu University	Oromia	Metu
29	Adama University	Oromia	Nazerth
30	Wollega University	Oromia	Nekempt
31	Meda Welabu University	Oromia	Robe
32	Semera University	Afar	Semera
33	Wolayita Sodo University	SNNPR	Sodo
34	Mizan Tepi University	SNNPR	Tepi
35	Welkitie University	SNNPR	Welkite
36	Woldia University	Amhara	Woldia

New sites need to be connected to EthERNet

No.	List of Universities	Regions	Cities
1	Arsi University	Oromia	Arsi
2	Bonga University*	SNNPR	Bonga
3	Debark University*	Amhara	Debark
4	Dembi Dolo University*	Oromia	Dembidolo
5	Gambella University*	Gambella	Gambela
6	Injibara University*	Amhara	Injebara
7	Jinka University*	SNNPR	Jinka
8	Kebri Dehar University*	Somali	Kebri Dehar
9	Mekidela Amba University*	Amhara	Mekdela
10	Oda Bultum	Oromia	Chiro
11	Raya University *	Tigray	Maichew
12	Selale University*	Oromia	Fichi
13	Werabe University*	SNNPR	Werabi

List of Beneficiary Public TVET Poly Technic Colleges

No.	Name of TVET Poly Technic Colleges	Region	Cities
1	Openo PTC	Gambella	Gambela
2	Assossa PTC	Benishangul	Assossa
3	Harar PTC	Harari	Harari
4	Agaro PTC	Oromia	Agaro
5	Nejo PTC	Oromia	Nejo
6	Wonji PTC	Oromia	Wenji
7	Gelemso PTC	Oromia	Gelemso
8	Hallaba	SNNP	Hallaba
9	Ginner PTC	Oromia	Ginner
10	Sheno PTC	Oromia	Sheno
11	Kemissie PTC	Amhara	Kemissie
12	Almaz Bem PTC	Amhara	Alem
13	Mota PTC	Amhara	Mota
14	Lalibela PTC	Amhara	Lalibela
15	Nifas Mewucha PTC	Amhara	Nifas Mewucha
16	Sawula PTC	SNNPR	Sawula
17	Tercha PTC	SNNPR	Tercha
18	Butajira PTC	SNNPR	Butajira
19	Sekota PTC	Amhara	Sekota
20	Shashemene PTC	Oromia	Shashemene
21	Kombolcha PTC	Amhara	Kombolcha
22	Hawassa PTC	Sidama	Hawassa
23	G. Wingate PTC	Addiss Ababa	Addis Ababa
24	Dire Dawa PTC	Diredawa	Dire Dawa
25	Holleta PTC	Oromia	Holleta
26	Tigrai PTC	Tigrai	Tigrai

27	Gode TVET	Somali	Gode
28	Worabe PTC	SNNPR	Worabe
29	Akaki PTC	Addiss Ababa	Addis Ababa
30	Adadale PTC	Afar	Asagita

12.3 List of participants of the Consulted Universities & Polytechnic communities for the sub project

Lists of Community participated on Consultation made at Universities

JigJiga University

List of Participants
Universities/ EtherNET

No	Nameof representative	Responsibility	Sub-project area /Region/city	Telephone	Sign
1	Ahmed Kulif	Sys-Admn (ICT)	Jigjiga Univ'sty	0915044443	[signature]
2	Naol Tadesse	Network Engineer	Anhui Antai	0935644318	[signature]
3	Yeremew Sifwa	Councile Regional	Afa'ri Jig	094522910	[signature]
4	Bezuayehu Birke	GRM committe		0911144562	[signature]
5	Yonas Hailu	MINT	CEO	0913158888	[signature]
6					

Lists of Community participated on Consultation made at Harar Harar Poly technic

List of Participants
Poly technics/ EtherNET

No	Nameof representative	Responsibility	Sub-project area /Region/city	Telephone	Sign
1	Aseta Tolcha	college Dean	Harar. PTC	0914987606	
2	Muniib Mohammed	I.C.T Director	Harar. PTC	0915742035	
3	Andualem	A/t / Dikan	Harar PTC	0933348313	
4	Naol Tadesse	Anhui Antai	"	0935644318	
5	Bezuayehu Birke	GRM committee	Federal	0911144562	
6	Yonas Hailu	CEO	MINT	0913158888	
7	Gebremeskel	Team leader	" "	0945229518	
8					
9					

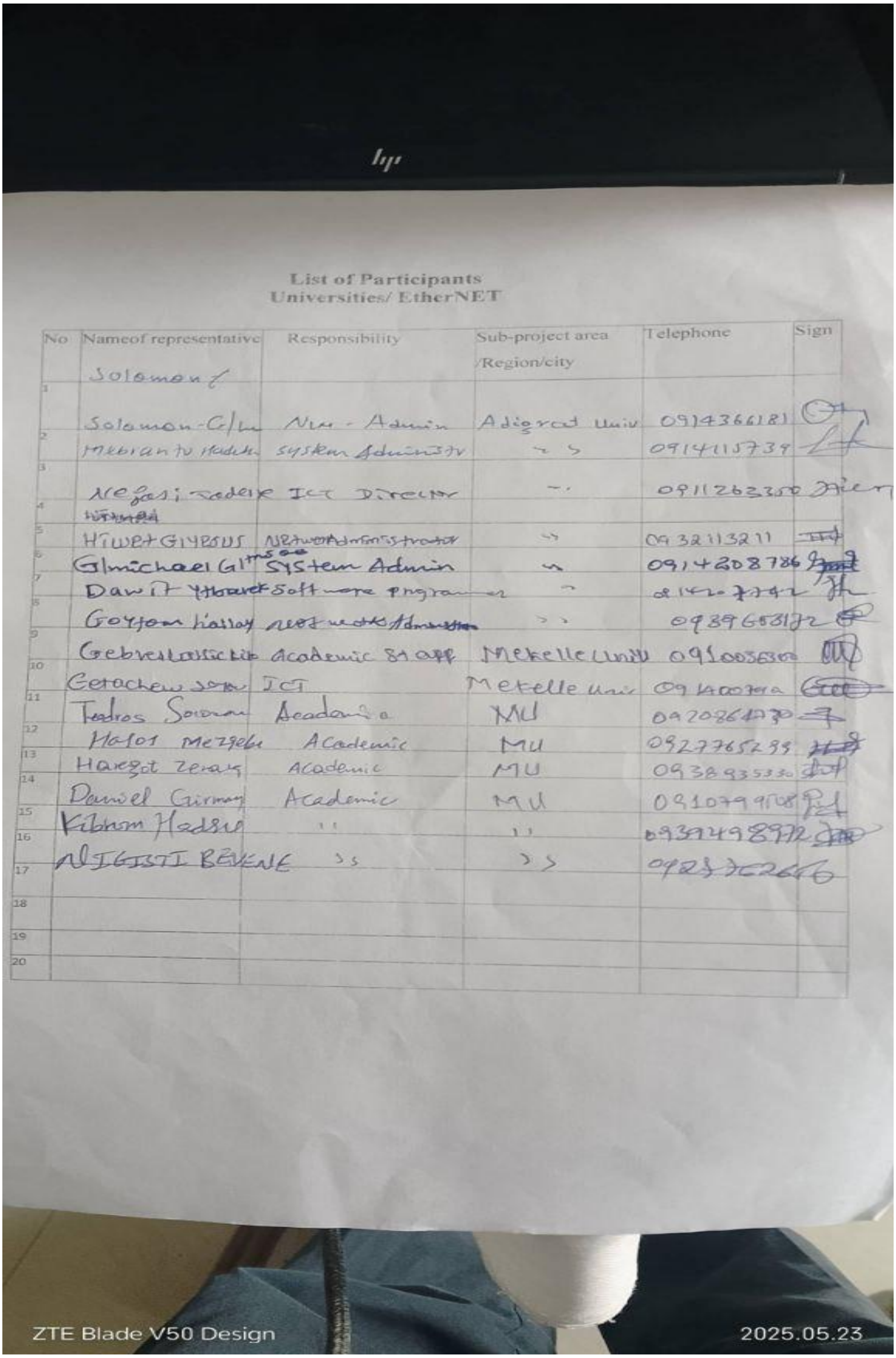
Lists of Community participated on Consultation made at Haramaya University

Lists of Community participated on Consultation made at University of Dire Dawa University

List of Participants
Universities/ EtherNET

No	Nameof representative	Responsibility	Sub-project area /Region/city	Telephone	Sign
1	Bisrat Ayalu	Network Administrator	DDU	0913403079	
2	Damana Datto	ICT Directa	DDU	0912433215	
3	Isvael Mekonnen	focal person	MoE	0912493768	
4	Naol Tadesse	Network Engineer	Anhui Antai	0935644318	
5	Yonas Hailu	CEO	MINT	0913158888	
6	Jeremew Sitot	Technician	DU	0945229120	
7	Meket Tesfu	Desk	MINT	0911345429	
8	Bezuayehu Birke	GRM committee	MINT	0911144562	
9					

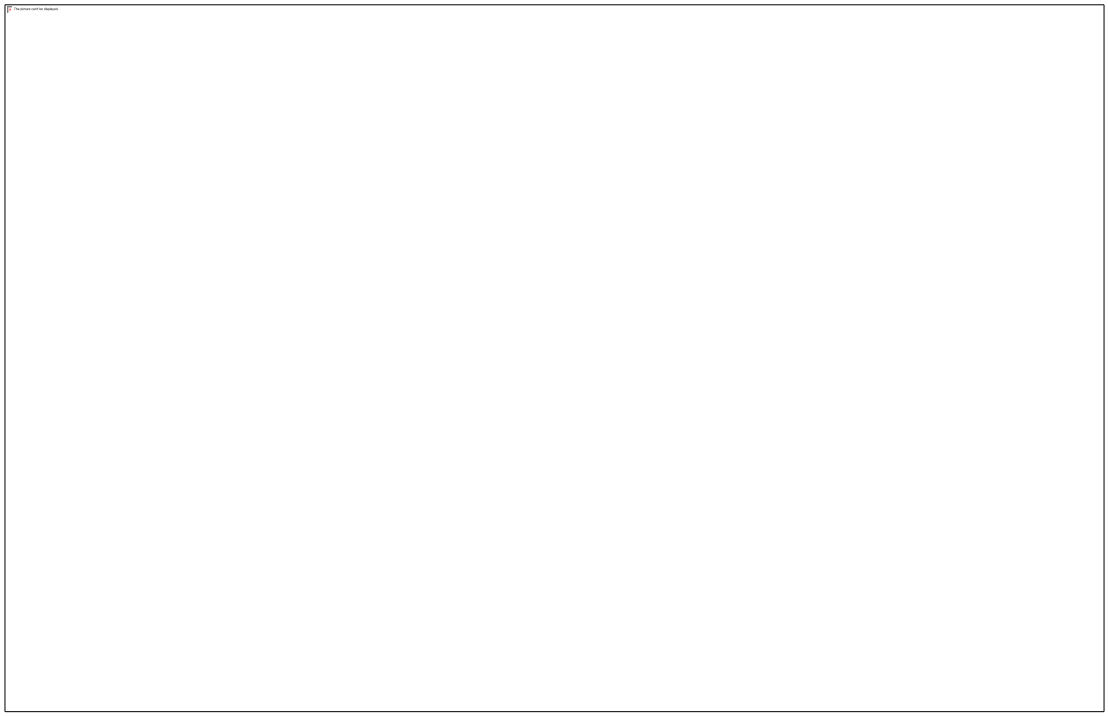
Lists of Community participated on Consultation made at Universities of Tigray (Mekele and Adigrat) and

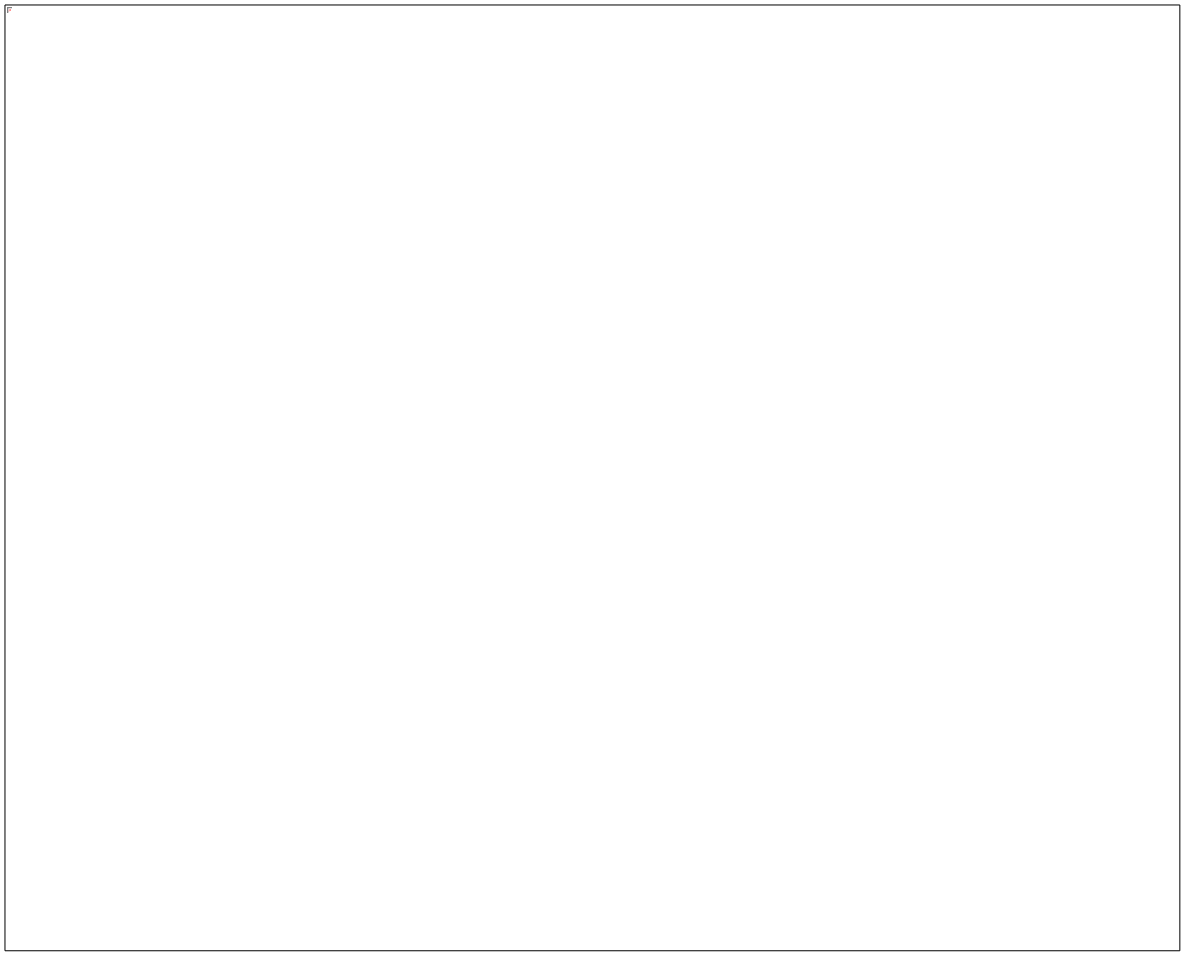


List of Participants
Universities/ EtherNET

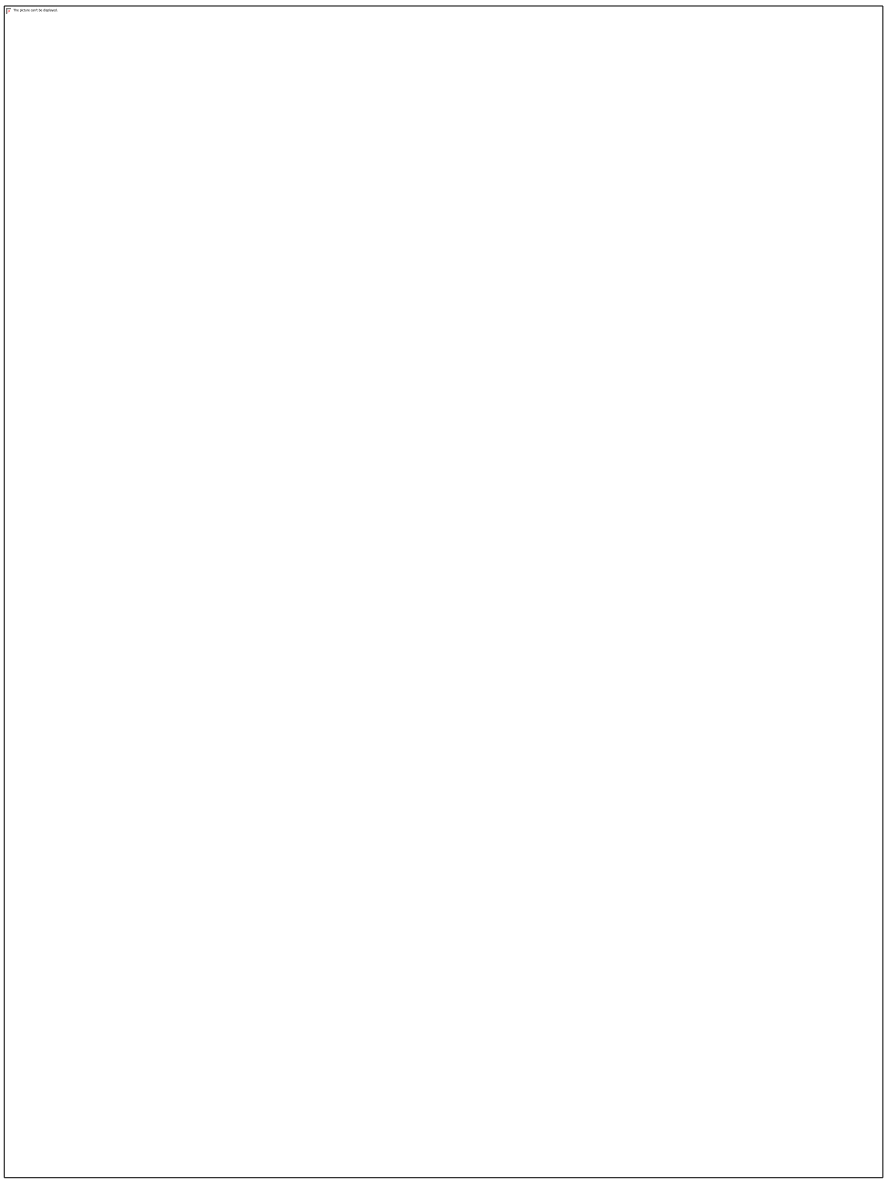
No	Nameof representative	Responsibility	Sub-project area /Region/city	Telephone	Sign
1	Solomon-G/H	Nw - Admin	Adigrat Univ	0914366181	
2	Mebrahtu Hadish	System Administr	"	0914115739	
3	Nefasi Tadele	ICT Director	"	0911263350	
4					
5	Hiwet G/Yesus	Network Administrator	"	0932113211	
6	G/michael G/tinsae	System Admin	"	0914208786	
7	Dawit [illegible]	Software programmer	"	0914207742	
8	Goitom Hailay	Network Administration	"	0939658172	
9	Gebreslassie Kife	Academic Staff	Mekelle Univ	0910036300	
10	Getachew [illegible]	ICT	Mekelle Univ	0914007[illegible]	
11	Tedros Solomon	Academic	MU	0920864730	
12	Hagos Mezgebe	Academic	MU	0927765293	
13	Haregot Zeray	Academic	MU	0938935330	
14	Daniel Girmay	Academic	MU	0910799408	
15	Kibrom Hadush	"	"	0939498972	
16	ALIGISTI BEYENE	"	"	0923762666	
17					
18					
19					
20					

Participants lists for Consuktation at Mekele Poly technics Institutions

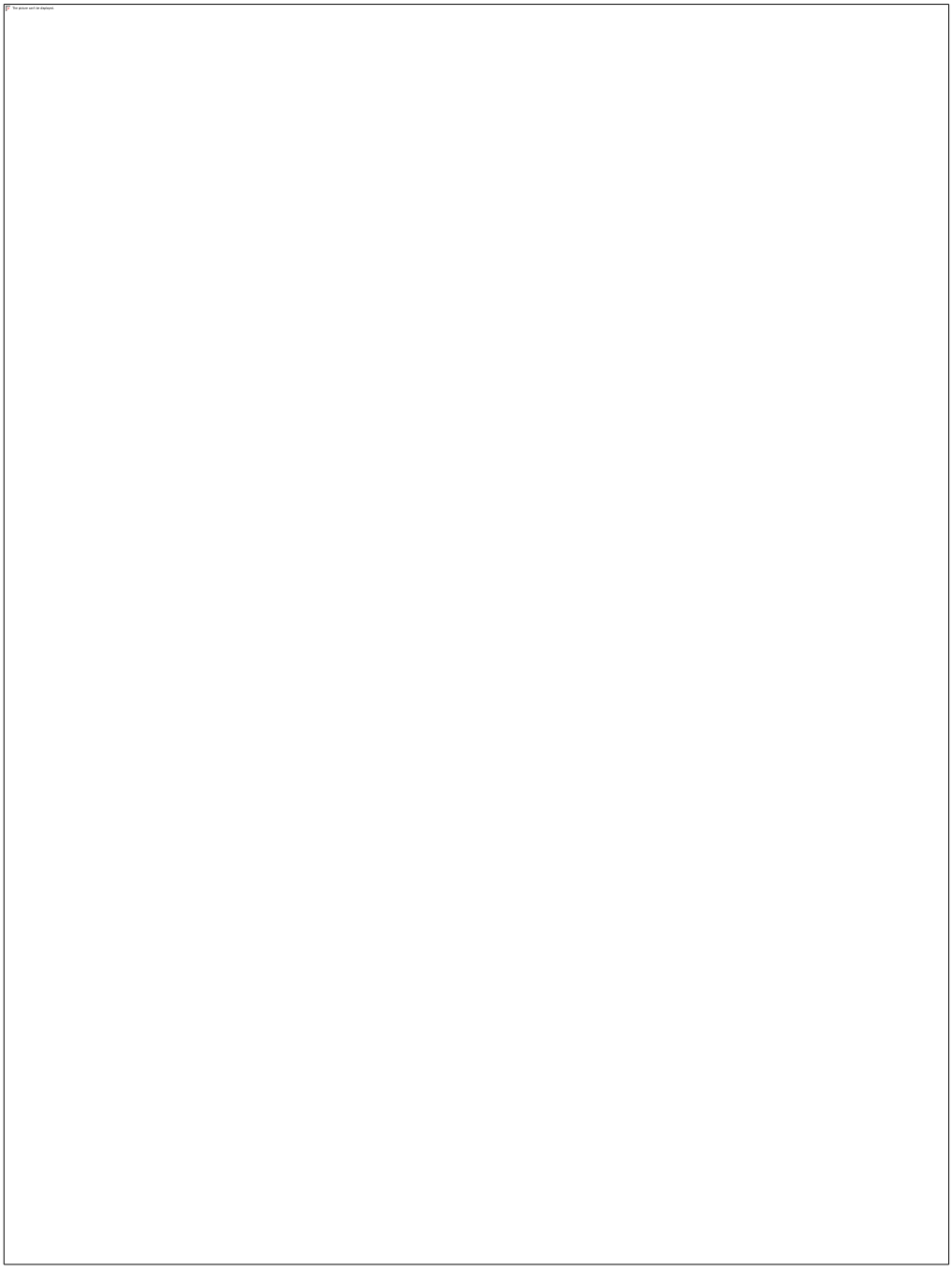




Lists of Cummunity during Discussion made at Assela University

2. 

Cummunity during Discussion made at Adama University

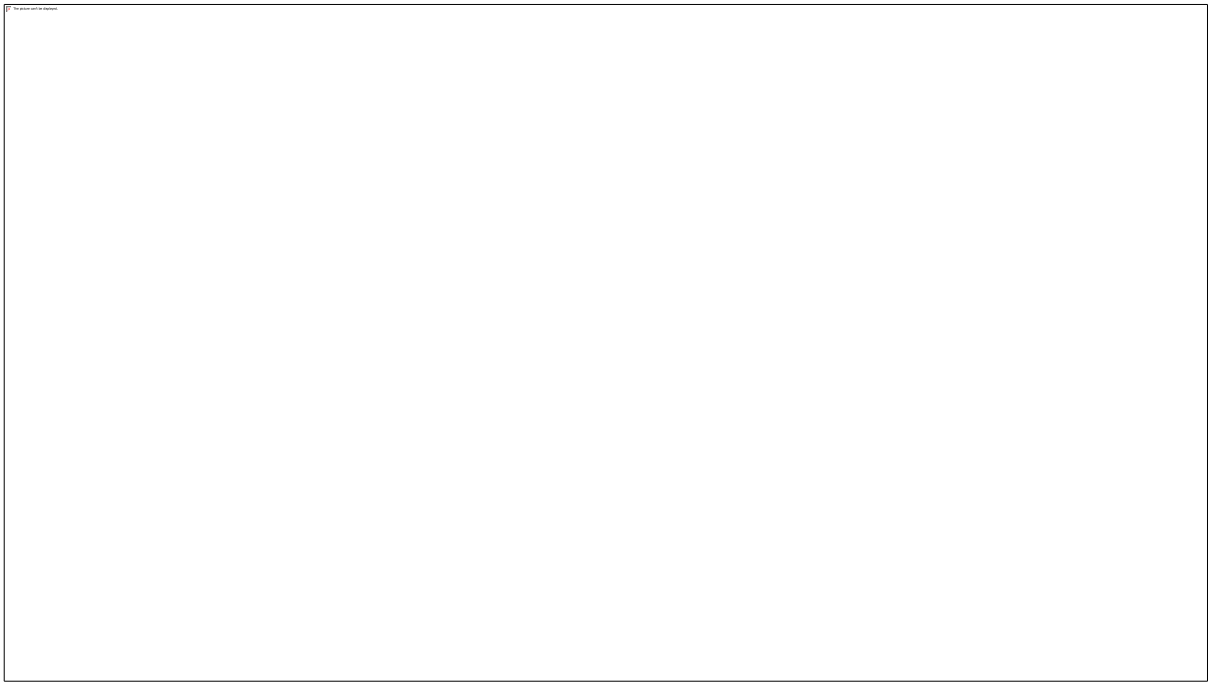
3. 

List of Community consulted during discussion made at Wonji Poly techniques

4. 

12.4 Some Field Level Consultaion Photos and the field team at different areas of Institutions

Focal Group Discussion at Axum Universities:



The team at Mekele Polytechnic:

The team discussing with Mekele Univesity's Department head of ICT:

The visiting team at Harar Poly Technic

Harar Polytechnic

The visiting Team at Assela University:

The Team at Dire dawa Univesity:

The team at Haromaya University:

12.5. Photo taken for some Univesities (Mekele, Axum and Adigrat)

Photo at Somali Regions Institutiosn