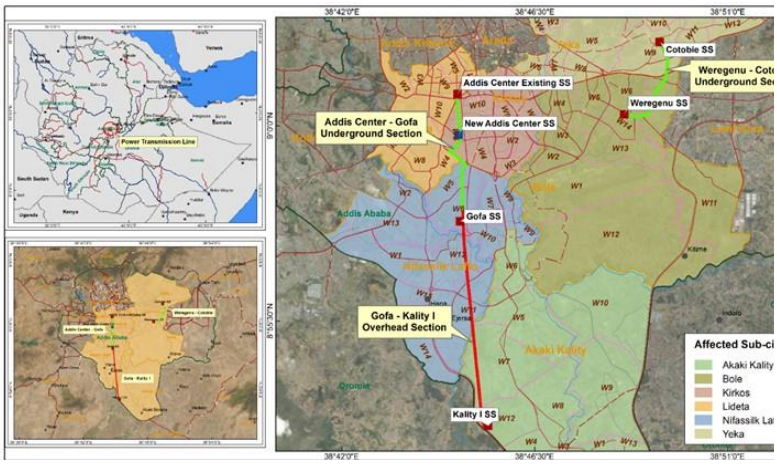
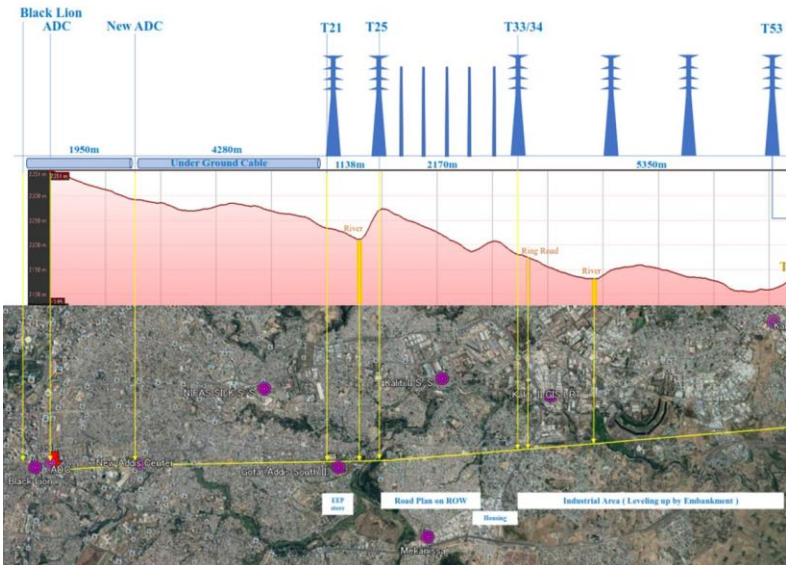
Federal Democratic Republic of Ethiopia
Ethiopian Electric Power

ADDIS ABABA POWER SUPPLY REINFORCEMENT PROJECT





Environmental & Social Impact Assessment

FINAL

Mid-Day International Consulting Engineers

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Abbreviations

AAC	Addis Ababa City
AACA	Addis Ababa City Administration
AACRA	Addis Ababa City Roads Authority
AADMP	Addis Ababa Distribution Master Plan
AAWSA	Addis Ababa Water and Sewerage Authority
ADC	Addis Center
ADN	Addis North
AIDS	Acquired Immune Deficiency Syndrome
AfDB	African Development Bank
ARCCH	Authority for Research and Conservation of Cultural Heritage
BLL	Black Lion
BPCDA	Beautification, Parks and Cemeteries Development and Administration
C-ESMP	Contractor Environmental and Social Management Plan
CFP	Chance Finds Procedure
CLO	Community Liaison Officer
CoC	Code of Conduct
CPF	Country Partnership Framework
CRGE	Climate Resilient Green Economy
CSA	Central Statistical Agency
dB	Decibels
E&S	Environmental and Social
EA	Environmental Assessment
EAPP	Eastern Africa Power Pool
EBA	Endemic Bird Areas
EEA	Ethiopian Energy Authority
EEP	Ethiopian Electric Power
EEPA	Ethiopia Environmental Protection Authority
EEU	Ethiopian Electric Utility
EHS	Environment, Health, and Safety
EHSQ	Environmental, Health, Safety and Quality
EI	Environmental Inspector
EIA	Environmental Impact Assessment
EMF	Electro Magnetic Field

ENREP	Electricity Network Reinforcement and Expansion Project
EP	Environmental Protection
EPA	Environmental Protection Authority
EPE	Environmental Policy of Ethiopia
ESA	Environmental and Social Assessment
ESAO	Environmental and Social Affairs Office
ESAP	Environmental and Social Assessment Procedures
ESCP	Environmental and Social Commitment Plan
ESF	Environmental and Social Framework
ESHS	Environment, Social, Health and Safety
ESHS-CA	Environmental, Social, Health and Safety Compliance Audit
ESI	Environmental and Social Inspector
ESIA	Environmental and Social Impact Assessment
ESIR	Environmental and Social Inspection Report
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESSs	Environmental and Social Standards
ETB	Ethiopian Birr
EWCA	Ethiopian Wildlife Conservation Authority
FCCC	Framework Convention on Climate Change
FDRE	Federal Democratic Republic of Ethiopia
FHH	Female Headed Household
FI	Financial Intermediaries
GBV	Gender Based Violence
GBD	Global Burden of Disease
GCF	Green Climate Fund
GFI	Ground Fault Interrupter
GHG	Green House Gas
GIIP	Good International Industry Practice
GoE	Government of Ethiopia
GRC	Grievance Redress Committee
GRM	Grievance Redress Mechanism
GRP	Grievance Redress Procedure
GRS	Grievance Redress Service
Ha	Hectare

HH	Household
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome
IBA	Important Bird Areas
JICA	Japan International Cooperation Agency
Km	Kilometer
KV	Kilo Volt
LILO	Line in Line Out
LMP	Labor Management Procedures
LRP	Livelihood Restoration Plan
m	Meter
masl	Meter Above Sea Level
MHH	Male Headed Households
MIS	Management Information System
MoARD	Ministry of Agriculture Rural Development
MoFEC	Ministry of Finance and Economic Cooperation
MoWE	Ministry of Water and Energy
MPA	Multiphase Programmatic Approach
MSE	Micro and Small Enterprise
MSIPs	Management Strategy and Implementation Plans
MV	Medium Voltage
MW	Mega Watt
MWIE	Ministry of Water, Irrigation and Electricity
NADC	New Addis Center
NDC	Nationally Determined Contribution
NEP	National Electrification Program
NGO	Non-Governmental Organization
OH	Overhead
OHS	Occupational Health and Safety
PCP	Pentachlorophenol
PAHs	Polynuclear Aromatic Hydrocarbons
PTL	Power Transmission Line
PRIME	Power Sector Reform Investment and Modernization
PA	Project affected
PAP	Project Affected People
PEA	Petroleum and Energy Authority

PIUs	Project Implementation Unit
PIZ	Project impact zone
PPE	Personal Protective Equipment
R&D	Research & Development
RAP	Resettlement Action Plan
RE	Resident Engineer
RF	Resettlement Framework
RoW	Right of Way
SC	Supervision Consultant
SDG	Sustainable Development Goals
SE	Supervising Engineer
SEP	Stakeholder Engagement Plan
SESMP	Site specific Environmental and Social Management Plan
SMP	Security Management Plan
SOPs	Security Operating Procedures
SDI	Socio Demographic Index
SOP	Standard Operating Procedures
SS	Substation
STD	Sexually Transmitted Disease
TL	Transmission Line
ToR	Terms of Reference
TVET	Technical and Vocational Education and Training
UEAP	Universal Electricity Access Program
UG	Underground
USD	United States Dollar
WB	World Bank
WBG	World Bank Group's
WER	Wereganu
WHO	World Health Organization

0. Executive Summary

0.1 Introduction and Background

The current project is part of the Addis Ababa Transmission and Distribution System Rehabilitation and Upgrading Project that covers Addis Ababa City Administration (AACA) and an approximate 50km radius area around the city, and it comprises four components that are described in the project description section. The main objective of the project is to rehabilitate and upgrade transmission and distribution system to supply stable power to grid of the city and to contribute to the improvement of industrial infrastructures and socioeconomic development.

This Project is aligned with Ethiopia's National Electrification Program (NEP 2.0), which envisions to achieve near-universal electrification by 2030 and the Ethiopian Electric Power's (EEP) Electricity Sector Development Strategy/Plan (2020/21 – 2030), which provides for priority investments in generation, transmission and interconnection as well as the distribution and network expansion over its 2020/21 – 2030 plan horizon.

The International Development Association (World Bank) has agreed to finance this initiatives that are essential for robust preparation and timely implementation of the Project activities.

The Addis Ababa Power Supply Reinforcement Project has been identified and committed for construction by EEP. The nature and magnitude of the impacts of the proposed project, as per the Ethiopian ESIA Guideline, WB's ESF and ESS1, it is classified as Schedule 1 and Substantial risk, respectively. Thus, the project requires an Environmental and Social Impact Assessment (ESIA).

The World Bank Environmental and Social Framework (ESF) that includes 10 Environmental and Social Standards (ESSs), out of which only ESS9 is not applicable for the proposed project. The Project is rated with overall substantial environmental and social (E&S) risk with the social risk substantial and environmental Substantial, as per ESS1 definition. The Project also applies the World Bank Group (WBG) General Environmental, Health and Safety (EHS) guidelines[1], as well as the Electric Power Transmission and Distribution (2007)[2].

Purpose of the ESIA Study

The consultancy service is required to prepare ESIA for Addis Ababa Power Supply Reinforcement Project. The main objectives of the consultancy for undertaking the ESIA include:

- To address all E&S risks and impacts that are likely to arise during the pre-construction, construction and closeout of works, operation, and decommissioning phases while taking into account national laws and regulations as well as the World Bank's Environmental and Social Framework (ESF), the relevant Environmental and Social Standards (ESSs) and gap analysis between Ethiopian laws and ESF to bridge the gap.
- Identify baseline data on the physical and biological environment, as well as the social, gender issues, cultural heritages including, if any, tangible and intangible cultural heritage sites, demographic, and economic characteristics of the population in and around the transmission line corridor and substation area.

[1] https://www.ifc.org/en/insights-reports/2000/general-environmental-health-and-safety-guidelines

[2] https://www.ifc.org/content/dam/ifc/doc/2000/2007-electric-transmission-distribution-ehs-guidelines-en.pdf

- Identified potential environmental and socio-economic risks and impacts associated with transmission lines and substation areas during pre-construction, construction and closeout of works, operation, and decommissioning phases and to make sure these impacts do not outweigh the expected project benefits.
- Conduct participatory consultation and engagements with different levels and groups of stakeholders.

This Executive Summary is aimed at the executive decision makers who require key information without the background and technical details.

Approach and Methodology:

The approach and methodology adopted for this ESIA follows the established pattern for infrastructure project including the Addis Ababa Power Supply Reinforcement Project and meets the requirements of Environmental Protection Authority (EPA's) guideline (EPA, 2000) and World Bank's (WB's) Environmental and Social Standards (ESSs).

Members of the ESIA Team carried out site investigations between October 14 – 22, 2024. During the field investigation, information on physical and ecological resources, socio-economic aspects, health, cultural and other values in the project area has been collected. Various quantitative and qualitative data collection and information gathering techniques were used in this assessment.

Field investigation included extensive community and Stakeholder consultation at various levels.

0.2 Project Location

The project crosses and influences 6 Sub-Cities and 14 Woredas in Addis Ababa City Administration. The Affected Sub-Cities and Woredas are listed in the table below.

Project Component	Affected Sub-City	Affected Woredas
Underground PTL Section: Black Lion – Gofa SS (5.64km)	Lideta	W4 & W7
	Kirkos	W5 & W7
	Nifas Silk Lafto	W5 & W6
Underground PTL Section: Weregenu – Kotebe (4.4km)	Bole	W6, W7 & W14
	Yeka	W9
Overhead PTL Section: Gofa – Kality I (9.26km long)	Nifas Silk Lafto	W6, W11 & W12
	Akaki Kality	W7 & W12

0.3 Project Description

The current project comprises four components. These include:

- Construction of a double circuit 132 kV overhead TL (9.26km long) between Gofa substation and Kaliti-1 substation;
- Construction of a double circuit 132 kV underground transmission cables (5.64km long) between Black Lion substation and Gofa substation;
- Construction of a double circuit 132 kV underground transmission cables (4.36km long) between Wereganu substation and Kotebe substation
- Construction of one new substation, namely New Addis Centre SS that will replace the existing Addis Centre SS, and upgrading of Kaliti-1, Black Lion, Weregenu and Gofa substations.

Tower Design: The 132kV Transmission line from Gofa substation to Kality-I is 9.26 km with 56 tower. Two (2) kinds of tower, namely, "Tubular Tower" and "Lattice Tower" will be applied in the following section to utilize the feature of each tower type. Land required for installing a typical Tower is 12.96m^2 (3.6m x 3.6m) and for tubular tower is 36m^2 (6m x 36m) for lattice tower.

Trench Excavation: Excavation a trench for the installation of conduits for the underground cables. Compared to the direct-buried-method, the conduit system requires additional cost initially but the system has many advantages as follows. The system protects the cables from unexpected damages caused by other construction works. Once the system is installed, the cables can be replaced without excavation work. And the system enables a flexible work schedule because it is not necessary to keep a trench until the cables are laid. An estimated 10.04 km of open trench will be excavated.

Tunneling: Underground system introduces a more reliable and resilient infrastructure to the network. Therefore, during major road crossings, tunnels using micro-tunneling will be adopted and not open trench excavation. It avoids traffic disruptions, noise, air pollution and most other utility impacts along the tunnel alignment. An estimated 1.17 km of an underground tunnel will be built.

Land Requirement: On the basis of the feasibility routing and engineering design (9.26km length and 26m width), the proposed TL Works would affect an estimated area of about 24.1ha of land found within the overhead TL corridor. Although temporarily land will be required during the construction of the underground transmission line, the Contractor will be required to accommodate the work within the road median strip. In addition, it will require 0.38ha of land for construction the NADC Substation.

The spatial boundary of the project is governed by the direct and indirect impacts areas of influence. The areas of influence considered are.

Direct Impacts Area of Influence for the Overhead Transmission Line and SS: The area likely affected by the direct impacts of the project include project activities or facilities that are directly owned, operated, and managed by the project owner (including by contractors engaged by the owner) during the life of the project. These include the transmission line right-of-way or corridor (which is 26 m wide and 9.26km long for the Overhead TL), the transmission tower foundation (which is 6 m by 6 m area within the corridor) and the temporary/ancillary construction facilities.

Direct Impacts Area of Influence for the Underground Cable Transmission Line: The area likely affected by the direct impacts of the project include project activities or facilities that are directly owned, operated, and managed by the project owner (including by contractors engaged by the owner) during the life of the project. These include 10.0km long underground TL and the size of the trench line including the space necessary for the installation work varies from 2 m to 4 m by width, the New Addis Centre Substation (which is 0.38ha plot of land), and the temporary/ancillary construction facilities.

Indirect Impacts Area of Influence: This is the area likely affected by the indirect project impacts on physical, biodiversity, or social environment. The indirect impacts area of influence includes areas close to the transmission line corridor and the substation which will be affected during project construction and operation. The indirect impacts area of influence includes the contiguous areas along the transmission line corridor where impacts on physical and biological environment is felt (typically, a corridor as wide as 5.0 km is considered, particularly to account for ecological and biodiversity impacts), the administrative areas where the project is located (i.e. Woredas 7 & 12 of Akaki Kality SC, 5 & 7 of Kirkos SC, 5, 6, 11 & 12 of Nifas Silk Lafto SC, 4 & 7 of Lideta, 6, 7 & 14 of Bole and 9 of Yeka).

0.4 Policy and Legal Framework

The Environmental Assessment guideline prepared by the Environmental Protection Authority (EPA) (EPA, 2002) requires development projects to avoid, minimize and reduce adverse impacts on the physical, biological and socio-economic environments.

The project activities were revised against the provisions of the relevant national legislation and the ESF of the World Bank.

The review to identify all substantive environmental, social, and health and safety factors, was conducted in accordance with the applicable national and lender requirements as follows:

- The Constitution of Federal Democratic Republic of Ethiopia (FDRE);
- Environmental Policy,1997, National Updated Energy Policy of Ethiopia, Water Resources Policies, Health Policy, National Biodiversity Policy 1998, Environmental and Social Impact Assessment Proclamation No. 299-2002, Environmental Pollution Control Proclamation No. 300-2002, Establishment of Environmental Protection Organs (Proclamation No. 295/2002), EIA Procedural Guideline, 2003, Proclamation on Solid Waste Management (No. 513/2007), Labour Proclamation 1156/2019, Regulations on Electricity Operations (No. 49/1999), and Directive on Overhead Electric Lines and Quality of supply (no. EEA/1/2005);
- National Legislation Governing Land Acquisition, Compensation and Resettlement;
- The World Bank's Group (WBG) Environmental and Social Framework (ESF) and Environmental, Health and Safety (EHS) guidelines including the General Environmental, Health and Safety (EHS) guidelines[3], as well as the Electric Power Transmission and Distribution (2007)[4]. However, neither ESS7 nor ESS9 are applicable to the project.
- In addition to national environmental and social legislations, Ethiopia is also a party to some regional and international conventions and protocols about the environment which are of relevance to the project. Therefore, these regional and international /multilateral agreements are reviewed and considered.

Therefore, in response to the requirements of the EPA and the WB, EEP has commissioned this ESIA as an integral part of the project design and construction and the findings of this assessment are presented in this report.

0.5 Description of the Baseline Environment

0.5.1 Physical Environment

Topography: The topography of the corridors of the proposed overhead and underground transmission lines are dominantly rolling with certain areas characterized by flat terrain. In addition, there are relatively small areas of hilly topography particularly along the Akaki River.

Rainfall: The average annual rainfall in Addis Ababa is 1,300 mm with over 70% of it occurring during the main rainy season (*Kiremit*) that extends from June to September. July and August receive the highest average rainfall of 320 mm and 269 mm respectively. In general, the period from November to January is the driest season.

[3] https://www.ifc.org/en/insights-reports/2000/general-environmental-health-and-safety-guidelines

[4] https://www.ifc.org/content/dam/ifc/doc/2000/2007-electric-transmission-distribution-ehs-guidelines-en.pdf

Temperature: Addis Ababa is characterized by a subtropical highland climate, with temperature differences of up to 10°C. Based on meteorological data for the year 2019 to 2024, the mean monthly maximum temperature in the city varies from 21.5ºC to 26.6ºC. The mean monthly minimum temperature ranges from 9ºC to 13ºC. The annual minimum and maximum temperatures are observed in the month of December and March respectively.

Drainage and Water Resources: The drainage system of the city is generally in the north to south direction being drained by numerous streams, among which Kebena, Little Akaki and Great Akaki rivers are the major ones. Of the streams crossed by the project transmission lines, Little Akaki is the largest river and is crossed by the Gofa – Kality-1 overhead TL twice. The streams draining through Addis Ababa are highly polluted mainly due to uncontrolled disposal of municipal sewage, industrial wastes and solid wastes into the water bodies. Most of the wastewater reaches the streams untreated, seriously polluting the water bodies.

Land Use and Land Cover: The predominant land use/land cover of the power transmission routes corridor is built up areas comprising residential and commercial areas as well as road infrastructure. Built-up areas comprise 79% of the 26m wide corridor of the overhead TL followed by crop lands (14%), grazing land (4.6%) and trees cover (2.5%).

Soils: Three major soil types including Vertisols, Nitisols and Luvisols are identified in Addis Ababa; the former is dominant covering 55.4% of the city. The corridor of over 89% of the overhead TL is characterized by Vertisols, while the corridor of both underground transmission routes is entirely covered by Eutric Nitosols.

Geology: According to the Geological Map of Ethiopia, the overhead TL traverses two types of geological formation, which are Nazret Series (62%) and Bishoftu Formation (38%). The geological formation of the underground transmission routes corridor is dominantly Nazret Series and the remaining is Alage Formation.

Air Quality: Air quality in Addis Ababa is considered to be poor, mainly due to the high levels of traffic and the use of old motor vehicles as well as the prevalence of old vehicles, substandard road infrastructure and inadequate road network.

Ambient Noise: Noise pollution is observed in most parts of Addis Ababa that comes from various sources including vehicular noise, noise from airport, amplified noise from religious institutions and night clubs. Churches, mosques and night clubs are releasing escalated level of noise even during the night (resting hours).

0.5.2 Biological Environment

Vegetation and Flora: The corridors of the project routes contain little natural vegetation cover since the areas have been completely transformed into urban settlement and agricultural lands. Only some remnant or secondary growth indigenous trees and shrubs are observed here and there within cultivated lands, rivers and streams banks, and within tree plantation areas, residential and commercial areas, compounds of religious and other institutions. Main indigenous trees observed in these areas include Flat-top acacia, East African cordia, Woodland croton, Cape fig, Birrbirra *(endemic*), Common olive, Forest long-pod albizia and Bitter leaf.

Wildlife Resources: Since the natural habitats of the project sites have severely degraded, they contain little habitats that could support wildlife except avifauna. As a result, the areas contain only a few wild animals that are adapted to dwell in modified habitats including burrows, a small area of mixed forest and river bank vegetation along the Akaki River, which are found in the corridor of the overhead TL. According to local informants 7 mammalian species occur in these habitats including Spotted hyenas, Common duiker, Common jackal, Vervet monkey, Abyssinian hare, Crested porcupine and Ethiopian Genet. These species

are very common in many parts of the country. As per the IUCN Red List, all the mammal species have *Least Concern* conservation status except one species for which data is deficient at present.

Avifauna: The project routes corridors contain a variety of bird species dominantly water-birds, song birds and seed-eaters. A total of 53 bird species were recorded during the current and previous field surveys. The birds in the area are not among the protection concern species of the country. All the bird species recorded from the study area have been evaluated for the IUCN Red List. Of these, only one (1) species, which Great Spotted Eagle, is classified as a *Vulnerable Species*. The remaining 52 bird species are categorized as *Least Concern* species.

Protected/reserved areas, National Parks and Sanctuaries: There are no designated or protected areas of ecological interest within the project influence area. The project corridor is also neither contiguous with, nor in close proximity with any of nationally, regionally (Ethiopian regions), and locally protected areas like National Parks, Wildlife Reserves, Controlled Hunting Areas or National Forest Priority Area. However, there is an IBA, namely Akaki-Aba Samuel IBA, located at about 2km southwest of the Kality-1 SS or end of the Gofa - Kality-1 overhead TL. This site is selected as IBA because of its importance in supporting wintering water birds, globally threatened species, and biome restricted species.

0.5.3 Socio-Economic Environment

The AACA is structured into 11 sub-cities and 116 Woreda administrations. The facilities included in the current project would affect 6 sub-cities (Akaki Kality, Nefas Silk Lafto, Kirkos, Bole, Lideta, & Yeka) and 14 Woredas of the sub-cities.

The key findings of the socio-economic survey conducted for the households potentially affected by the overhead transmission line are presented as follows:

Households, Population and Headship Pattern: There are a total of 581 persons living in the 121 Project-affected households that participated in the survey. The average household size is 4.8 persons per household. Out of total 121 project affected households, the majority (71.9%) are male headed and (28.1%) are female headed households (FHH).

Age Structure: The proportion of project affected household heads whose age is between 40 - 44 and 45-49 is relatively higher than other age groups with equal percentage of (18.3%), followed by household heads that belong to (35-39) age group constituting 15.7%. On the other hand, about 10.4% of the household heads are considered as old age citizen whose age is 65 years old and above.

Ethnic Affiliation: The ethnicity profile of the project affected households entails close to half (47.8%) of the household heads belong to the Amhara ethnic group. Amhara is followed by Oromo ethnic group constituting 32.2% of the total project affected households. Tigre, Silte and Gurage and other ethnic groups constituted the remaining 20%.

Religious Affiliation: With respect to religious affiliation, overwhelming majority (82.6%) of the household heads reported to affiliate with Orthodox Christianity, followed by Muslim (10.4%) and protestant religion (6.1%).

Educational Status: As far as the educational level of the project affected households is concerned, the majority (89.5%) of them have at least some form of formal education. Of the remaining, 7.0% of the household heads are only able to read and write while the rest 3.5% are illiterate or have no any formal education at all.

Employment and Occupation: According to the survey result, vast majority (89.3%) of the project affected household heads reported to have primary occupation while the remaining 7.4% and 3.3% of the household heads are retired and unemployed respectively. Salaried employment and petty trade/business is the dominant occupation of the household heads.

Land Ownership: Almost half (49.1%) of the project affected households reported that they do not have land ownership certificate but paying annual tax to local government, while 24.5% of them have also no legal document except the '97 *Ayer Karta'*. On the other hand, about 26.4% of the households whose residential houses are located within project corridor owned legal ownership certificate.

Vulnerable households: Based on information collected on project affected households, 45 (37.2%) household heads are categorized as vulnerable households mainly because of their age, headship status and a combination of the two vulnerability factors.

Properties within project corridor: Based on the route survey, 118 housing structures of which 106 are residential houses, a total length of 788-meter fence, 20 fruit trees, 182 trees of different species and 252m^2 of farmland belongs to 121 individual households and 21 different institutions are found within the overhead TL corridor.

Sites of Cultural and Archaeology Importance: During the survey, no visible and known archaeological evidence or other type of cultural heritage has been identified in and around the proposed project area. Therefore, the project will have no impact on archaeological and cultural heritage sites.

Although no know protected cultural, historical or archaeological sites were identified in and around the project Area, the ESF requires that the construction contract makes provision for work to be halted and the relevant authorities to be notified, in the event of accidental discovery of archaeological remains. The Contractor is expected to strictly adopt the chance find procedure presented in this report.

0.6 Project Alternatives

For the 132 kV transmission lines between New Addis Centre and Kaliti-1 Substations, three alternatives have been identified and compared in terms of their significance or preference with respect to consistency with city planning, impact on natural environment, impact on social environment and project cost.

For the 132 kV transmission lines between New Addis Center and Kality - 1 Substations, the following three alternatives have been identified:

- *Alternative 1: "No-Project" or "do-nothing*"
- *Alternative2.1:* A combination of Underground and Overhead Transmission Line
- *Alternative2.2:* Overhead Transmission Line for all Sections
- *Alternative2.3:* Underground transmission line is applied for all sections

Therefore, implementation of the proposed Alternative 2: Addis Ababa Power Supply Reinforcement Project by constructing a 132/33 kV line combination of 10.0km underground and 9.26km overhead transmission and construction of the new Addis Center SS and expansion of 3 existing SSs is preferable.

Implementation of the proposed Alternative 2.1 constructing a combination of Underground and Overhead Transmission Line is preferable. This is because alternative 2.1 is consistent with the city planning. No involuntary resettlement and land acquisition is expected for the UG Line. For the OH Line along the Gofa and Kality-1 substation section, the construction is done within the existing ROW. However, there are 106 HHs who have illegally settled within the existing ROW and these HHs need to be resettled from the OHTL ROW and this issue is common to all alternatives.

With the "no-project" alternative, the development objectives for the city of Addis Ababa will be compromised and slowed down.

Therefore, implementation of the proposed Addis Ababa Power Supply Reinforcement Project as presented in Chapter 2: Project Description Chapter is preferable to Alternatives 2.2 and 2.3 and "No-project" alternative.

0.7 Project Risks and Impacts

Like all other infrastructure development projects, notwithstanding the far-reaching social and economic benefits, admittedly, the project would have impacts on the biophysical and socio-economic environment that need to be accounted for and avoided or mitigated when and wherever feasible.

Therefore, the benefits as well as potential adverse impacts of the TL works on the physical, biological and socio-economic environment are identified and appropriate benefit enhancement and/or mitigation measures are recommended.

0.7.1 Beneficial Environmental & Social Impacts

Reliable energy supply and cost reduction: The main anticipated benefit of the Reinforcement of the transmission and distribution network in Addis Ababa and surrounds is improved and reliable energy supply and distribution to residents and businesses in the capital city and environs. It is expected to improve the coverage of reliable power supply, thereby stimulating the economy and social service delivery in the impact area. Reliable electric energy supply will also reduce the costs and inconvenience associated with using substitute forms of energy supply.

Employment opportunity for local people: Implementation of the project is expected to bring a positive impact on local economy through creation of employment opportunities for unskilled, semi-skilled and skilled labour that will be sourced within Addis Ababa including from the local communities.

Benefits of underground cables: Underground TLs have a number of benefits over overhead TLs including the potential to reduce outages, maintenance cost and transmission losses. They create less visual impacts and other E&S impacts. They emit no electric field, require a narrower band of land to install thereby minimizing the requirement for land acquisition, and they are less susceptible to the impacts of severe weather.

0.7.2 Adverse Environmental & Social Risks and Impacts

Main adverse E&S risks and impacts expected from the construction and operation of the proposed power transmission lines and their mitigation meaures are presented below.

Occupational health and safety risks

Construction of the proposed power lines will involve occupational health and safety risks to construction workers resulting from fatalities and injuries at construction sites including risks from electrocution of live power lines, falls, lifting objects, machinery, stepping on or striking against objects etc.

The risk rating of occupational hazard is *Substantial*. Therefore, implementation of the necessary mitigation measures is critical and can reduce the risk rating to *Low*, which is social impact with no or limited consequence.

Necessary mitigation measures include provision of appropriate personal protective equipment to all project workers; ensuring that safety procedures are followed at all workplaces; utilising visual safety warning signs; carrying out routine safety checks on construction sites, plant and facilities, etc.

Noise and vibration

The operation of plant and heavy duty equipment including micro-tunneling and construction traffic on site and to and from the site has the potential to generate noise and vibration impacts on the nearby residents and properties.

The bulk of the underground transmission line is open trench installation and backfilling. The trench excavation will also involve jack-hammering through hard strata which is significant source of noise and vibration. However, at selected road crossings the construction activities also include micro-tunneling.

The risk rating of noise and vibration impact is *Low* for the overhead TL, and *Moderate* for the underground cables. However, implementation of the necessary mitigation measures specified in this ESIA document will reduce the risk rating of noise and vibration impact to *Low*.

Necessary mitigation measures include use of modern mechanical plant, equipment and vehicles fitted with effective noise silencers/ mufflers and their regular maintenance to minimize noise levels; use of equipment and plants that will not produce heavy vibration; switching off equipment and vehicles when not in use; provision of ear protection equipment for workers in vicinity of noise emissions; and carrying out noisy construction activities in the vicinity of sensitive areas during normal working hours only.

Air pollution

During construction, there will be impacts on air quality resulting from dust emission caused by movements of vehicular traffic on unpaved roads and earth moving activities as well as exhaust emissions from construction vehicles and equipment. The risk rating of air quality impact is *Moderate*. However, implementation of the necessary mitigation measures specified in this ESIA report will reduce the risk rating to *Low*.

Necessary mitigation measures include implementing measures that will reduce dust emission including spraying water on unpaved access roads, exposed earth and any stockpiles on site; setting & enforcing speed limits for vehicular traffic operating on unpaved access roads; and regular maintenance of diesel powered equipment and vehicles to reduce exhaust emissions.

Water pollution

During construction there will be a risk of surface water and groundwater pollution due to inadequate handling and spillage of hazardous substances such as fuel, oils and paints, and discharge of effluents or wastewater. There will be water pollution risk due to increased sedimentation and turbidity of Akaki river and streams crossed by the subproject TLs caused by runoff water erosion of soil exposed due to excavation for foundation of tower base and burying electric cables. The risk rating of water pollution is classified as *Moderate*. However, implementation of the necessary mitigation measures presented in this ESIA report will reduce the risk rating to *Low*.

Water pollution risks will be minimized through undertaking re-fueling of equipment and vehicles at standard fuel stations or properly designated dispensing points of fuels and lubricants; proper storage and handling of hazardous substances to avoid water and soil pollution by accidental spillages; prohibition of washing of project vehicles and plant in or adjacent to any water sources etc.

Pollution from solid wastes

Large scale construction works like the Addis Ababa TL and substation works has the potential to produce considerable amount of construction wastes that would cause pollution of the environment including air, land, and water resources. The risk rating of

impacts from solid wastes is classified as *Moderate*. However, implementation of the mitigation measures specified in this ESIA will reduce the risk rating to *Low*.

Necessary mitigation measures include proper collection and dumping of excavation materials only in approved disposal sites or proper stockpiling and re-using it for rehabilitation works; prohibition of littering and establishing routine clean-up at project sites; training of project staff in effective waste handling and management procedures; etc.

Impacts on soils

The project construction works have the potential to cause damages to soil structure and expose the soil to runoff water erosion. Excavation of trench for installation of the underground transmission lines will cause more significant impact on soil. In addition, project construction activities will cause soil compaction by heavy duty equipment & vehicles, and soil contamination from spillages of fuel and other hazardous substances. The risk of impact on soils is rated as *Moderate*. However, implementation of the necessary mitigation measures will reduce the risk rating to *Low*.

Impacts on soils will be minimized through carrying out land clearing and excavation works in the dry season only; careful removal and proper stockpiling of the topsoil from the underground transmission routes, tower base, and access routes, and re-using it for site restoration when construction works are ended; keeping vehicles on defined access tracks to avoid soil compaction and impairment of its use for agriculture.

Impacts on landscape

During construction, removal of existing trees along certain sections of the underground transmission routes and excavation works for laying sub-surface cables have a negative impact on local landscape. The risk rating of impacts on landscape is classified as *Substantial*. However, implementation of necessary mitigation measures will reduce the risk rating to *Low*.

Impacts on landscape will be reduced or mitigated through removal of all excess or leftover construction materials and wastes from the site and transporting to places where the materials can be used for another project or disposed of properly rehabilitation and reinstatement of excavated areas and temporary access roads upon completion of the works; and re-vegetation of all cleared surfaces and exposed areas to its original state at all worksites after completion of work.

Impacts on road traffic and safety

The proposed underground transmission lines largely run along the median of main roads, which are mostly busy with high volume of vehicular traffic. The project construction activities including excavation of trenches using plant and equipment, earthmoving works, heavy machineries and vehicles for the transport of materials to site and their handling or storage on site during installation of electric cables are likely to cause obstruction or disruption to normal traffic flows. It is also likely to aggravate the existing traffic jam/congestion problem on the roads. The risk rating of impact on road traffic and safety is *Substantial*. Therefore, implementation of necessary mitigation measures is critical and can reduce the risk rating to *Low*.

Necessary mitigation measures include implementation of appropriate traffic management plan; posting proper and clearly visible signs, barricades, reflectors at appropriate locations; delineation or fencing of work zone; setting and enforcing speed limits for vehicular traffic around project operational area; arrangement of alternative routes for normal traffic; reinstatement of the damaged sections of roads as soon as the construction works have been completed; and applying pipe jacking technique or micro-tunneling to install underground cables without damaging major roads and causing disruption to normal traffic flows.

Community health & safety hazards

Potential sources of community health and safety hazards include risks from electrocution of live power lines, exposure to electro-magnetic fields, and safety risks from operation of project equipment and vehicles including traffic accidents. There could also be potential risks from open foundation of towers and trenches of underground cables. The risk rating of this impact is *Substantial*. However, implementation of necessary mitigation measures will reduce the risk rating to *Low*.

Necessary mitigation measures include prohibition of access of un-authorized persons to the construction sites; fencing of excavation sites to prevent accidents to local residents, animals and vehicular traffic; provision of training for project workers so that they take precaution in operation of equipment and vehicles and avoid infringement into sensitive areas (settlement areas, business centers etc.); and provision of awareness training for local communities about the risks related to the project activities and the safety measures they shall take.

Impacts on vegetation and flora

Impacts on vegetation will be mainly related to the need to remove tall trees from the clearance zone, which is a minimum distance of 13m from the overhead TL. In addition, excavation for laying underground cables will require removal of the trees planted along the proposed BLL – NADC – Gofa and Weregenu – Kotebe transmission routes. The latter activity is expected to affect a total of about 610 ornamental trees (68% small, 28% medium & 4% large) that have been planted for city beautification.

The risk rating of impacts on flora due to the reinforcement of the overhead TL is classified as *Low*, while the impact due to the construction of the proposed underground TLs is classified as *Moderate.* However, implementation of necessary mitigation measures will reduce the risk rating to *Low*, which is environmental impact with no or limited consequence and less likely to occur.

Impacts on vegetation/flora will be minimized or mitigated by following the route of the existing overhead TL, taking precautions during stringing of cables and through tower design and implementing tree replanting elsewhere to compensate for the trees lost during construction of the underground lines.

Impacts on wildlife resources

During construction of the overhead TL, project activities are likely to cause some disturbances to terrestrial and water birds and a few mammals, as well as the habitats that support the faunal species. The risk rating of this impact is *Low*, and implementation of necessary mitigation measures will reduce the risk rating to *Negligible*.

Impacts on wildlife and their habitats will be minimized through taking precaution during construction of the overhead TL sections that traverse important wildlife habitats, and avoidance of locating access roads through those habitats; posting appropriate signs and applying speed limits for access road sections passing in the vicinity of important wildlife areas; and providing on-job “awareness creation” training so that the construction workers refrain from adversely affecting the birds and wild animals occurring in the area.

Risk to birds and bats

Construction of the overhead TL will potentially impact on birds and bats by causing bird mortality through collision with power lines and through electrocution, as well as due to habitat disturbance and displacement of birds. The risk rating of impacts on birds and their habitats is classified as *Moderate*, and implementation of the proposed mitigation measures will reduce the risk rating to *Low.*

Necessary mitigation measures include use of insulated conductors to avoid the risk of electrocution; use of supports with safe cross-arm configurations that minimize electrocution risk; addition of different types of line markers or bird flight diverters that can reduce collisions between birds and power lines; etc.

Involuntary resettlement of residents

According to the inventory conducted along the overhead TL corridor a total of 106 residential houses that belong to the same number of households (106) are found within the 26m corridor. 86% of the houses are made of wood plastered with mud wall and with corrugated iron sheet (CIS) roofing. In order to avoid the risks from electrocution of live power lines and exposure to electro-magnetic fields, the households living within the 26m corridor need to be relocated to safe places. Unlike the OHTL, installation of the underground TLs will not involve any resettlement of people as there are no residents within the direct impact zone of the TLs. The risk rating of resettlement of residents is classified as *Substantial*. However, implementation of the proposed mitigation measures will reduce the risk rating to *Low/ moderate.*

Necessary mitigation measures include carrying out a detailed inventory of potentially affected properties and their valuation, and paying sufficient cash compensation for the affected households. This mitigation measure would be realized through preparation and implementation of a Resettlement Action Plan (RAP).

Impact on farmlands

Land taking for foundation of 8 towers of the Gofa – Kality-1 overhead transmission line is estimated to cause permanent loss of 288m^2 of farmland. The croplands are mainly used to grow cereal crops dominantly wheat and teff through rain-fed cultivation. In addition, temporary loss of farmlands is expected due to use of certain area of land for access roads and storage of materials and operation of equipment and vehicles during construction. The risk rating of impact on farmlands is classified as *Low*. Implementation of the mitigation measures indicated below will reduce the risk rating to *Negligible*.

Impact on farmlands will be mitigated through payment of cash compensation for the affected households according to applicable government law and regulations and restoration of temporarily affected areas to productive state by removing any pavement materials, ripping compacted soils and spreading topsoil over the surfaces.

Impact on Trees

A total of 189 trees of 11 different species that belong to 21 households and 6 institutions are located within the 26m corridor of the OHTL and these are potentially affected. About 61% of the trees are eucalyptus (39%) and Grevillia (22%) trees and others include Acacia, Cypress, Shewshewe, Cordia, Croton and fruit trees (Avocado & Kazimir). In addition, construction of the underground TLs is expected to affect about 610 ornamental trees that have been planted in the road median for city beautification.

Impact on Privately Owned Business Establishments

Based on inventory taken during the field survey, the proposed transmission line would also affect privately owned business establishments. Based on the route survey, buildings belonging to 11 different business establishments are located within the project corridor.

Temporary disturbance of petty business activities

There are some petty trade activities mainly selling of vegetables that are practiced on roadsides at two places along the NADC–Gofa UG TL. These activities are likely to be temporarily affected during construction of the TL due to lack of space, dust and noise disturbance and safety risks. It is proposed to mitigate the impacts through arrangement of

alternative work places for the traders or payment of cash compensation to traders for loss of income benefits during the construction period.

Impacts on road infrastructure and community access

Installation of the underground power lines is expected to cause significant damages to a number of main roads as well as community access roads due to cutting of the roads for burying electric cables. It is likely to entail damages to 14 major road intersections (cross-roads) and 6 major junctions, as well as 37 other road intersections and junctions. The risk rating of impacts on road infrastructure is *Substantial*. However, implementation of necessary mitigation measures will reduce the risk rating to *Low*.

The impacts on road infrastructure will be mitigated through restoration of the damaged sections of the roads on timely basis (using phased approach) and applying pipe jacking/drilling technique to install the envisaged electric cables without damaging major roads, squares, and utilities.

Impacts on public utilities

There are abundant public utility lines including water supply pipelines, sewer lines, telecommunication lines and electric distribution lines in the corridor of the underground and overhead transmission lines. Several of these are potentially affected during construction of the transmission lines particularly the underground cables as they intersect the electric lines at many places. The risk rating of impacts on public utilities is *Substantial*. However, implementation of the proposed mitigation measures will reduce the risk rating to *Low*.

Impacts on public utilities will be avoided or minimized by avoiding the location or route of major utility lines during detail design of the electric lines; relocation of the potentially affected utility lines prior to commencement of construction works; and at locations where primary water lines or sewer lines intersect with the underground TLs, adopting pipe jacking/drilling technique to install the envisaged electric cables without causing damages to the water or sewer lines.

Impacts on Vulnerable Groups

In the assessment of vulnerable households, we have identified 45 vulnerable household heads and therefore they require special assistance during project implementation from EEP through inclusion in RAP preparation and implementation. These include 12 elderly male headed households, 3 elderly female headed households and 30 female headed households. However, information about vulnerable PAPs will be collected and updated during census survey for the RAP.

In the interest of protecting lives and livelihoods of this group, in addition to compensation payment, vulnerable PAPs shall receive special assistance.

0.8 Public Consultation

Several consultation meetings were held from October 14 - 22, 2024 and 16 May 2025, in project affected sub-cities and woredas with the concerned officials, stakeholders and members of the project affected community. These public consultations were carried out with the objective of informing the stakeholders on the potential impacts and seek the participation and contribution of the public and other stakeholders during the construction of the proposed transmission line and substation project.

A total of 10 different public and stakeholder consultation meetings were conducted, of which 6 of the consultation meetings were conducted with local authorities (Addis Ababa City, Sub city and Woreda administration), while 4 consultation meetings with affected community members, of which 2 of the meetings were focused on women groups. Concerning participants' numbers, about 98 people were consulted, of which 32 were

local officials at Addis Ababa City and Sub city and Woreda administration levels. About 66 community members, of which 26 were women participants.

The study team provided adequate information to the participants about the nature, components and the transmission routes at the beginning of each consultation session. The participants voiced their fears, concerns and uncertainties associated with implementation of the proposed transmission line and substation project in the localities. They have identified several key issues that EEP needs to take into consideration seriously in the course of implementation of the TL works. Critical issues of discussion were related to resettlement, land acquisition/expropriation, property registration and administration of compensation payment, infrastructure, and social service facilities. The ESIA team memebrs responded to the questions raised from consultation participants.

They were also given the opportunity to propose some measures to avoid or mitigate negative impacts and enhance the potential beneficial impacts.

Accordingly, they identified the following impacts and proposed mitigation/compensation measures:

- Strongly proposed to the government and EEP to arrange land replacement or residential house for project impact on residential house.
- The participants explained that they do not want to live within the project corridor and want to relocate in other places if government provide them replacement land.
- Recommended adequate compensation for project impact on farmland.
- For people earning their livelihood from petty trade and renting houses, alternative sources of livelihood shall be created at the new settlement area or at reasonable distance from where they live.
- Plead the government and responsible bodies not to abandon them without compensation payment.
- Since the PAPS had not been cautioned by EEP or local government while constructing their residential house within project RoW, therefore, they considered it as it was not only their fault and EEP as well as local the government were equally responsible.
- EEP can use plastic covered live wire technology to avoid accidents so that relocation may be avoidable.
- How EEP does compensates people engaged in urban agriculture like honey production and affected by the project?
- The project shall consider the Proclamation on Expropriation of Landholding (Amendment Proclamation No.1336/2024).
- The project shall work in coordination with water, telecommunication, road and different stakeholders.
- Priority of employment opportunity for local people during the project construction phase.
- Ensuring health and safety of the public by placing strict safety measures especially during construction phase of the project.
- The project owner shall award the contract to a company that can deliver the project with high standards, quality and in a short period of time. In addition, the organization shall impose strict penalties for failing to deliver in specific standard and time frame outlined on the contract.

ESIA Report Disclosure and Clearance

As the project developer, EEP is responsible for providing correct and up-to-date information on this ESIA to all stakeholders. The ESIA/ESMP report shall be disclosed on EEP's website. The final version will be disclosed on EEP's[5] and WB's external website[6] as part of the public disclosure process.

The ESIA report will be reviewed and cleared by the WB. The ESIA document will then be sent to EPA for review and clearance.

0.9 Environmental and Social Management Plan

Environmental and Social Management Plan (ESMP) is necessary to avoid, minimize or offset adverse impacts of the works, and enhance positive and beneficial impacts during their implementation.

ESMP is used to ensure that E&S risks and adverse impacts identified are mitigated during the different phases of the project and to maximize positive impacts. The selected contractor's obligation is to elaborate and operationalize a Construction ESMP (C-ESMP) and comply with it throughout the contract period. The ESIA/ESMP related responsibilities of the contractor will be reflected in the bidding document and the contract.

The implementation responsibility of the ESMP will be for EEP and EEP's representatives. Construction contractor will be responsible for preparing and implementing the C-ESMP, while the ultimate responsibility to ensure compliance with the ESMP lies with EEP.

Addis Ababa City Government Environmental Protection Authority will be responsible for ensuring that the ESIA/ESMP is properly and effectively implemented during all phases of the project. Addis Ababa City Land Development and Administration Bureau and Sub City line offices will take the lead role in the implementation of land acquisition and compensation activities in their respective Woredas.

0.10 Environmental and Social Monitoring Plan

Continuous monitoring and strive for continuous improvement are essential components of project implementation. They facilitate and ensure the follow-up of the implementation of the proposed mitigation measures and help to anticipate possible environmental hazards and/or social issues and/or detect unpredicted or unforeseen impacts over time.

During the preconstruction phase, monitoring will largely be concerned with checking that the appropriate measures have been incorporated in designs and contract documents. This will be the responsibility of the design consultant's Team Leader assisted by his E&S team members.

During the actual construction period, day-to-day monitoring will be the responsibility of the Engineer's construction supervision staff, with support from the E&S Specialist attached to the construction supervision team.

Monitoring during the operational phase of the project will be limited to checks relating to the need for normal and special maintenance works, and it is expected that these will be the responsibility of EEP as the organisation responsible for operation and maintenance of the type of works.

[5] https://www.eep.com.et/

[6] WB website: https://projects.worldbank.org/en/projects-operations/project-detail/P176731 under "Documents"

The contractors and supervising firms will need to provide monthly monitoring reports on ESHS performance to EEP according to metrics specified in the respective documents and contracts. The quarterly ESHS reports shall be disclosed to EPA, Addis Ababa city Government Environmental Protection Authority and to different stakeholders.

0.11 Grievance Redress Mechanism

Proclamation No. 1161/2019 and WB's ESF (ESS 10) require the establishment of a grievance redress mechanism (GRM) to receive and facilitate resolution of affected communities' concerns and grievances about the project's E&S performance or any other issue affecting them, pertinent to the project.

The GRM shall seek to resolve concerns promptly, using an understandable and transparent consultative process, and at no cost and allowing also anonymous feedback. The mechanism shall not impede access to judicial or administrative remedies.

Grievance Management Approach

For minor grievances between PAPs, or between PAPs on the one hand and other community members on the other, EEP will refer the matter to relevant community elders for resolution. If the grievances are deemed Substantial, then EEP in partnership with the Sub City Resettlement Committee (WRC), will facilitate a mediation or negotiation between the parties.

Where a grievance relates to EEP's management of the E&S performance or RAP/LRP process, community-based resolution is not appropriate. Grievances relating to these will be dealt with in accordance with the GRM.

Grievance Redress Committee (GRC) will be established, consisting of representatives from PAPs, EEP representative, representative from affected Sub City Administration and elders or influential personalities other than the aggrieved persons.

The GRM shall be adequately disseminated among affected communities in the course of the stakeholder engagement process and its access shall be adapted to the social and cultural context.

EEP shall regularly prepare Subproject construction monitoring reports on the Subproject environmental and social performance, including consultation activities and grievance management as part of its quarterly reports to the World Bank, as required in the Environmental and Social Commitment Plan (ESCP). It is necessary that these reports shall be disclosed to EPA, Addis Ababa city Goveernment Environmental Protection Authority and to different stakeholders including communities with adapted methods.In addition, a Stakeholder Engagemnt Plan (SEP) is prepared and the plan includes a mechanism by which people can raise concerns, provide feedback, or make complaints about subproject activities financed by the PRIME-1 funding. Therefore, the SEP is applicable for this subproject.

0.12 Capacity Building and Training

Training and capacity building of relevant organizations

The training programme is to strengthen EEP Environmental and Social Affairs Office (ESAO's) capability in the area of E&S impact/risk management and monitoring. This shall include short term specialized trainings and additional and specialized training related to high voltage transmission line project.

In an effort to strengthen institutional capacity and environmental awareness, seminar/workshop to be organized under this project shall also be open for individuals from

concerned ministries and agencies such as Federal EPA, Addis Ababa City Government Environmental Protection Authority, and Woreda level Environment department, etc.

The objectives of the seminar-workshop are to ensure environmental awareness, knowledge and skill for the implementation and monitoring of this ESIA.

Training and Capacity Building for Construction Workers

The Contractor is responsible for informing employees and subcontractors of their ESHS obligations, and for ensuring that employees are adequately experienced and properly trained to conduct the works in a manner to minimize negative ESHS impacts.

Upon arrival on site, all new employees, including the project administrators, security personnel and subcontract personnel shall be given ESMP and ESHS induction training, carried out by ESHS Manager or his representative.

Therefore, the Contractor shall:

- Ensure employees are familiar with the ESHS requirements of the project;
- Develop and provide employees job safety training specific to their jobs;
- Ensure continuous development of its human resource through training and awareness;
- Develop and implement a mechanism for a continuous assessment of competence of the workforce; and
- Maintain all training records by the ESHS Office and produce respective reports on request.

0.13 Environmental and Social Mitigation, Management and Monitoring Costs

The total environmental and social mitigation, management, monitoring and training costs are summarized and amounts to some 139.17 million Birr (1.27 M USD) (For the cost comparison an exchange rate of 115.0 birr equivalent to 1 US$ was used). This amount will be allocated to cover implementation of the environmental and social mitigation, management, monitoring activities. Of this amount, the total compensation cost for loss of privately-owned farmland and other properties is Birr 103.74 million..

It shall be noted that no substantial increase in construction costs is expected in connection with requiring the Contractor for compliance with environmental and social wellbeing protection clauses, since these merely require the Contractor to behave in a responsible manner in relation to the environment and in accordance with good construction practice.

Costs associated with several environmental mitigation and management plans shall be an integral part of the construction contract (to be incorporated in unit rates and bill items), and no separate budget is necessary to cover these aspects. The cost estimate has made adequate provisions for contingencies, and it has to be considered as a component of the financial requirement of the project.

0.14 Conclusions

The Addis Ababa Power Supply Reinforcement Project is technically feasible and economically attractive. If the benefit enhancement and mitigation measures described in this ESIA report are adopted, there are no E&S grounds for not proceeding with implementation of the project in the form in which it is presently envisaged. Such a worthwhile scheme, which will bring net benefits to the nation in general and the City communities in particular shall be implemented at the earliest possible date.

However, it is recommended for EEP to implement the following:

1) *Resettlement Action Plan:* Results of the property surveys along the TL route revealed that privately owned farmland will be affected by the project. Therefore, a Resettlement Action Plan (RAP) and Livelihood Restoration Plan (LRP) shall be prepared and implemented to mitigate the land acquisition impact of the project as per the requirements of GoE's land expropriation laws and WB's ESS5 on Land Acquisition, Restrictions on Land Use and Voluntary Resettlement. Therefore, EEP who is the implementing Authority must prepare a RAP and LRP once the project is committed for construction.
2) *Project designs, specifications, and contract documents:* The project designs and specifications shall incorporate appropriate measures to minimise negative impacts and to enhance beneficial impacts.

   The appropriate ESHS clauses shall be included in the bidding and contract documents to allow control of actions by the contractor, which are potentially damaging to the environment, the community and construction workers.
3) *Maintain Ongoing Stakeholder Engagement:* Maintaining ongoing and transparent discussions and consultations both with members of affected communities and their administrations is in the best interest of the TL works. Such platforms shall be used to disclose information about the project, to create shared understanding and trust between parties involved in the process.

1. Introduction

1.1 Background to the Project

With an estimated population of over 115 million in 2020, Ethiopia is the second most populous country in Africa. Forecasts of population growth predict a doubling of the population before the year 2050. The country has one of the lowest levels of annual energy consumption per capital in the world and majority of the population survives in conditions of relative poverty and energy insecurity.

Ethiopia also faces the third highest energy access deficit in Sub-Saharan Africa with an electricity access rate of 51% in 2020. Over 56 million people in Ethiopia lack electricity access, posing a binding constraint to social development and economic growth. About 93% of urban houses are connected to the grid (99.9% in Addis Ababa), while only 40% of rural households have access to electricity services – mainly through standalone solutions. More than half of those connected to the grid are not formally registered as consumers with the utility. Per capita electricity consumption in Ethiopia is 69 kWh compared to world average of about 3,131 kWh.

The National Electrification Program (NEP) was launched in 2017 and presented an investment roadmap and action plan for achieving universal electricity access by 2025 through grid and off-grid solutions, and 96% on-grid access by 2030. The NEP was designed to have a focus on fast-paced grid connections roll out, off-grid access program with strong private sector participation, and explicit cross-sectoral linkages with the productive and social service sectors. The updated version of the NEP (NEP 2.0) was launched in 2019 and presented a full-fledged integrated approach to electrification, building on best practices and incorporating off-grid solutions to complement grid electrification.

The proposed Power Sector Reform Investment and Modernization (PRIME) program is consistent with Ethiopia's Country Partnership Framework (CPF) 2018-2022 with the World Bank and supports the World Bank's mission to end extreme poverty and boost prosperity on a livable planet. The program will leverage resources from Green Climate Fund (GCF) to support Government of Ethiopia's (GoE) endeavour to scale renewable-based electricity service, consistent with the Climate Resilient Green Economy (CRGE) and the Nationally Determined Contribution (NDC) for Ethiopia.

According to the Addis Ababa Distribution Master Plan (AADMP) prepared by the African Development Bank (AfDB) in 2015, the power demand in Addis Ababa Capital Region is expected to continuously increase from 800MW in 2014 to 3,600MW in 2034. However, the utilization ratio of distribution transformers and most of the medium voltage distribution network is beyond 100 % of the rated capacity. Moreover, the capacity of power network including the substations has already reached the breaking point.

Accordingly:

1) Approximately 19% loss in distribution system occurs due to lack of capacity and equipment deterioration;
2) Capacity of transformers and distribution line is getting overloaded because of the rapid increase in demand; and
3) Degradation due to aging of equipment, are causing problems of frequent power outage and voltage drop in the distribution network. For example, in Addis Ababa, a frequency of power outage was more than 20,000 times and total duration was more than 20,000 hours during the year of 2017.

JICA has carried out a feasibility study for Addis Ababa Transmission and Distribution System Rehabilitation and Upgrading Project (2018) and to carry out the necessary study to evaluate the implementation of the Project as an ODA loan project which includes a study

on the necessity of the Project, outline, preliminary design, project cost, implementation schedule, procurement and construction method, organization structure for the Project, operation and maintenance organization, environmental and social consideration, etc.

The plan to upgrade the transmission and substations and rehabilitate the distribution network, is aligned with AADMP and Ethiopia's NEP, which envisions to achieve near-universal electrification by 2030 and the Ethiopian Electric Power's (EEP) Electricity Sector Development Strategy/Plan (2020/21 – 2030), which provides for priority investments in generation, transmission and interconnection as well as the distribution and network expansion over its 2020/21 – 2030 plan horizon.

The nature and magnitude of the impacts of the proposed project, as per the Ethiopian ESIA Guideline, WB's ESF and ESS1, it is classified as Schedule 1 and Substantial risk, respectively. Thus, the project requires an Environmental and Social Impact Assessment (ESIA). The World Bank Environmental and Social Framework (ESF) that includes 10 Environmental and Social Standards (ESSs), out of which only ESS9 is not relevant to the Project. The Project is rated with overall High environmental and social (E&S) risk with the social risk High and environmental Substantial, as per ESS1 definition. The Project also applies the World Bank Group (WBG) General Environmental, Health and Safety (EHS) guidelines[7], as well as the Electric Power Transmission and Distribution (2007)[8].

A separate ESIA was prepared by JICA in October 2018, as part of the feasibility study. However, Mid-Day International (MDI) Consulting Engineers of Ethiopia was charged with the responsibility to update this ESIA.

Therefore, updated ESIA was prepared in line with the WB's ESSs requirements and to assess the existing and anticipated impacts during the construction and operation phases of the project. The JICA report was reviewed and used as a reference material during the updating of the ESIA.

1.2 Objectives and Scope of the ESIA Study

The main objectives and scope of the consultancy for the ESIA include:

- To address all E&S issues that are likely to arise during the pre-construction, construction and closeout of works, operation, and decommissioning phases while taking into account national laws and regulations as well as the World Bank's Environmental and Social Framework (ESF), the relevant Environmental and Social Standards (ESSs) and gap analysis between Ethiopian laws and ESF to close the gap.
- Identify baseline data on the physical and biological environment, as well as the social, gender issues, cultural including if there are any Archaeological Sites (AS), demographic, and economic characteristics of the population in and around the transmission line corridor and substation area.
- Identified potential environmental and socio-economic impacts associated with transmission lines and substation areas during pre-construction, construction and closeout of works, operation, and decommissioning phases and to make sure these impacts do not outweigh the expected positive environmental benefits.
- Conduct participatory consultation and engagements with different level of stakeholders.

[7] https://www.ifc.org/en/insights-reports/2000/general-environmental-health-and-safety-guidelines

[8] https://www.ifc.org/content/dam/ifc/doc/2000/2007-electric-transmission-distribution-ehs-guidelines-en.pdf

1.3 Approach and Methodology

The approach and methodology adopted for this ESIA follows the established pattern for infrastructure project including high voltage transmission line Addis Ababa Power Supply Reinforcement Project meet the requirements of EPA's guideline (EPA, 2000) and WB's Environmental and Social Framework (ESF).

The following section provides the details of the approach and methodology adopted for the ESIA of the proposed power transmission and substation works.

Definition of the Study Area: In consideration of the nature and the location of the potential future conditions and consequences, the Study Area has been identified.

Area of influence of the environmental and social impact assessment considers both the spatial and temporal boundaries of the project direct and indirect impacts. IFC Performance Standard 1 states that where the project involves specifically identified physical elements, aspects, and facilities that are likely to generate impacts, environmental and social risks and impacts will be identified in the context of the project's area of influence.

The spatial boundary of the project is governed by the direct and indirect impacts areas of influence. The areas of influence are.

Direct Impacts Area of Influence for the Overhead Transmission Line and SS: The area likely affected by the direct impacts of the project include project activities or facilities that are directly owned, operated, and managed by the project owner (including by contractors engaged by the owner) during the life of the project. These include the transmission line right-of-way or corridor (which is 26 m wide and 9.26km long for the Overhead TL), the transmission tower foundation (which is 6 m by 6 m area within the corridor) and the temporary/ancillary construction facilities.

Direct Impacts Area of Influence for the Underground Cable Transmission Line: The area likely affected by the direct impacts of the project include project activities or facilities that are directly owned, operated, and managed by the project owner (including by contractors engaged by the owner) during the life of the project. These include 10.0km long underground TL and the size of the trench line including the space necessary for the installation work varies from 2 m to 4 m by width, the New Addis Centre Substation (which is 0.38ha plot of land), and the temporary/ancillary construction facilities.

Indirect Impacts Area of Influence: This is the area likely affected by the indirect project impacts on physical, biodiversity, or social environment. The indirect impacts area of influence includes areas close to the transmission line corridor and the substation which will be affected during project construction and operation. The indirect impacts area of influence includes the contiguous areas along the transmission line corridor where impacts on physical and biological environment is felt (typically, a corridor as wide as 5.0 km is considered, particularly to account for ecological and biodiversity impacts), the administrative areas where the project is located (i.e. Woredas 7 & 12 of Akaki Kality SC, 5 & 7 of Kirkos SC, 5, 6, 11 & 12 of Nifas Silk Lafto SC, 4 & 7 of Lideta, 6, 7 & 14 of Bole and 9 of Yeka).

Cumulative impacts that result from the incremental impact, on areas or resources used or directly impacted by the project, from other existing, planned or reasonably defined developments at the time the risks and impacts identification process has been assessed. The cumulative impacts assessments considered the indirect impacts area of influence.

The temporal boundary of the project considers the planning/pre-construction, construction, operation, and decommissioning phases of the project. The life of the project could reach up to 50 years and how the project will be decommissioned is difficult to determine at this stage. Project infrastructure may be upgraded or renovated based on cost-benefit analysis and new technologies.

Therefore, the area of influence for the project includes all areas that might be potentially affected by a project works, or study of which is necessary to understand the impacts of the project. Most of the construction sites (mainly for towers errection) are expected to be accessed through existing roads while some feeders could be accessed through open field during dry periods (i.e. only a spur from the existing road). However, due to the location of these works, unskilled labor will be hired from the local community to avoid labor influx. (i.e. from the villages traversed by the transmission line). Therefore, construction labour camp will not be required. Aggregates and sand will come from the nearby existing aggregate production sites and the Civil Contractor will not require to open and operate a new quarry site.

However, cumulative impacts - impacts that result from the incremental impact on areas or resources used or directly impacted by the project, from other existing, planned or reasonably defined developments at the time of the risks and impacts identification processis is included in the study.

The direct and indirect impacts area of influence has been the principal areas of focus for fieldwork and data collection.

Collection and review of Available Information: The available Feasibility Study for Addis Ababa Power Supply Reinforcement Project have been reviewed with the objective to identify potential sources of impact of the project on the environment.

The ESIA report prepared by JICA in October 2018, as part of the feasibility study was reviewed to facilitate a better understanding of the work.

The consultant also collected and reviewed published documents, regulations, and CSA's census reports. Information on existing environmental conditions, necessary to provide the background for impact identification and assessment has been obtained from these published sources.

The legislative framework applicable to the proposed project is governed by the Federal Democratic Republic of Ethiopia (FDRE). The national legislative and institutional framework, policies, procedures, guidelines etc. have also been reviewed (See References). Environmental and Social Standards (ESSs) Environmental and Social Framework (ESF) were also reviewed.

The following PRIME-1 E&S instruments are applicable EEP and the Contractor are required to review and adopt these plans as appropriate:

i) Environmental and Social Management Framework (ESMF)
ii) Resettlement Framework (RF)
iii) Environmental and Social Commitment Plan (ESCP)
iv) Stakeholder Engagement Plan (SEP)

Maps and Images: Topographic maps prepared by Ethiopian Mapping Agency and other relevant sources were used to identify and delineate resources and facilities that could potentially be affected when the proposed scheme is realized.

The current national and regional conservation area map issued by the Federal Government of Ethiopia is also used. Satellite images have also been used to assess the land use, vegetation cover, infrastructure, settlements and other socio-economic activities within the TL corridor.

Field Investigation: Members of the ESIA Team carried out site investigations between October 14 - 22, 2024. During the field investigation, information on physical resources, ecological resources, socio-economic aspects, health, cultural and other values in the project area has been collected. Various quantitative and qualitative data collection and information gathering techniques were used in this assessment.

Public Consultations: The field investigation also included consultations with various community members as well as different stakeholders and local authorities in the project affected area along the proposed Transmission Line corridor and substations. The consultation was carried out to obtain the views of the project affected communities on various aspects of the project, background information relevant to impact assessment (identify any areas of specific concern which needed to be addressed in this assessment) and identification of mitigation measures.

Description of the Baseline Environment: Information on the existing natural and socio-economic resources is of fundamental importance for evaluation of E&S impacts. Therefore, the baseline data on the physical, biological and social, cultural & socio-economic setting of the project have been assembled, evaluated and presented.

Identification of E&S Impacts: Key potentially beneficial and adverse impacts on the physical, biological and socio-economic environment associated with the construction and operation phases of the project have been identified and quantified where possible.

Environmental and social Mitigation and Benefit Enhancement Measures: Feasible and cost effective mitigation and benefit enhancement measures that may avoid or reduce potentially substantial adverse E&S impacts to acceptable levels are identified and recommended.

Preparation of ESIA Report: The final step is the preparation of the ESIA report. This report has concentrated on key issues and impacts, which are of importance in terms of affecting the overall environmental performance of the project.

This report also answers the essential questions needed to establish whether the project as conceived is environmentally and socially viable, or shall be modified during construction phase so as to become acceptable.

1.4 Report Structure

The content of this ESIA report is designed to meet requirements and guidelines of the EPA as well as World Bank Environmental and Social Framework (ESF). Therefore, the content of this ESIA are presented below:

- Following the *Executive Summary*, Chapter 1 is the *Introduction* and presents an overview of the proposed project and its benefits. It defines and describe in detail the following:
  - The Project background/context
  - The specific project background/context
  - Rationale for the project
  - The objectives of the ESIA
  - The scope of the ESIA
  - Approach/methodology of the ESIA
  - The structure of the ESIA report
- *Chapter 2* provides a detailed *description of the planned project* (i.e. project description) and components and justification;

  The project description is the basis for the ESIA including to establish environmental and social baseline conditions, identifying and prioritizing key E&S issues, and recommending measures to avoid, reduce, mitigate, and offset the identified impacts;

- *Chapter 3* summarizes relevant national *Legal and Institutional Frameworks* regarding environmental protection in Ethiopia within which the ESIA is to be carried out. World Bank's Environmental and Social Framework (ESF), the relevant Environmental and Social Standards (ESSs). It identifies relevant international environmental/social agreements to which the country is a signatory;
- *Chapter 4* gives *E&S Baseline Conditions* that is an account of the physical, biological and socio-economic environments within the Transmission Line Corridor and substations and their respective influence areas;

  Therefore, the basic E&S baseline conditions of the Project area of influence includes:

  - The physical environment (climate, topography, geology/geomorphology, soils, water resources, land use, land cover, etc.)
  - The biological environment (flora, fauna, key biodiversity areas, natural, critical, and modified habitats)
  - The socio-economic environment (demography, ethnic composition, traditionally underserved communities, social structures, religions, cultural heritages, settlement patterns/land uses, livelihood strategies, household income and employment, food security, access to social services and utilities, etc.).
- *Chapter 5* presents a detailed analysis of *E&S Risks and Impacts* of the project on the physical, biological and socio-economic environment;

  The chapter focuses on E&S effects that are substantial in their likelihood and consequences. Further, the impacts identified are both beneficial/positive and adverse/negative impacts;

  Appropriate benefit enhancement and *Mitigation Measures* and complementary initiatives are identified and required to avoid, reduce, compensate or mitigate the adverse environmental and/or social impacts.
- *Chapter 6* provides *Analysis of Alternatives and Design Options* and analysis of the same with respect to biophysical environmental, social and economic features (including the "Without project" option) which could be implemented to address the development needs of the country;
- *Chapter 7* presents *Cumulative Impact assessment***.** Identifies potential impacts and recommends reasonable, feasible options for mitigating or avoiding contribution to any significant cumulative effects, at the project level;
- *Chapter 8* presents *Stakeholder Identification, Consultations, Information disclosure.* Results of consultation with project-affected community (including women, youth, elders, etc.) as well as other concerned key stakeholders at Sub City and Woreda levels will be presented. Perceptions and attitudes of project affected communities and their leaders are presented in this chapter;
- *Chapter 9* presents indicative *E&S Management Plan*. It also provides the management responsibilities relating to the mitigation measures associated with specific impacts;
- *Chapter 10* of the report contains the *E&S Monitoring Plan,* and defines monitoring indicators derived from the baseline survey. It identifies responsibility and specifies the time frame for monitoring and reporting;
- *Chapter 11 Grievance Redress Mechanism (GRM)*: The chapter describes the process of addressing grievances and provides information regarding the process for registering complaints, appropriate response times, and communication modes;

- *Chapter 12* Institutional arrangement, capacity development and training and reporting. In this chapter, the existing institutional capacity of the concerned parties has been assessed and measures to strengthen their capacities (such as training) are recommended and capacity development and indicative training budget presented;
- Chapter 13 discusses the Environmental Mitigation, Management & Monitoring costs;
- *Chapter 14* of the report contains the *conclusions and recommendations*. Conclusions are be drawn from the key findings of the ESIA. Further, this chapter shall provide recommendations based on the findings of the assessment;
- Tables, figures, annexes, and list of references shall be incorporated in the ESIA reports.

2. Project Description

2.1 Project Location

The proposed project to expand the transmission line and substation facility is necessary to respond to the increasing power demand in Addis Ababa, the capital city of Ethiopia.

In this project, the following substations are targeted for the expansion and reinforcement: Addis Center (hereinafter called “ADC”) substation, an important station in the Addis Ababa power system which transmits to the central region of Addis Ababa city and Weregenu substation in the eastern part of the city.

The project crosses and influences 6 Sub-City and 14 Woredas in Addis Ababa City Administration. The location and the administration of the project area is shown in Figure 2.1.

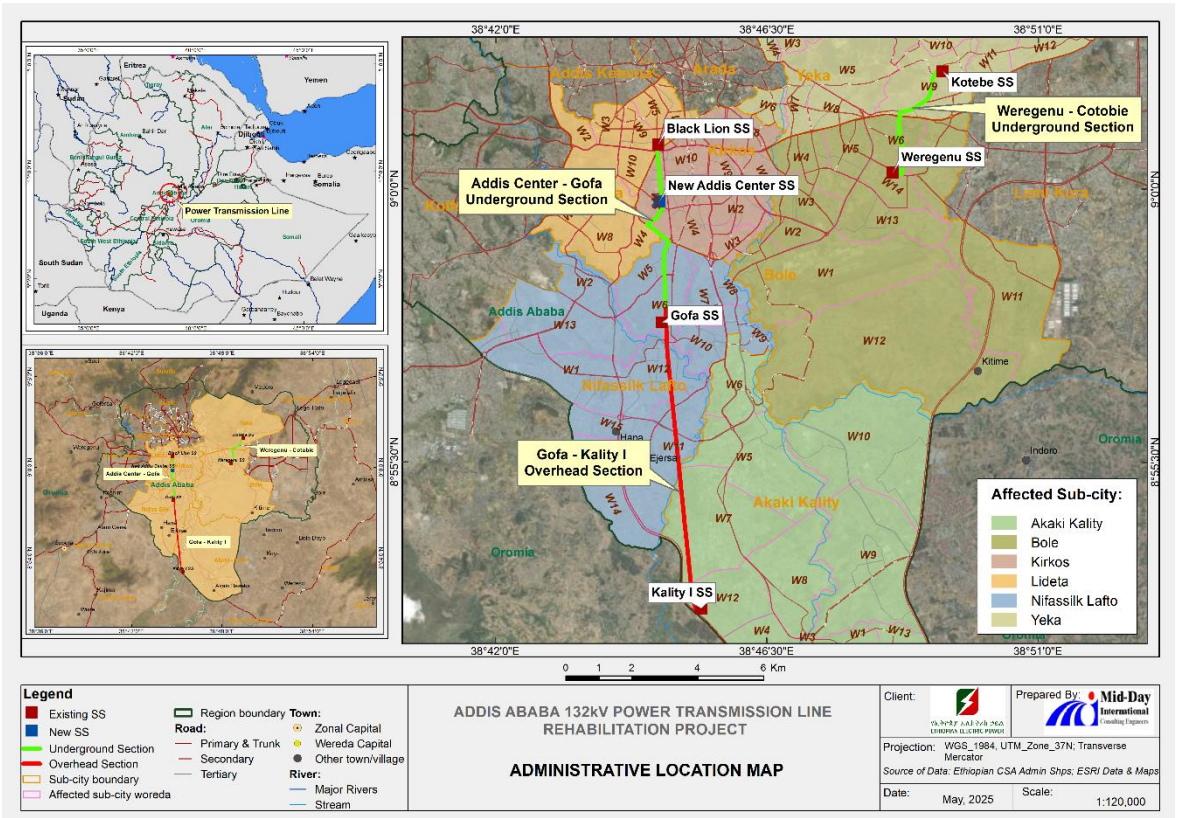


Figure 2.1: Location and Administration Map of the Proposed Project Area

2.2 Description of Project Components

The description of project components is shown in Table 2.2 and Figure 2.2. Locations of the Under Ground Cable and Overhead Transmission Line is presented in Figure 2.3.

Table 2.1: Description of Project Components

No	Project components
1	Black Lion SS - Existing
2	Addis Center SS - New
3	Kality I Substation - Existing
4	Weregenu SS - Existing
5	Construction of 132kV Under Ground Transmission Line (Black Lion Substation - Addis Center SS - Gofa SS)
6	Construction of 132kV Overhead Transmission Line (Gofa Substation - Kality I SS)
7	Construction of 132kV Under Ground Transmission Line (Weregenu Substation - Connection point at Kotebe SS)

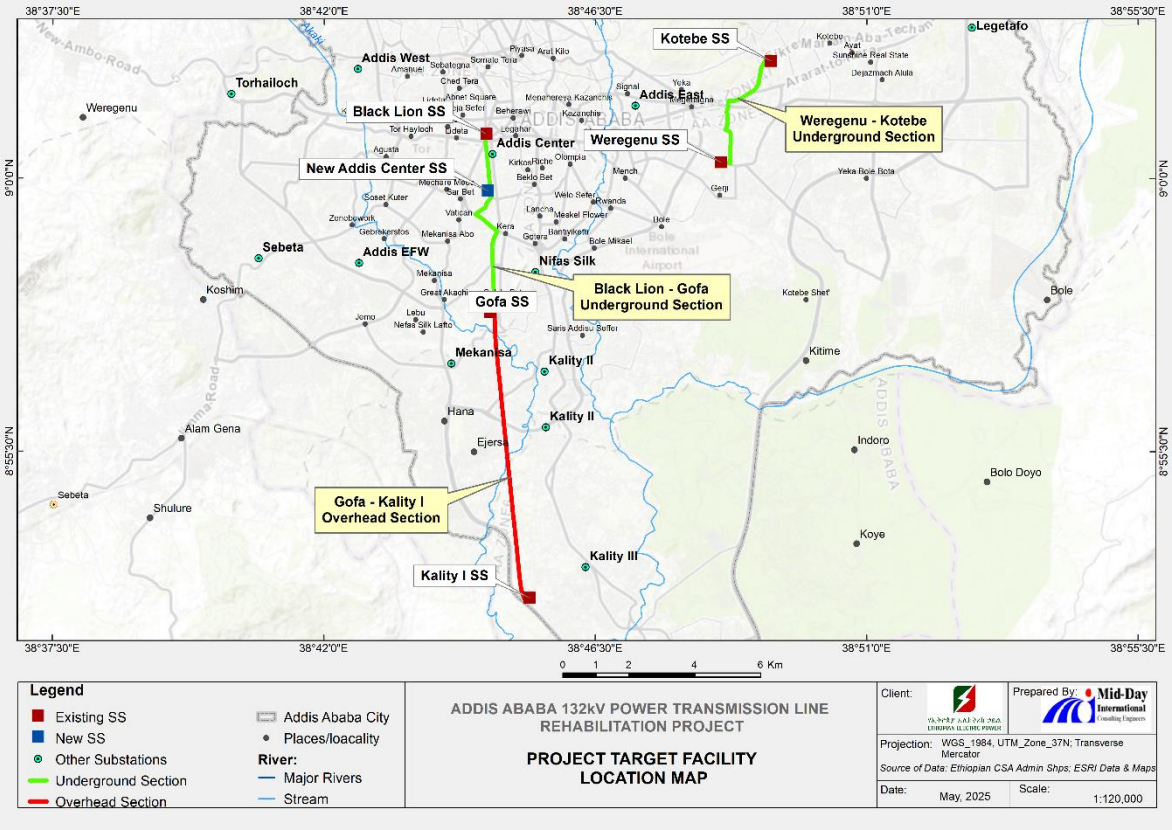


Figure 2.2: Locations of Target Facilities

2.2.1 Underground Cable Transmission Line (132 kV)

1) Outline of Route

The routes for 132 kV underground cable system are categorized in three sections as follows (See Table 2.3).

Table 2.2: Salient Features of Underground Cable Transmission Line

To	Terminal 1	Terminal 2	Route length
Section 1	Black Lion substation	From Black Lion substation to new Addis Center substation	1.77 km
Section 2	New Addis Center substation	Connecting point with the overhead line which is close to Gofa substation	3.87 km
Section 3	Weregenu substation	Connecting point at Kotebe SS	4.40 km

Subsequently, the route of each section and features are described below:

Section 1: A single circuit of 132kV cable will be installed for the connection between the Black Lion substation and the new Addis Centre substation, with a route length of 1.77km (See Figure 2.3).

Ras Lulseged Street is suitable for the route because the street has a wide median strip. The influence on the traffic caused by the installation work may be minimized by burying the conduit system under it.

Section 2: Double circuits of 132kV cable will be installed for the connection between the new Addis Centre substation and the connecting point with the overhead line adjacent to the Gofa substation, which has a route length of 3.87km (See Figure 2.3).

Section 3: Double circuits of 132kV cable will be installed for the connection between the Weregenu substation and the Kotebe SS, and the route length is 4.40km (See Figure 2.3).

Underground cables are adopted in urban areas where land acquisition is difficult and consideration for landscape is required. Underground power lines will avoid the disruption caused by recurring construction, repair and upgrading of cables. They prevent downed utility cables from blocking roads. The construction requirement is briefly described below.

There are two methods to lay underground cables. One is to bury cables directly and the other is to lay cables in conduit pipes installed in advance. Although each method has merits and demerits, the latter method improves the reliability of the infrastructure facilities in the city where the development is underway. Therefore, the underground cable system in the Project has been studied based on the condition that the conduit system is applied.

Conduit pipes are buried under a sidewalk, a roadway or a median strip. However, since infrastructure such as sewer pipes, water pipes, communication lines, etc. are already buried in the sidewalk, it is considered difficult to lay conduit pipes under it. Therefore, conduit pipes will be buried under a roadway or a median strip. On the other hand, when opting to have conduit pipes buried under the median strip, plants, fences and the like, which exist on the median strip, become an obstacle in construction.

Trench Excavation: Excavation a trench for the installation of conduits for the underground cables. Compared to the direct-buried-method, the conduit system requires additional cost initially but the system has many advantages as follows. The system protects the cables from unexpected damages caused by other construction works. Once the system is installed, the cables can be replaced without excavation work. And the system enables a

flexible work schedule because it is not necessary to keep a trench until the cables are laid. An estimated 10.04 km of open trench will be excavated.

Tunneling: Underground system introduces a more reliable and resilient infrastructure to the network. Therefore, during major road crossings, micro-tunnels with minimum diameter will be adopted and not open trench excavation. It avoids traffic disruptions, noise, air pollution and most other utility impacts along the tunnel alignment. An estimated 1.17 km of an underground tunnel will be built.

Manhole: A manhole is one of the essential equipment of the conduit system. The cables shall be connected in appropriate span with a joint box. The joint boxes are protected in the manhole. Figure 2.3 shows an example of the cable and the joint box cable arrangement in the manhole. In general, the size including the space necessary for the installation work varies from 2.0 m to 4.0 m by width and from 8.0 m to 14.0 m by length.

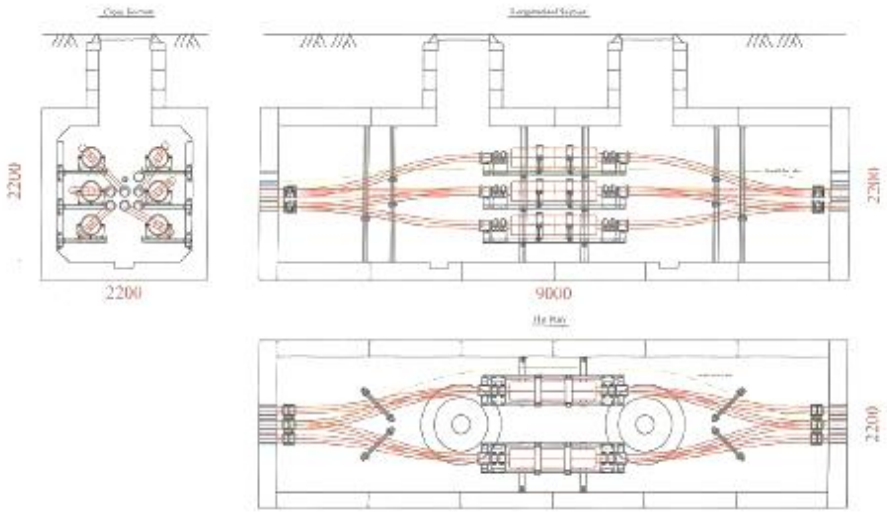


Figure 2.3: Example of cable and joint box arrangement in manhole

2.2.2 Overhead Transmission Line (132 kV)

Existing 132kV Transmission line from Addis Centre to Kality-I is 9.26 km with 56 tower. In this project, the existing one (1) circuit transmission line will be replaced by two (2) circuits of a new double circuit overhead transmission line. New overhead transmission line will be constructed from Gofa, located in the store of EEP, up to the Kality- I substation.

It is recommended that the preliminary design of the overhead power transmission facilities be in line with the preliminary design applied in the existing facilities of EEP such as tower, conductor and insulation, as much as possible. As many tubular steel towers are already used for 132kV overhead transmission lines in Addis Ababa, the similar design can be applied for this study. Common designing allows exchange of materials between any projects of EEP.

The design for the Overhead Transmission Line will be as follows:

- This project component will involve dismantlement of the existing single circuit overhead transmission line and construction of a new double circuit transmission line between Gofa station and Kality-I substation
- The route for overhead transmission line shall be in the existing ROW (Right of Way as Corridor). The angle tower shall be kept in the same original location, and the suspension tower will be adjusted to an optimum position within the ROW.

- The tower shall be designed to have a common compatible design with the existing 132 kV steel tower in the EEP, and the diameter of the phase conductor which will be directly related to the wind pressure loading, and it shall not exceed the diameter which is used in design of the existing 132 kV towers in EEP, and phase conductor shall have necessary thermal current capacity.
- Tubular tower will be implemented to minimize the foundation size. The foundation will be a concrete chimney to hold a tubular tower which has balanced tension.

Salient Features of overhead transmission line is presented in Table 2.4.

Table 2.3: Salient Features of Transmission Line

S/No	Features	
1	Voltage Rating	132 kV
2	Type of Transmission Line	Double Circuit
3	Width of T/L Right of Way (RoW)	26m
4	Type of Line Support	Tubular and lattice steel tower
5	Termination point:	Kality substation
6	Approximate Length of T/L	9.26km
7	Average span between towers over normal topography	350 m
8	Land required for installing a typical Tower	12.96m^2 (3.6m x 3.6m) for tubular tower 36m^2 (6m x 36m) for lattice tower

2.2.3 Tower Design

Two (2) kinds of tower, namely, “Tubular Tower” and “Lattice Tower” will be applied in the following section to utilize the feature of each tower type. The Tower Arrangement and tower alignment are presented in Figure 2.4.

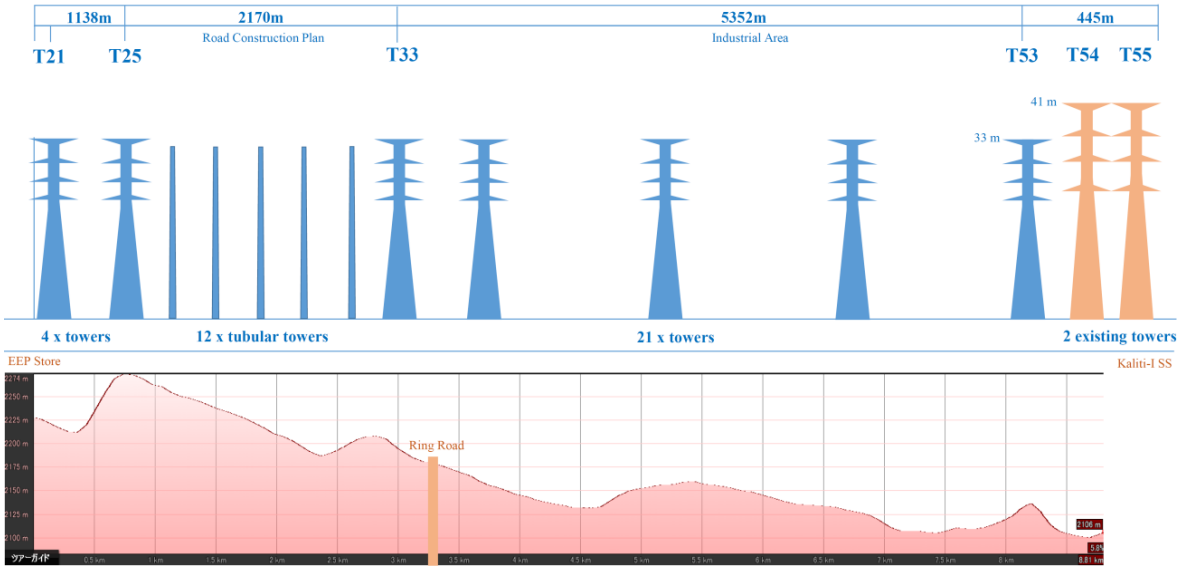


Figure 2.4: Tower Arrangement

2.3 Substation facilities

Under this component there are four substations which will be upgraded/installed. Details of the facilities are shown in the table below. Generally, if a certain substation is upgraded/installed, it is necessary to refurbish the opposite side substation(s), with repairs to protection relay, current transformer, communication system, etc.

Table 2.4: Salient Features of Substation Facilities

Substation	Main Component	Primary Voltage (kV)
New Addis Centre ADC Substation	Transformers 250 MVA (50 x 5 units) Load shift from temporary Addis Centre to new Addis Centre	132 kV
Kality Substation	Newly install 132kV transmission line bay for new ADC substation Reinforcement of receiving equipment (2 c.c.t./ AIS)	132 kV
Weregenu Station	Newly install 132kV transmission line bay and 1 unit of 132/33 kV power transformer including transformer bay. Reinforcement of receiving equipment (2 c.c.t./ AIS)	132 kV
Gofa Substation	Newly install 132kV transmission line bay Modification of outdoor equipment existing substation.	132 kV

Existing substation: Air Insulated Switchgear (hereinafter called "AIS") substation: The existing substation will be reinforced as AIS to meet the criteria of the existing facilities. There is no big concern about site constraint in the existing substations.

New substation: Gas insulated Switchgear (hereinafter called "GIS") substation: From the view point of site constraint, new ADC substation will be constructed as GIS substation to reduce size of substation site. New ADC substation will be located at a central area of the city where new buildings are expected to be constructed one after another. Therefore, the new ADC substation shall be installed as an outdoor type GIS to minimize the size of substation site.

The new substation is located at nearby the African Union and it will replace the existing Addis Centre substation located at Mexico. The Google location of the proposed new and existing substation sites are shown in Figure 2.5 to 2.7.

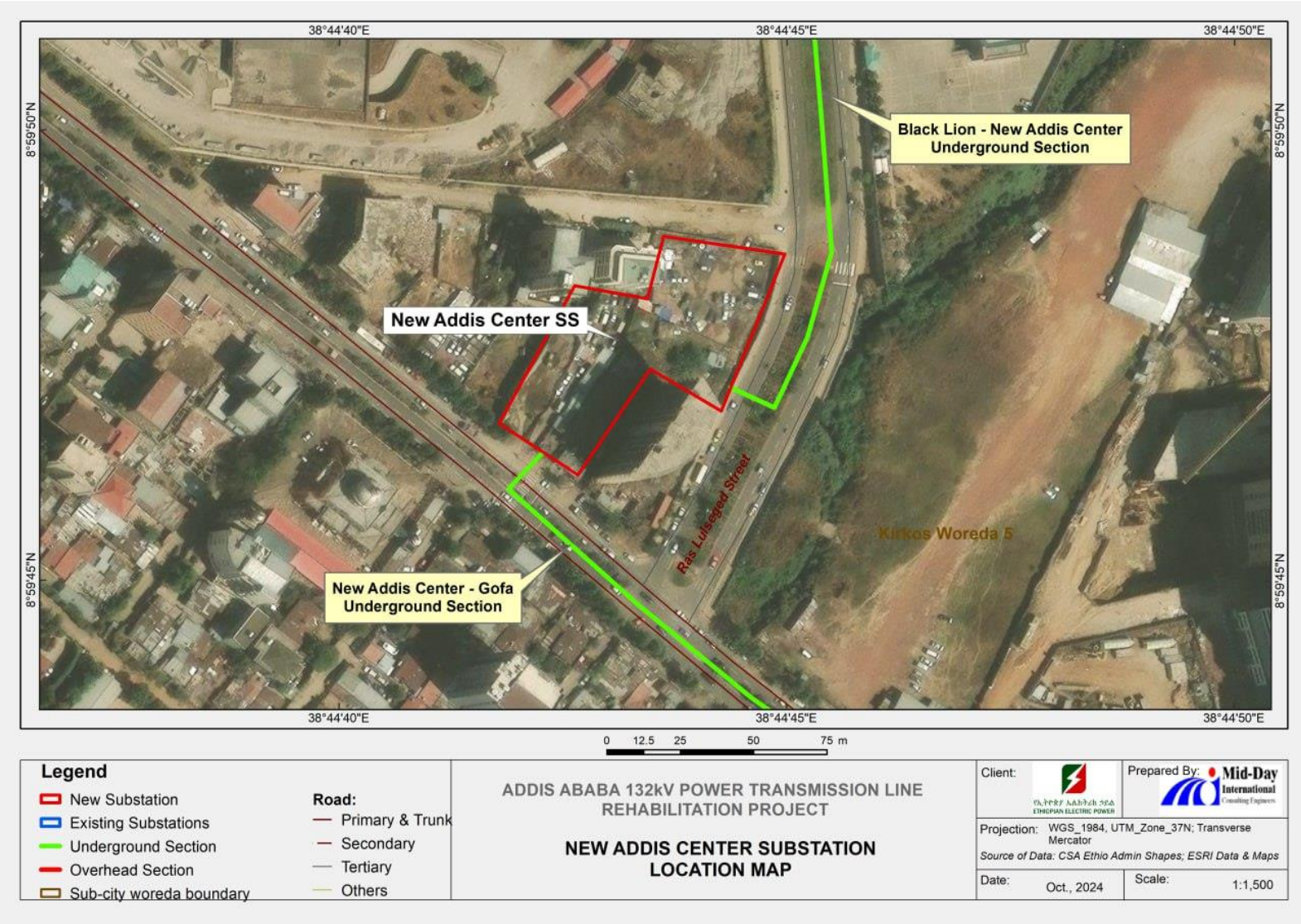


Figure 2.5: Location of the New Addis Centre Substation

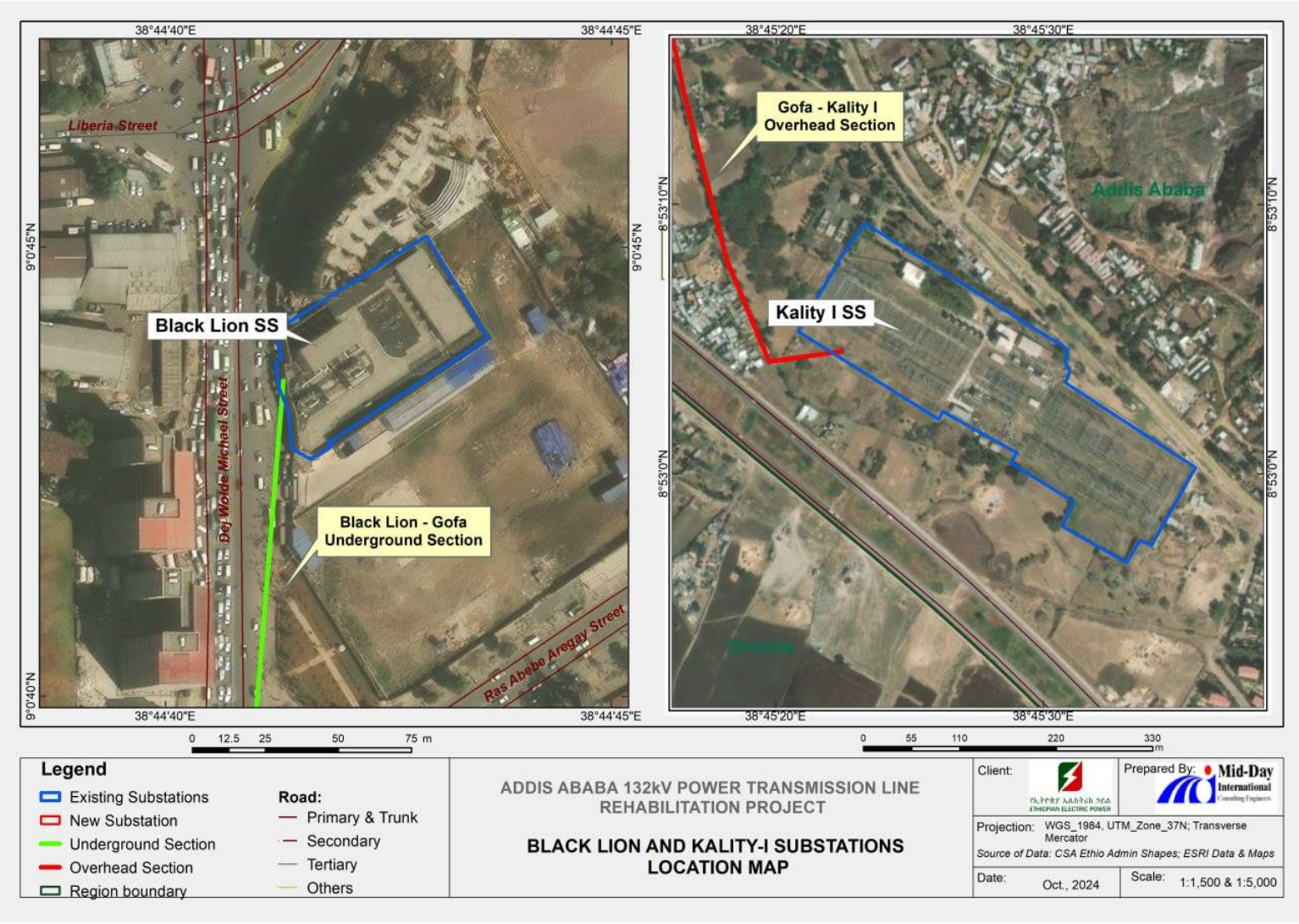


Figure 2.6: Location of the Existing Black Lion and Kality Substations

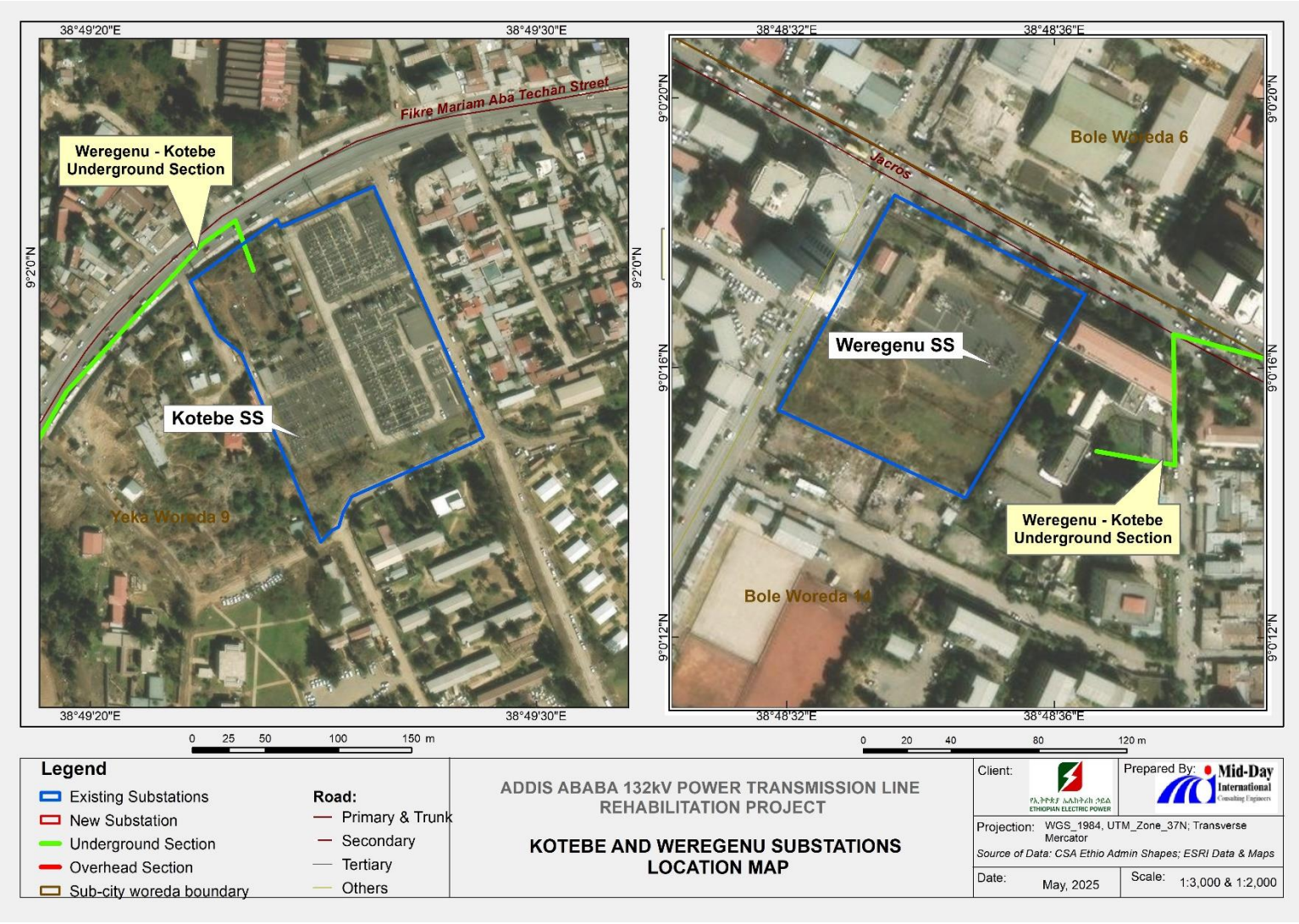


Figure 2.7: Location of the Existing Weregenu and Kotebe Substations

2.4 Right of Way

Right of Way (RoW) is required for the overhead Transmission Line to ensure the safe construction, maintenance and operation of the power line.

According to the Ethiopian Electricity Agency directives of overhead electric line clearance 26m wide ROW is required for 132kV.

It is assumed that the majority of transmission lines pass through open lands and fields; and a 26 meter width for ROW Corridor passage was maintained and secured at the time of construction in 1980s. However, as the development of Addis Ababa city started after 2000, and the business and residential area were expanded, some parts of the ROW Corridor have been encroached and occupied by houses and such ROW have disappeared throughout the corridor.

2.5 Construction Phase Activities for the Underground Works and Overhead TL

The Contractor is required to prepare and submit to the project Engineer a detailed Method Statements in order to safely construct and install the underground works and overhead transmission lines.

However, the key construction phase activities for the transmission lines and substations will include the following:

- Site Clearing
- Foundation Excavation and backfilling
- Micro-tunneling using TBM
- Trench excavation,
- Underground conduit and cable laying,
- Construction of the concrete bases for the transmission line pylons, including stubs implementation
- Assembly and erection of the towers
- Cable stringing; and
- Site rehabilitation

EEP shall prepare and implement a RAP and LRP as per the requirements of the GoE's land expropriation laws and WB's ESS5 before construction and installation works commence.

2.5.1 Site Clearing

In the ROW other than the access track, clearance of vegetation will be minimized. However, vegetation clearance will be required along the underground works and in the immediate area of the overhead tower foundations. Only trees that could be damage by the construction activities will be cleared.

2.5.2 Tower Foundation

The transmission line is located inside the city, heavy trucks pass near the towers, and the tower foundation may be deformed due to unexpected force and loads from trucks, houses and the weight of embankment soil.

Therefore, the preliminary designs have been carried out by considering the load reaction force of the tower. Typical foundation excavation depths for towers depending on the soil condition is about 2 to 3.5 meters.

The foundation footing shall be designed in such a way that the deformation by unexpected soil pressure after construction shall be minimized. The types of foundation considered in this project are presented in Figure 2.8 and 2.9.

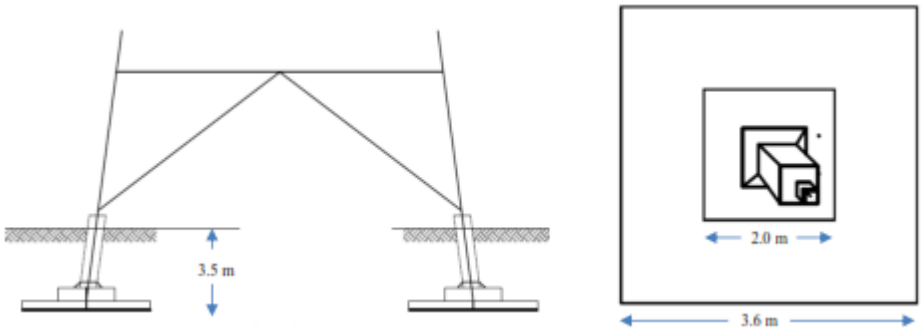


Figure 2.8: Basic Foundation Design

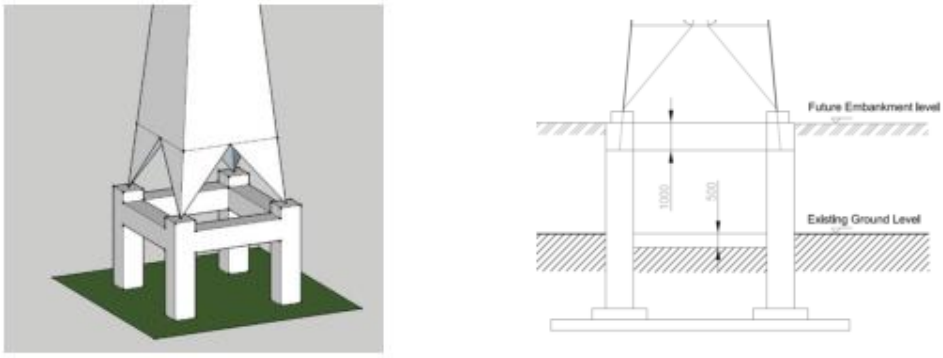


Figure 2.9: Rigid Foundation Design

2.5.3 Construction of the concrete bases for the transmission tower:

The excavation shall be carried out using excavators to open the ground to prepare the foundation solution. Each excavation will be inspected and tested to confirm its suitability. Tower foundations are filled with concrete.

The Contractor is required to safeguard excavations. This shall include erecting a temporary fence or warning solution around the excavation to protect the safety of people and animals.

2.5.4 Access Roads and Access Roads

Site access road will be required to provide access to channel traffic generated by the construction activities for the safe transport of personnel, equipment and materials.

Therefore, the contractor will access the tower locations as much as possible via a short ‘spur’ from existing track/road.

Main Roads

The proposed underground and overhead transmission lines traverse or run along the median of a number of main roads, most of which are mostly busy with high volume of vehicular traffic. In addition, they travel along or cross several access roads, most of which are built from cobblestone. The roads potentially affected by the proposed TLs are indicated below.

***Black Lion – New Addis Centre UG TL*:** This route crosses one-way of the road from Mexico square to Diafrique Hotel and runs at the median of this road and crosses Mexico square. Then travels at the median of a two-way main road running from Mexico square to African Union Office through the Sudan Embassy for about 1.77km length (See Figure 2.10).

***New Addis Centre - Gofa UG TL*:** This route travels at the median of AU-Bulgaria road for 190m stretch and runs along a coble stone access road of average 5.5m wide for about 240m length. Then, it goes along an access road (old asphalt road) of 6-7m wide for about 500m length. Thereafter, it crosses the Sarbet-Kera main road and travels on RHS of this road following pedestrian walkway for about 620m, and follows a cobblestone access road for 350m stretch. The remaining section totally follows the route of the existing overhead TL, which is recently built asphalt road and several access roads that cross the route. The new two-way asphalt road is constructed by the Addis Ababa City Roads Authority (AACRA) between Tower 12 (Kera) and Tower 20 (Gofa Condominium area) on both sides of the existing overhead TL. The TL crosses the Gofa Gebreal – Germany main road between the existing Towers 16 & 17 and one main access road (asphalt road) just after Tower 20. In addition, it crosses about 6 cobblestone built access roads between Towers 13 and 20 (See Figure 2.10).

***Weregenu – Kotebe UG TL*:** This proposed UG transmission line runs at the median of the road from Ring Road (near Anbessa City Bus Garage) to Jackros to Sahelete Mihret Church. The road section followed by the UG TL is about 4.36km long and has several road junctions, two road intersections and one major square (See Figure 2.11).

***Gofa - Kaliti 1 OH TL*:** This overhead TL crosses four main roads and some access roads. The main roads are located between Tower (TR)-23 & TR-24, TR-28 & TR-29, TR-31 & TR-32, and TR-33 & Tr-34. In addition, there is a new two-way asphalt road built by AACRA between TR-25 and TR-31 on both sides of the overhead TL.

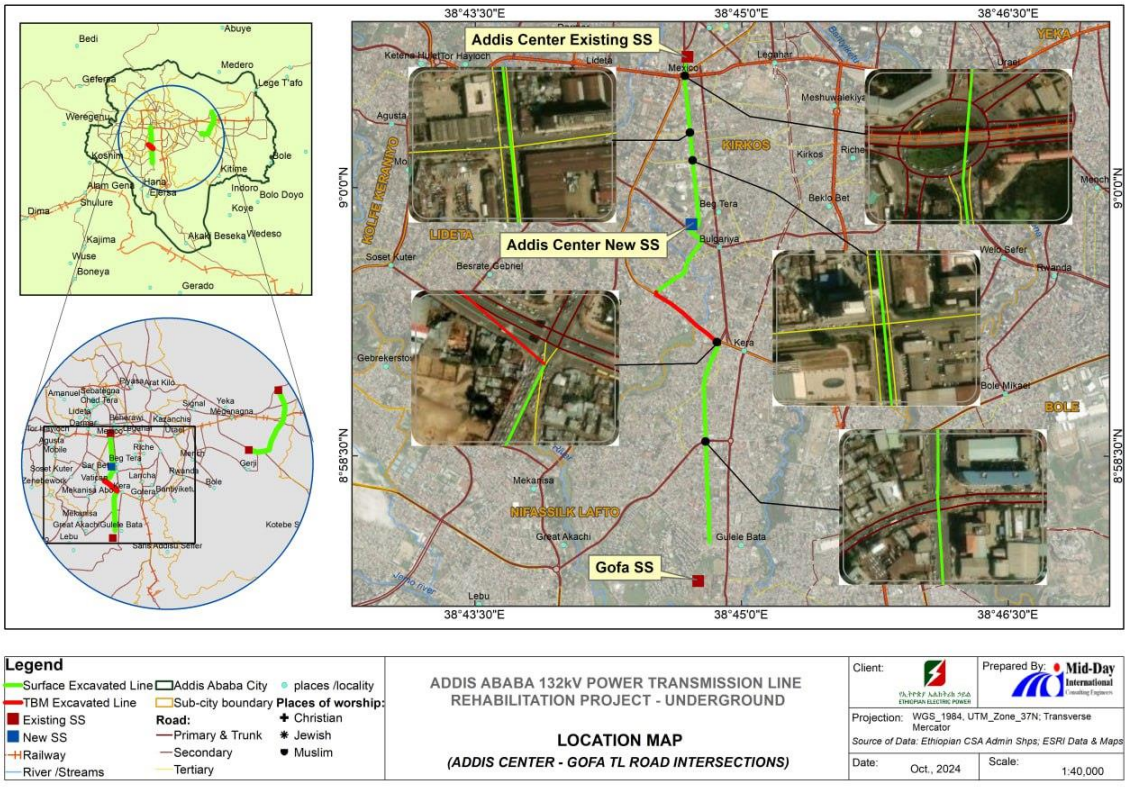


Figure 2.10: Major Road Crossings between Black Lion, New Addis Centre and Gofa SSs

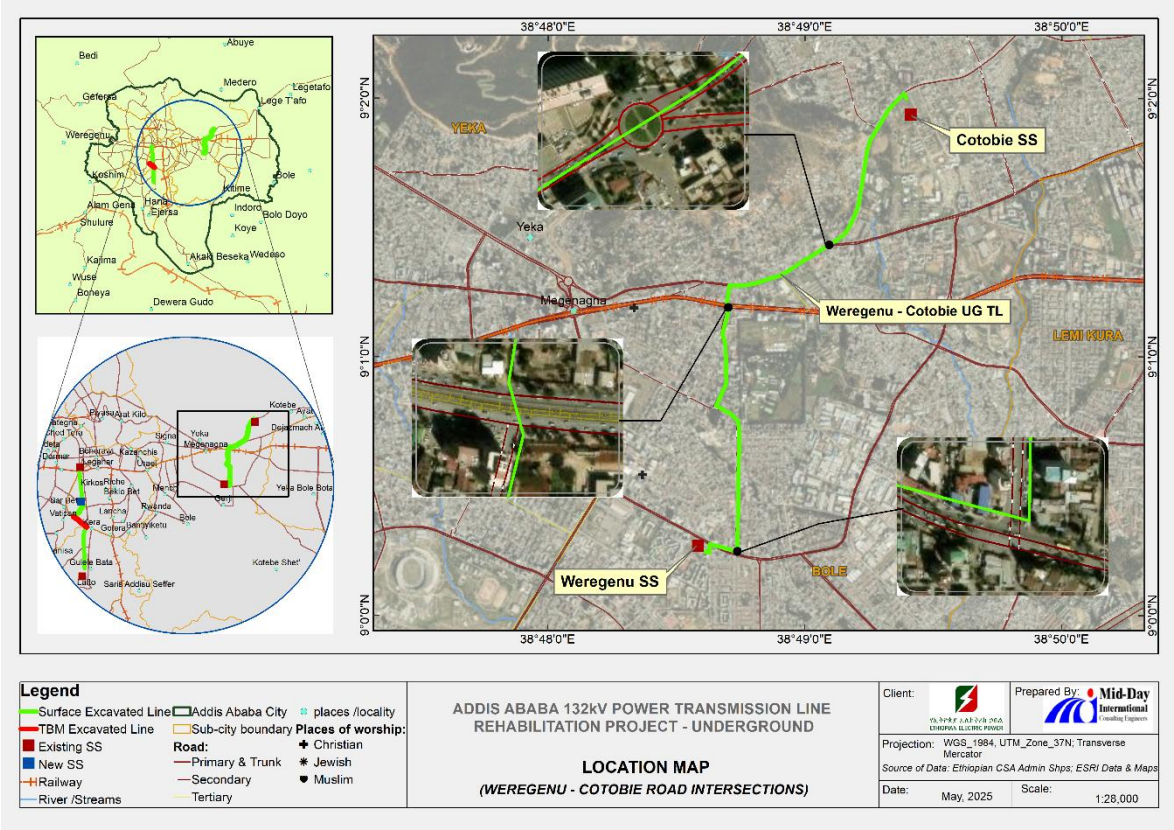


Figure 2.11: Major Road Crossings between Weregenu and Kotebe SSs

2.6 Construction Phase Activities for Substations

The Contractor is required to prepare and submit to the Project Engineer a detailed Method Statements in order to safely construct and install the substation and control room and ancillary facilities.

The key construction phase activities for the substation will include the following:

- Topographical Survey;
- Preparation of the construction site, earthwork;
- Establish the work zone and excavation for equipment and control room foundation;
- Foundation work for all buildings, tower & equipment structure, offices and stores;
- Construction of the concrete bases and lay the foundations;
- Laying the foundation and supply of external networks;
- Backfill the foundations and substation yard;
- Install major electrical components;
- Assemble the steel structures and construction of supporting metal structures;
- Assembly and installation of auxiliary systems;
- Construction of the control building;
- Construction of compound/internal access road;
- Property fencing; and
- Cleaning construction waste, landscaping and site rehabilitation.

2.7 Land Required for the Project

On the bases of the proposed routing and engineering design, the land requirement for the Project is assessed. Description of project components and land required for the project is shown in Table 2.6.

Table 2.5: Description of Land Required for the Project

No	Project components	Required Land
1	New Addis Center SS	0.38ha of land acquisition will be required. No new land acquisition is required. The land is already secured the change of land use registration has been initiated.
2	Gofa SS	Expansion of the existing SS site is required. No land acquisition is required. Expansion work will be accommodated within the existing SS boundary.
3	Kality I SS	Expansion of the existing SS site is required. No land acquisition is required. It will be accommodated within the existing SS boundary.
4	Weregenu SS	Expansion of the existing SS site is required. No land acquisition is required. Expansion work will be accommodated within the existing SS boundary.
5	Kotebe SS	Expansion of the existing SS site is required. No land acquisition is required. Expansion work will be accommodated within the existing SS boundary.
6	Construction of 132kV underground transmission line (Addis Center SS - Gofa SS)	Underground transmission lines will be constructed along the existing street median strip. Therefore, no ROW issue associated with the construction of underground TL. Although temporarily land will be required during the construction of the underground transmission line, the Contractor will be required to accommodate the work within the road median strip.
6	Construction of 132kV transmission line (Gofa - Kality I Substation)	Existing overhead transmission lines will be replaced by 9.3km long new 132 kV Transmission line. An estimated 24.18 ha (i.e. 9.3km length and 26m corridor/ROW) of land will be impacted for the ROW and construction 56 tower foundations. However, the ROW of the existing transmission lines and access roads will be utilized.
7	Construction of 132kV line (Weregenu SS – Kotebe SS/Connection point)	Underground transmission lines will be constructed along the existing street median strip. Therefore, no ROW issue associated with the construction of underground TL. Although temporarily land will be required during the construction of the underground transmission line, the Contractor will be required to accommodate the work within the road median strip.

2.8 Requirements for Raw Materials/Construction Materials

The construction materials required for transmission line and substation construction include cement, coarse and fine aggregates, sand, reinforcement steel, rough sawn timber, bellies and steel- bar, checker-plate, anchor-bolts, and electric cables.

Gravel and sand materials requirement for concrete and backfill is relatively small and the Civil Contractor will not require to open and operate a new quarry sites. Aggregates and sand will come from the nearby existing aggregate production sites and will be supplied by private material suppliers. Therefore, all impacts associated with opening and operating a quarry site is avoided.

2.9 Construction Power Requirements

Electricity will be required for the construction of this project and to light construction site offices, stores and installation sites. This power requirement during construction will be supplied from the existing power line.

2.10 Water Supply Requirements

Water is one of the main resource during construction and operation phases to be used for different purposes such as for concrete works and drinking and domestic consumption for construction workers.

The Contractor will need to identify its own water supply sources for the construction requirements and this will be to buy water from licensed suppliers.

2.11 Temporary Construction Facilities/ Ancillary Activities

During the works contract, the contractor will establish temporary construction site facilities including the following:

- Temporary site offices
- Material storage yard
- Machinery and equipment storage yard
- Water storage tanks
- Toilets and septic tanks
- Canteen facilities
- Access road (i.e. only a spur from the existing road)

The storage area is expected to be the base for a fleet of vehicles to be used for the construction process. Material destined for the transmission line will be trucked from the storage yard to be located within or close to the new SS site.

The locations of auxiliary activities shall be the existing substations. Therefore, no privately owned land will be required for storage area.

However, if the contractor is required to designate land for those activities, appropriate compensation payment shall be considered. The Contractor's Environmental and Social Management Plan (C-ESMP) shall include proper mechanisms for management and monitoring of anticipated impacts due to the implementation of these ancillary activities.

2.12 Construction Manpower and Facilities Requirements

The construction works are usually executed by engaging both local and international workers. The Contractor will engage skilled manpower as per their requirements to complete the work within given timeline.

Therefore, the construction of this TL and SS project will provide short-term employment opportunity for several local people. Based on similar scale projects in Ethiopia, the required number of skilled and semi-skilled workers is estimated at 50. During the peak construction periods, the job opportunities for unskilled (labourer) including the workers for supporting services will be about 150. The opportunity for female workers ranges between 5% and 10%. This will mainly be in the site project coordination offices.

As much as possible unskilled labor will be hired from the local community to avoid labor influx. (i.e. from the villages traversed by the transmission line). Therefore, the requirement for construction labour camp is avoided. These workers will receive adequate training prior to commencement of construction.

The construction crews will be different depending on the activity to be performed, e.g. for foundations, tower erection or cable stringing. During different phases of construction work, excavators, TBM operators, foundation and superstructure laborers, carpenters, electricians, heavy equipment operators, iron workers, masons, plasterers, plumbers, pipefitters, sheet metal workers, steel fixers, and welders will be engaged whenever necessary. The technical staff will include civil engineers, electrical engineers, supervisors, and technicians of various trades.

In addition, the workforce required during operation at the New Addis Center SS will be 20 professional and 30 semi-professional. The total job opportunities for operators and workers for supporting services will be about 50.

Environmental and Social Management Framework (ESMF) (See Annex 9 of the ESMF) has been developed as an E&S instrument for assessing, managing and monitoring E&S risks and impacts of the project where the full nature, scope and geographical locations are not exactly known yet. Specific E&S instruments, designed for the risk mitigation of the project are annexed to the ESMF and this includes Labor Management Procedures (LMP). Therefore, the Contractor is required to adopt the LMP as presented in the ESMF.

2.13 Contractors' Machinery and Equipment

It is expected that plant-intensive construction methods will be adopted, given the nature and scale of the works. The project contractors will mobilise and operate the following machinery and equipment for construction of the proposed transmission lines and substation:

- Earth moving machines (excavators, back-hoe loaders, etc.)
- Tunnel Boring Machine (TBM)
- Compactors and rollers
- Lifting machines (crane, forklift)
- Dump trucks, light pickup, crew truck/car hauler
- Water trucks
- Concrete mixers
- Vibrating roller
- Concrete vibrators
- Compressors
- Cable drum and drum puller,
- Overhead line rig, static wire reel
- Generators
- Welding machines
- Scaffolding
- Electric cables and pipes
- Various tools

2.14 Energizing, Testing, and Power Commissioning

The supplier of each component shall design and construct the respective component to the standard and subject it to testing as required by the relevant standard for that specific component. If the component satisfies the provisions of the standard and related testing criteria, then individual component shall be considered in compliance with the standard.

To ensure the line performs as per specifications, a number of tests will be undertaken. Therefore, on completion of the work, physical inspection and checking will be carried out for all foundation work, tower erection and stringing to ensure strict adherence to the technical requirements.

During testing, ground clearance for the line will be thoroughly checked. In addition, insulation and continuity test as well as earth resistance of each tower will be carried out before final energization.

2.15 Operation and Maintenance for Transmission Line

After completion of the construction, EEP will be responsible for the operation and maintenance of the substation and transmission line.

The main activities to be carried out during the operation life of the transmission line include surveillance of the condition of the transmission line routine, emergency maintenance and repairs and vegetation control.

Below is the list of O&M works usually conducted for transmission lines:

- Evacuation/transmission or distribution of electric power from power plants/substations to substations/load centres in controlled manner;
- Monitoring the transmission line from the control room of associated power plants/ SSs;
- Periodical visual inspection of transmission line routes;
- Fault detection in case of any occurrence of faults;
- Fault correction through replacement or repair works;
- In case of emergency works, commence work immediately following safety procedures and notify authorities immediately upon completion of work;
- In case of regular schedule maintenance works, commence work following safety procedures only after notifying authorities before commencement of work;
- Regular inspection and controlling future land uses within the ROW (TL Corridor) and ensuring that no new structures are constructed. In particular, buildings must be at a minimum distance from the line conductors.
- Regular inspection and controlling vegetation growth on the right-of-way will be done to ensure safe and reliable operation of the line. Therefore, vegetation cover shall be cleared occasionally to ensure that vegetation does not interfere with the operation of the lines.

2.16 Operation and Maintenance for Substation

The life of a substation is about 40 to 50 years. Replacement and refurbishment work may need to be done from time-to-time. Maintenance of the substation is essential for ensuring its reliability and safety.

Therefore, the main activities to be carried out during operation life of the SS include:

- Conduct regular inspection and carry out maintenance as required. This may involve replacing some aging equipment or rebuilding certain sections of the substation;
- Regularly monitor and maintain the SS equipment like transformers with associated bay equipment, bus bar coupler, capacitor banks, battery and battery chargers, relays, and underground cables need to be after substation commissioning;
- Measurement of leakage in line current and neutral current of transmission lines;
- Regular inspection and refilling and maintenance of firefighting equipment;

- Water supply and sanitation are also considered necessary for sound operation of substation; and
- Regularly inspect and keep the substation sites tidy at all times.

2.17 Decommissioning

It is anticipated that the power transmission line and the SS will be continuously maintained and repaired, and will be operated for several decades.

Because of its long life cycle, the circumstances under which the line might ultimately be decommissioned and abandoned are difficult to foresee. Towers may be upgraded/renewed based on cost/benefit analysis and new technologies.

However, if decommissioning is undertaken, EEP shall be required to prepare specific Decommissioning Management Plan at the time. Therefore, the decommissioning procedure shall include site-specific rehabilitation plans for the footprint of the project. All regulatory requirements will be complied with for the decommissioning phase.

2.18 Construction Arrangements

The construction works will be tendered under International Competitive Bidding procedures acceptable to the WB, the financing agency, and to EEP, following pre-qualification of suitably qualified and experienced contractors.

The construction contracts will use the FIDIC Conditions of Contract, with Special Conditions to suit site conditions and the nature and extent of the works.

2.19 Construction Supervision

Construction supervision and monitoring will be contracted to a suitably experienced international consultancy firm appointed under international competitive bidding procedures, providing “the Engineer” as defined in the construction contract and other senior supervisory staff. A firm of local consultants, working in joint venture with the international consultant, is likely to provide the bulk of the support staff.

3. Policy and Legal Frameworks

Environmental and Social Impact Assessments (ESIAs) of infrastructure projects in Ethiopia fall under the jurisdiction of the Environmental Protection Authority (EPA).

The ESIA for the Addis Ababa Power Supply Reinforcement Project has been prepared to comply with the Ethiopian, specifically EPA's respective regulations. In addition, this ESIA has been prepared in compliance with the ESIA procedures required by the WB Environmental and Social Framework (ESF).

In the following section relevant national policies, strategies, legal and institutional frameworks, guidelines, national and international agreements, and WB's ESF are reviewed and summarized to make sure that the proposed power transmission project is in line with these legal instruments. EEP, the project proponent will consult and use these legal instruments as a springboard in the course of project design, construction and operation.

3.1 National Regulatory and Policy Framework

The legal instruments which provide the legal framework for environmental protection and management in Ethiopia include the constitution of Ethiopia, E&S related sectoral policies and environmental proclamations, and supporting regulations and guidelines.

3.1.1 Constitution of Ethiopia

The Constitution of the Federal Democratic Republic of Ethiopia (FDRE) adopted in 1995 provides the basic and comprehensive principles and guidelines for environmental protection and management. Among other things, the constitution states that everyone has the right to live in a clean and healthy environment and the government will make every effort to provide such an environment.

The Constitution has the following key environmental objectives that have relevance to the development projects.

- Development projects shall not damage or destroy the environment.
- People have the right to full consultation and the expression of their view in the planning and implementation projects that affect them directly.
- Government and citizens shall have the duty to protect the environment.

The specific articles of the constitution relevant to the proposed project include:

a) Article 43 (1) gives broad rights to the peoples of Ethiopia to improve living standards and sustainable development.

b) Article 43 (2) acknowledges the rights of the people to be consulted concerning policies and projects affecting their community.

c) Article 43 (3) requires all international agreements and relations by the State to protect and ensure Ethiopia's right to sustainable development.

d) Article 44 (1) Environmental Rights stipulations that all citizens have the right to a clean and healthy environment.

e) Article 92 (1-4) Environmental objectives are identified as the government would endeavor to ensure that all Ethiopians live in a clean and healthy environment. The design and implementation of programs and projects would not damage nor destroy the environment. Citizens also have a right to full consultation and to the expression of views in the planning and implementation of environmental policies and projects that directly affect them.

The Constitution of Ethiopia includes legal frameworks that protect the Ethiopian citizen's rights to private property and set conditions for expropriation of such property for state or public interests.

The Constitution leaves the detailed implementation of the provisions concerning tenure rights over rural land to be determined by subsequent specific laws to be issued at both the Federal and Regional levels.

3.1.2 Federal Relevant Environmental and Sectoral Policies and Strategies

To support the sustainable development efforts of the country, the Government of Ethiopia has adopted several policies and strategies including environmental and related sectorial policies and strategies, which were developed, based on the provisions of the constitution of Ethiopia.

Table 3.1 below summarizes policies and strategies relevant to the proposed project.

Table 3.1: Summary of relevant policies and strategies

Policies/Strategies	Relevance
Environmental Policy,1997	The environment policy adopted in 1997 is Ethiopia's umbrella policy on environmental management Objective: Its overall objective is to improve and enhance health and quality of life for all Ethiopians, and to promote sustainable social and economic development through the adoption of sound environmental management principles. The specific objective of the policy relevant to the project include: 1. To conserve, develop, sustainably manage and support Ethiopia's rich and diverse cultural heritage; 2. Prevent the pollution of land, air, and water most cost-effectively; 3. To ensure policies and instruments support conservation of biological diversity; 4. To ensure that the environment of heritage sites is so managed as to protect the landscape, the monuments, and the artifacts or the fossils as the case may be; and 5. To give priority to waste collection and its safe disposal. Relevance to the Project: Environmental Policy of Ethiopia in particular EIA policies recognizes the need for development projects undertaken by ESIA to address social, socio-economic, political, and cultural impacts, in addition to physical and biological impacts and public consultations to be integrated within ESIA procedures. In addition, each ESIA shall include measures within the design process for both public and private sector development projects and inclusion of mitigation measures and accident contingency plans within E&S impact statements. This policy provides clear directives that are required in promoting sustainable project development and EEP needs to comply with this policy during all project stages.
National Updated Energy Policy of Ethiopia	The National Energy Policy, formulated in 1994, was updated in 2013. The broad objective of the energy policy is to meet the improved security and reliability of energy supply and be a regional hub for renewable energy, increase access to affordable energy, promote efficiently, cleaner, and appropriate energy technologies and conservation measures, build strong energy institution, ensure E&S safety and sustainability of energy supply and utilization and strengthening energy sector financing. Relevance to the Project: The policy stresses the need to integrate environmental sustainability into all energy initiatives for the production, transportation, and utilization of energy. It presents the requirement to introduce mandatory E&S impact assessment on new energy projects to assess the level of emissions of pollution and determine whether the project will have to be realized and on the type of necessary mitigation measures to be adapted as necessary.
Health policy	Objectives: The policy promotes occupational health and safety, development of environmental health, rehabilitation of health infrastructures, appropriate health service management system, carrying out applied health research, provision of essential medicines, and expansion of frontline and middle-level health professionals. Relevance to the Project: Occupational Health and Safety (OHS) provisions will be particularly important for the project, particularly during construction. The employees and workers at the project site shall be initially instructed on health and safety issues and be given the proper health and safety rules, equipment, etc.

Policies/Strategies	Relevance
Water Resources Policies	Objectives: The overall goal of the water resources policy is to enhance and promote all national efforts towards the efficient and optimum utilization of the available water resources for socio-economic development on sustainable bases. The policies are meant to establish and institutionalize environmental conservation and protection requirements as integral parts of water resources planning and project development. The Policy emphasizes the need to control and ensure that water bodies are protected from indiscriminately discharged industries waste water and other wastes and protect water bodies and water systems from pollution and depletion. Relevance to the Project: The developer is required to comply with stipulations of the policy in the use and exploitation of water resources. In case the construction of the proposed project may eventually have an impact on water quality in streams, or adjacent lakes, adequate measures Shall be implemented to avoid negative impacts.
Wildlife Policies and Legislation	Wildlife Development Conservation and Utilization Policy and Strategy was updated and approved in March, 2005. The main objectives of the Policy and Strategy include: ▪ Conserve and develop the country's wildlife and habitat; and ▪ Enable the resource contribute to the country's economic development and to the benefit of the people. The specific objectives of the policy include: ▪ To conserve, manage, develop and sustainably utilize the wildlife resource so that the country can drive the socio-economic and ecological benefit from the resource; and ▪ To enable the country to discharge its obligations assumed under the international treaties regarding the conservation and utilization of wildlife and pass the resource and benefits to the coming generation.
National Biodiversity Policy 1998	Objective: The key objective of this policy is to conserve, develop and utilize the country's biodiversity resources. Relevance to the Project: Integration of biodiversity conservation and development into federal and regional sectorial development initiatives and mobilization of international cooperation and assistance has been identified as the principal strategies for implementing the policy. The project must take note of the biodiversity of the project area and the regional biodiversity initiatives/strategies.
Revised National Biodiversity Strategy and Action Plan (2015-2020	The Ethiopian Revised National Biodiversity Strategy and Action Plan (NBSAP) was published in 2015. The main goals of the NBSAP are to address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society and awareness of the public and decision-makers on the value of biodiversity and ecosystem service. Ecosystem-based approaches of resource management are recommended as the main implementation strategy required to conserve and sustainably utilize biodiversity to be archived through sustainable management of resources such as participatory forest management, sustainable range land, and aquatic ecosystem management practice. Relevance to the Project: The strategy emphasizes the need to ensure the diverse value and opportunities derived from conservation and sustained use are recognized in all relevant public and private decision making such as national and local development. The project must give due emphasis to biodiversity resources in the proposed project area and its vicinity.

Policies/Strategies	Relevance
Cultural Policy of Ethiopia	Objective: Based on the Constitution, the Council of Ministers of Ethiopia endorsed the Cultural Policy of Ethiopia in October 1997 and amended it in 2016. The amended Federal Democratic Republic of Ethiopia Cultural Policy clearly states strategic issues and strategies regarding the conservation and protection of heritage resources of the country. Article 2 of the Policy states to systematically identify, develop, preserve and use the cultural, historical, and natural heritages of the peoples of Ethiopia, to sustainably apply them for economic, social, and human development, and to facilitate their study, documentation, visibility, and transfer to the next generation. It also devised implementation strategies, which includes: ▪ The country's heritages shall be protected and maintained following their cultural and historical values by devising and applying a heritage management system. ▪ Close relations shall be forged with communities and other partners to protect and manage the country's heritages. Moreover, the Policy puts down strategic statement regarding "Cultural Resources and Indigenous Knowledge. **Relevance to the Project**: In planning and implementation of the 132 kV power transmission project, consideration Shall be taken to protect cultural, historical, and natural heritages of the country in general and the project area in particular.
The National Conservation Strategy-1994	Objective: The National Conservation Strategy (NCS) which was initiated in 1994 takes a holistic view of natural, human-made, and cultural resources, and their use and seeks to integrate them into coherent framework plans, policies, and investment-related to environmental sustainability. Relevance to the Project: The national conservation strategy evaluated the state of the natural resources, the environment, and the development in Ethiopia aimed at ensuring sustainable use and management of natural resources. Hence, the proposed project Shall ensure protection, sustainable use, and management of the resource in the project area at different stages of the project.
National Policy on Women (1993)	This policy requires and emphasizes that government policy, laws, regulations, plans, programs and projects shall ▪ Ensure participation of women in the formulation of government policies, laws, regulations, programs and projects that directly or indirectly benefit and concerns women; ▪ Support and encourage participation and involvement of women in implementation and decision-making processes; ▪ Guarantee equal access of men and women to the country's resources. Relevance to the Project: The proposed project shall consider this policy to ensure women participation and women are benefited from the project during the various phases of the project.
National Social Protection Policy	The objectives of Social Protection Policy of Ethiopia are the following: ▪ Protect poor and vulnerable individuals, households, and communities from the adverse effects of shocks and destitution; ▪ Increase the scope of social insurance; ▪ Increase access to equitable and quality health, education and social welfare services to build human capital thus breaking the intergenerational transmission of poverty;

Policies/Strategies	Relevance
	▪ Guarantee a minimum level of employment for the long term unemployed and underemployed; ▪ Enhance the social status and progressively realize the social and economic rights of the excluded and marginalized; and, ▪ Ensure the different levels of society are taking appropriate responsibility for the implementation of social protection policy. Relevance to the Project: This policy applicable to the TL project to ensure social protection of project works, vulnerable groups and other members of the community during the various phases of the project.
Rural Development Policy and Strategies (ARDPS)	These Policy and Strategies were developed with a view to improving rural land administration and reducing the country's vulnerability to drought. The RDPS are an overarching policy and strategic framework incorporating the main principles of: efficient use of human resources, prudent allocation and use of land resources, agricultural development in line with agro-ecology, encouraging specialization, diversification and Commercialization of agricultural production, integration with other sectors, and improving agricultural marketing. Generally, the ARDPS states that Ethiopian who wants to make a livelihood from farming is entitled to have a plot of land free of charge. The government, as a custodian of the land, is responsible for land distribution and has the right to re-distribute existing holdings whenever it needs to do so to ensure access by all who require land as a means of engaging in an agricultural livelihood. It can also utilize land not being used by farmers for various purposes, as it deems necessary. If the government, for whatever reasons, takes land from peasants, it will fully compensate them for the capital and other resources invested on the land. It is in this context that land is referred to, as being government owned in Ethiopia.

3.1.3 Federal Proclamations, Regulations, and Directives

Some proclamations and regulations containing provisions for the protection and management of the environment that reflect the principles of the Ethiopian Constitution and Environmental Policy of Ethiopia have been prepared. The following table summarizes proclamations and regulations relevant to the proposed project.

Table 3.2: Summary of relevant Proclamations and Regulations

Proclamations/ Regulations/Directives	Relevance
Environmental and Social Impact Assessment Proclamation No. 299-2002	Objectives: This Proclamation has made EIA a mandatory legal prerequisite for the implementation of major development projects. The key objective of the proclamation on E&S Impact Assessment No. 299/2002 is to make EIAs mandatory for specific categories of projects implemented either by the public or by the private sector. The general provisions of the Proclamation outline the following processes for implementation and licensing as: 1. Implementation of any project that requires an EIA is subject to an authorization from the Environmental Protection Authority (EPA) or from Regional Environmental Agency (REA); 2. Any licensing agency shall, before issuing an investment permit, trade, or an operating license for any project ensure that the EPA or the relevant REA has authorized its implementation; 3. The EPA or the relevant REA (depending on the degree of expected impacts) may waive the requirement for an EIA; 4. A licensing agency shall either suspend or cancel a license that has already been issued, in the case that the EPA or the REA suspends or cancels the environmental authorization; 5. Approval of the ESIA or the granting authorization by EPA or the REA does not exonerate the proponent from liability for damage;
Environmental Pollution Control Proclamation No. 300-2002	Objective: This proclamation is promulgated to eliminating or, when not possible mitigate pollution as an undesirable consequence of social and economic development activities. The main objective of the proclamation on Environmental Pollution Control is to provide the basis for the set-up of standards on protection of ambient environment in Ethiopia and to endorse the respect of these standards. The proclamation prescribes the principle of the "polluter pays" for all individuals, businesses, industries, etc. Therefore, development projects shall minimize the generation of pollutants to an amount not exceeding the limit set by the relevant environmental standard and dispose of it in an environmentally sound manner (Article 4 (1)). In addition, the developers shall have the obligation to handle equipment, inputs, and products in a manner that prevents damage to the environment and human health (Article 4(2)). Any violation of these standards is a punishable act.
Establishment of Environmental Protection Organs (Proclamation No. 295/2002)	Objective: The objective of this Proclamation is to allocate mandates to separate organizations for environmental development and management activities on one hand and environmental protection regulations and monitoring, on the other hand, to ensure sustainable use of environmental resources and avoid possible conflicts of interest and duplications of effort. It is also intended to establish a system that fosters coordinated but differentiated duties among environmental protection agencies at federal and regional levels. The developer is required to get an environmental clearance certificate from the relevant environmental protection agency before project implementation.

Proclamations/ Regulations/Directives	Relevance
Solid Waste Management Proclamation **No. 513/2007**	Objectives: This proclamation sets the rules for sustainable management of wastes to achieve social and economic development out of projects and preserve nature and protect the environment. The development of transmission line projects will generate waste that will need to comply with this proclamation. A solid waste management plan shall be prepared and incorporated along with the E&S management plan. Measures to assure monitoring and verification of the proper implementation of the solid waste management plan shall be included in the environmental monitoring plan.
Directive on Overhead Electric Lines and Quality of Supply (no. EEA/1/2005	This Directive is issued by the Ethiopian Electricity Agency (currently replaced by Ethiopian Energy Authority) according to the authority vested in it by Articles 55, 67, and 69 of Electricity Operations Council of Ministers Regulations No. 49/1999. Article 6, 7, and 8 of this directive include the minimum standard distance of different voltage for clearance of overhead electric lines, clearance from other lines, and clearance from vegetation corresponding to electric lines from the ground for a road accessible to vehicular traffic, a building or structure, track of a small gauge railway/tramway system and clearance from vegetation as well as other lines.
Labour Proclamation 1156/2019	This proclamation provides various statements on working conditions and occupational health and safety conditions. The proclamation obliges that an employer shall take the necessary measures to adequately safeguard the health and safety of the workers. Components are as follows: women shall not be discriminated against as regards employment and payment based on their sex. It is prohibited to employ women on the type of work that may be listed to be particularly odious or harmful to their health. An employer shall not terminate the contract of employment of a woman during her pregnancy and until four months of her confinement reformulated by Labour Proclamation No.1156/2019 until four months after her confinement. Grant leave to pregnant women without deducting her wage; adhere to the occupational health and safety requirements provided in the proclamation; take appropriate steps to ensure that workers are properly instructed and notified concerning the hazard of their respective occupation and the precautions necessary to avoid accident and injury to health; provide workers with protective equipment, clothing, and other materials and instruct them of its use; and Ensure that the workplace and premises do not cause danger to the health and safety of the workers. The proclamation also states that no one may employ persons under 15 years of age. Public Health and Safety: Article 92 of the Labour Proclamation states the fundamental obligations of an employer concerning putting in place all the necessary measures to ensure that workplaces are safe, healthy, and free of any danger to the wellbeing of workers. In the same article the employer is obliged to take particular measures to safeguard the health and safety of the workers, as follows: ▪ To comply with the occupational safety and health requirements; ▪ Take appropriate steps to ensure that workers are properly instructed; ▪ Establish an occupational, safety, and health committee; ▪ Provide workers with protective equipment, clothing, and other materials and instruct them of its use; ▪ Ensure that all processes of work shall not be a source or cause of

Proclamations/ Regulations/Directives	Relevance
	physical, chemical, biological, ergonomic, and psychological hazards to the health and safety of the workers. Article 93 provides the obligations of workers of the required co-operation and practice of the regulation and instruction given by the employer to ensure safety, health, and working conditions at workplaces. Public health and safety addresses concerns of adjacent communities with regards to project construction and closeout of works, operation, and decommissioning activities, and that might negatively impact water, ambient air, or cause issues due to sanitation and wastewater / solid waste mismanagement. The project developer is required to comply with key areas and basic descriptions of hygiene and sanitation needs for enforcement of water and food sanitation; waste management, and ambient pollution controls. The construction of the transmission line project, its operations, and eventual decommission will need to fully comply with the labor proclamation. The enforcement of occupational health requirements and standards in workplaces also includes medical care, sickness benefit, old-age benefit, employment injury benefit, maternity benefit, invalidity benefit, and survivors' benefit.

3.1.4 Environmental Guidelines

The Ethiopian Environmental Protection Authority (EPA) has prepared several environmental guidelines. The guidelines provide a list of projects and activities, which require full, preliminary, or no EIA. Table 3.3 below summarizes details of major environmental guidelines relevant to the 132 kV substation and power transmission project.

Table 3.3: Summary of environmental guidelines relevant to the proposed project

No.	Name of Guideline	Summary
1	**EIA Guideline, 2000**	This Environmental Impact Assessment (EIA) Guideline document provides a background to environmental impact assessment and environmental management in Ethiopia. In essence, the document aims at being a reference material to ensure effective environmental assessment and management practice in Ethiopia for all parties who engage in the process. The guideline recommends implementing a cleaner production strategy- alternative products, production processes, raw materials, energy sources, preventing or reducing waste, waste recycling, re-use, and introducing water and energy-saving measures.
2	**EIA Procedural Guideline, 2003**	According to the environmental impact assessment procedural guidelines published by Ethiopian Environmental Protection Authority (EPA) (2003) the various stages to be followed in Environmental Impact Assessment (EIA) of public and private development projects include the following processes: **Pre-screening** Consultation: The application of pre-screening is proposed in recognition of its importance that before screening or scoping process the proponent and the respective environmental or sectoral agencies establish contact and hold a consultation on how best to proceed with the EA. **Screening:** The screening is the process of determining whether or

No.	Name of Guideline	Summary
		not a proposed project requires EA and the level at which the assessment should occur. At this stage, a proponent initiates the process by submitting the project profile or an Initial Environmental Examination (IEE) report after undertaking an Initial Environmental Assessment (IEA), to the relevant environmental agency. Based on this report, a decision would be made whether an EIA is required and whether a preliminary assessment or a full-scale EIA has to be undertaken. **Scoping:** It is the process that defines the key issues that should be included in the environmental assessment which aims at the identification of boundaries of EA studies, important issues of concern, significant effects, and factors to be considered. **Environmental Impact Study:** The purpose of undertaking an environmental impact study is to generate sufficient information on significant impacts that enable the preparation of an environmental impact study report. The steps of this study include impact prediction, impact analysis, consideration of alternatives, preparation of management plan (mitigation, monitoring activities), and preparation of contingency plan. **Reviewing:** The review process serves to examine and determine whether the EIA report is an adequate assessment of the environmental effects and sufficient and quality for decision making **Decision Making:** The possible decisions to be made by the environmental agency include a request for supplementary or new EA report, approval of the EA report or performance reports at various stages in the project cycle; approval of the implementation of the proposal with or without conditions; approval subject to ongoing investigation or rejection. **Systematic follow-ups (monitoring and auditing of impacts):** Systematic follow-ups are undertaken to ensure that the anticipated impacts are maintained within the levels predicted, to see that the unanticipated impacts are managed and or mitigated before they become problems, to realize benefits expected, and provide information for a periodic review and alteration of an impact management plan and to enhance environmental protection through good practice at all stages of the project.
		Licensing and Permit: To get an investment permit a proponent should submit a letter of approval or environmental clearance certificate to a licensing agency awarded by an appropriate environmental agency. Licensing agency is any organ of government empowered by law to issue an investment permit, trade or operating license, or work permit or register a business organization as a case may be. The licensing agencies are required to ensure that before issuing licenses and permits, proponents submit authorization or a letter of approval or environmental clearance certificate awarded by the appropriate environmental agency.
3	**Guideline for Environmental Management Plan, 2004**	The purpose of this guideline is to give guidance on the design and proper implementation of the Environmental and Social Management Plan (ESMP). The guideline outlines the necessary measures for the preparation of an Environmental Management Plan (EMP) for proposed developments in Ethiopia and the institutional arrangements for the implementation of EMPs.

3.1.5 Institutional Framework

Ethiopia has a federal-level government comprising various ministries and authorities responsible for setting national policy and legislation and regional structures with powers delegated to the regional government.

Several institutions are involved in environmental protection and management. At the federal level, the Ethiopian Environmental Protection Authority (EPA) is the main Environmental Protection Organ.

Regional environmental protection agencies have also been established, which decreed that each national regional state shall establish an independent regional environmental agency.

Table 3.4: Summary of Institutional Arrangement for environmental and related responsibilities of relevant institutions

No.	Institutional Arrangement	Relevance
1	**Federal**	The Ethiopian Environmental Protection Authority (EPA) is the Federal institution for managing the Environment of Ethiopia. In 2021, the Environment and Forest and Climate Change Commission was renamed and restructured to the Ethiopian Environmental Protection Authority EPA is responsible to ensure the realization of the environmental rights, goals, objectives and basic principles enshrined in the Constitution. As well as the Environment Policy of Ethiopia through coordinating appropriate measures, establishing systems, developing programs and mechanisms for the welfare of humans and the safety of the environment. It is mandated to formulate or initiate and coordinate the formulation of strategies, policies, laws and standards as well as procedures and up on approval monitor and enforce their implementation. It is also responsible for the synergistic implementation and follow-up of international and regional environmental agreements. Including those pertaining to hazardous chemicals, industrial wastes and anthropogenic environmental hazards in which Ethiopia is a party. The proposed project shall engage with the EPA to obtain the required environmental clearance and permits
		The Ethiopian Electric Power (EEP): EEP focuses on project development, the construction and operations of the generating plants supplying the national interconnected system, of the transmission network, including the exports to neighboring countries, and for overall planning and system management. The primary purposes of EEP re-establishment are to: ▪ Undertake feasibility studies, design, and survey of electricity generation, transmission, and substation; to contract out such activities to consultants as required; ▪ Undertake electricity generation, transmission, and substation construction, and upgrading. EEP shall contract out such activities to contractors as required; ▪ Lease electricity transmission lines as required; ▪ Sell bulk electric power; and ▪ In line with directives and policy guidelines issued by the Ministry of Finance and Economic Cooperation (MOFEC), negotiate and sign agreements with local and international finance sources. EEP's Environmental and Social Office (ESO): EEP's Environmental and Social Affairs Office is one of the functional areas of EEP to address the major E&S issues in the power sector development. The Office is responsible to ensure the power generation and transmission construction is environmentally sustainable and socially acceptable. It works in line with the environmental proclamations, policies, and international conventions. The Office is responsible to ensure EEP's power sector projects are in full compliance with the approved E&S management plan. ▪ Facilitating the integration of environmental concerns into electric power projects; ▪ Conduct or supervise environmental assessment for EEP; ▪ Ensure that mitigation measures, conditions and specifications are fully implemented during construction and resolving

No.	Institutional Arrangement	Relevance
		problems as encountered; ▪ Supervise restoration of the construction area to its natural state that was affected during the construction period of a project; ▪ Facilitate and ensure compensation payment for material damage in the implementation of power projects; ▪ Monitoring proper implementation during resettlement and post resettlement of communities; Submit ESIA and other environmental review documents to EPA for review and approval and clarify request; ▪ Conduct and supervise community safety program around electric power lines, plants, etc., and monitor its implementation; ▪ Conducting periodic environmental monitoring during construction activities (dumping areas, health, and safety, discharge of untreated water, dust pollution, etc.); and ▪ Advise on E&S issues for EEP investments
		Petroleum Energy Authority (EEA): EEA the former "Ethiopia Energy Authority" is now replaced by "Petroleum and Energy Authority" by Proc. No. 1263/2021 and serves as the power sector regulator with functions including licenses/permits, power purchase agreements, and tariffs. The Authority is also responsible for energy efficiency and energy conservation in particular to set-up standards, carryout testing, and labeling of appliances, industrial and commercial audits. EEA is also responsible for the negotiation of tariffs for fully off-grid Independent Power Projects (IPPs) The proposed power transmission project will need to engage with the appropriate authorities/ministries to implement and obtain the required permits.
		The Ministry of Labor and Skills (formerly Ministry of Labour and Social Affairs, MOLSA): According to Proclamation No.1263/2021): A Proclamation to provide for the definition of the powers and duties of the executive organs of the FDRE, Ministry of Labor and Skills shall have the following powers and duties: ▪ Initiate policies, strategies and laws with respect to labor and employment and skill; ▪ Establish a system to prevent occupational accidents and occupational diseases; issue occupational health and safety standards and supervise their implementation; ▪ Establish a system for the expansion of efficient, accessible and equitable job opportunity and employment; ▪ Monitor and follow up the proper implementation of labor laws; ▪ Encourage and support employers and workers to form association and thereby exercise their right of collective bargaining; register employers' association and trade unions established at national level; ▪ Coordinate and follow up the job creation initiatives including rural job creation conducted by different sectors, shall force others to send report.

No.	Institutional Arrangement	Relevance
		Authority for Research and Conservation of Cultural Heritage (ARCHH): ▪ Responsible for preservation of cultural and historical assets; ▪ Protection and conservation of cultural heritage from manmade and natural hazards; ▪ Has the power of issuing building permission for any work to be carried out in an area declared reserved by the Council of Ministers; ▪ Removal of any cultural ruins is to be carried out under strict supervision of the responsible authority, the ARCCH ▪ If buried archaeological remains or cultural heritage sites are discovered during excavation and site clearance , ARCCH will be called to conduct additional surveys during the construction and quarrying to determine if there is a need to change the location of the project layout (such as when the finding is irremovable remains of cultural or archaeological importance) & conservation, preservation, restoration. Construction will resume only after authorization is provided by the ARCCH. ▪ Receive reports to give appropriate direction on how to handle the discovered cultural resource. This may include conservation, preservation, restoration, or salvage.
2	**Regional**	*Regional Environmental Agencies/Bureau:* Proclamation 803/2013 empowers each region to establish its independent environmental agency with the responsibilities to coordinate and follow-up efforts to ensure public participation in the decision-making process, to play an active role in coordinating the formulation, implementation, review, and revision of regional conservation strategies as well as to foster environmental monitoring, and protection and regulation. ▪ Set up its environmental unit with the responsibilities to coordinate and follow-up to ensure that its activities are in harmony with national efforts to protect and preserve the environment. ▪ coordinate and follow-up efforts to ensure public participation in the decision-making process, to play an active role in coordinating the formulation, implementation, review, and revision of regional conservation strategies as well as to foster environmental monitoring, protection, and regulation. ▪ Provide environmental clearance certificate through reviewing ESIA reports with their respective region. Sectorial Environmental Units: Each Federal and Regional organization dealing with environmental matters is required by Proclamation No 803/2013 to set up its Environmental Unit with the responsibility to coordinate and follow-up to ensure that its activities are in harmony with national efforts to protect and preserve the environment. *Sector Offices from project Affected Sub Cities:* Will be involved in the oversight of the land acquisition process, review and verify the valuation process and compensation schedule, and participate in the implementation of the resettlement packages and compensation payments.

3.2 Energy Policy, Regulation, and Proclamation with Emphasis for Energy Transmission and Distribution

3.2.1 Energy Policy

The National Energy Policy, formulated in 1994, was updated in 2013. The broad objective of the energy policy is to meet the improved security and reliability of energy supply and be a regional hub for renewable energy, increase access to affordable energy, promote efficiently, cleaner, and appropriate energy technologies and conservation measures, build strong energy institution, ensure E&S safety and sustainability of energy supply and utilization and strengthening energy sector financing.

The specific policy objectives and policy instruments relevant to energy transmission and distribution include:

- To strengthen environmental and safety management practices with policy instruments such as enforcing environmental rules and regulations that reduce environmental pollution during power generation and transmission; and
- Provide adequate, reliable, and affordable electricity supply to meet growing power demand for socio-economic development with relevant policy instruments including expanding the electric power generation capacity through public investment and power transmission infrastructure and distribution network; supporting local manufacturing of power generation, transmission, and distribution equipment and materials and promoting R&D on electricity generation, transmission and distribution.

3.2.2 Proclamation on Energy

Energy Proclamation (No. 810/2013) was issued in January 2014. Under Article 4, the proclamation provides the powers and duties of the Ethiopian Energy Authority (EEA), which was established by the Council of Ministers Regulation No.308/2014.

The powers and duties of EEA, among several others, include the following:

- Formulate long-term, medium-term, and short-term energy efficiency and conservation strategy and program at national and sectoral levels;
- Issue energy audit code, energy efficiency standards code, energy efficiency labeling code, grid code, customers' service code, technical inspection code, quality service standard code, building electrical installation code, technical standard code, and other codes and supervise the implementations of same; and
- Approve electric power purchase and network service agreements.
- Article 16 states that any generation, transmission or distribution & sale, import or export licensee:
- May enter the land or the premises in the holding of any person after securing prior permission from the person to carry out the installation of new electricity supply, or to carry out activities required to connect, repair, upgrade, inspect or remove electrical lines; and
- Shall have the right to cut or lop trees or to remove crops, plants, or other things that obstruct the construction or operation of electrical works or may cause danger to electrical lines.

Article 17 deals with the Compensation issue and states that the licensee shall pay compensation, under the relevant law, for damages caused to the property of a landholder while performing the activities provided under Article 16 of this Proclamation.

Article 18 contains provisions on Expropriation of Land and it states that where the public interest so justifies, any generation, transmission, distribution and sale, import or export licensee may be made the beneficiary of an expropriation measure, taken following the relevant law, by the government over private landholdings.

3.2.3 Regulations on Electricity Operations

The Council of Ministers Regulations No. 49/1999 was issued in 1999 according to Article 28(1) of the Electricity Proclamation No. 86/1997 to provide the regulations of electricity operations in the country.

The provisions of the proclamation relevant to the proposed transmission line projects are described below. As part of the Standards of Safety, Technical and Quality of Service (general safety requirements for Transmission Lines and Substations):-

- Sub-article 47(2) prohibits undertaking any type of construction work or growing trees under electric power lines or within the distance of horizontal clearance thereof;
- Article 49 (Line Rout) states that in the process of line route selection, size and character of load, reliability of power sources, positions of substations, future expansion possibilities, safety, and E&S impacts as well as construction and operational costs shall be taken into consideration;
- Article 58 provides the requirements for Clearance from Buildings and Structures. Sub-article (1) states that the horizontal distance from conductors to any point of a building or structure shall, with maximum wind, be at least 4.5 meters. If the requirement stated under Sub-Article (1) cannot be fulfilled, the height of the conductor from the building or structure shall, at maximum temperature and with conductor broken in the neighboring span, be at least 5.5 meters;
- Similarly, Article 59 provides the safety requirements for Clearance from Trees. According to Sub-article (1), the vertical distance of conductors from trees shall be at least 1.5 meters plus the minimum distance between live and un-energized parts. In the case of fruit trees, the distance shall be 4m plus the minimum distance between live & un-energized parts as per Sub-article (2). The distances stated above shall be maintained by the expected tree growth (Sub-article 3).

3.3 Directive on Clearance of Overhead Electric Lines and Quality of Supply

This Directive (No. EEA/1/2005) was issued by the Ethiopian Electricity Agency according to the authority vested on it by Articles 55, 67, and 69 of Electricity Operations Council of Ministers Regulations No. 49/1999. The objective of this Directive is to set standards for the clearance spaces associated with transmission and distribution lines for the protection of persons from risk and property from damage, as well as to specify the quality of supply voltage.

Relevant articles of the directives to the proposed transmission line projects (with voltage 132, 230, and 400kV) are described below:

Article 6 of the Directive sets standards for the clearance of overhead electric lines.

Sub-Article 6.1.5 applies for a line with a voltage exceeding 132kV but not exceeding 230kV: 10.5 meters above a road accessible to vehicular traffic and 8.0 meters above any other point.

Article 7: Clearance from Vegetation

Sub article 7.1 states that the growth of trees under overhead electric lines shall not be allowed. An overhead electric line shall not, at any time, be closer to vegetation in all directions than the following minimum distances corresponding to the voltage of the line: Sub-Article 7.1.4 applies to a line exceeding 132kV but not exceeding 230kV 15.0 meters.

3.4 Legislation Governing Land Acquisition, Compensation, and Resettlement

The following section presents the review of the legal and regulatory framework governing land acquisition, compensation, and resettlement. The constitutional, federal legal, and administrative instrument framework governing the land acquisition, compensation, and resettlement include:

- The Constitution of Federal Democratic Republic of Ethiopia;
- Expropriation of Landholdings for public purposes and payments of compensation proclamation No. 1336/2024;
- Payment of compensation for property situated on landholdings expropriated for public purposes regulation (Regulations No. 472/2020).

3.4.1 Proclamation on Expropriation of Landholding (Amendment Proclamation No.1336/2024)

The federal proclamation to amend expropriation of land holding for a public purpose, payments of compensation, and resettlement (Amendment Proclamation No.1336/2024) "Expropriation of Landholdings for Public Purposes and Payment of Compensation, Proclamation No.1161/2019".

The new proclamation has become necessary to address the steadily growing urban population, which requires more land for building houses, infrastructure, and for the redevelopment of the urban slums to invigorate investment and other services. For development activities in rural areas, it defines the powers and responsibilities of authorities, which are in charge of property valuation, payment of compensation, and resettlement. It rectifies and fills gaps envisaged in the former law and includes other provisions to make the system of expropriation of land holdings and payment of compensation more appropriate and fairer and decision-making processes and grievances procedure related to the expropriation and payment of compensation more effective.

The proclamation states that the landholder whose land has been expropriated shall be paid compensation for the property on the land and the permanent improvement made on the land. The amount of compensation for the property on the land shall cover the cost of replacing the property anew.

The Proclamation requires compensation and resettlement for land expropriation to sustainably restore and improve the livelihood of displaced people.

Specific clauses from the expropriation of landholding for a public purpose, payments of compensation, and resettlement (proclamation No. 1336/2024) are highlighted in Table 3.5.

Table 3.5: Summary of Relevant Clauses from Proclamation No.1336/2024 (Amendment)

Theme	Relevant Sections
Institutional responsibility	Part IV, Article 25, requires and authorizes Woredas or Urban Administrations to organize consultative meetings with people that are going to be displaced on the type, benefits, and generally the process of the project. To pay compensation, implement resettlement packages, maintain a record of the property located on the expropriated land and support and ensure the improvement of the livelihood of displaced farmers and pastoralists and maintain records and evidence relating to the displaced.
Land Requiring Body	Article 9 states that land requiring body shall submit to the city or Woreda administration the decision that shows the size and exact location of the land to be expropriated at least one year before the commencement of the project. Sub-Articles (2) and (3) of Article 9 of the Proclamation are hereby deleted and replaced by the following new Sub-Articles (2) "When the land is expropriated for public purpose, payment of compensation and resettlement cost is covered by the following bodies: ▪ When the land is expropriated for infrastructure and social service development to be carried out by the federal government, the Regions Administration where the development is carried on shall have the duty to make the payment for asset compensation, support to the displaced people, economic loss compensation, social ties discontinuance and moral damage compensation, to the land holders; ▪ The money allocated for the compensation to be paid according to Sub-Article (2) letter (a) of this Article will be from the Budget support that the Federal government allocates to the Region every year, as well as from the Budget allocated to the Regions considering the compensation payment and the revenue from the Region; ▪ When the land is expropriated for public purpose other than what is provided under Sub-Article (a) of this Article, the land requiring body shall pay the required compensation and resettlement expenses to the City or Woreda Administration;" ▪ Subject to the provisions of Sub-Article (2) (b) of this Article, when an infrastructure or social service concerns two or more Woredas or City Administrations in the same region, the responsibility for coordinating the work will be to the Region, and when it concerns two or more regions. The relevant Federal Agency will coordinate the work; ▪ Service-providing infrastructure facility lines (Ethio Telecom, Electricity and Road Management) Federal service-providing facility infrastructure line relocation and reconstruction payment regarding the transfer or start-up and reconstruction cost of the assets as estimated by the service-providing facilities in accordance with the federal infrastructure plan that requires the assets to be moved Institutions are covered Sub-Articles (3): "the City or Woreda Administration shall not require handing over of the land unless compensation is made to the landholder in accordance with Sub-Article (2) of this Article."
Landholder notifications for expropriation, compensation, and land handover	Article 8 sub-articles 1-9 require the city Administration or Woreda: ▪ To consult landholders who are to be displaced at least one year before they handover their holdings on the type, benefits, and general process of the project ▪ To collect landholding rights and conduct inventory, amount, and size of all compensable properties from displaced people or their legal representatives. Properties added after the expropriation notification is given to the landholder are not compensated ▪ To notify the landholder or his agent in writing to hand over the land

Theme	Relevant Sections
	expropriated for public purpose with the description of the amount of compensation to be paid and/or the size and location of the land or house in-kind compensation The landholder may be forced to hand over the land within 120 (one hundred and twenty) days of the payment in cash or in-kind compensation; or after the cash is deposited in the bank. Where there is no permanent property or crop on the expropriated land, the landholder shall hand over his landholding within 30 (thirty) days of the payment of compensation to the City or Woreda Administration. Where the land expropriated is under illegal occupation, the occupant shall evacuate without claim for compensation within 30 (thirty) days of notice.
Removal of Utility Lines	Article 10 (1-6) indicates that the City or Woreda Administration shall request in writing the utility line owner organizations to reply if they have utility lines over or underground on the land to be expropriated. The owner of the utility lines on the expropriated land shall estimate the value of the utility line to be affected and send it with evidence to the City or Woreda Administration that requested it under sub-article 1 of this Article within 30 (thirty) days of receiving the request. The utility line-owner shall remove utility lines and clear the land within 60 (sixty) days after the payment has been made. The utility line-owner shall remove complex utility lines and clear the land within 120 (one hundred and twenty) days after the payment has been made.
Compensation	Article12 (1-6) highlights that a landholder is entitled to payment of compensation for his property situated on the land and for permanent improvements made on the land. The amount of compensation for the property on the land shall cover the cost of replacing the property anew. Compensation for permanent improvement to land shall be equal to the current value of capital and labor expended on the land. Article 13 further requires that in addition to the compensation payable under Article 12, rural landholders whose landholding has been permanently expropriated shall, in addition, be paid displacement compensation and land substitution. The amount of compensation given to the temporarily displaced people shall not be greater than the amount of compensation given to permanently displaced people. A rural landholder whose landholding has been provisionally expropriated shall be paid displacement compensation for lost income based on the highest annual income secured during the last three years preceding the expropriation of the land until repossession of the land. The following new Sub-Article (5) is added under article 23 of this proclamation: “5/ shall pay or cause to be paid appropriate compensation to land holders who have been displaced in accordance with Sub-Article (2) of Article 9 of this Proclamation/”
Valuation of Property	Article 17 (1-3) states that compensation for the property situated on land to be expropriated shall be evaluated by a certified private institution or individual consultant evaluators based on a nationally approved valuation method. Where there is no private certified property valuation organization or individual Consultant, the valuation shall be an Autonomous Government Organization established for this purpose. Where the organizations under sub-articles 1 and 2 of this article do not exist, it shall be, considering the location of the expropriated land evaluated by valuation committee established by the relevant Urban or Woreda Administrations comprising proper professionals.

Theme	Relevant Sections
Grievance resolution	Article18 (1-3) indicates that regional states and city administrations shall establish complaint hearing bodies and appeal hearing councils, which shall have jurisdiction to entertain grievances arising from decisions under this proclamation. Article 19 further states that any person who receives an order of expropriation of his landholding or who has an interest or claim on the property to be expropriated may file an application within 30 (thirty) days of service of the order to the Complaint Hearing Body, which is established as per sub-article 1 of Article 18 of this proclamation. The following new Sub-Articles (3) and (5) are added under Article 20 of this Proclamation and the existing Sub-Article (3) is renumbered as Sub-Article (4): "3/ Subject to the provision under Sub-Article (2) of this Article, in relation to the infrastructure and social service expansion projects carried out by the Federal Government, lawsuits filed against the infrastructure or social service implementing institution that implements the projects, in which the Federal Institution is a party, will be submitted to first instance court where the Headquarters of the Federal Institution that performs the infrastructure or social service is located cases related to infrastructure and service expansion projects carried out by the Regions, as well as cases related to border enforcement in which the federal institution is not a party, will be heard in the courts of the Regions and City Administration: 5/ According to Sub-Article (3) of this Article, following any kind of court arguments, an order to arrest the officials of the infrastructure of social service institution and execute the decision, an order to suspend the development work, the freeze the bank account or to deduct money directly from the account, An injunction can only be issued by the President of the Federal First Instance Court.
Under Article 26 of the Proclamation, the following new provision is added as Sub-Article (3): without prejudice to the other provisions laid down under this Article, The Council of Ministers shall issue regulations regarding the amendments to the provisions of this Proclamation.	
The following new provision is added as Sub-Article (2) of Article 27 by making the existing provision as Sub-Article (1): Subject to the provisions of Sub-Article (1) of this Article, any claim for compensation or settlement costs pending payment by existing projects before the effective date of this proclamation will be settled according the provisions of the Proclamation that were in force before the effective date of this Proclamation.	

3.4.2 Council of Ministers Regulations No. 472/2020

This regulation repealed the Council of Ministers Regulation on Payment of Compensation for Property Situated on Landholdings Expropriated for Public Purposes (Regulation No. 135/2007).

This regulation contains property valuation and compensation methods and formulae that shall be used in calculating compensation for various properties. It also contains lump sum compensation to be paid for severed social relationships and moral damages.

The regulation also sets the provision of land expropriation procedure, propriety right to develop the land to be expropriated, and provision of substitute of land, housing and resettlement, and shareholder rights of the displaced. The compensation items are categorized and presented in Table 3.6 below.

Table 3.6: Summary of Relevant Clauses from Council of Ministers Regulations No. 472/2020

Theme	Relevant Sections
Compensation Assessments	**Compensation for building (Article16**): The amount of compensation for a building shall be determined based on the current cost price of construction materials of the demolished building and current labor cost. It shall include also the current cost for constructing floor tiles of the compound, septic tank, and other structures attached to the building and the estimated cost of demolishing, lifting, reconstructing, installing, and connecting utility lines of the building. The amount of compensation for a building shall be determined based on the current market price per square meter for a similar building or the current cost of constructing a comparable building. **Compensation for fences:** The amount of compensation for a fence shall be determined by calculating the cost of an existing square meter or meter cube needed to rebuild a similar fence with the demolished fence or by producing a single value if the construction material of the fence cannot be estimated per square meter (Article 17). Compensation for property to be Relocated (Article 18): The amount of compensation for a relocated property shall be determined by computing the estimated costs of labor, material, and transport to be incurred at market value for removing, transferring, and installing the property. **Compensation for crops (Article 19):** The amount of compensation payable will be based on the amount of products available and the market value that the product could produce if the crop or vegetable were harvested. Compensation for crop surplus will be determined based on the current market price of the leftover produce. If one crop is produced more than once in one year, the amount of the crop produced during the year will be the sum of the products produced during the year. **Compensation for perennial crops (Article 20):** Where the perennial crop is ripe when the land is expropriated, the owner may collect the fruit within a prescribed time and where the owner fails to collect the products within the specified time, he shall be compensated for the production. Where the land is urgently required and the owner is not given adequate time to collect the production, he shall be compensated the market price of one-year production based on the average yield of similar perennial crop production in the area. The cost incurred to grow the perennial crop shall be calculated based on the local market and shall be paid. **Compensation for fruitless trees (Article 21):** The amount of compensation for trees shall be determined based on the level of growth of the tree, and the current local price per cubic meter or unit. The owner of trees may, instead of compensation, cut and collect the trees within the period fixed. **Compensation for protected grass (Article 22**): The amount of compensation for protected grass shall be determined based on the productivity of the land and the current local market price of the grass per square meter. The owner of protected grass may, instead of compensation, cut and gather the grass within the period fixed **Compensation for a licensed miner (Article 23):** The compensation shall be paid for the landholder by a licensed miner shall be determined based on mining law and compensation shall not be paid for a miner who holds land without a license.

Theme	Relevant Sections
	Compensation for burial-ground (Article 24): The amount of compensation for a burial-ground shall be determined by the estimated costs to be incurred for removing the gravestones, preparing another burial-ground, transferring and relocating the corpse, and for conducting religious and cultural ceremonies to the process. **Compensation for rural land (Article 25):** The amount of annual production of the three years of production shall be calculated at the present rate before the rural owner is removed. **Compensation for permanently displace rural landholder (Article** 26): Where substitute land to be given to the expropriated landholder and where the residential or commercial building of the holder is to demolished, he shall be given freely a comparable house for two years or a two year estimated rental value for his demolished houses a resettlement compensation. Where a substitute house is to be given to the displaced house owner, he shall be paid a one-year rent as resettlement compensation. **Compensation for permanently displaced urban landholder (Article 28**): Where substitute land to be given to the displaced urban landholder, and where the property is a residential or commercial building, a comparable building shall be given for two years free of charge or he shall be entitled to a two years rental based on the demolished building and current price. **Compensation for severed social relationship and moral damage (Article 30):** the amount of compensation for severed social relationship and moral damage shall be 25,000- 60,000
Valuation formula (Article 13 (1-6))	Compensation for building = Current building cost + permanent improvement cost Compensation for Fence = unit price of the fence in meter square /meter cube X total size of the fence in meter square /meter cube ` Compensation for relocated property = cost of removal + cost of loading/offloading+ cost of transport +cost of installation or and connection Compensation for crops = area per hectare x current market value of crop per quintal production per hectare in quintal +cost of permanent improvement on land Compensation for ripe perennial crops =yield of the perennial crop from a single plant /legs in kilogram x the number of plats legs + cost incurred to grow perennial crops with the current +cost of permanent improvement on land Compensation for unripe perennial crops = number of plant legs X cost incurred to grow Compensation for fruitless trees =(large trees in number X Local current price of one tree +(medium tree in number X local current price of one tree)+(small tree in number x local current price of one tree) +(number of seedling/unripe tree x local current price of one seedling unripe tree)+cost of permanent improvement on land Compensation for protected grass = area covered by the grass with square meter x yield of grass with a current local per meter square +cost of permanent improvement on land

Theme	Relevant Sections
	Burial Ground compensation =cost of corpse pickup burial ground preparation cost +cost of corpse transport and relocation +cost of religious and cultural ceremonies For rural landholder who does not receive replacement farmland displacement compensation = annual income x15 For rural landholder who is not granted replacement farmland and is temporarily removed developmental compensation = Temporary land lease rate per hectare x Annual income per year
Support for displaced people	Support for displaced rural landholders shall be determined by the directive that shall be issued by regional slates. Two years house rent shall be paid to displaced urban landholders and support units they build a new house where they are given substitute land
Providing substitute land or housing	Where the displaced are elderly and people with disabilities, three shall be given substitute land sin accessible and convenience areas as much as practical .substitute housing shall be provided where substitute land is not given and the displaced pays the full price at once
Resettlement package	Resettlement package: This package shall contain residential housing, livelihood option, social services like roads, health clinics, schools, religious sites, training counseling, credit access, etc.

3.5 Ethiopia's Climate Resilient Green Economy Strategy

In 2011, the Climate Resilient Green Economy (CRGE) strategy has been issued and coordinated by the then Environmental Protection Authority and the Ministry of Finance and Economic Cooperation (MoFEC) of Ethiopia. The CRGE is Ethiopia's overarching framework and a national strategy towards a green economy with the main objective to protect the country from the adverse effects of climate change and to build a green economy that will help realize Ethiopia's ambition to reach middle-income status before 2025.

The objective of the strategy is to identify green economy opportunities that could help Ethiopia reach its ambitious growth targets while keeping greenhouse gas emissions low. The CRGE strategy has identified four priority sectors (pillars): Agriculture and forestry, power and industry, transportation and buildings as instrumental that will support Ethiopia's developing green economy and for reaching middle-income status by 2025

Under the CRGE strategy, an energy and water sector resilience strategy has been developed with the following three objectives:

- To identify the economic and social impacts of current climate variability and future climate change on water and energy in Ethiopia (The Challenge);
- To identify priority ways that the water and energy sectors can build climate resilience and reduce the impact of climate variability and climate change (The Response); and
- To map the necessary steps to finance and implement measures in the water and energy sectors to build climate resilience in Ethiopia (Implementation) and deliver an integrated climate-resilient green economy.

Accordingly, climate resilience strategy for water and energy identified eleven strategic priorities under four major priority sub-sectors and one cross-cutting response. These include:

- Power generation/expansion (diversify energy mix & improve energy efficiency);
- Energy Access (improve the efficiency of biomass use and accelerate non-grid energy access);
- Irrigated and industrial agriculture (accelerate irrigation plans, support resilience of rain-fed agriculture, and balance water demands);
- Access to WASH (accelerate universal access to WASH and enhance the climate resilience of self-supply); and
- Cross-Cutting response (data systems for decision-support and accelerating the delivery of existing plans).

3.6 Regional and International / Multilateral Agreements

In addition to national environmental and social legislations, Ethiopia is also a party to some regional and international conventions and protocols about the environment which are of relevance to the project.

The international agreement to which Ethiopia is a signatory includes:

Convention on Biological Diversity, 1992: The three goals of this convention are the conservation of biodiversity; the sustainable use of the components of biodiversity; and the fair and equitable sharing of the benefits arising from the use of genetic resources.

The Convention was ratified by Ethiopia by Proclamation No. 98/94, on May 31, 1994. By Proclamation No. 362/2003; Ethiopia has ratified the Cartagena Protocol on Biosafety to the Convention on Biological Diversity.

United Nations Framework Convention on Climate Change (UNFCCC), 1992: Ethiopia ratified this convention through Proclamation No. 97/1994 on May 2/1994. This convention takes into account the fact that climate change has transboundary impacts. The basic objective of this convention is to provide for agreed limits on the release of greenhouse gases into the atmosphere to prevent the occurrence of climate change. It also aims to prepare countries to minimize the impact of climate change shall it occur.

The Kyoto Protocol was an international treaty which operationalizes the 1992 United Nations Framework Convention on Climate Change by committing state parties (i.e. industrialized countries and economies in transition), to limit and reduce greenhouse gases (GHG) emissions, based on the scientific consensus that global warming is occurring and that human-made CO_2 emissions are driving it in accordance with agreed individual targets.

The Paris Agreement is a legally binding international treaty on climate change. It was adopted by 196 Parties at the UN Climate Change Conference (COP21) in Paris, France, on 12 December 2015. It entered into force on 4 November 2016. Its overarching goal is to hold “the increase in the global average temperature to well below 2°C above pre-industrial levels” and pursue efforts “to limit the temperature increase to 1.5°C above pre-industrial levels.”

The Kyoto Protocol required only developed countries to reduce emissions, while the Paris Agreement recognized that climate change is a shared problem and called on all countries to set emissions targets. Ethiopia is a signatory to the Paris Agreement.

The Basel Convention, 1989: The objective of the Basel Convention is to control and regulate the transboundary movement of hazardous wastes and their disposal adopted on 22 March 1989. The Bamako Convention of 1991 plays a similar role at the level of the African continent.

Ethiopia ratified the Basel Convention through its Proclamation No. 357/2002. Its amendment was ratified through Proclamation No. 356/2002. The country has also ratified the Bamako Convention through Proclamation No. 355/2002.

The Stockholm Convention: In the year 2002, Ethiopia fully accepted and ratified the Stockholm Convention on Persistent Organic Pollutants by proclamation No. 279/2002 designed to ban the use of Persistent Organic Pollutants (POPs). The EPA has the full mandate to implement the Convention at the national level.

The Rotterdam Convention: The Rotterdam Convention on Prior Informed Consent (PIC) relates to prior informed consent in the context of international trade in specific hazardous chemicals and pesticides. The federal EPA is the organ responsible for the domestic implementation of this convention, which has been ratified by Ethiopia Proclamation No. 278/2002.

Convention on the protection of World Cultural and Natural Heritage: Each state party to this Convention recognizes the duty of ensuring the identification, protection, conservation, preservation, and transmission to the future generation of the culture and natural heritage situated on its territory, belongs primarily to the state. Ethiopia has ratified this convention in 1997.

Convention on the means of prohibiting and preventing the Elicit, Import, Export, and Transfer of ownership of cultural property: The states parties undertake to oppose such practices with the means at their disposal, and particularly by removing their causes, putting a stop to current practices, and by helping to make the necessary preparations. Ethiopia ratified this convention in 2003.

UNESCO's Conventions and Recommendations: Standards for the protection and management of cultural heritage, in general, have been issued by a variety of institutions; foremost among these is the United Nations Educational, Scientific and Cultural Organization (UNESCO); the International Council on Monuments and Sites (ICOMOS); the Council of Europe (COE); and national governments. Most of these standards pertain to material culture, often termed 'tangible' cultural heritage; however, there is increasing attention also to 'intangible' heritage, including the products and processes of artistic and creative expression.

The definition for 'tangible' cultural heritage used by the World Bank is similar to that of UNESCO and other cultural heritage organizations. It is: "movable or immovable objects; sites; structures; groups of structures and natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural

The UNESCO standard-setting documents consist mainly of conventions and recommendations. The five UNESCO conventions regarding cultural heritage treatment include armed conflict (1954); illicit trade (1970); world heritage (1972); underwater cultural heritage (2001); and intangible cultural heritage (2003). Of the five, the 1972 'World Heritage Convention,' which provides for the designation of World Heritage Sites, is by far the most popular and widely known. Ethiopia has been a member of UNESCO since 1976.

In addition to the conventions, from 1956 to 1980, UNESCO issued recommendations to encourage international and regional cooperation, and especially, improvement in the management of cultural heritage at the national level. Recommendations were issued on numerous subjects, including international competitions in architecture and town planning (1956); safeguarding the beauty and character of landscapes and sites (1962); prohibiting and preventing the illicit export, import, and transfer of cultural property (1964); preservation of cultural property endangered by public or private works (1968); protection, at the national level, of the cultural and natural heritage (1968); safeguarding and contemporary role of historic areas (1976) and protection of movable cultural property (1978).

ICOMOS Charters: ICOMOS, a non-governmental international organization comprised of cultural heritage practitioners, issues standard-setting documents in the form of charters. The ICOMOS charters are drafted by experts and agreed upon by the membership through a formal process. ICOMOS charters treat the following topics: conservation and restoration of monuments and sites (1964), historic gardens and landscapes (1982), conservation of historic towns and urban areas (1987), protection and management of the archaeological heritage (1990), underwater cultural heritage (1996), cultural tourism (1999), historic timber structures (1999), and built vernacular heritage (1999). National committees also may create charters of these the Australia ICOMOS Charter for Places of Cultural Significance of 1999 (the 'Burra' Charter), is by far the most influential and widely known.

3.7 World Bank Environmental and Social Framework (ESF) and Relevant Standards

3.7.1 Environmental and Social Standards (ESSs)

The World Bank ESF (2017) is framework which is used to screen, identify and manage E&S risks and impacts associated with the infrastructure projects and programs. The ESF consists of ten E&S Standards prepared to help Borrowers to manage the risks and impacts of a project and improve their E&S performance and those standards applicable and relevant to the proposed project are summarized below in Table 3.8.

Table 3.7: Summary of relevant World Bank's E&S Standards

ESSs	Summary
ESS1	**Assessment and Management of E&S Risks and Impacts**: ESS1 aims to identify, evaluate and manage the environment and social risks and impacts adopt a mitigation hierarchy approach including avoidance, minimize or reduce risks and impacts to acceptable levels, utilize national E&S institutions, systems, laws, regulations and procedures in the assessment, development and implementation of projects, whenever appropriate and promote improved E&S performance, in ways which recognize and enhance Borrower capacity. **Relevance**: The proposed power TL project is likely to cause E&S risks and impacts. Hence, ESS1 requires the borrower to assess, manage and monitor E&S risks and impacts associated with each stage of a project supported by the WB in order to achieve E&S outcomes consistent with the ESSs. Hence, assessment and management of E&S impacts and risks is required.
ESS2	**Labor and Working Conditions:** ESS2 focuses on the importance of employment creation and income generation in the pursuit of poverty reduction and inclusive economic growth. It requires the Borrower to promote sound worker-management relationships and enhance the development benefits of a project by treating workers in the project fairly and providing safe and healthy working conditions. **Relevance**: The proposed TL project will involve temporary or permanent workforce for the various phases of the project. Hence, the project will apply this standard.
ESS3	**Resource Efficiency and Pollution Prevention and Management**. ESS3 recognizes that economic activity and urbanization often generate pollution to air, water, and land, and consume finite resources that may threaten people, ecosystem services and the environment at the local, regional, and global levels. The Objectives of ESS3 are to: ▪ Promote the sustainable use of resources, including energy, water and raw materials ▪ Avoid or minimize adverse impacts on human health and the environment by avoiding or minimizing pollution from project activities. ▪ Avoid or minimize project-related emissions of short and long-lived climate pollutants. ▪ Avoid or minimize generation of hazardous and non-hazardous waste. ▪ Minimize and manage the risks and impacts associated with pesticide use. **Relevance**: Given the anticipated pollution impacts emanated from the project and the need for applying resource use efficiency including construction material, water and energy resource, ESS3 is also applicable to the power TL project.
ESS4	**Community Health and Safety**: ESS4 recognizes that project activities, equipment design and safety, infrastructure, and safety services can increase community exposure to risks and impacts. It also addresses Infrastructure and equipment design and safety of services which involves provision of services to communities and the corresponding responsibility of borrowers to avoid or minimize such risks and impacts. **Relevance**: The proposed project will support construction, operation and use of various equipment and infrastructure which will likely to cause adverse health and safety risks on the local community. Hence, this standard is applicable to this project.
ESS5	**Land Acquisition, Restrictions on Land Use and voluntary Resettlement**: ESS5 recognizes that project-related land acquisition and restrictions on land use can have adverse impacts on communities and persons which may cause physical displacement (relocation, loss of residential land or loss of shelter), economic displacement (loss of land, assets or access to assets, leading to loss of income sources or other means of livelihood) or both. **Relevance**: This ESS will be applied since the proposed project will likely cause land acquisition, at least loss of income sources or means of livelihood of the local community as a result of the project whether or not the project affect persons (PAPs) are required to move.

ESSs	Summary
ESS6	**Biodiversity Conservation and Sustainable Management of Living Natural Resources:** ESS6 recognizes the need to protect, conserve biodiversity; maintaining core ecological functions of habitats; sustainable management of primary production and harvesting of living natural resources and the need to consider the livelihood of project-affected parties, including Indigenous Peoples, whose access to, or use of, biodiversity or living natural resources may be affected by a project. **Relevance**: This ESS will be applied since the project activities may affect biodiversity and be located in areas providing ecosystem services upon which potentially affected stakeholders will be dependent for survival, sustenance, livelihood or primary income source.
ESS7	**Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local**: ESS7 applies to a distinct social and cultural group identified in accordance with paragraphs 8 and 9 of the ESS7. ESS7 contributes to poverty reduction and sustainable development by ensuring that projects supported by the Bank enhance opportunities for Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local communities to participate in, and benefit from, the development process in ways that do not threaten their unique cultural identities and well-being. **Relevance:** There are no ethnic minorities present in the project area and ESS7 is not relevant to it.
ESS8	**Cultural Heritage**: ESS8 recognizes that cultural heritage provides continuity in tangible and intangible forms between the past, present and future. People identify cultural heritage as a reflection and expression of their constantly evolving values, beliefs, knowledge and traditions. Cultural heritage, in its many manifestations, is important as a source of valuable scientific and historical information, as an economic and social asset for development, and as an integral part of people's cultural identity and practice. Sets out measures designed to protect cultural heritage throughout the project life cycle and general provisions on risks and impacts to cultural heritage from project activities. **Relevance**: This ESS8 will be applied to the proposed project which will undertake construction activity. The project shall identify any important physical cultural resources that need protection in the project area and its surrounding. A chance finds procedure shall also be considered if no physical cultural site is identified at the early stage of the proposed project.
ESS9	**Financial Intermediaries**: ESS9 sets out how FIs will assess and manage E&S risks and impacts associated with the projects of a World Bank financed FI operation; promotes good E&S management practices in the projects the FIs finance; and promotes good environmental and sound human resources management within the FIs. **Relevance:** There are no FIs engaged in the project and ESS9 is not relevant to it.
ESS10	**Stakeholder Engagement and Information Disclosure:** ESS10 recognizes the importance of open and transparent engagement between the Borrower and project stakeholders as an essential element of good international practice. Effective stakeholder engagement can improve the E&S sustainability of projects, enhance project acceptance, and make a significant contribution to successful project design and implementation. **Relevance**: The standard is relevant to the proposed project since stakeholder engagement and information disclosure is a priority for planning, implementing and ensuring sustainability of this project.

3.7.2 WBG EHS Guidelines

In addition to Environmental and Social Standards (ESSs), the WB has sector-specific Environmental, Health and Safety (EHS) guideline documents. The guidelines applicable to the proposed project include:

The Environmental, Health and Safety (EHS) General Guidelines which identifies detailed EHS management and technical recommendations of relevance to all development projects. The World Bank Group (WBG) General EHS Guidelines are organized into four focus areas including Environmental; Occupational Health and Safety; Community Health and Safety; and Construction and Decommissioning.

Also, the WBG EHS Guidelines9 on Electric Power Transmission and Distribution (2007) is applicable to the current project. The key provisions in these guidelines are summarized below.

a) Environmental

Terrestrial Habitat Alteration: Construction activities within the right-of-way of a project have a potential to transform natural habitats, depending on the characteristics of existing vegetation, topographic features, and installed height of the transmission lines.

Aquatic Habitat Alteration: While aligning power transmission and distribution lines, and associated access roads and facilities, it is possible that construction of corridors crossing aquatic habitats may disrupt watercourses and wetlands and require the removal of riparian vegetation. In addition, sediment and erosion from construction activities and storm water runoff may increase turbidity of surface watercourses.

Electric and Magnetic Fields (EMF): Electric and magnetic fields (EMF) are invisible lines of force emitted by and surrounding any electrical device (e.g., power lines and electrical equipment). Electric fields are produced by voltage and increase in strength as the voltage increases. Magnetic fields pass through most materials and are difficult to shield. Although there is public and scientific concern over the potential health effects associated with exposure to EMF (not only high voltage power lines and substations, but also from everyday household uses of electricity), there is no empirical data demonstrating adverse health effects from exposure to typical levels from power transmissions lines and equipment. However, while the evidence of adverse health risks is weak, it is still sufficient to warrant limited concern.

Hazardous Materials: Hazardous materials in this case include mainly insulating oils / gases such as Polychlorinated Biphenyls (PCB), sulphur hexafluoride (SF6), and fuels, in addition to chemicals or products for wood preservation for poles and associated wood construction material.

b) Occupational Health and Safety:

Live Power Lines: There is a possibility that workers may be exposed to occupational hazards from contact with live power lines during construction, maintenance, and operation activities on transmission lines.

Working at Height (on poles and structure): Like in the case of live power lines, workers may be exposed to occupational hazards when working at elevation during construction, maintenance, and operation activities on transmission lines.

Electric and Magnetic Fields (EMF): Due to the nature of the project, electric utility workers typically have a higher exposure to EMF than the public due to working in proximity to electric power lines.

[9]https://www.ifc.org/content/dam/ifc/doc/2000/2007-electric-transmission-distribution-ehs-guidelines-en.pdf

Exposure to Chemicals: Occupational exposures to chemicals include handling of pesticides (herbicides) used for right–of-way maintenance, etc.

c) Community Health and Safety

Electrocution: Hazards most directly related to power transmission and distribution lines and facilities occur as a result of electrocution from direct contact with high-voltage electricity or from contact with tools, vehicles, ladders, or other devices that are in contact with high-voltage electricity.

Electromagnetic Interference: The corona of overhead transmission line conductors and high frequency currents of overhead transmission lines may result in the creation of radio noise.

Visual Amenity: Power transmission and distribution are required to transport energy from power facilities to residential communities but may be visually intrusive and undesirable to local residents.

Noise and Ozone: Normally, noise in the form of buzzing or humming can often be heard around transformers or high voltage power lines producing corona. In addition, ozone, a colourless gas with a pungent odour, may also be produced. Neither the noise nor ozone produced by power distribution lines or transformers carries any known health risks

Aircraft Navigation Safety: Power transmission towers, if located near an airport or known flight paths, can impact aircraft safety directly through collision or indirectly through radar interference.

3.8 Comparison of the National Legislations and the WB's ESSs

The comparison of the national legislations and the WB's Environmental and Social Standards (ESSs) indicated that WB's ESFs have equivalent national environmental and land related legislations. However, there are few gaps between the WB's ESSs and the national requirements. In general, the WB's requirements appear to be more stringent than the national requirements.

The following table (Table 3.8) summarizes the gaps and proposed recommendations to bridge the identified gaps between the World Bank Environment and Social Standards (ESSs) and the respective national requirements relevant to the proposed TL and SS Works.

However, the World Bank framework (ESSs and EHS Guidelines) shall be given precedence in all cases, including to fill identified gaps. In instance of differences between the Ethiopian legislation and World Bank ESSs, the most stringent one shall be applied, including compensation-related regulation that provides the greatest benefit to PAPs.

Table 3.8: Summary of Comparison of Ethiopian Environmental and Social Legislation and WB's ESSs and recommendations to Address Gaps

WB ESS	Equivalent National E&S Frameworks	Gaps and recommendations to bridge identified gaps
ESS1	▪ EIA Proclamation (Proc. No. 299-2002) ▪ Various EIA Guidelines	▪ The national proclamation and Guideline are very much focused on the environmental aspect when compared with the social aspects, while ESS1 gives equal importance to both environmental and social impacts. Therefore, to fill the gaps of equivalent National E&S Frameworks, all ESS1 requirements shall be applied.
ESS2	▪ Labour Proclamation 1156/2019	▪ The National labour proclamation covers most of the requirements in ESS2. However, labour & working condition related to vulnerable and migrant workers are not addressed. Therefore, all ESS2 requirements shall be applied i.e project specific OHS management plan shall use appropriate good international practices/ESS2 and WBG EHS guidelines.
ESS3	▪ Hazardous Waste Management and Disposal Control Proclamation (Pro.No.1090/2018) ▪ Industrial Chemical Registration and Administration Proclamation (Pro. No.1075/2018) ▪ Environmental Pollution Control Proclamation No. 300-2002 and Solid Waste Management Proclamation (Proc.513/2007)	▪ The majority of ESS3 requirements are covered by existing national proclamations, which indirectly address resource use efficiency, pollution prevention and management aspects. But there is no clear & specific national legal framework related to efficient use of raw materials and water use efficiency (i.e that avoid or minimize water usage so that the project's water use does not have significant adverse impact on communities, other users, and the environment). Therefore, to fill the gaps in the national legal framework, all ESS3 requirements shall be applied.
ESS4	▪ *The Ethiopian Constitution:* Article 44 states that all persons have the right to a clean and healthy environment. ▪ *The Environmental Policy of Ethiopia*: States that the people are assured of their fundamental rights to an environment that is clean and healthy. ▪ *Public Health Proclamation (No 200/2000):* Prohibits disposal of untreated waste which can affect the health of human being. ▪ *Environmental Pollution Control Proclamation (No. 300/ 2002):* Advocates a 'polluter pays' policy and the right to close or relocate any enterprise if the activity being carried out poses a risk to human health or the environment.	▪ The national E&S frameworks indirectly address Community Health and Safety (CHS). But there is no clear and specific national E&S framework regarding CHS. Furthermore, these national requirements do not address the risks posed by project security personnel to those within and outside projects. Therefore, ESS4 requirements shall be applied.

WB ESS	Equivalent National E&S Frameworks	Gaps and recommendations to bridge identified gaps
ESS5	▪ Expropriation of landholding for public purpose, payments of compensation and resettlement Proclamation No.1336/2024 ▪ Council of Ministers Regulations No. 472/2022	*The national land related legislation* ▪ The Council of Ministers shall issue regulations regarding the amendments to the provisions of this Proclamation. However, the regulation is not issued. ▪ Does not specify avoidance or minimization of involuntary resettlement as a requirement. ▪ Any claim for compensation or settlement costs pending payment by existing projects before the effective date of this proclamation will be settled according the provisions of the Proclamation that were in force before the effective date of this Proclamation ▪ Does not address shareholder rights of the displaced people in development projects. Therefore, in case of differences, the highest or most stringent will prevail..
ESS6	▪ National Biodiversity Policy 1998 ▪ Revised National Biodiversity Strategy and Action Plan (2015-2020)	Both the national biodiversity policy and strategy & action plan cover most of the requirements of ESS6 but do not address the need to develop and implement biodiversity management plan for significant risks and impacts on biodiversity. Therefore, all ESS6 requirements shall be applied.
ESS8	▪ Cultural Policy of Ethiopia (2016) ▪ Research and Conservation of Cultural Heritage ▪ Proclamation (Proc. No. 209/2000)	The national cultural policy and the proclamation on research and conservation of cultural heritage (Proc. No. 209/2000) contain appropriate measures that must be taken to preserve, conserve, protect and treat both tangible and intangible cultural heritages. More specifically, Article 41 of the proclamation provides procedure to be followed and implemented during fortuitous discovery (chance finds) of cultural heritages. The proclamation addresses most of ESS8 requirements on tangible and intangible cultural heritage. Therefore, both the ESS8 and the national requirements shall be applied.
ESS10	▪ The Constitution of the FDRE ▪ Environmental and social impact assessment proclamation (proclamation No.299/2002)	In contracts to ESS10, the FDRE constitution and the ESIA proclamation do not specify the need: ▪ To identify and consult vulnerable groups of the community ▪ To prepare project specific stakeholder engagement plan ▪ To disclose project information to allow stakeholders to understand the risks, impacts, and potential opportunities of the project. Therefore, all the ESS10 requirements shall be applied.

4. Environmental and Socio-Economic Baseline Description

4.1 Physical Environment

4.1.1 Landform & Topography

The Addis Ababa City (AAC) is located in the high plateaus of central Ethiopia. It is situated between 8º 49' 55.9" and 9º 5' 53.8" North latitude and between 38º 38' 16.6" and 38º 54' 19.5" East longitude. The altitude of the city ranges from 2,050 masl at Akaki plain at the southern edge of the city to 3,000 masl at Entoto Mountain in the north.

The topography of Addis Ababa is rugged with many typical volcanic features. The central is characterized by gentle and rolling topography with patches of hills, while the southern and eastern parts are dominantly flat.

The topography of the corridors of the proposed overhead and underground transmission lines are dominantly rolling while certain areas are characterized by flat terrain. In addition, there are relatively small areas of hilly topography particularly along the Akaki River.

Major topographic features and slope categories along the transmission line route corridor are presented in Table 4.1. Figures 4.1 presents the typical land form and topography along the Black Lion – Gofa – Kality 1 overhead TL route are presented.

Table 4.1: Slope categories of the TL Routes

S. No	Average Slope (%)	Length in km	%
I	**Black Lion-Gofa Underground TL**		
1	Flat or almost flat (0 – 3%)	0.70	12.44
2	Gently sloping (3 – 8%)	3.61	63.94
3	Moderately sloping (8 – 15%)	1.33	23.55
4	Sloping (15 – 30%)	0.004	0.07
	Total	***5.64***	***100***
II	**Gofa-Kality I Overhead TL**		
1	Flat or almost flat (0 – 3%)	1.17	12.63
2	Gently sloping (3 – 8%)	4.20	45.30
3	Moderately sloping (8 – 15%)	3.23	34.89
4	Sloping (15 – 30%)	0.56	6.07
5	Steep (> 30%)	0.10	1.11
	Total	***9.26***	**100.00**
II	**Weregenu-Kotebe Underground TL**		
1	Flat or almost flat (0 – 3%)	1.30	29.86
2	Gently sloping (3 – 8%)	2.34	53.62
3	Moderately sloping (8 – 15%)	0.65	14.95
4	Sloping (15 – 30%)	0.07	1.57
	Total	***4.36***	***100.00***

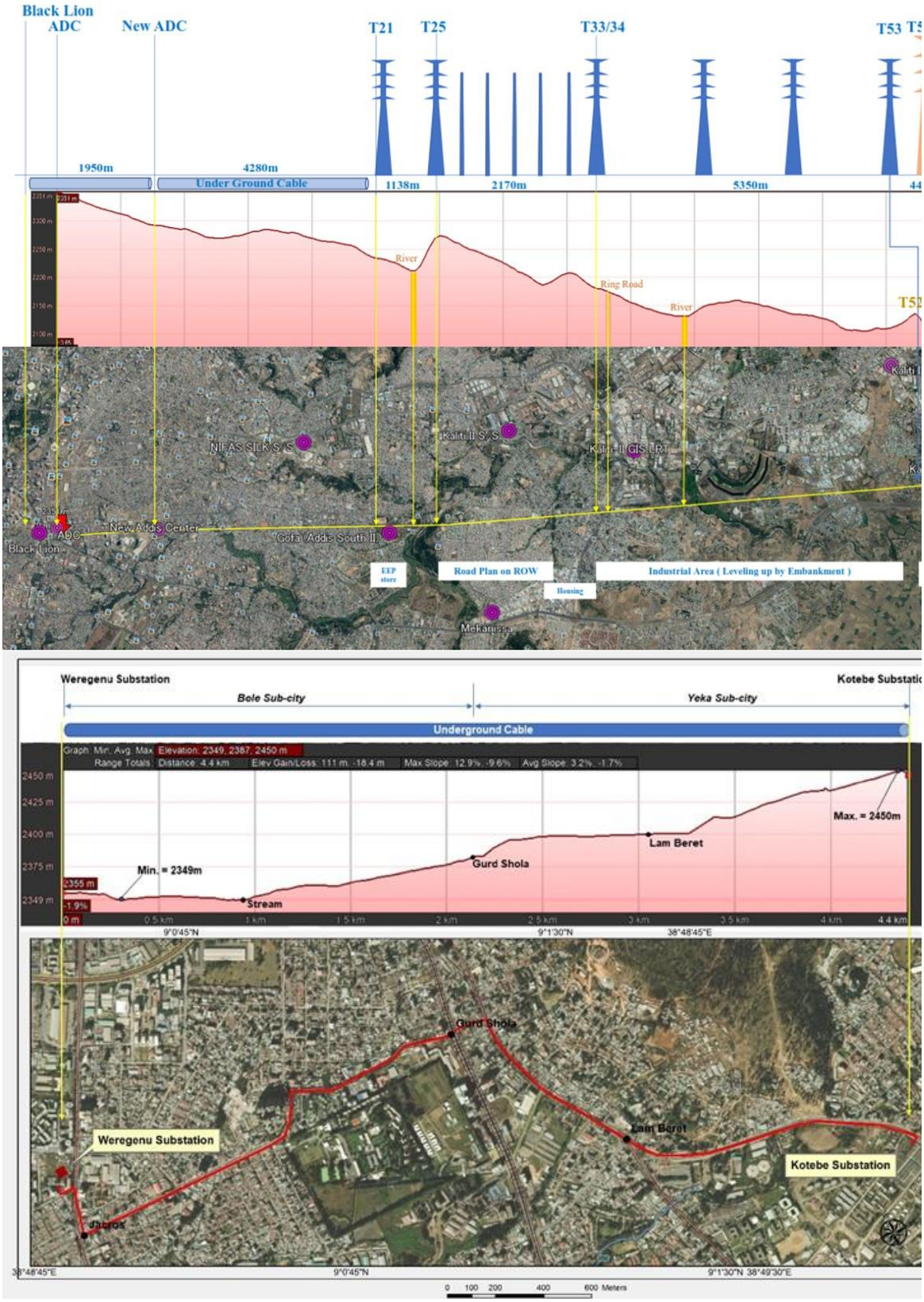


Figure 4.1: Elevation Profile Map along the Black Line - New Addis Centre – Kality and Weregenu – Kotebe UG (below) Power TL Routes Line

4.1.2 Climate

Rainfall: Addis Ababa falls within the central highlands that has about seven rainy months from March to September. The main rainy season (*Kiremit*) extends from June to September, with July and August presenting the highest average rainfall of 280 mm and 290 mm respectively. In addition, small rains occur between March and May. In general, the period from November to January is the driest season.

According to the climatic data obtained from the Ethiopian Meteorology Institute for the year 2019 to 2024, the average annual rainfall in Addis Ababa and Akaki towns is 1302 mm and 1075 mm respectively. Based on this data the rainy season extends from April to September and the main rainy season is from June to September. July and August receive the highest average rainfall of 320 mm and 269 mm respectively in Addis Ababa. More than 72% of the annual rainfall occurs from June to September. The temporal variations of mean monthly rainfall in Addis Ababa and Akaki towns are depicted in Figure 4.2.

Temperature: The city is characterized by a subtropical highland climate, with temperature differences of up to 10°C, depending on the elevation. The city's proximity to the equator means that temperatures do not fluctuate much during the year. Highest average temperatures (26 – 27°C) occur during February to May and lowest average temperatures (9 - 10°C) occur during November to January.

As per the data obtained from the Ethiopian Meteorology Institute for the year 2019 to 2024, the mean annual maximum temperature in Addis Ababa city varies from 21.5ºc in July to 26.6ºc in March. Similarly, the mean annual minimum temperature ranges from 9ºc in December to 13ºc in April. The hottest months are from January to May and the coldest months are in November and December. The monthly mean temperature variations in Addis Ababa are shown in Figure 4.2.

Climate change refers to any change in the current climate, attributed directly or indirectly to human activity, to which is added the natural climate variability observed over comparable time periods. It is widely accepted by the scientific community that climate pattern worldwide is already changing and that the trend will be towards an overall increase in average air temperature, greater variability in rainfall regime and the increased occurrence of extreme situations such as flooding phenomena, cyclones and extended periods of drought. However, theProject construction period is relatively short and noticeable changes in the climate may not observed. Therefore, potential climate change will not be relevant for example in terms of availability of water resources, frequency of extreme events and changes to temperature.

The Addis Ababa Power Supply Reinforcement Project is aligned with the national environmental and energy policies recommended, in order to enable the fulfilment of international commitments in reducing greenhouse gas (GHG) emissions, with particular emphasis on the targets set out in the Paris Agreement, and resulting from the 21st Conference of the Parties to the United Nations Framework Convention on Climate Change (COP21). This Faramework signed by Ethiopia.

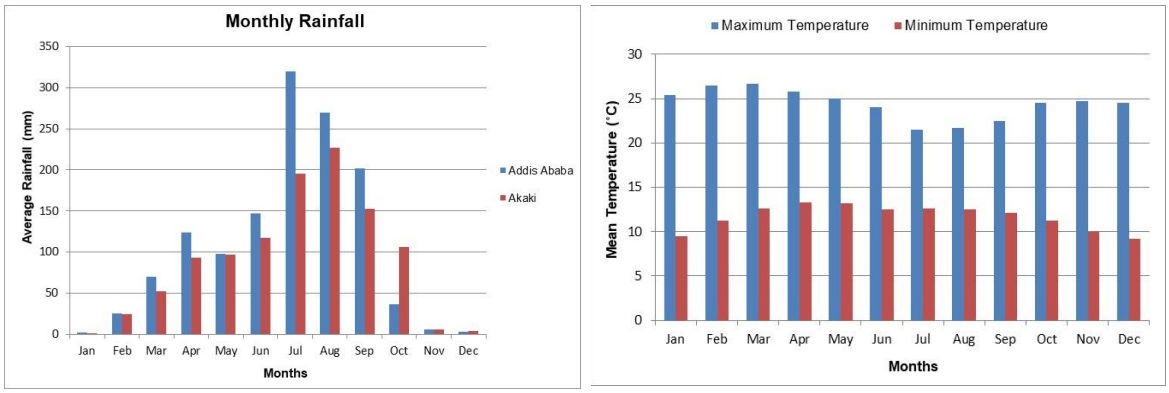


Figure 4.2: Monthly Rainfall Pattern (left) and Mean Temperature Variation (right) at Addis Ababa and Akaki Meteorological Stations

4.1.3 Land Use/Land Cover

The land use and cover was assessed to determine the categories and extent of land use and land cover within the TL corridor. The land uses that will be impacted by the proposed power transmission lines and substation project was identified and categorized.

According to the study conducted by Addis Ababa City Environmental Protection Authority (EPA, 2022) about 72% of Addis Ababa city is classified as a built up area in 2021 and is the largest overall land use type. Other land uses include agriculture land (17%), forest land (7%), and water body (4%). The forest land is dominated by plantation forests (mainly eucalyptus plantations) that cover the northern and north-western parts of the city (the Entoto Mountain & its foot).

The predominant land use/land cover of the corridor of the transmission routes is built up areas comprising residential and commercial areas as well as road infrastructure. Crop lands are also significant in the corridor of the Kality 1 – Gofa overhead TL; Photo 2 below illustrates examples of land use/ land cover types traversed by the overhead TL. Vegetables are mainly grown on the banks of Akaki river and its major tributary through irrigation by diverting the river water. Elsewhere rain-fed cultivation is practiced to produce mainly cereal crops including Teff, wheat and maize. Other land use/land cover types include grassland/ rangeland and forest/ trees cover mainly on hillslopes and along the Akaki river.

The land cover types along the Gofa – Kality 1 overhead TL are classified into four land cover classes. The land cover map (Figure 4.3) shows that the power line crosses built-up areas, agricultural lands, tree plantation areas and grassland/rangelands. The dominant land use/land cover traversed by the OHTL is built-up areas that cover for about 19ha or 79% of the total 26m wide corridor (RoW). Constructed areas are followed by crop lands, rangeland, and trees cover comprising about 14%, 4.6% and 2.5% of the TL RoW respectively. The built-up areas are dominated by residential areas followed by commercial establishments, and road infrastructure

The land use/land cover along the BLL-NADC-Gofa and Weregenu-Kotebe underground transmission lines is predominantly constructed areas. It comprises residential and commercial areas, international & government organizations, various enterprises, social services, religious institutions, and road infrastructure.

Table 4.2 below presents the types and coverage of land use and land cover traversed by the Gofa – Kality power TL.

Table 4.2: Land Use/Land Cover Types along the Gofa – Kality 1 TL Route

S/N	Land Use/Land Cover Types	Length (Km)	Area (Ha) within 26m Corridor	Percent (%)
1	Trees plantation	0.23	0.60	2.48
2	Agriculture land /Crops	1.33	3.46	14.33
3	Built-up Area	7.28	18.93	78.60
4	Rangeland	0.43	1.12	4.64
Total		**9.27**	**24.11**	**100.0**

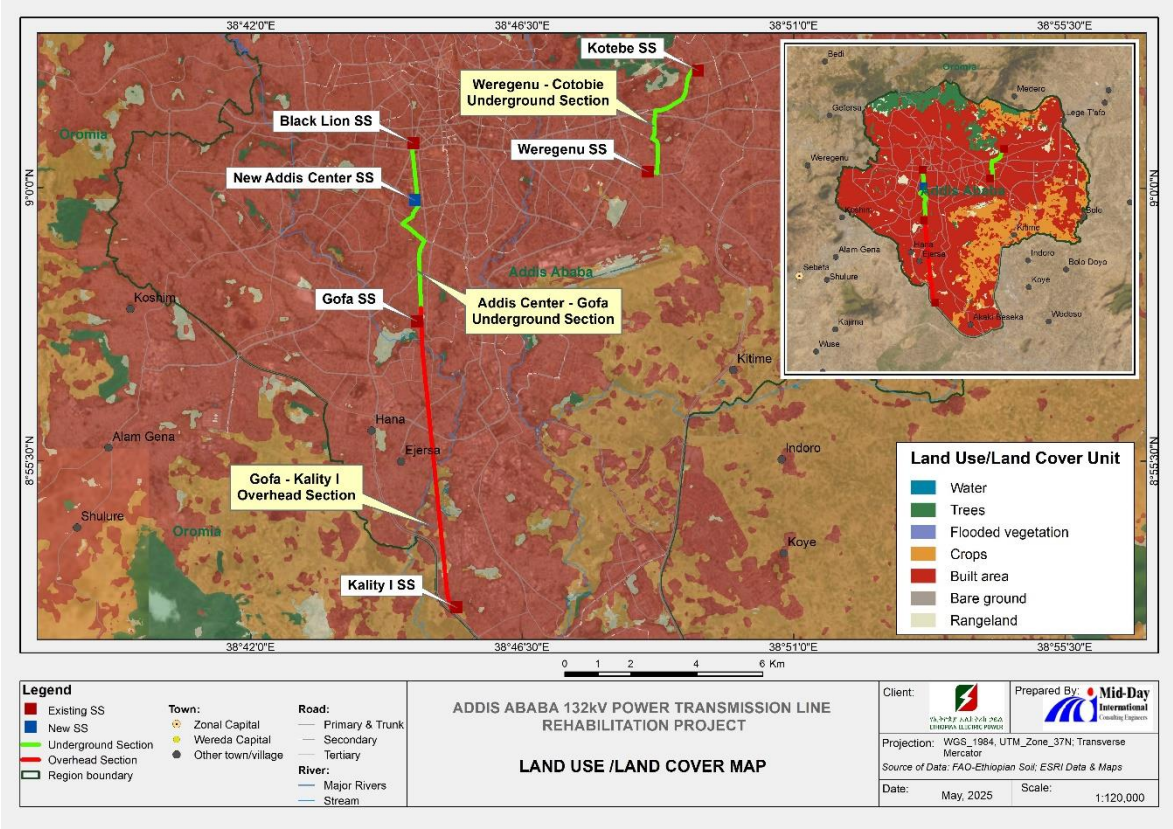


Figure 4.3: Land Use/Land Cover Map of the Power Transmission Routes Corridor

a) Extensive Teff farm between TR-48 & TR-50 on rolling terrain

b) Flat landscape around TR 44 cultivated dominantly for Teff production

c) Densely built area for residential use around TR-38

d) Asphalt road infrastructure built along gently sloping landscape bn TR-26 & TR-30

e) Mixed forest cover on hilly terrain bn TR-23 & TR-24 on right side of Akaki river, dominated by plantation trees

f) Grazing land bn TR-48 & TR-49 on rolling topography

Photo 1: Main land use/land cover types and topography along the Gofa - Kality 1 OH TL

4.1.4 Soils

Three major soil types are identified in Addis Ababa. These include Vertisols, Nitisols and Luvisols. Vertisols are dominant covering about 55.4% of the city and these soils are characterised by swelling when wet and cracking when dry, which makes cultivation and construction difficult and problematic. Nitisols cover about 31.4% of the city while Luvisols comprise around 12.5%.

With regards to the power transmission routes, the corridor of over 89% of the overhead TL is characterized by Vertisols soil type, and the remaining is covered by Eutric Nitosols. The corridor of both the Black Lion - Gofa and Weregenu - Kotebe Underground transmission routes is entirely covered by Eutric Nitosols. The soil types are shown in Table 4.3 and Figure 4.4 below.

Table 4.3: Major soil types along the Overhead and Underground TLs Corridor

S/N	Project Component	Major Soil Types	PTL	
			Length (km)	%
I	Gofa - Kality 1 Overhead TL	Pellic Vertisols (Vp)	8.28	89.42
		Eutric Nitosols (Ne)	0.98	10.58
		Total	***9.26***	***100***
II	Black Lion - Gofa Underground TL	Eutric Nitosols (Ne)	5.64	100
III	Weregenu - Cotobie Underground TL	Eutric Nitosols (Ne)	4.36	100
	Total for the Project	Eutric Nitosols (Ne)	10.98	57
		Pellic Vertisols (Vp)	8.28	43
		Total	**19.26**	**100**

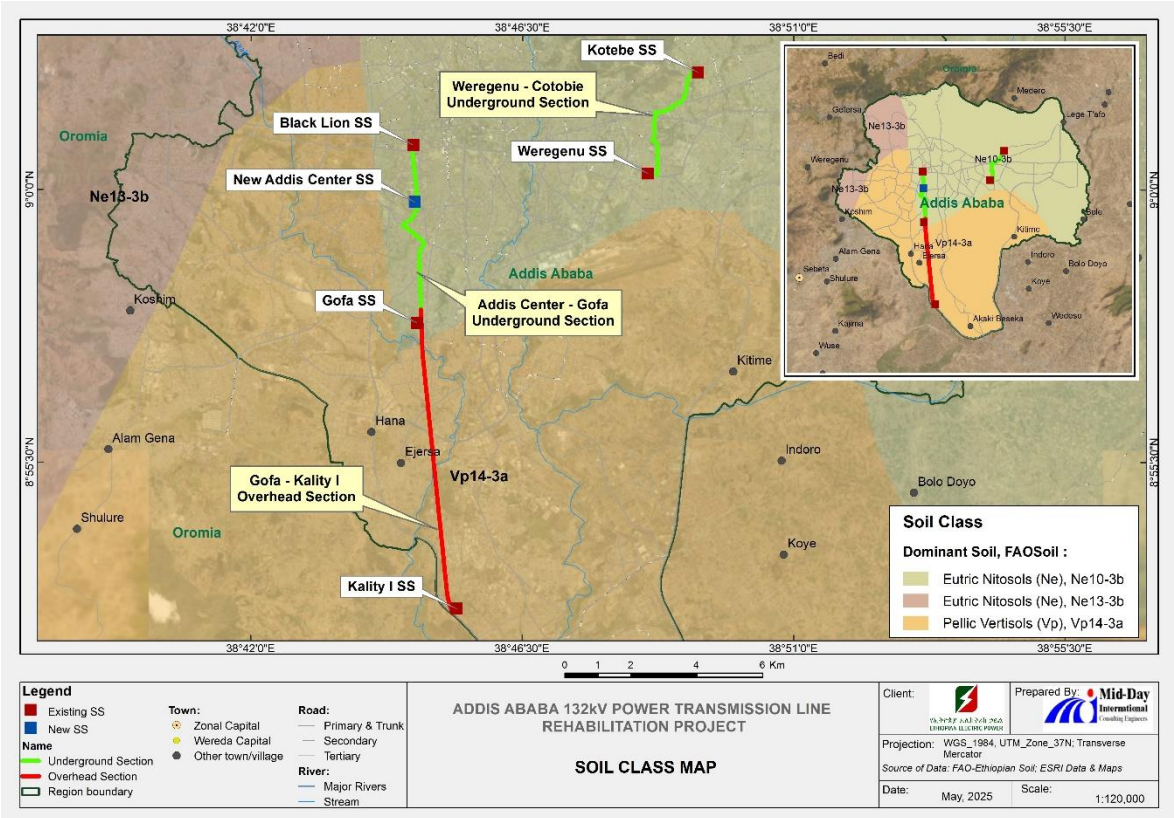


Figure 4.4: Soil Map along the Overhead and Underground TLs Corridor

4.1.5 Geology

According to the Ethiopian Geological Surveys Institute (1996) the geology of Addis Ababa constitutes Late Tertiary to Quaternary Volcanic to Sedimentary rocks, mainly of Bishoftu Formation (NQtb). These are plio-pleistocene basalt flows associated with scoria on the escarpments. The geological formation types of the project power transmission routes corridor are shown in Table 4.4 and Figure 4.5 below.

Table 4.4: Major geological formations of the TLs corridor

S/N	Project Component	Type of Geology	Description	PTL Length	
				Length, km	(%)
I	Black Lion - Gofa Underground TL	Nazret Series	Ignimbrites, unwelded tuffs, ash flows, rhyolitic flows, domes and trachyte.	5.64	100.00
			Total	***5.64***	***100.00***
II	Gofa - Kality 1 Overhead TL	Bishoftu Formation	Alkaline basalt and trachyte.	3.55	38.34
		Nazret Series	Ignimbrites, unwelded tuffs, ash flows, rhyolitic flows, domes and trachyte.	5.71	61.66
			Total	***9.26***	***100.00***
III	Weregenu - Kotebe Underground TL	Alage Formation	Transitional and subalkaline basalts with minor rhyolite and trachyte eruptive.	1.03	23.62
		Nazret Series	Ignimbrites, unwelded tuffs, ash flows, rhyolitic flows, domes and trachyte.	3.33	76.38
			Total	***4.36***	***100.00***

Source: Geological Map of Ethiopia (1995), Geological Survey of Ethiopia (GSE)

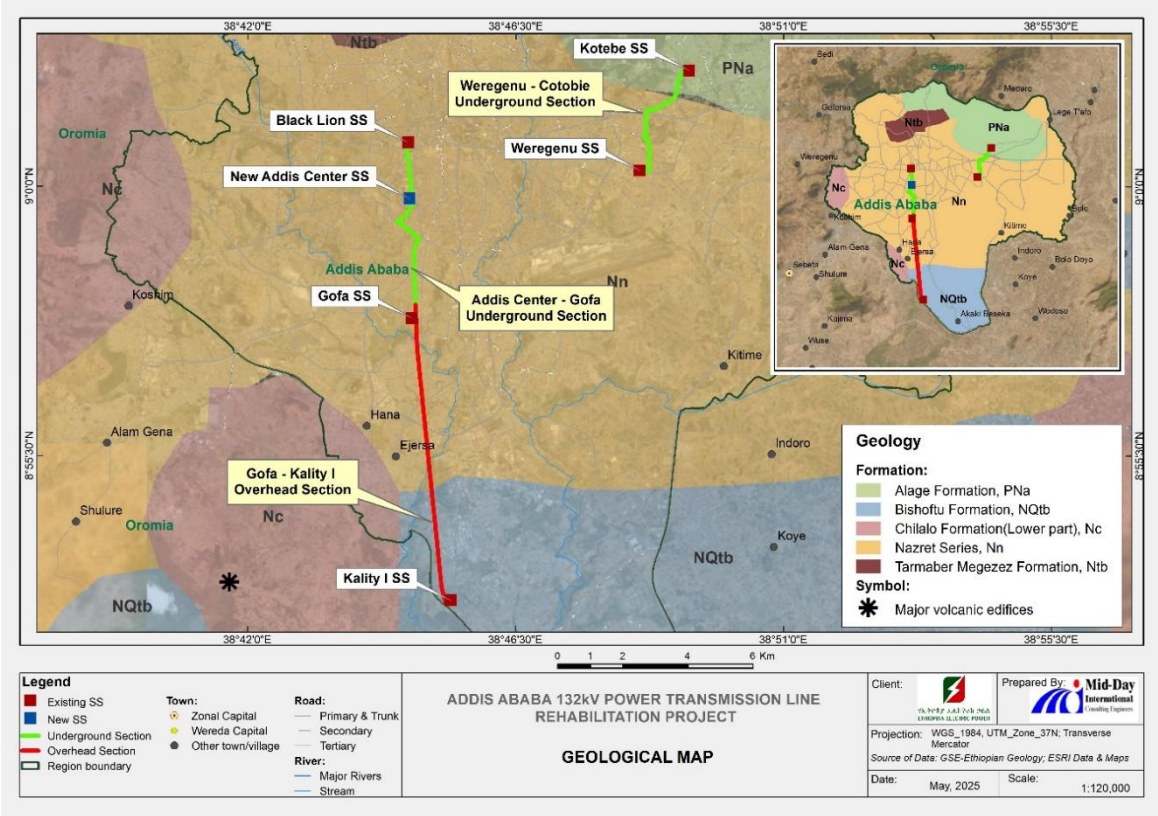


Figure 4.5: Geological Formation of the Power Transmission Routes Corridor

4.1.6 Drainage and Water Resources

Addis Ababa is situated in the upper part of the Awash River system. The river rises on the High plateau near Ginchi town west of Addis Ababa and flows along the rift valley, and terminates in Lake Abbe on the border with Djibouti. The drainage system of the city is generally in the north to south direction. It is drained by numerous streams, among which Kebena, Little Akaki and Great Akaki rivers are the major ones. All the streams finally join the Great Akaki River, which has a catchment area of 917 km^2 at the bridge on the Lebu – Akaki main road. Akaki River is a tributary of Awash River. Of the streams crossed by the project transmission lines, Little Akaki is the largest river and is crossed by the Gofa - Kality 1 overhead TL twice that is between TR-23 & TR-24 and between TR-37 & TR-38 (see Photo 2 and Figure 4.6 below).

The streams draining through Addis Ababa are highly polluted due to uncontrolled disposal of municipal sewage, industrial wastes and solid wastes into the water bodies as well as urban runoff water or storm-water entering the streams during the wet seasons. Most of the wastewater reaches the streams untreated, seriously polluting the water bodies. According to the Addis Ababa City Atlas (2015) the discharge of untreated effluents and wastewater from industries, households and institutions are the main sources of water pollution in the city. Same source indicates that industrial wastewater is the primary cause of water pollution followed by domestic wastewater and human excreta. Wastewater is discharged directly into streams while several of them are important sources of water for small scale farmers in and around the city for producing vegetables and fodder for livestock. Most industries release their effluents containing pollutants into the natural environment including streams and rivers without any treatment, causing serious environmental pollution with serious health and social effects on those exposed to it. Use of wastewater for producing vegetables through irrigation is likely to pose high public health risks.

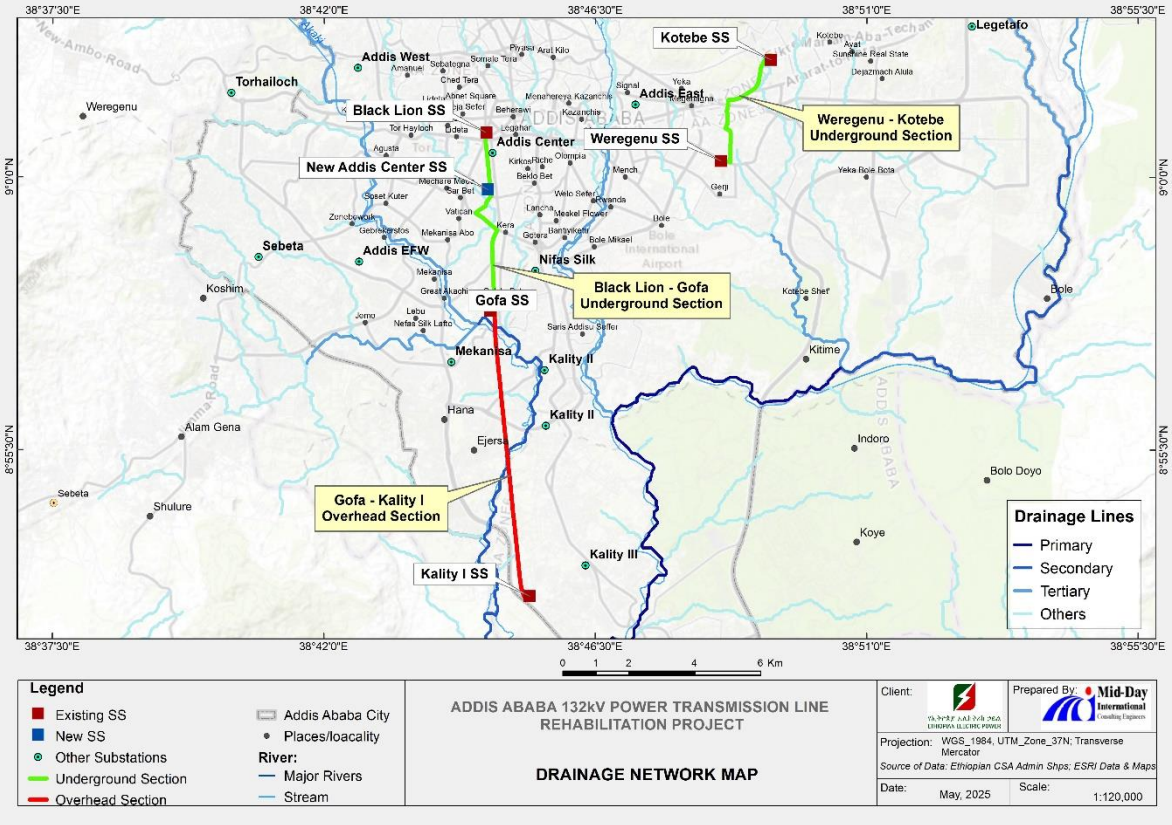


Figure 4.6: Drainage Network Map in and around the project Influence Area

a) Highly polluted Akaki river crossed by the OH TL between TR-23 & TR-24

b) Polluted Akaki river traversed by the OH TL between TR-38 & TR-39

Photo 2: Akaki River crossed by the Gofa - Kality 1 overhead TL

4.1.7 Air Quality

According to some data sources air quality in Addis Ababa is considered to be poor, mainly due to the high levels of traffic and the use of old motor vehicles. C40 study through CAP-AQ showed that the $PM_{2.5}$ annual average concentration was found 33 µg/m³ in 2016 (AA EPA; C40, 2021b). The World Bank Report has shown the air pollution status of the city from the year 2016 to 2020 using the data from air quality sensors in the city such as two high graded air quality stations managed by US Embassy, Black Lion Hospital and other low cost sensors. This analysis aims to estimate $PM_{2.5}$'s impact on health during a typical year by using exposure averages across 2016-2019 as the basis, which corresponds to 34 µg/m3 (Xie et al., 2021).

In addition, according to Van Donkelaar et al. (2019), the air quality status of the city was between 22 to 42 µg/m^3 which was different spatially across the city in 2016 (AA EPA, 2021). Further, the estimation from the US Embassy-managed air quality monitoring at the Embassy and International School measurement of PM 2.5 average hourly measurement has shown 20.3 and 30.8 µg/m^3 for the year 2021 respectively (AA EPA, 2021). These figures are higher than the national air quality standard and WHO air quality guidelines of 15 µg/m3 (EPA et. al., 2003) and 5 µg/m3 (WHO, 2021) respectively.

Towards the end of 2020, the state of the air quality was classified as being "Moderate" according to recommendations by the World Health Organization (WHO). The recorded figure was 76 US AQI with the main pollutant being the fine particulate matter, PM2.5 with a concentration of 24µg/m³. The WHO states any figure up to 10 µg/m³ is their target figure, between 10 and 12 µg/m³ is classed as "Good" and 12.1 – 35.4 µg/m³ is classed as being "Moderate". In 2019, the average PM2.5 level was 20.1 µg/m³ which did not vary too much throughout the whole year. Previous years returned figures of 27.1 µg/m³ and 26.9 µg/m³ for the years 2018 and 2017 respectively (IQAir, 2022).

The US Embassy's air quality monitoring data gathered at two locations - one at the Embassy and the other at International Community School (ICS) reveals a moderately polluted atmosphere. Air quality index (AQI) as a measure of PM2.5 (fine particulate matter) readings from the US system showed a reading ranging between 61 and 65. On 28 July, 2018 AQI reading was 63 (min. 42, max. 163) at US Embassy and 87 (min. 61, max. 161) at ICS. With regards to health implications, this level of air quality is generally acceptable. However, for some pollutants there may be a moderate health concern for people who are

unusually sensitive to air pollution. According to AQI, the index for moderate pollution ranges from 51 to 100 and a good air quality ranges between zero and 50.

Air pollution level in Addis Ababa is presumed to be high due to the prevalence of old vehicles, substandard road infrastructure and inadequate road network. Assessment of CO concentration as a measure of traffic air pollution showed that the mean for 15 minutes CO concentration was 2.1 ppm and 2.8 ppm for wet and dry seasons, respectively (Kume, A, et. al., 2010). The CO temporal and spatial profiles among the two seasons were similar. The overall mean on-road CO concentration was 5.4 ppm, and 15% of roadside samples and all on-road samples exhibited more than 50% of the 8-hr CO WHO guideline. The consistency in spatial and temporal profiles and the variation on both on-road and road side traffic lines imply that vehicles are the main source of traffic air pollution. There is a concern that the CO 8-hr World Health Organization guideline might be exceeded in future.

4.1.8 Ambient Noise

Noise pollution is observed in most parts of Addis Ababa that comes from various sources. Major sources include vehicular noise (including horns, over-amplified music systems, etc.), noise from airport, amplified noise from religious institutions and night clubs. Though there is noise standard that limits the maximum allowable noise level in Ethiopia for day and nighttime (for residential and Industrial areas), it has seldom been monitored and implemented. Churches, mosques and night clubs are releasing escalated level of noise even during the night (resting hours).

Noise measured in 2017 by AA EPA showed that noise level almost at all the measured areas exceeded the acceptable standard for residential and commercial areas (Addis Ababa City State of Environment and Outlook, 2017 cited in AA EPA, 2022).

The daytime noise measured at the roadside at Hail Garment area showed maximum of 76.8 dB and average value is 60.5 dB which is higher than the residential area standard.

The maximum allowable noise standard issued by the EPA for day and nighttime as well as for industrial and residential areas is shown in Table 4.5, similarly, the IFC guideline for noise pollution are shown in Table 4.6.

Table 4.5: Noise Standard of Ethiopia

Area Category	Limit in dB (A) Leq	
	Day time	Night time
Industrial area	75	70
Commercial area	65	55
Residential area	55	45

Source: Ambient Environment Standard for Ethiopia, August 2003

Table 4.6: Noise Standard of IFC

Receptor	One hour LAeq (dB)	
	Day time	Night time
Residential, Institutional, educational	55	45
Industrial; commercial	70	70

Source: IFC: Environmental, Health, and Safety guideline, April 30, 2007

Table 4.7: Noise pollution level and its harmful effects

No.	Level (in dB)	Effect
1	up to 23	No disturbance
2	30-60	Stress, tension, psychological (illness, heart attack) effects especially at upper range
3	60-90	Damage to health, psychological (disturbance in stomach-gall function, pains in muscles, high blood pressure, disturbance in sleeping)
4	90-120	Damages to health and ontological (ear diseases)
5	Above 120	Painful effects in long run

Source: Addis Ababa City, State of Environment 2017-201 (AA EPA, 2022)

The baseline environment along the transmission line corridor is largely urban setting with mostly densely built residential and commercial areas. The Gofa – Kality 1 TL route also traverses agricultural areas and industrial establishments.

Existing noise levels in the vicinity of the transmission line routes reflect urban and peri-urban environment and are generally characterized by noises of vehicular traffic, amplified noise from religious institutions (churches & mosques), manufacturing industries, garages, small scale metal and wood works, and bars.

There are several noise sensitive receptors along the PTL routes. These include residential areas, schools, health institutions, religious places (mosques & churches), and government and private offices. These receptors are already exposed to existing noise pollution and vibration problem and the problem may aggravate during construction of the transmission line.

4.2 Biological Environment

4.2.1 Vegetation and Flora

a) Vegetation Types and Species Composition

According to the general classification of Ethiopian vegetation the climax vegetation of Addis Ababa and environs is Dry Evergreen Montane forest and grassland. However, most of the natural vegetation has been deforested for expansion of cultivation and settlement areas including urbanization of the city as well as due to exploitation of wood materials for construction, fuel wood and timber production. The forest would have been dominated by *Juniperus procera* (*Tid*) with stands of *Podocarpus falcatus (Zigba)*, *Acacia abyssinica (Girar)*, *Olea europaea cuspidata (Weira)*, *Hagenia abyssinica (Yekosso Zaf)*, Ficus spp. (Sholla), and *Croton macrostachyus* (*Bisana*) particularly at the higher altitudes of the Entoto Mountain range and its foot.

Currently the Entoto mountain range is largely covered with Eucalyptus plantations dominantly *Eucalyptus globulus*. The area also contains several indigenous tree species of which the most common species include *Juniperus procera, Olinia rochetiana, Myrsine africana, Erica arborea,* and *Maesa lanceolata.* In addition, the area consists of some sparsely distributed indigenous tree species such as *Hagenia abyssinica*, *Ilex mitis* and *Apodytes dimidiata*.

The corridors of the project routes contain little natural vegetation cover since the areas have been completely transformed into urban settlement and agricultural lands. Only some remnant or secondary growth indigenous trees and shrubs are observed here and there within cultivated lands, along river and stream banks, along streets, and within tree plantation areas, residential and commercial areas, compounds of religious and other

institutions etc. Several indigenous tree species are observed in these areas including Acacias (mainly *A. abyssinica*), *Cordia africana (Wanza), Croton macrostachyus (Bisana), Ficus sur (Sholla*), *Millettia ferruginea* (*Birbira*), *Olea europaea (Weyra)*, *Albizia schimperiana* (*Sassa*), and *Vernonia amygdalina (Girawa).* In most places plantation trees (dominantly exotic species) and shrubs are more common than the indigenous trees. The commonly observed exotic tree species include *Eucalyptus camaldulensis*, *Grevillea robusta, Casuarina equisetifolia, Cuppressus lusitanica, Jacaranda mimosifolia, Spathodea campanulata, Acacia decurrens, A. mearnsii and Schinus molle.*

Grevillea robusta (Silky Oak) is commonly planted on roadsides and at road median for town beatification while it also contributes to carbon sequestration. There are also some other ornamental trees and shrubs that are planted at road median or on roadsides. These include *Araucaria heterophylla (*Norfolk Island pine)*, Phoenix canariensis (*Canary Island Date Palm), *Callistemon citrinus* (scarlet bottlebrush), *Callistemon pallidus* (Lemon Bottlebrush), *Nerium oleander (*oleander/rosebay). The former two tree species are dominant along the BLL – NADC underground transmission route.

A detail list of the flora identified from the corridor of the transmission lines is provided in Annex 2.

b) Protected Forest

There are no any protected areas in the corridor of the project transmission line routes. However, there is a small area of disturbed forest cover crossed by the Gofa – Kality I loverhead transmission line between Towers no. 23 & 24. The tall trees under the TL have been cleared in the past to avoid interference of trees with the electric cables.

The forest area is located in Woreda 12 of Nifas Silk Lafto Sub-city on right bank of Little Akaki river on hilly terrain (see Photo 3). The forestland is owned by the Sub-city Environmental Protection Office.

The forest contains a mixture of indigenous and exotic tree species . The main indigenous trees occurring in the forest include *Acacia abyssinica*, *A. sieberiana, Croton macrostachyus* and *Vernonia amygdalina.* Exotic trees include *Eucalyptus camaldulensis*, *Grevillea robusta, Acacia mearnsii*, and *Acacia saligna*. Taller trees under the existing transmission line have been removed to avoid contacts/interference with the TL that could cause power outages. According to the Energy Directive No. EEA/1/2005, the overhead electric line (with voltage of 132kV) shall not be closer to vegetation in all directions than 13m.

Photo 3: Part of the forest area between TR-23 & TR-24

The other important trees cover is found at the road median along the Mexico Square to AU Office or the BLL – NADC underground transmission route. This green area was developed by the AAC Beautification, Parks and Cemeteries Development & Administration Agency for town beautification or aesthetic value. It is traversed by the existing ADC - Kality 1 overhead transmission line between Towers 2 & 7 and by the proposed BLL – NADC underground TL between Mexico square and AU Office.

As observed during the present assessment, the steel reinforcement fence, as well as the shrubery and herbaceous ornamental plants have been removed and trees cover maintained. The green area is currently under redevelopment. The existing trees are dominated by Norfolk Island pine *(Araucaria heterophylla*) and Canary Island Date Palm (*Phoenix canariensis*). The area also contians some Acacia trees. Photo 4 below illustrates parts of the trees along the proposed BLL-NADC underground TL.

Photo 4: Partial view of the ornamental trees planted at the road median along the BLL-NADC power transmission route

c) Diversity, Endemism and Conservation Status of Plant Species

One hundred eighteen (118) plant species were recorded from the project corridor. These plant species belong to 44 families. The dominant plant families are Poaceae (grass family), Asteraceae, Fabaceae and Polygonaceae comprising 20, 16, 12 and 6 plant species respectively.

Of the plants identified from the study area, three (3) species are endemic to Ethiopia. These are *Millettia ferruginea* (tree), *Lippia adoensis* var. koseret (shrub) and *Urtica simensis* (herb). The project area is not a unique or particularly important habitat for these endemic species. These plant species are widely distributed in other parts of Addis Ababa city and elsewhere in the country. According to IUCN Red List *Millettia ferruginea* is a *Least Concern* species and its current population status is stable. The other two plant species have not yet been evaluated for the IUCN Red List, thus, their conservation status is not yet determined. Project activities are unlikely to cause significant impact on the habitats of these plant species.

In this study 34 tree species, 24 shrub species, 59 herbaceous plants (including grasses) and one succulent plant are identified from the project corridor. Twenty nine (88%) of the identified trees, 11 (46%) of the shrubs, and 15 (25%) of the herbaceous species have been assessed for the IUCN Red List. Of the evaluated plants, two tree species are classified as *Vulnerable* species at global level. Both tree species, namely *Araucaria heterophylla* and *Jacaranda mimosifolia,* are introduced ones and they are widely planted as ornamental trees in the Addis Ababa City. Only one tree species, namely *Eucalyptus camaldulensis* is considered as *Near Threatened* species. Similarly, one tree species, namely *Leucaena leucocephala* is considered as *Lower Risk/ Conservation Dependent* species.

Forty nine (49) plant species (42%) are categorized as *Least Concern* species. These include 24 tree species, 11 shrubs and 14 herbaceous plants. Of the flora recorded from the study area, 61 (52%) plant species have not yet been assessed for the IUCN Red List, and data is deficient for 2 species.

4.2.2 Habitats and Fauna

Since the natural habitats of the project sites have severely degraded, they contain little habitats that could support wildlife except avifauna. As a result, the areas contain only a few wild animals that able to dwell inside burrows, and in available forestland and river bank vegetation. These include the mixed forest found between TR-23 & TR-24 and some other dense vegetation along the Akaki River. Based on the information provided by local officials and local people, seven (7) mammalian species occur in the project corridor; these belong to 7 families. These are shown in Table 4.8.

Spotted Hyenas are the main wild animals that occur in the corridor of the Gofa – Kality 1 overhead transmission line. They are generally nocturnal and they scavenge on wastes around the city. Other mammals reported to occur in the area include Common Duiker, Common Jackal, Vervet Monkey, Abyssinian Hare, Crested Porcupine and Abyssinian/ Ethiopian Genet. These wild animals mainly occur in the forest area found between Towers 23 and 24 of the OH TL and along the banks of Akaki River.

Endemism and Conservation Status of Mammalian Species

Of the large mammals recorded from the project corridor, only one species, namely Ethiopian Genet is near endemic to Ethiopia. It is native to Ethiopia, Eritrea, Somalia, Sudan, and Djibouti[10]. According to the IUCN Red List of Threatened species, all the mammals recorded from the study area have *Least Concern* conservation status (see Table 4.8) except one species, which is the Ethiopian or Abyssinian Genet for which data is deficient.

The project area is not a unique or particularly important habitat for the Ethiopian Genet. It dwells in a variety of habitats including human disturbed or inhabited areas, forests, shrublands and grasslands. Implementation of the project is not expected to cause an appreciable impact on the habitats of this faunal species and the fauna itself.

Table 4.8: Mammals recorded from Project Corridor

Ser. No.	Family	Scientific Name	Common Name		IUCN Status[11]
			English name	Amharic Name	
1	Hyaenidae	*Crocuta crocuta*	Spotted Hyena	Tekateko Jib	LC
2	Bovidae	*Sylvicapra grimmia*	Common Duiker	Midako	LC
3	Canidae	*Canis aureus*	Golden/Common Jackal	Tera Kebero	LC
4	Viverridae	*Genetta abyssinica*	Ethiopian Genet*	Shelemtimat	DD
5	Leporidae	*Lepus habessinicus*	Abyssinian Hare	Tinchel	LC
6	Cercopithecidae	*Chlorocebus pygerythrus*	Vervet Monkey	Tota	LC
7	Hystricidae	*Hystrix cristata*	Crested Porcupine	Jart	LC

** = Endemic; Key to IUCN Status: LC = Least Concern; DD = Data Deficient*

[10] https://en.wikipedia.org/wiki/Abyssinian_genet

[11] The IUCN Red List of Threatened Species. Version 2024-1. https://www.iucnredlist.org. Accessed on 21st October 2024.

4.2.3 Avian Resource of the Project Area

4.2.3.1 Bird species assessment along the transmission lines corridor

The avifauna resource of the project corridor was assessed through field survey and review of previous studies. During the field survey, the habitats and bird species observed in the project corridor were recorded.

a) Birdlife Habitats

Most of the habitats found in the project corridor are transformed landscapes dominantly built up areas. Others include cultivated lands, a grazing land spot, forestland, riverside/riverine environment and a wetland (marshland) spot.

Within the built-up areas there are a variety of tree species including some fruit trees like Avocado and Kazmir and shrubbery vegetation that support different bird species. A marshland spot with geographic location of 8º53'51"N, 38º45'12"E and which is largely sustained by wastewater released from surrounding industrial establishments was observed to support some waterbirds including Sacred Ibis, wattled Ibis and Little Egret (see Photo 5(f)). Examples of the different habitats are shown in Photo 5. Unique bird species found within the proposed transmission line corridor include Palearctic and Intra African migrant birds.

a) Built up area with trees cover around Kality 1 SS

b) Big fig tree within grassland Near Kality 1 SS

c) Riverine habitat containing dense giant reed, Enset plantation & other vegetation

d) Wetland (marshland) supporting waterbirds and several grass, sedges and other plant species

Photo 5: Different Habitats Crossed by the Kality 1 – Gofa Overhead Power Line

b) Avifauna composition along the Project Corridor

The project routes corridors contain a variety of bird species dominantly water-birds, song birds and seed-eaters. A total of 53 bird species (Annex 3) were recorded during the current and previous field surveys. The water-birds observed on the banks of Akaki river, at a wetland spot located at 8º53'51"N, 38º45'12"E and at Kality wastewater treatment plant during the site visits along the Gofa-Kality 1 overhead TL include Sacred Ibis, Watled Ibis (endemic species), Hadada Ibis, Egyptian Goose, Yellow-billed Duck, Black-winged Stilt, Spur-winged Plover, African Pigmy-goose, Hamerkop and Little Egret.

Song birds comprise Speckled Pigeon, Doves (Ring-necked Dove, Red-eyed Dove & Laughing Dove, Greater Blue-eared Starling, Little Bee-eater, Fork-tailed Drongo, Fan-tailed Raven, Pied Crow, Thick-billed Raven, Abyssinian Ground-hornbill and Red-billed Oxpecker. Seed-eaters comprise Village Weaver, Speckled Mouse-bird, Swainson's Sparrow, Ethiopian Boubou, Mocking Cliff Chat, Red-cheeked Cordon-bleu, Red-billed Fire-finch, etc. Moreover, several raptors observed in the study areas and these include Yellow-billed Kite, Tawny Eagle, Greater Spotted Eagle and Lesser Kestrel.

c) Endemism and Conservation Status of birds

In the current assessment fifty three (53) bird species have been recorded from the corridor of the overhead and underground power transmission route. However, the number of bird species occurring in the study corridors is expected to be more than this. The list of the bird species is presented in *Annex* 3. Of these, two (2) species, namely Wattled Ibis and Thick-billed Raven are endemic to Ethiopia and Eritrea. In addition, there is one near endemic bird species, which is Ethiopian Boubou. The latter bird species mostly occurs in Ethiopia, but its range also extends into eastern Sudan, northwestern Somalia, and extreme northern Kenya.

All the bird species recorded from the study area have been evaluated for the IUCN Red List. Of these, only one (1) species is globally threatened species. This is Greater Spotted Eagle, which is a *Vulnerable Species*. The remaining 52 bird species are categorized as *Least Concern* species.



a) Examples of waterbirds: Sacred Ibis & Watled Ibis (left), Hadada Ibis (middle) and Egyptian Goose (right)



b) Examples of songbirds: Thick-billed Raven (left), Greater Blue-eared Starling (middle) and Common Fiscal (right)



c) Examples of raptors: Greater Spotted Eagle (left) & Tawny Eagle (middle), & Seed-eaters: Blue-breasted Bee-eater (right)

Photo 6: Some bird species observed in the corridor of the Kality 1- Gofa OH TL

4.2.3.2 Ecology and Biodiversity

a) Biodiversity Hotspot

Biodiversity hotspots include a variety of environmental services, with high-diversity places providing the greatest societal benefits. However, although having lesser cost advantages, significant carbon storage regions are similarly essential as conservation objectives. According to general agreement, biodiversity hotspots are those parts of the planet with very high levels of plant endemism but grave habitat threats. At least 1,500 vascular plants must be endemic to the region for it to be considered a biodiversity hotspot, and at least 30% of the region's original natural vegetation must still exist. The Addis Ababa Power Supply Reinforcement Project area is located outside of the biodiversity hotspot area of Ethiopia.

b) Important Bird Areas (IBA) and Endemic Bird Areas (EBA)

An area that has been determined to be crucial globally for the conservation of bird populations is known as an Important Bird and Biodiversity Area (IBA). In Ethiopia, only 73 Important Bird Areas (IBA) have been identified (Birdlife International, 2020; M'Cormack-Hale & Beoku-Betts, 2015). The reinforcement project is not located within any of the proposed IBAs.

However, the Akaki floodplain and Aba Samuel reservoir, which is located at about 2km Southwest of the Kality-1 SS or end of the Gofa - Kality-1n OH TL, is recognized by the Birdlife International and the Ethiopian Wildlife and Natural History Society (EWNHS) as one of the IBAs in Ethiopia (see Figure 4.7). The Akaki-Aba Samuel wetland area is selected as IBA because of its importance in supporting wintering water birds, globally threatened species, and biome restricted species. The Akaki floodplain is often seasonally inundated mainly in July and August, which attracts large numbers of water birds.

The most crucial locations for the protection of birds' habitats are known as Endemic Bird Areas (EBAs), which are parts of the planet that reflect natural areas of bird endemism. The power line project site is not close to any EBAs.

4.2.4 National Parks, Nature Reserves, IBSs and other Protected Areas

Ethiopia is making efforts to protect biodiversity and conserve resources through the creation of protected parks, wildlife resources, and controlled hunting areas. The establishment of these Conservation and Protection Areas has been one of the more farsighted and ecologically beneficial occurrences in the country.

There are no designated or protected areas of terrestrial ecological interest within the project influence area. The project corridor is also neither contiguous with, nor in close proximity with any of nationally, regionally (Ethiopian regions), and locally protected areas like National Parks, Wildlife Reserves, Controlled Hunting Areas or National Forest Priority Area[12] (See Figure 4.7).

[12] *These categories are based on the national classification of protected areas.*

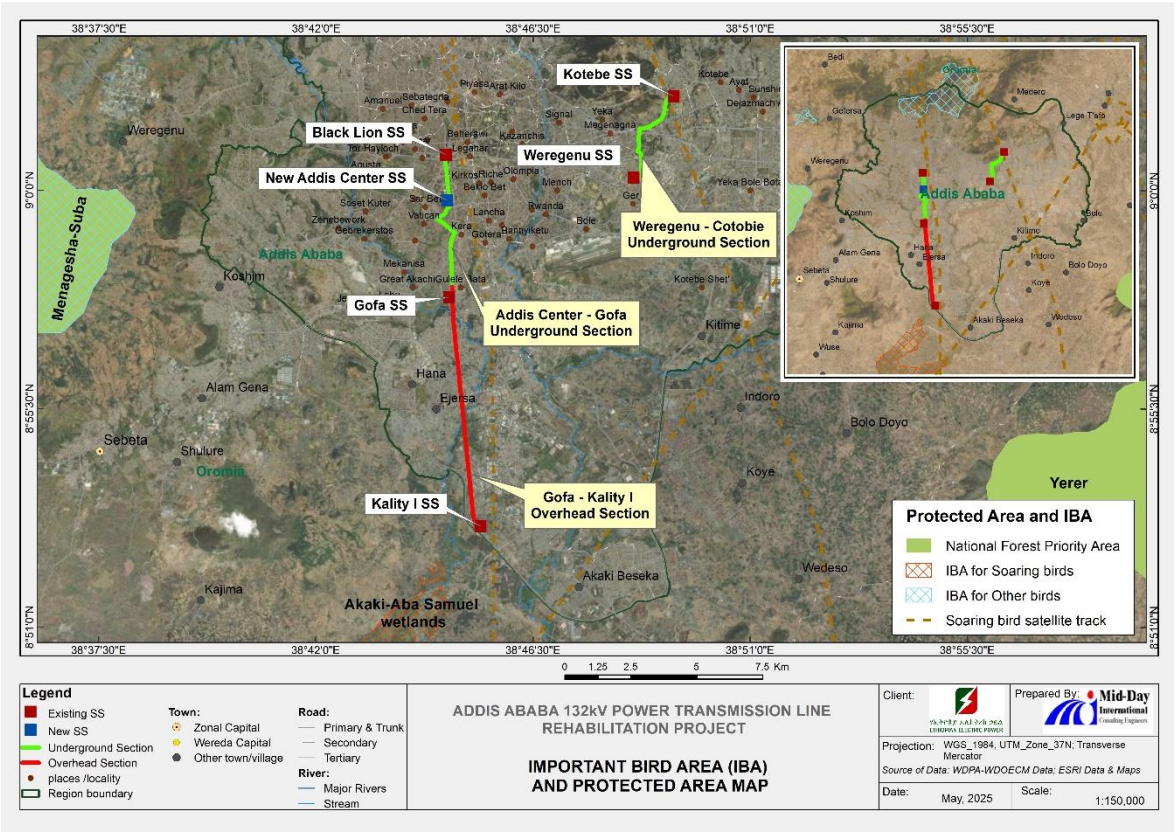


Figure 4.7: Protected Areas and IBAs Location Map

4.3 Socio-Economic Environment of the Project Affected Woredas

4.3.1 Socio-Economic Characteristics of the Project Affected Woredas

4.3.1.1 Administrative Structures and Sub-divisions

Addis Ababa is the Capital City of Ethiopia and the seat of the Federal Government and Parliaments. The city is recently restructured into eleven sub-city adminstrations which are the second administrative layers just below the city administration. Lemmi Kura is the newly established sub city of Addis Ababa located in the Easter part of the city. The eleven sub-cities further subdivided into 119 woredas, which are the smallest administrative units in the present administrative structure of the city administration.

The spatial organization of the sub cities of Addis Ababa administration shows that Lideta, Kirkos, Arada and Addis Ketema represent the central areas of the city, whereas Akaki Kality Nefas Silk Lafto, Kolfe Keraniyo, Gulele, Yeka, Bole and Lemmi Kura correspond partly to the expansion areas at their peripheries. Addis Ketema and Lideta are the smallest sub cities, while Bole and Akaki Kality are the largest sub cities in Addis Ababa.

No	Sub city	Number of Woreda
1	Lideta	10
2	Kirkos	10
3	Akaki Kality	12
4	Arada	8
5	Gullele	10
6	Addis Ketema	12
7	Bole	11
8	Yeka	12
9	Kolfe-Keranyo	11
10	Nifas-Silk	13
11	Lemi -Kura	10
	Total	**119**

4.3.1.2 Population Size and Density

Based on population projection made by CSA, Addis Ababa has an estimated total population of 4,030,000 in year 2024 of which (52.9%) are female and (47.1%) are male population. The average family size of households in Addis Ababa is estimated to 3.6 persons per household. Having a total land size of 527 km^2 , Addis Ababa is not only the largest urban areas in the country but also one of the densely populated urban centers in the country with crude population density of 7,647 people per km^2. However the population density in Addis Ababa varies across the sub-cities, while Addis Ketema, Arada, Lideta and Kirkos sub-cities have higher population density, whereas Akaki-Kaliti, Bole, Yeka and Lemi-Kura are among sub cities with lower population density. Unlike many other places in the country, Addis Ababa has no rural kebeles, therefore, all the population in Addis Ababa is considered as urban residents. In fact, almost one-quarter of all people in Ethiopia that live in urban areas believed to be reside in Addis Ababa.

4.3.1.3 Ethnicity and Religion

No available official data that reflect the most current statistics on ethnicity and religious affiliation of Addis Ababa residents. Nevertheless, there is no doubt that Addis Ababa is a home of religiously and ethnically diversified population. In fact, the 2007 CSA census report indicated the dominance of the Amhara ethnic group in terms of proportion with 47.04%, followed by Oromo (19.51%), Gurage (16.34%), Tigray (6.18%), Silt'e (2.94%) and Gamo (1.68%) (CSA, 2007 Census).

In terms of religious composition, the same data source revealed that vast majority (74.7%) of the city's population were affiliated to Orthodox Christianity while Muslim constituted (16.2%) of the city population. On the other hand, Protestant and Catholic religion followers accounted for 7.77% and 0.48% of Addis Ababa population in the indicated census year.

4.3.1.4 Employment Status and Occupation Groups

Relatively a recent survey conducted in 2022 by Central Statistic Authority (CSA) on urban employment and unemployment showed that out of a total population of Addis Ababa in the year 2022, majority (64.0%) of them were economically active population. Among the economically active population of the city residents nearly half (49.6%) of them were employed of which majority (60%) of them were male while female constituted (40%) of the employed population of the city in the indicated year. Based on this data source self-

employment, government and private organizations were the three important sources of employment for the city residents.

Regarding provision of employment the service and manufacturing sectors accounted for (77.0%) and (20.3%) of all employments in Addis Ababa respectively, while other sectors constituted the remaining (2.7%) of all employment in the city (UEUS, 2022 1st Round Survey).

With regard to occupation groups significant proportion (36.2%) of Addis Ababa residents were service & sales worker, followed by elementary occupation (16.4%) and professionals (11.5%). On the other hand, the proportion of city's resident employed as manager, Clerical support workers and skilled agricultural forestry & fishery workers were among the lowest with (2.2%), (4.3%) and (0.6%) of all occupation respectively in the year 2022 (See Figure 4.8).

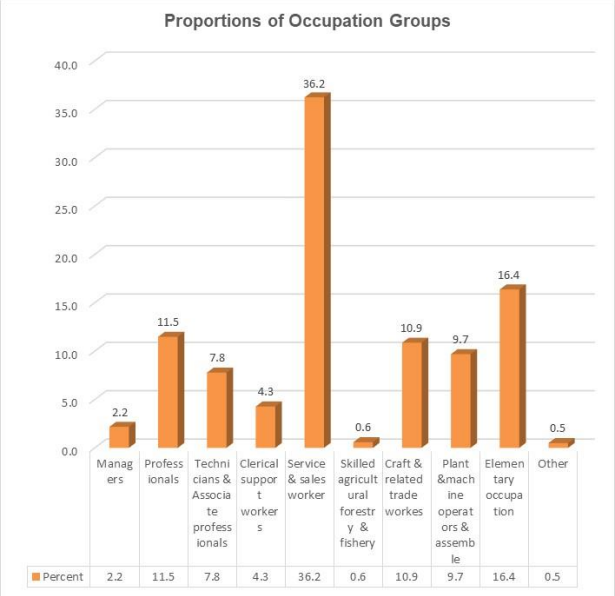


Figure 4.8: Proportions of Occupation Groups Residents of Addis Ababa engaged in 2022

The 2022 survey on urban employment and unemployment furthermore indicated the occupational difference between male and female population of the city. Based on the survey result the proportion of male population involved in well-paying jobs was higher than female. For example, while (69.1%) of male were employed in managerial position compared to (30.9%) of female employed city residents in the same position. The proportions of employed male population as professional and technicians & associate professionals constituted (57.2%) and (56.5%) respectively compared to (42.8%) and (43.5%) for female for the same positions respectively. Conversely, more women were employed on relatively low paid job including clerical support workers (75.2%), Service & sales worker (60.7%) and elementary occupation (59.0%) (See Figure 4.9).

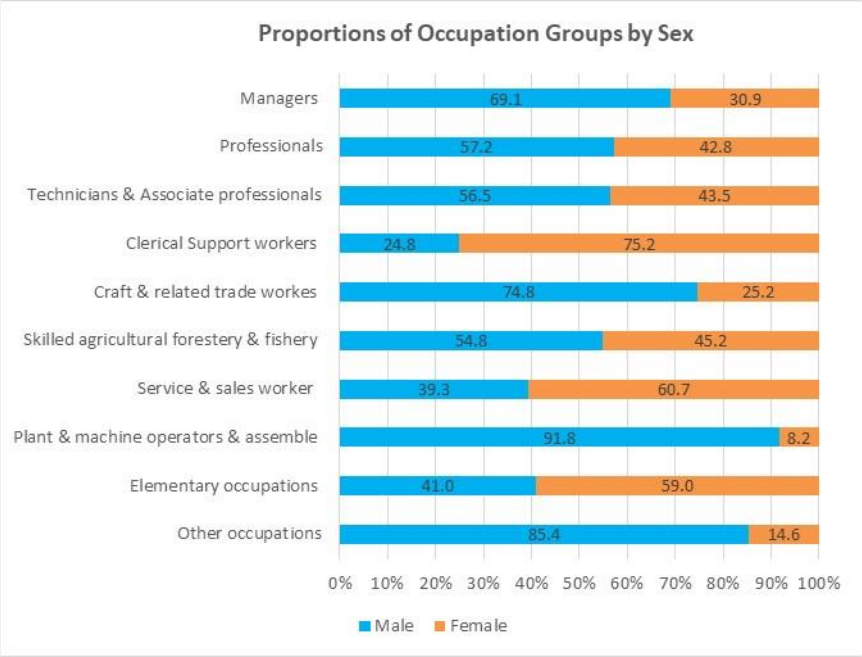


Figure 4.9: Proportions of Occupation Groups by Sex in Addis Ababa. 2022

4.3.1.5 Education Status and School Facilities

Regarding literacy rate as of 2022 data, of all city's population aged seven and above overwhelming majority (91.4%) of Addis Ababa's population reported to be literate, and the percentage of literate female population was higher than male (54.5% for female, 45.5% for male population). In fact, Addis Ababa is one of the biggest city that hosts several educational facilities than any other town and cities found in the country. For example, in addition to numerous government and private colleges and universities, data released on Addis Ababa education office website indicated that over 2,454 educational facilities ranging from preprimary to high school levels owned by government, non-governmental organization as well as private sector were found in Addis Ababa in 2022/23 academic year

4.3.1.6 Health Facilities, Services and Main Problems

Addis Ababa hosts a mix of public and private hospitals, clinics, and other health facilities, that offering a range of healthcare services to the city's population. Data retrieved from Addis Ababa City Administration Health Bureau website revealed that about 3,161 health facilities were found in Addis Ababa in the year 2023. Based on this data source about (46.6%) of the health facilities were pharmacy, followed by medium clinics which constituted (24.5%) of all health facilities. The proportion of drug stores reported to be found in the city was also significant accounted for (18.5%) of all health facilities, while the share of primary clinics in the indicated year was (4.8%) of all health facilities. Health Centers which are running by government constituted (3.5%) of all health facilities in Addis Ababa. On the other hand, the proportion of Hospitals and Laboratories found in the city in the year 2023 constituted only (1.3%) and (0.7%) of all health institutions in the city respectively.

On the other hand, socio-demographic index (SDI) of Addis Ababa was the highst in the coutry with 0.64 in the year 2019. SDI which contains an interpretable scale from 0 to 1, is a composite average of the rankings of the incomes per capita, average educational attainment, and fertility rates of all areas in the Global Burden of Disease (GBD) study. Therfore, in this regard Addis Ababa had higest incomes per capita, better educational attainment, low child mortality and lowest fertility rate compared to other regions in the country.

4.3.1.7 Access to potable water

The overall potable water coverage and access is higher in Addis Ababa. Although the potable water coverage of the city is estimated between 90 to 99 percent which is significantly higher than the current national potable water coverage of (69.5%), however, potable water shortage become one of the main problems in the city for the past 5 to 7 years. The potable water supply shortages have already forced the Addis Ababa Water and Sewerage Authority (AAWSA) to ration water for the last six years, at least officially. Data from the authority reveals that only two woredas in Akaki-Kality, three in Arada, one in Yeka, and one in Bole enjoy a steady supply of water seven days a week, while the remaining woredas access water through ration three to four days per week.

4.3.1.8 Sources of Energy and Other infrastructures

Studies estimated the overall coverage of electricity service in the capital at close to 97%. However, residents of the city use a combination of both traditional and modern energy sources for domestic energy needs. In fact, electricity is the primary energy source of overwhelming majority of the households and business premises in the city. On the other hand, electricity, kerosene, LPG, fuel wood, charcoal and dung are among widely used energy sources for both the residents and many local business in the city particularly for cooking purpose. Some latest data estimated that about 73 percent of Addis Ababa residents use electricity for cooking purpose compared with 9 percent in other small towns in the country. Despite this, the use of firewood and charcoal for cooking purpose by the city residents as well as business premises still remains high. For instance, several households and local business particularly those business engaged in food production activities such as bakery, restaurants, local drink production and others business in Addis Ababa continue to heavily rely on biomass fuel such as firewood, charcoal, and dung. Charcoal is also the most used energy source in daily basis for cooking and during the coffee ceremony in almost all urban households. It is also commonly used for heating indoors in urban households like Addis Ababa, particularly during the cold season.

A recent study conducted in 2024 by EfD Ethiopia in collaboration with the Addis Ababa City Environmental Protection Authority (EPA) showed that over 86% of households in the capital rely on charcoal as a backup when electricity fails. Though 96% of urban households have access to electricity, frequent power outages—averaging 9.4 hours per week—force residents to supplement with charcoal and firewood. In addition, frequent power interruption in the city imposes additional cost to many businesses due to increased production cost, limited production time, cost related to backup energy sources (Generator) and others.

In fact, the steady population growth and economic development in the city create a growing demand for all types of energy source. Despite Addis Ababa has increased quantitatively in the past few decades in terms of electricity provision and supply, however, the city is still facing major stresses of power outages and energy scarcity, which negatively impact on the overall economic activity and quality of life of the city residents.

Therefore, the implementation of the proposed Addis Ababa Power Supply Reinforcement Project will definitely contribute in alleviating the power problem and outrage the city has been experiencing in recent years by supplying stable power to grid of the city and to contribute to the improvement of industrial infrastructures and socioeconomic development.

Regarding other infrastructures, Addis Ababa has made strides in improving and expanding access to infrastructure like access road, transportation system, telecommunication and housing, however, challenges remain, particularly in informal settlements where infrastructure may be lacking. For instance, with regard to road infrastructure the city has seen extensive expansion of existing roads and the creation of new ones to accommodate the growing population and increasing vehicle numbers, however, an increase in vehicle ownership have led to severe traffic congestion now days.

Although the city has various transportation system including light rail transit system, public buses, and taxis, however, the existing transportation system in the city are under intense pressure due to high population, impacting mobility and quality of life. Moreover, there has been a push for urban development, including the construction of housing to accommodate the rapidly growing city's population which has led to informal settlement in several parts of the city including in two project impact woredas (Woreda 7 and 12 of Akaki-Kality sub-city). The city also faces challenges related to waste disposal and management. Increasing waste generation, coupled with inadequate waste collection and recycling systems, has created environmental and health concerns to the city residents.

4.3.1.9 Gender Situation

Women constituted more than half (52.9%) of the population of Addis Ababa; the proportion of married women was also higher then male. For example, the 2022 UEUS 1st Round survey on urban employment and unemployment, revealed that among the residents of Addis Ababa aged 10 and above, while over half (51.2%) of female population were married, whereas (48.8%) of male population of the city reported to be married in year 2022. Unfortunately, the proportions of divorced, separated and widowed was higher among female population of the city. Based on this data sources among Addis Ababa population who were reported their marital status during the survey as "divorced" and "separated" women accounted for (77.8%) and (78.7%) of divorced and separated population of the city respectively. Similarly, among widowed population, the overwhelming majority (88.4%) of them were female. This clearly shows that many women in the city may face increased vulnerability to poverty, Isolation and psychological issues as result of marriage.

Regarding employment, women participate in various sectors in Addis Ababa despite their proportion was lower than male (40% for female vs 60% for male). Moreover, the informal economy employs many women compared to male which can lack stability and benefits. Studies also shows women often face barriers in accessing higher-paying jobs even in the formal sector. On the other hand, access to education for women has improved, with more girls attending school and pursuing higher education. Similarly, women access to healthcare, including reproductive health services have shown significant improvement both in Addis Ababa and other part of the country. Overall, while progress is being made in women's participation in economic, political, and social life, significant challenges persist, and continued efforts are needed to improve the situation for women in Addis Ababa.

4.3.2 Background of Project Affected Sub-Cities and Woredas

4.3.2.1 Project Affected Sub-Cities and Woredas

The facilities included in the current project would affect 6 sub-cities and 13 Woredas of the sub-cities. Table 4.9 below shows the sub-cities and woredas affected by the project facilities.

Table 4.9: Project Affected Sub-City and Woredas

Project Component	Affected Sub-City	Affected Woredas
Underground PTL Section – Mexico - Gofa	Lideta	W4 & W7
	Kirkos	W5 & W7
	Nifas Silk Lafto	W5 & W6
Underground PTL Section – Weregenu - Kotebe	Bole	W6, W7 & W14
	Yeka	W9
Overhead PTL Section – Gofa – Kality	Nifas Silk Lafto	W6, W11 & W12
	Akaki Kality	W7 & W12

4.3.2.2 Demographic features of project Affected Households

From field survey along the project route the implementation of the proposed transmission line project would affect directly a total of 121 households residing in three project woredas found in two sub-cities of Addis Ababa Administration. According to the survey result (82.6%) of the project affected households are found in Akaki Kality sub city (42.1% of the PAPs found in Woreda 12 and 40.5%) in Woreda 7, while the remaining (17.4%) of project affected households are found in Woreda 11 of Nefas Silk Lafto sub city.'

4.3.2.3 Headship Status

Majority (71.9%) of project affected households are headed by male, while (28.1%) of them are female headed household (FHH). Relatively, higher proportion of female headed households are found in Woreda 12 of Akaki Kality sub city with (31.4%), conversely lower FHH are recorded in Woreda 7 of Akaki Kality sub city (24.5%).

Table 4.10: Project Affected Households by Sex and by Woreda

Project Affected Sub-City	Woreda	Male	Female	Both Sex	Percent
Nefas Silk Lafto	Woreda 11	15	6	21	17.4
Akaki Kality	Woreda 12	35	16	51	42.1
	Woreda 7	37	12	49	40.5
Total		**87**	**34**	**121**	**100**
Percent		**71.9**	**28.1**	**100.0**	

4.3.2.4 Population and Family size of PAPs

With regard to household population a total of 581 population resides in 121 project affected households of which (52.9%) are female, while male constituted (47.1%) of the household population. The average household size of project affected households is 4.8 members per household which is higher than average family size of Addis Ababa which estimated to 3.6 members per household. Across project woredas the highest family size is recorded in Woreda 7 with 5.3 family members per household, while the lowest family size of 4.2 members registered in Woreda 11 of Nefas Silk Lafto sub city.

4.3.2.5 Age of HH Heads

Regarding age of project affected household heads, as indicated in figure below the proportion of household heads whose age is between (40-44) and (45-49) is relatively higher than other age groups with equal percentage of (18.3%), followed by household heads belongs to (35-39) age group by constituting (15.7%) of all age groups. On the other hand, about (10.4%) of the household heads considered as old age citizen whose age is 65 years old and above.

Across the project impacted Woredas, higher proportion of elderly household heads are found in Woreda 12 of Akaki-Kality sub city which accounted for (11.8%) of all projects affected household heads, while only (4.7%) of household heads in Woreda 7 of Akaki-Kality sub city are reported to be elderly household heads (See Figure 4.11).

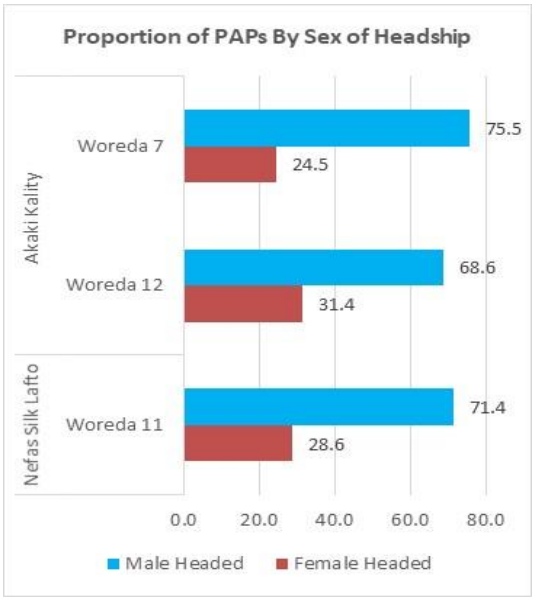


Figure 4.10: Proportion of PAPs by HH Headship

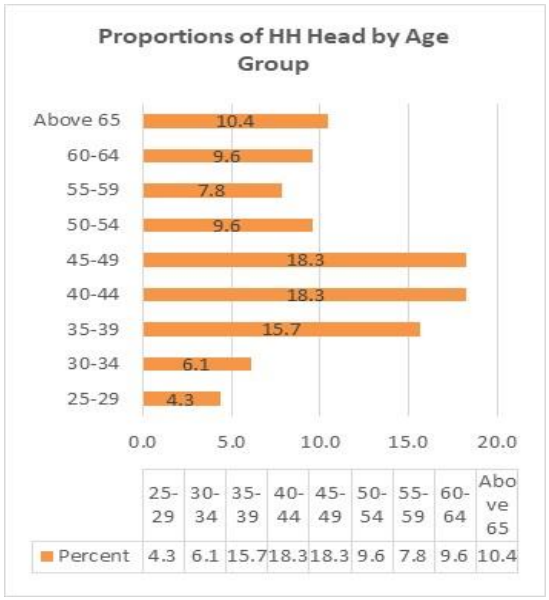
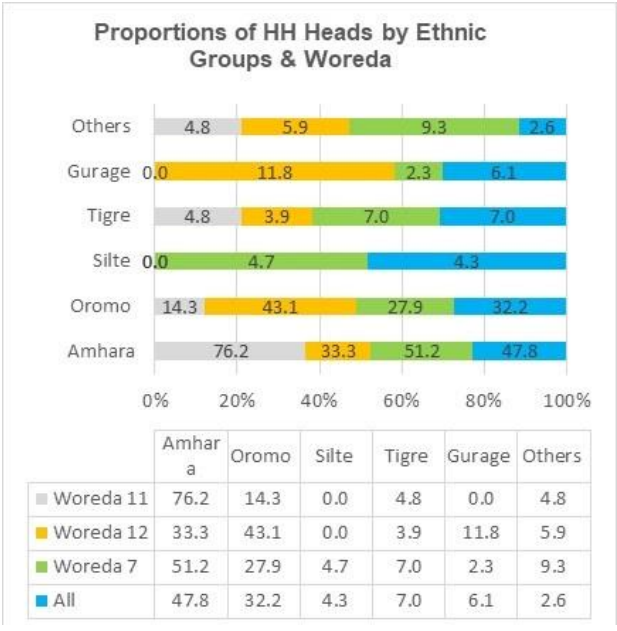


Figure 4.11: Proportions of HH Head by Age Group

4.3.2.6 Ethnic Composition

The ethnicity profile of the project affected households entails close to half (47.8%) of the household heads belongs to Amhara ethnic group, followed by Oromo ethnic group constituting (32.2%) of the total project affected households and Tigre ethnic with (7.0%) of all household heads.



	Amhara	Oromo	Silte	Tigre	Gurage	Others
Woreda 11	76.2	14.3	0.0	4.8	0.0	4.8
Woreda 12	33.3	43.1	0.0	3.9	11.8	5.9
Woreda 7	51.2	27.9	4.7	7.0	2.3	9.3
All	47.8	32.2	4.3	7.0	6.1	2.6

Figure 4.12: Proportions of HH Heads by Ethnic Groups & Woreda

The proportions of Silte and Gurage ethnic groups accounted for (4.3%) and (6.1%) of project affected household heads respectively and other ethnic groups constituted the remaining (2.6%) of project affected HH heads. Across project woredas the proportion of Amhara ethnic group is disproportionately higher with (76.2%) in Woreda 11 of Nefas Silk Lafto sub city. Similarly, more than half (51.2%) of the project affected household heads in Woreda 7 of Akaki-Kality sub city also belongs to Amhara ethnic group. On the other hand, significant proportions (43.1%) of household heads in Woreda 12 belongs to Oromo ethnic group, followed by Amhara ethnic group with (33.3%) and Gurage (11.8%).

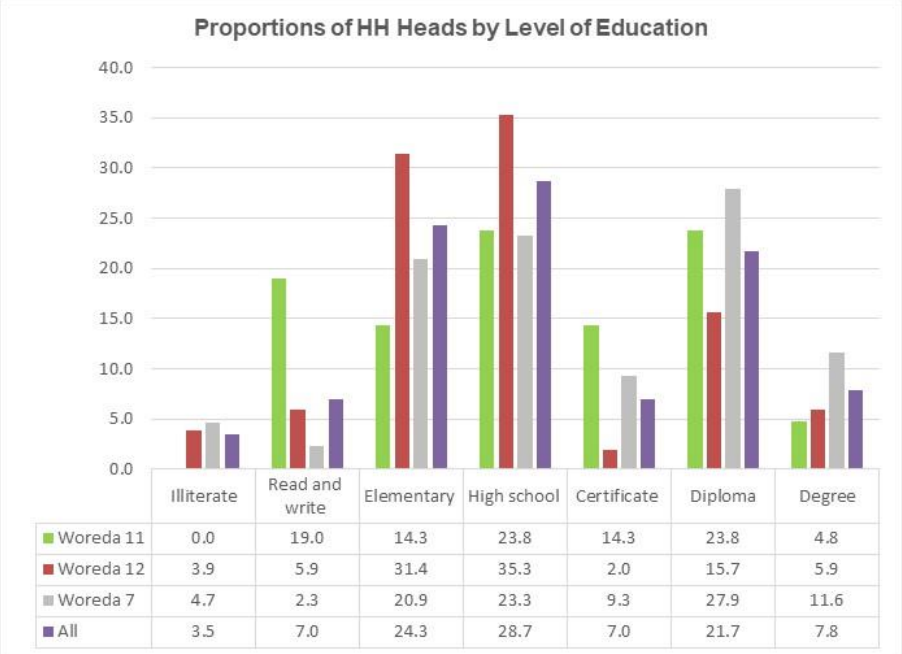
4.3.2.7 Religious Affiliation

With respect to religious affiliation, overwhelming majority (82.6%) of the household heads reported to affiliate with Orthodox Christianity, followed far by Muslim (10.4%) and protestant religion (6.1%). The proportion of household heads affiliated with Orthodox Christianity is highest in Woreda 11 as overwhelming majority (95.2%) of the household heads in the Woreda reported to follow this religion. The ethnicity and religious affiliation of the project affected households reflects the ethnicity and religious composition of Addis Ababa's population despite some difference in percentage.

4.3.2.8 Education Level of HH Heads

As far as the educational level of the project affected household is concerned, while (3.5%) of the household heads are illiterate or have no formal education at all, whereas (7.0%) of them only able to read and write. On the other hand, about (28.7%) of the household heads had high school (grade 9 to 12) educational level, while (24.3%) of the heads had elementary school (grade 1 to 8) education. With regard to tertiary education, significant percentage (36.5%) of the household heads had some kind of college education of which (21.7%) and (7.8%) of them reported to have diploma and degree educational background respectively, while the remaining (7.0%) of the household heads had obtained college certificate.

Across project woredas while no illiterate household head is reported in Woreda 11, whereas the number of household heads having higher educational level (certificate, diploma and degree) is highest among project affected households in Woreda 7 of Akaki Kality Sub city. The educational level of project affected household heads by Woreda is depicted in Figure 4.13 below.



	Illiterate	Read and write	Elementary	High school	Certificate	Diploma	Degree
Woreda 11	0.0	19.0	14.3	23.8	14.3	23.8	4.8
Woreda 12	3.9	5.9	31.4	35.3	2.0	15.7	5.9
Woreda 7	4.7	2.3	20.9	23.3	9.3	27.9	11.6
All	3.5	7.0	24.3	28.7	7.0	21.7	7.8

Figure 4.13: Proportions of HH Heads by Level of Education and Woreda

4.3.2.9 Occupational Status of HH Heads

According to the survey result, vast majority (89.3%) of the household heads reported to have some occupation while the remaining (7.4%) and (3.3%) of the household heads are retired and unemployed respectively. The proportion of retired household heads is highest among household heads in woreda 12 with (13.7%) of all project affected household heads

in the woreda, while the highest unemployed household heads are reported in Woreda 11 of Nifas Silk Lafto sub city with 14.3%.

On the other hand, among currently employed household heads 29.8% of project affected households are salaried employed (government, non-government organizations and private sectors), followed closely by business /trading in which 26.4% of the household heads involved. For about 13.2% of project affected household heads reported farming as their primary occupation, while 9.1% of the household heads are doing private work (like broker, home care service). Based on the survey result the primary occupation of 4.1% and 2.5% of the household heads are skilled labor and daily labor respectively.

Across the project woredas little variation is observed with regard to household heads occupational status. For example, while the proportion of household heads involved in salaried employment and business activity is higher among project affected household heads in Woreda 7 of Akaki- Kality sub city, whereas the proportion of household heads reported to have private job is relatively higher among households in Woreda 11 with (19.0%). Farming as occupation is practiced by project affected households in Akaki Kality sub city with (18.4%) of project affected household heads in Woreda 7 involved in farming, while the proportion household engaged in farming is reduced to (13.5 %) in Woreda 12 of Akaki- Kality sub city. Interestingly, the two project woredas (Woreda 7 and 12) of Akaki Kality sub city are among pocket of remaining places in Addis Ababa where farming still practice by some residents of the city. Figure 4.14 shows the proportion of project affected household heads by type of occupation involved.

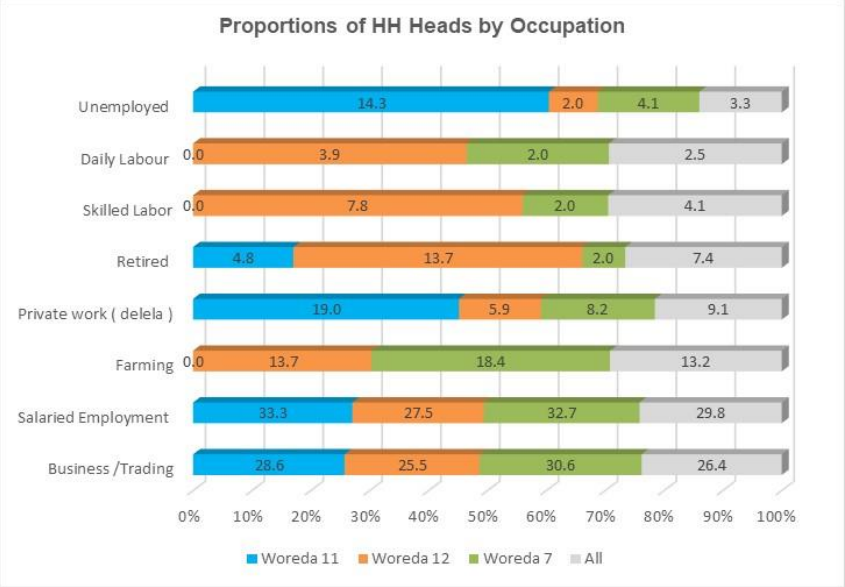


Figure 4.14: Proportions of Household Heads by Occupation and Woreda

4.3.2.10 Health Status and Vulnerability

The present health status of project affected household also revealed that overwhelming majority of (89.6%) of the household heads were in good health condition during the present route survey, while the remaining (10.4%) of the household heads are elderly people who considered as more vulnerable to health issues than others due to age related factors. Based on information collected on project affected households 45 or (37.2%) of the household heads are categorized as vulnerable mainly because of their age, headship status and a combination of both vulnerability types. Among identified vulnerability majority (66.7%) of the vulnerability types are attributed to headship status (being FHH), while (26.7%) of the vulnerability type is because of age (elderly HH head) and the remaining (6.7%) of is due to both attributes (Elderly & FHH).

Across the project Woredas, close to half (48.9) of the vulnerable household heads are found in Woreda 12, followed by Woreda 7 constituted (28.9%) of all vulnerable household heads and the remaining (22.2%) of vulnerable households are reported to be found in Woreda 11 of Nifas Silk Lafto sub city. When we assess vulnerability of project affected household heads within the project impact woredas, the proportion of vulnerable household heads is relatively higher in Woreda 11 Nifas silk Lafto sub city where (47.6%) of project affected household heads are identified as vulnerable, closely followed by Woreda 12 with (43.1%) of vulnerable household heads. The proportion of vulnerable HHHs in Woreda 7 of Akaki-Kality sub city is also significant with 30.2% of all projects affected HHs in the Woreda.

Table 4.11: Number of Project Affected Vulnerable HH Heads by Types of Vulnerability

Vulnerability Type	Woreda 11	Woreda 12	Woreda 7	All	Percent
Elderly	4	6	2	12	26.7
Female Headed Household	5	14	11	30	66.7
FHH & Elderly	1	2	0	3	6.7
All	10	22	13	45	100.0
Percent	22.2	48.9	28.9	100.0	
Percent within the Woreda	47.6	43.1	30.2	39.1	

5. Environmental and Social Risks and Impacts and Impacts and Mitigation Measures

5.1 Risks and Impacts Assessment Methodology

An environmental and social impact is any change to the environment (physical, biological and socio-economical environment), whether adverse and beneficial, wholly or partially resulting from changes to an environmental and social aspects.

Evaluation of environmental and social impacts involves rating of the risks and likely impacts resulting from a particular activity. An environmental and social risk is defined as a risk that arises from the relationship of human interventions and the environment and the social context, respectively. For the current project, four risk classes were considered as per the ESMF and to easily identify and understand project-related impacts (See Table 5.1). It is also in line with the World Bank ESS1.

Table 5.1: Environmental and social risk classes

Risk Class	Nature of Risk and Impact Description
Low	Activities with risks that are likely to be minimal or negligible
Moderate	Activities that have E&S risks and impacts that are not likely to be significant; temporary, predictable, reversible; low in magnitude; low probability of serious adverse effects to human health
Substantial	Activities that have substantial E&S risks and impacts, including those that are not as complex as High risk projects, and are temporary, predictable, reversible; limited degree of social conflict; medium spatial extent; less severe cumulative and transboundary impacts; low probability of serious adverse effects to human health
High	Wide range of significant adverse risks and impacts on human population or the environment; complex nature; sensitive location; long term, permanent, irreversible; significant adverse cumulative and transboundary impacts; serious adverse effects to human health

5.2 Identification and Assessment of Beneficial Impacts

The key potentially beneficial impacts associated with implementation of the Addis Ababa Power Supply Reinforcement Project is summarized below:

5.2.1 Reliable Energy Supply and Cost Reduction

This project is aligned with Ethiopia's National Electrification Program (NEP 2.0), which envisions to achieve near-universal electrification by 2030 and the Ethiopian Electric Power's (EEP) Electricity Sector Development Strategy/Plan (2020/21 – 2030), which provides for priority investments in generation, transmission and interconnection as well as the distribution and network expansion over its 2020/21 – 2030 plan horizon.

Therefore, the project will be an important electricity transmission facility to contribute for achieving Ethiopia's National Electrification Program goals.

The main anticipated benefit of the reinforcement of the transmission and distributions network in Addis Ababa and surrounds is improved and reliable energy supply and distribution to residents and businesses in the capital city and environs. It is expected to improve the coverage of reliable power supply in urban and rural areas of Addis Ababa, thereby stimulating the economy and social service delivery in the impact area.

The overall impact of implementation of the current project is anticipated to be beneficial in respect of a more reliable, re-enforced and expanded energy supply to residents and businesses and will help service the rapid rate of new development within Addis Ababa city and its surrounds. Improved coverage and reliability of energy supply will also help improve mobile phone and internet services, which are currently impacted during interrupted supply.

Reliable electric energy supply will also reduce the costs and inconvenience associated with using substitute forms of energy supply. Frequent power outages force both households and businesses to switch to diesel generators, kerosene lighting and even candles. These substitutes incur additional expenses, risks and inconvenience to the users. Businesses which cannot afford reserve energy sources are often forced to close during power disruptions resulting in lost production while still incurring cost of labour and overheads.

Generally the current project is an important part of the AADMP projects and programmes that are expected to have major, long term socio-economic indirect beneficial impact for Addis Ababa has a whole.

5.2.2 Impacts on Local Economy and Employment

Implementation of the project is expected to bring a positive impact on local economy through creation of employment opportunities for unskilled, semi-skilled and skilled labour that will be sourced within Addis Ababa including from the local communities.

To enhance this positive impact, it is recommended that that EEP will encourage the contractor(s) to hire workers from local project affected communities based on skills of the people. In addition, EEP in cooperation with local stakeholders and contractors will provide trainings for people who have potential skills that can be used in this project as well as in future projects.

5.2.3 Impacts on Women

Implementation of the project is expected to create employment opportunity for women through direct employment and engagement in small businesses around the construction sites. Both women as well as men will benefit from the short term, local employment opportunities created during the construction phase. It is common to see women working as daily labourers, timekeepers, store keepers and other positions. Therefore, the beneficial impacts on local economy and business mentioned above are also likely to benefit women.

It is also anticipated that there will be indirect benefits to women as they can actively engage in different income generating activities through sales of goods and services to the construction workers. It is evident that a number of catering services, coffee and tea shops, restaurants, kiosks and bars around many construction project sites are mainly managed and run by women. The participation of women in such income generating activities could increase their income and help them to empower themselves economically.

5.2.4 Landscape and Visual Impact

Demolishment of the existing towers and overhead transmission line along the ADC (Mexico square) - Gofa route and replacement with underground cables will have a positive impact on landscape.

5.2.5 Benefits of Underground Cables over Overhead TL

Underground transmission lines have a number benefits over overhead TLs. They have the potential to reduce outages, maintenance cost and transmission losses. They create less visual impacts and other environmental impacts. They emit no electric field, require a narrower band of land to install thereby minimizing the requirement for land acquisition, and they are less susceptible to the impacts of severe weather.

In addition, underground cables are inherently safe as they are insulated, electrically shielded, and out of the way. Underground transmission poses very little risk as there is no electrocution hazard for people or wildlife; no collision hazards for birds; no risk of line exposure from traffic collisions; and no fire risk to people, wildlife, nature or homes from arching lines during windy conditions.

5.3 Identification of Environmental and Social Risks and Impacts

5.3.1 Impacts on labour and working conditions (ESS2)

5.3.1.1 Occupational Health and Safety (OHS)

Construction of the proposed power transmission lines will involve occupational health and safety risks to construction workers.

From the nature of construction works, impacts on the health and safety to workers are anticipated through the following major causes and effects:

- Workers on construction sites are highly exposed to injuries unless precautionary measures are taken;
- Major causes of fatalities and noticeable injuries include electrocution effect during energizing and maintenance of the live line;
- Major causes of fatalities include: falls, fatalities caused by machinery and/or transport, struck by falling object etc.;
- Major causes of noticeable injuries include: falls, lifting objects, machinery, stepping on or striking against objects, transport, etc.;
- Death and injuries have adverse economic and social implications to families in particular and the country in general; and
- Risks from manual handling of heavy loads.

a) Provision for Personnel Protective Equipment

All personnel assigned on this project shall be provided by the Contractor and/or any sub-contractor with required Personal Protective Equipment (PPE) that meets the work requirements with international and local certification. They will require the use of PPE based on the hazards of the worksite and the work.

The Contractor shall:

- Identify all personal protective equipment required;
- Communicate the requirements for personal protective equipment to the workforce;
- Supply the required PPEs and ensure PPEs are maintained in proper working order; and
- Ensure that workers are highly visible at all times and work areas.

Hence, all workers and visitors must wear personal protective equipment appropriate to the task/locations, unless in designated safe/non-PPE/locations, all personnel shall have with them and/or wear the following PPE when entering the site/minimum standard/:

- Safety shoes and/or gum boots;
- Safety glasses – when required;
- Hard hat (helmets) with bill facing forward;
- Work gloves (either leather or cotton or metal braised) – when required;
- Hearing protection – for the reduction of noise and vibration caused by equipment;
- Goggles (during hot works such as welding); and
- Fall protection/full body harness/ - when working at heights.

In addition, the following measures shall be implemented to enhance occupational health and safety of the construction workers at all workplaces:

- Ensure that safety procedures are followed at all workplaces;
- Utilize visual safety warning signs, including those for electrical and mechanical equipment, and chemical hazards;
- Make arrangements (to the extent possible) for the regular inspection of all temporary buildings, structures, machinery and equipment to ensure that those are capable of withstanding the stresses likely to be imposed upon them and of safely performing the functions for which they are used;
- Carry out routine safety checks on construction sites and plant and facilities in line with standard safety procedures; and
- All unsafe conditions and work practices shall be promptly rectified and recorded accordingly. Safety check shall include assessment of equipment functionality, PPE usage and staff adhering to procedures.

b) Working at Heights/Scaffolding & Working Platforms

Scaffold means any temporarily provided structure on or from which persons perform work, and any temporarily provided structure, which enables persons to obtain access to or which enables materials to be taken to any place at which such work is performed. This includes any working platform, gangway, run, ladder or stepladder together with any guardrail, toe board or other safeguards and all fixings. Incomplete scaffolding that does not comply with this Safety Plan will have its access effectively blocked and warning notices prominently displayed.

- All workers working above 2.0M off floor level shall wear full body safety harness. Access and egress as per standards will be provided.
- For all works, a safe work method statement shall be prepared. The method statement will be implemented on site without any deviation unless getting written permission from the approving authorities.
- The Contractor shall prepare & communicate a fall protection plan to emphasis its commitment to the safety of the personnel & regulations.
- No works shall be started without an approved method statement in place.
- All working at height will be done with the combination of vertical lifeline and retractable lanyard. 100% attachment policy and “0” tolerance for violation will be enforced.

- If a safety harness is required as a fall arrester, each workman working there shall be provided with one;
- Every safety harness shall be provided with a suitable anchorage and fittings to prevent serious injury in the event of fall;
- Whenever the use of a safety harness is necessary, a workman has a duty to wear the safety harness provided and keep it attached to a secure anchorage for his own or any other person's safety; and
- The workman must keep the harness provided attached to a secure anchorage for his own or any other person's safety.
- Tools must be tied with the wrist or waist properly to avoid any material fall incident.

c) Lifting

- All the lifting work whether heavy or light shall be inspected by the ESHS Manager prior to job execution.
- All the loose and fixed lifting tools, tackles and equipment shall be inspected and shall be done in an if and when required basis.
- Weight of the sections to be lifted shall be pre-decided.
- Proper care shall be taken to avoid over loading or overturning of forklift trucks.
- All lifting works shall be suspended during heavy wind or rain.

d) Safety Hazards through Live Power Lines

High voltage transmission lines also entail risks of electrocution during maintenance. For example, if proper safety procedures are neglected, maintenance of high voltage power lines has potential to cause fatal risk of electrocution to line maintenance crew.

Necessary Mitigation Measures

The risk can be minimized by adopting appropriate mitigation measures including the following:

- Develop and implement Health, Safety and Environment (ESHS) management system and review timely or after a major accident or incident.
- Provide awareness training regarding health and safety to construction workers involved in construction activities of the power line stringing and energization about the safety risks and the measures they shall take.
- Provide PPE including shock resistant gloves, shoes and other protective gears to workers handling electricity and related components.
- Reduce occupational hazards and accidents, ensure that construction staff strictly follow and comply with safety procedures including use of protective garment and equipment at all times during energization;
- Delineate or fence work zone or dangerous areas and provide sufficient information about the site through posting of clearly visible signs;
- Marking all energized electrical devices and lines with appropriate warning signs;
- Establish "No Approach" zones around or under high voltage power lines;
- Post proper and clearly visible signs, barricades, reflectors at appropriate locations so that road users (drivers) are aware of the active construction works and take precautions while driving through or at nearby project operational area;

- Disconnect power transmission through the existing lines during construction of the project TL to avoid electrocution risks; and
- Appropriate labeling of service rooms housing high voltage equipment ('electrical hazard') and where entry is controlled or prohibited.

For all construction activities(SS & TL works), the Contractors are required to develop a site-specific OHS Plan consistent, at least 4 weeks prior to commencement of activities on site, reviewed and cleared by the respective as part of the C-ESMP PIU. The OHS Plan shall have sub-plans, which will contribute to the overall implementation of the OHS Plan.

The risk rating of occupational hazard is *Substantial*, which is social impacts with Substantial consequences and likely to occur. Proper implementation of the proposed mitigation measures is critical and can reduce the OHS risk rating to *Low*, which is social impact with no or limited consequence and less likely to occur.

5.3.1.2 Working Conditions for the Construction Labours

In order to achieve the desired goal in construction works, proper working conditions shall be maintained as per the provisions stipulated in the Labor Proclamation No. 1156/2019 and Federal Civil Servants Proclamation No. 1064/2017 of Ministry of Labour and Skill (formerly MoLSA) and also according to WB's requirements.

The Contractor and subcontractors are required to comply with the procedures as presented below:

- Ensure compliance with national employment and labour laws and the ESS2 requirements;
- Protect all related workers, including migrant workers, workers engaged by third parties, and relevant supply chain workers;
- Promote safe and healthy working conditions and practices for the health of workers;
- Promote fair treatment, non-discrimination, and equal opportunity of workers;
- Establish, maintain, and constantly improve the worker-management relationship;
- Promote work opportunities of local people and particularly women and other vulnerable groups; and
- Exclude use of child and forced labor.

This is because priority will be given to employ most of the unskilled workers from the adjacent areas.

The Civil Contractor will not require to open and operate a new quarry sites.

Necessary Mitigation Measures

Therefore, the following mitigation measures are recommended and shall be considered by the Contractor:

- The Contractor shall provide reasonable working conditions and terms of employment to all construction workers;
- EEP in association with the local Woreda Authorities will monitor to ensure all persons under the age stipulated in the country's Labour Law and also according to WB's requirements are not employed;
- The Contractor shall adopt and implement the Labor Management Procedures (LMP) and a Code of Conduct (CoC);

- The Contractor shall establish workers Grievance Redress Mechanism (GRM) under the contractor framework; and
- As the national law recognizes workers' rights to form workers' organizations without interference and to bargain collectively (including express their grievances and protect their rights regarding working conditions and terms of employment), the Contractor shall comply with the law.

5.3.1.3 Noise and Vibration

In and around the project area and along the short section of the access road corridor the noise sources include vehicular traffic and the hooting of the vehicles, and human activity including religious institutions and livestock noise at villages.

The operation of plant and heavy duty equipment and construction traffic on site and to and from the site has the potential to generate noise and vibration impacts on the nearby residents and properties. The activities that are expected to generate significant noise and/or vibration include:

- Operation of the traffic that will delivery construction materials to and from the lay down areas and to site;
- Open excavation works to install a conduit system for underground cables;
- Drilling of pipe jacking to install a conduit system for underground cables where an open excavation method cannot be applied like at the Mexico square and the crossing of major roads;
- The activities involved in the fabrication and construction of the towers and stringing of the lines; and
- The dismantling of the existing tower structures and decommissioning of the electric lines.

Based on the nature, scale and duration of the construction works, and the proximity of project site/ activities to sensitive receptors such as residential and commercial/ business areas, international & government organizations (like African Union, Sudan Embassy), various enterprises, social services (like schools), religious institutions (churches), the noise impact is assessed to be minor, localized and temporary for the overhead TL and Feeders, and moderate, localized and temporary for the underground cables. The number of sensitive receptors is particularly high along the Black Lion – New Centre – Gofa and Weregenu – Kotebe. Point 3 underground transmission routes as they are located in the highly built and densely populated parts of the Addis Ababa city.

The summary table below provides the list of the primary sources of noise and vibration associated with the Construction Phase.

Source	Emissions of Primary Concern	Comments
On site vehicle movements	Noise	Movement of vehicles throughout the project work areas, including access road construction areas.
Construction plant	Noise & Vibration	Compressors, concrete mixers, impact equipment etc. used during construction
Earth works	Noise	Loading and movement of heavy machinery throughout the project area, access roads.
Tunnel boring and trench excavation	Noise & vibration	Open excavation works and drilling of pipe jacking to install a conduit system for underground cables
Power generation	Noise	Noise from temporary generators.
Offsite vehicle movements	Noise & vibration	Movement of vehicles, particularly haulage or heavy equipment vehicles in proximity to residential and commercial properties

There is no historic monument in the immediate vicinity of the project area that will be affected by activities producing high vibration levels. Therefore, no mitigation measure to protect historic monument is necessary. However, vibration generated by excavation works and drilling of pipe jacking usng heavy duty equipment and plants to install underground cables particularly along the sections that traverse through built-up areas may affect the stability of existing structures such as roadside buildings, utilities, and the road pavement itself including cracking of the structures. The risk of vibration impact is anticipated to be moderate.

No significant noise impacts are anticipated during the operation phase.

Necessary Mitigation Measures

Therefore, to cause the least inconvenience due to excessive noise to construction workers and the population around the sites, the Contractor shall:

- Use of modern mechanical plant, equipment and vehicles fitted with effective noise silencers/ mufflers and their regular maintenance to minimize noise levels;
- Along the sections where the risk of vibration is anticipated to be significant, use of equipment and plants that will not produce heavy vibration that would exceed the the acceptable limit shown below;
- If existing buildings or other structures are affected due to vibration impact, repairing the damage or paying compensation for as per the country's applicable law and regulation;
- Switching off equipment and vehicles when not in use to avoid noise emission;
- Minimize worker exposure to noise and vibration by providing appropriate PPE (earplugs), hearing protection and noise control device as required;
- Limitation of working time within extreme sound emissions and it shall be in compliance with best practice guidelines; and
- Carrying out noisy construction activities in the vicinity of sensitive areas during normal working hours only.
- Coordinate and implement all standard noise and vibration control measures to ensure National and WB standards are met;
- Noise hazard depends on noise intensity, duration of exposure during a typical working day and overall exposure during working life. Therefore, the Contractor shall carry out noise surveys to determine the degree of hazardous noise exposure

specially around the underground and substation works by surveying any area in which workers are likely to be exposed to hazardous noise (>80 dBA) level;

- Controls shall be undertaken to reduce exposures to >80 dBA, including layout of equipment, selection of quieter machines, isolation of workers from noise source etc.
- A proper routine and preventive maintenance procedure for project vehicles and equipment shall be set for their best operating conditions and lowest noise levels possible so that extraneous noises from mechanical vibration, creaking and squeaking are reduced to a minimum;
- Construction equipment generating high noise shall be designed to have an adequate noise control (such as mufflers, silenced exhaust acoustic);
- Driver to avoid reviving the vehicle while the vehicle is idle; and
- Conduct job-specific training for machinery and heavy vehicle operators to cover the importance of noise control and available noise reduction measures.

The risk rating of impacts on noise environment is classified as *Moderate*, which is environmental impact with some consequences and likely to occur. However, implementation of the referred mitigation measures will reduce the risk rating to *low*, which is environmental impact with no or limited consequence and less likely to occur.

The Contractor shall develop job specific noise and vibration management plans at the commencement of works as part of the C-ESMP where noise and/or vibration issues can be expected.

Vibration thresholds values for Ethiopia, India & Germany:

According to Ambient Environment Standards for Ethiopia (EPA, 2003), in quarrying and mining operations, the vibration levels from blasting should not exceed a peak particle velocity of 12 mm/s; No details for different structures and no provision for other activities;

Guideline value/ permissible limit of ground vibration (Peak particle velocity, mm/s) for India and Germany:

S/n	Type of Structures	India			Germany		
		Frequency Band width [Hz]			Frequency Band width [Hz]		
		< 8Hz	8-25Hz	>25Hz	4-8Hz	8-30 Hz	30-100Hz
1	Residential (domestic houses/ structures)	5	10	15	5	5-15	15-20
2	Commercial/ Industrial building	10	20	25	20	20-40	40-50
3	Objects of historical importance & sensitive structures	2	5	10	3	3-8	8-10

Sources: 1. Directorate General of Mine Safety (DGMS) Circular 7 of 1997 (for India)
2. The German Standards DIN 4150 Part 3, December 2016 (for Germany)

5.3.1.4 Risk of Forced Labor

The Contractor will not employ forced labour.

It is forbidden to hold original documents of the workers and conversely, they have the right to access their personal documents at all times. The Contractor recognizes the full freedom for the employees to leave the jobsite after the work time, except different rules set up for security reasons.

All workers have the right to resign or to leave the job freely. This provision applies also to the sub-contractor, contractor and suppliers.

5.3.1.5 Risk of Child Labor

The Contractor is required to be non-discriminatory regarding race, religion, gender, age, disability. However, child labor is illegal and considered harmful and creates psychological and social problems in the community. Therefore, if children below the age of 18 are employed in the construction works it may lead to exploitation of children and at the same time it is violation of FDRE Law.

The WB ESS2 states that the minimum age of employment is 14 years while the newly revised Ethiopian Labor Law has extended the minimum year of employment to 15 years. However, both WB and Ethiopian law prohibits the engagement of children under 18 years of age in works that have hazardous nature. Therefore, as presented in Annex 9 of the ESMF, the project will not allow employment under the age of 18.

The Contractor is also required to protect Violence Against Children (VAC).

Necessary Mitigation Measures

Therefore, the Contractor is required to implement the following measures:

- Offer equal employment opportunities to all collaborators based upon their specific professional qualifications and performance without any discrimination;
- Select, hire and manage collaborators according to competence and merit;
- Take strict measures against employment of children below the age of 18;
- The Contractor will not employ children that is economically exploitative, or is likely to be hazardous or to interfere with the child's education, or to be harmful to it's health or physical, mental, spiritual, moral, or social development;
- Put in place administrative measures to prevent and minimize VAC with proposed preventive and mitigation strategies;
- Strengthen grievance redress and other monitoring mechanisms to ensure safe and ethical reporting systems to alert cases of VAC and assure them to access adequate response; and
- Work closely with local authorities to prevent hiring underage children for the project construction works.

The risk rating of VAC is *Substantial*, which is social impacts with some consequences and likely to occur. However, implementation of the proposed mitigation measures will reduce the risk rating to *Low*, which is social impact with no or limited consequence and less likely to occur.

5.3.1.6 Conflict among Project Workers & between Project Workers & Communities

Employment opportunities for skilled and unskilled labourers will be created during construction. Development of major conflicts between local communities and contractor's migrant workers are not to be expected in this area. However, a grievance mechanism will need to be put in place well before the start of the project.

There is a huge influx of labor or in-migrants from different parts of the country into the metropolitan city of Addis Ababa due to construction booms. Therefore, the magnitude of labor influx due to this particular project can be overshadowed by other in-migration dimensions into the city. As a result it is difficult to determine precisely the magnitude of labor influx into the project sites due to the current project. The project contractor shall integrate an in-migration dimension into the program activities during the implementation of the project by employing the following strategies prior to construction phase:

Necessary Mitigation Measures

Although labour recruitment is a matter for the contractor, they must be formally requested to hire locally wherever possible, in order to maximise the benefit distribution and social acceptability of the project.

- Setting workforce recruitment policy and management for the project;
- Communicating the project's recruitment policy through Local Employment Offices to potential in-migrant workers;
- Limiting recruitment of labour locally that is within the project affected Woredas and/or sub-cities boundary;
- Monitoring the migrant population (in-migrants) into the project sites; and
- Assign the responsibility to liaison with local communities and local authorities to a named individual from the contractor's organization and to require effective liaison to promote social integration, and the development of mutually satisfactory solutions to problems affecting local communities.

The risk rating of conflicts between local and migrant workers is *Moderate*, which is - social impacts with some consequences and likely to occur. However, implementation of the proposed mitigation measures will reduce the risk rating to *Low*, which is social impact with no or limited consequence and less likely to occur.

5.3.1.7 Spread of Culturally Unacceptable Behaviour

With an influx of workers arriving into the community throughout the construction phase, it is likely that these workers, although minor in number, may spread certain behaviour including drinking alcohol, substance abuse and criminal activities in culturally unacceptable and noticeable way. Therefore, misunderstanding could arise and things could easily go wrong if and when outsiders, knowingly or otherwise, break their traditional norms, values and customs.

Necessary Mitigation Measures

Therefore, the Contractor is required to implement the following measures:

- Maximise local hire of labour, in so far as this is compatible with the contractor's skill requirements;
- Employees shall receive compulsory induction training at the time of employment. The training includes company policies and code of conducts to make the employees aware;
- Train all construction team about the local culture with the objective to protect the authentic culture and heritage of the people of the project area; and
- Assign the responsibility to liaison with local communities and local authorities to a named individual from the contractor's organization and to require effective liaison to promote social integration.

The risk rating of spread of culturally unacceptable behaviour is *Moderate*, which is - social impacts with some consequences and likely to occur. However, implementation of the proposed mitigation measure will reduce the risk rating to *Low*, which is social impact with no or limited consequence and less likely to occur.

5.3.1.8 Impacts on Disadvantaged and Marginalized Groups

Disadvantaged, marginalized and ethnic minority people and groups are often systematically discriminated against and excluded from mainstream societal life, and hence, they often find it very difficult, unless supported externally, to cope with shocks and hazards caused by eventualities such as physical displacement and loss of assets.

There are no disadvantaged or marginalized groups of people in and around the project area whose traditional lifestyles could become compromised through the development of the proposed Project.

Necessary Mitigation Measures

Therefore, no special mitigation measures or indigenous development plan will be required.

5.3.2 Resource efficiency and pollution prevention (ESS3)

5.3.2.1 Pollution from Solid Wastes

Large scale construction work like Addis Ababa Power Supply Reinforcement Project will produce considerable amount of construction waste. These wastes unless properly managed, would cause pollution of the environment and that is air, land, and surface and ground water resources.

The major waste materials (and their sources) that can be generated during construction of the project include:

- waste generated by construction works, construction and other facilities;
- Spoils generated due to excavation for tower foundation, tunnel boring and trench excavation;
- containers for various construction materials and plastics;
- used lumber for scaffolding material, packing material;
- metal scraps from different construction sites;
- hazardous solid wastes such as discharged fuel filters, batteries, etc. of vehicles and machinery; and
- hazardous solid wastes such as paints and solvents and clinical or medical wastes.

Necessary Mitigation Measures

The Contractor shall apply the duty of care principles to waste management activities to ensure that waste does not pose a threat to human health or the environment.

As a general practice at the construction site, the Contractor shall adopt the following waste minimization hierarchy that prioritises waste management solutions and these include reduce the overall amount of waste, reuse and recycling of any wastes that are unavoidably created and disposal as a last resort. Any waste material which is unable to be reused, reprocessed or recycled shall be disposed at a landfill.

The potential environmental impacts related to solid wastes generated by construction activities will be avoided or reduced by implementing the following mitigation and management measures:

- Construction wastes will not be allowed to accumulate on the construction site but will be promptly collected and removed regularly from the site by the Contractor;
- Avoidance of side-tipping of excavation materials on adjacent areas where it may affect road infrastructure, storm-water drainage systems, crops/croplands, trees and other vegetation or green areas through proper collection and dumping of the

materials only in approved disposal sites, or through proper stockpiling and re-using it for rehabilitation works when construction works are over;

- Indiscriminate disposal of solid waste shall be strictly prohibited;
- Prohibition of littering and establishing routine clean-up at project sites and waste collection depots;
- Management of solid and liquid wastes generated during construction and refurbishment activities of the project in accordance with applicable waste management laws and regulations;
- Training of project staff in effective waste handling and management procedures.
- Collection of all oily wastes like used oil, used oil filters generated on site from equipment and vehicles with particular care in appropriate containment such as impervious or spill free containers and storing them in a bounded area. Similarly proper handling of empty containers of engine oil and lubricants with particular care until the final destination of the wastes for recycling or reuse; and
- Transferring of hazardous wastes to a licensed company/companies who has/have the capacity to dispose wastes according to national or international standards. Complete documentation of waste streams including types and quantities from origin until disposal shall be handed over to EEP/EEP's Representative/ Project Auditor.
- Waste materials will be placed and stored in suitable containers. Storage areas and containers will be maintained in a sanitary condition and shall be covered to prevent spreading of wastes by wind or animals;
- Sufficient number of labelled and colour coded garbage bins and container will be made available at all construction offices, stores, canteens, etc. Ensure wastes are strictly segregated at generation sites (source). Waste bins shall be labelled in Amharic and English in account of potential language use of project workers which might come from other areas of the country and expat workers, as well as the language of the communities in the project area;
- Wastes will be appropriately segregated such that hazardous and non-hazardous wastes are not mixed and to allow for recycling and reuse where appropriate;
- All wastes generated shall be correctly identified and stored pending collection/transfer for reuse, recovery, recycling or disposal in an environmentally sound manner;
- Any waste material that is inadvertently disposed in or adjacent to any watercourses will be removed immediately in a manner that minimizes adverse impacts, and the original drainage pattern will be restored; and
- All wastes, which are not designated as combustible waste to be burned on-site, will be recycled, disposed of in an approved landfill, or shipped to an approved disposal facility.

Management of Hazardous Waste and Chemicals

The construction site is expected to have hazardous materials like chemicals, hydrocarbons, chemicals and products used for wood preservation, etc.

The removal and disposal of hazardous wastes in the project site shall follow nationally or internationally recognized procedures.

Therefore, the Contractor shall properly store (or stockpile) the hazardous waste on site at designated location and warning signs shall be posted and handled.

There are no licensed hazardous waste disposal sites around the construction area.

Therefore, the management measures include the following:

- Respect, as minimum requirements national and international laws, codes and guidelines and apply the strictest standards everywhere feasible. These include Proclamation 513/2007: Solid Waste Management and Proclamation 300/2002: WB's ESS3 Resource Efficiency and Pollution Prevention and Management and WBG General EHS Guidelines;
- All hazardous waste shall be disposed of in accordance with the national legislative requirements;
- Immediate remedial action will be taken following any spill or incident of hazardous wastes at disposal sites. These will include:
  - Site operators must ensure that spilled material/products are immediately cleaned to prevent seepage of the same into the nearby river and groundwater;
  - Establish temporary and permanent spill containment structures as necessary;
  - Ensure appropriate PPE is provided and used;
  - Know the location and proper use of clean-up material; and
  - Develop and implement emergency preparedness and response plan.

Toxic wood preservation chemicals may include polynuclear aromatic hydrocarbons (PAHs), pentachlorophenol (PCP), pesticides, and compounds of chrome, copper, and arsenic. Under some circumstances, working with treated wood may result in exposure to hazardous levels of arsenic or chromates. However, dusts that contain wood preservatives are less likely to cause harm than pure arsenic and chromate dusts, because the amount workers are exposed to is less.

Generally, treated wood is not considered hazardous waste under National Regulations. However, the proper management of hazardous waste and chemicals used in wood preservation is crucial for environmental protection. Therefore, it is recommended:

- Proper disposal of treated wood, handling and storage of chemicals, and compliance with regulations;
- *Follow all manufacturer's instructions and safety guidelines:* This includes personal protective equipment (PPE) like goggles and dust masks when sawing wood treated with chromated arsenicals;
- *Never burn treated wood:* Burning releases toxic chemicals into the air and environment; and
- *Dispose of treated wood in designated waste management facilities:* This can include landfills with protective liners, treatment, storage, and disposal facilities, or facilities that treat or recycle treated wood.

Risk from the use of Sulphur Hexafluoride

Sulphur hexafluoride (SF_6) is used in electricity transmission and distribution. Medium- and high-voltage electrical equipment (switchgear) contains SF_6 to insulate the live electrical parts and to safely switch the flow of electrical current on and off.

SF_6 is a synthetic, odourless gas that's used in the electricity industry to keep networks running safely and reliably as it's highly stable, non-toxic, non-flammable and electronegative. This stability means that it will not easily form other compounds that will alter its state and effectiveness, and it doesn't degrade easily in the atmosphere. However, as a greenhouse gas, it contributes to global warming in a similar way to carbon dioxide (CO_2).

Therfore, to prevent the release of SF_6 into the atmosphere and reduce risks associated with its use, the following measures are recommended:

- Designe electrical switchgears to avoid the release of the gas into the atmosphere;
- Implement robust safety protocols, including training for personnel, adequate ventilation, personal protective equipment (PPE);
- Ensure proper ongoing leak detection and maintenance programme of leak repair and mitigation; and
- Where still needed to use SF6 (such as for maintenance), re-use/recycle SF6 from decommissioned equipment wherever possible;

Medical Waste Management

At the project site there will be a clinic to handle an emergency cases. Medical wastes emanate from this clinic at project site in the form of unfinished, thrown-away drugs of different forms or expired drugs. Therefore, it is necessary that:

- All medical wastes shall be strictly segregated from other waste types to avoid cross contamination and temporarily stored in secured and labelled containers;
- All waste from the medical centre and the first aid posts shall be packed in containers designated for that purpose and discarded according to the rules and regulations established for the disposal of medical waste;
- The Contractor shall establish collaboration agreement with the nearby Hospital to share the available facility for medical wastes (such as needles and other sharp objects) disposal;
- All personnel handling medical waste shall wear appropriate PPE.

The Contractor will prepare its own Construction Waste Management Plan (C-ESMP) taking in to account of this Waste Management Plan as a framework and minimum requirement. The Waste Management Plan shall provide waste management measures, reflecting the WB requirements.

Therefore, as a minimum the Contractor shall make a clear coverage on the following points.

- The identification of waste streams to be produced by the project;
- The waste tracking system to be put in place; and
- The waste minimization including recycling and waste disposal options.

It is recommended to handle all waste generated during construction in a way that protects the environment and complies with applicable regulations such as IFC EHS guidelines on waste management. To this effect, the EPC Contractor shall:

Management of Wood Preservation

Wood materials such as wooden plates for trench works, scaffolding material, packaging material, paper, cardboard, etc. shall be collected and separated on site for possible recycling.

Dimensional lumber in good condition will be stockpiled for reuse when short-length pieces are needed.

Construction crew shall be strongly encouraged to reuse as much wood as possible. Scrap wood that is not reusable will be placed in a designated container located on the job site.

Housekeeping: all dismantled wooden drum and pallets will be collected and transported away from the site to the designated location.

The risk rating of impacts from solid wastes is classified as *Moderate*, which is environmental impact with some consequences and likely to occur. However, implementation of the proposed mitigation measures will reduce the risk rating to *low*, which is environmental impact with no or limited consequence and less likely to occur.

5.3.2.2 Air pollution

It is expected that during construction there will be some impacts on air quality resulting from dust emission caused by movements of vehicular traffic on unpaved roads and earth moving activities as well as exhaust emissions from construction vehicles and equipment. In general construction activities including cutting in soil, moving, loading and unloading of materials will be carried out at small scale for a short duration at discrete locations across a wide area for the overhead transmission line and linearly extensive location for the underground transmission lines. It is anticipated that air quality impacts will be generally minor, localized and temporary for the overhead TL and moderate, localized and temporary for the underground TLs.

Considering the limited scale and duration of the construction works, the distance of project site/ activities from sensitive receptors such as residential and commercial areas as well as social services (schools), the significance of air quality impact is assessed to be minor for the overhead TL and Feeders, and moderate for the underground TLs.

Necessary Mitigation Measures

Recognised good site practice must be followed to minimise dust production and vehicle emissions, this will protect the construction workers and those community members that cross the project area.

The potential environmental and social impacts related to air quality will be avoided or reduced by implementing the following mitigation and management measures:

- Implementing measures that will reduce dust from construction activities including spraying water on unpaved access roads, exposed earth and any stockpiles on site to suppress dust emission, and where feasible, covering over stockpiles on site with plastic materials;
- Setting speed limits for vehicular traffic operating on unpaved access roads esp. in the vicinity of sensitive areas (residential and business areas, social services, religious places) and enforcing the limit to reduce dust emission;
- To prevent high dust near settlements, traffic speed Shall be reduced to 30km/hr;
- Switching off equipment and vehicles when not in use to avoid the release of emission of pollutants;
- Regular maintenance of diesel powered equipment and vehicles to reduce excessive exhaust emissions;
- Concrete mixing plants and associated machinery installed for project activities will be equipped with suitable pollution control (dust suppression equipment) arrangements;
- Prevent the occurrence of smoke emissions or fumes from fuel oils;
- Avoid exposing any volatile chemical to the atmosphere; and
- Avoidance of burning of combustible, non- hazardous wastes at nearby sensitive areas including residential and commercial areas, institutions and social services (schools, health facilities) etc.

The Contractor is responsible to develop an ambient air quality monitoring and management plan as part of the C-ESMP, and with particular focus on dust monitoring. The Contractor is also responsible to monitor the air pollution risk at all construction sites, access roads and near settlements/villages.

Considering the level of emissions arising from vehicles and equipment's associated with construction activities and the limited scale, duration of the construction works and the distance of project site/activities from sensitive receptors, the significance of air quality impact is considered to be *Moderate*. Effective implementation of the above mitigation measures is expected to reduce the risk rating of impact due to emission of particulate matter to a *low* rating, which is environmental impacts with no or limited consequence and less likely to occur.

5.3.2.3 Water Pollution

During construction phase there will be a risk of surface water and groundwater pollution due to inadequate handling and spillage of hazardous substances such as fuel, oils and paints, and discharge of effluents or wastewater. In addition, there will be increased sedimentation of Akaki River and streams crossed by the overhead and underground transmission lines or running in the corridor of the TLs due to soil erosion from areas cleared off vegetation cover and excavated for foundation of tower base or burying electric cables. This impact is likely to be small magnitude. There are no sensitive surface or ground water resources such as potable water supply sources within the project impact area that would be affected by the project activities.

The existing water quality of Akaki River and other streams in the project area is very poor owing to unrestrained disposal of municipal sewage, industrial wastes and solid wastes into the water bodies as well as urban runoff water entering the streams during the wet seasons. In comparison with the existing water quality of the streams in the project influence area, the impact of project activities on water quality is considered to be minor. The impact on water resources including water quality is anticipated to be minor to moderate.

Impacts on water quality impacts are expected to be minor during operation period.

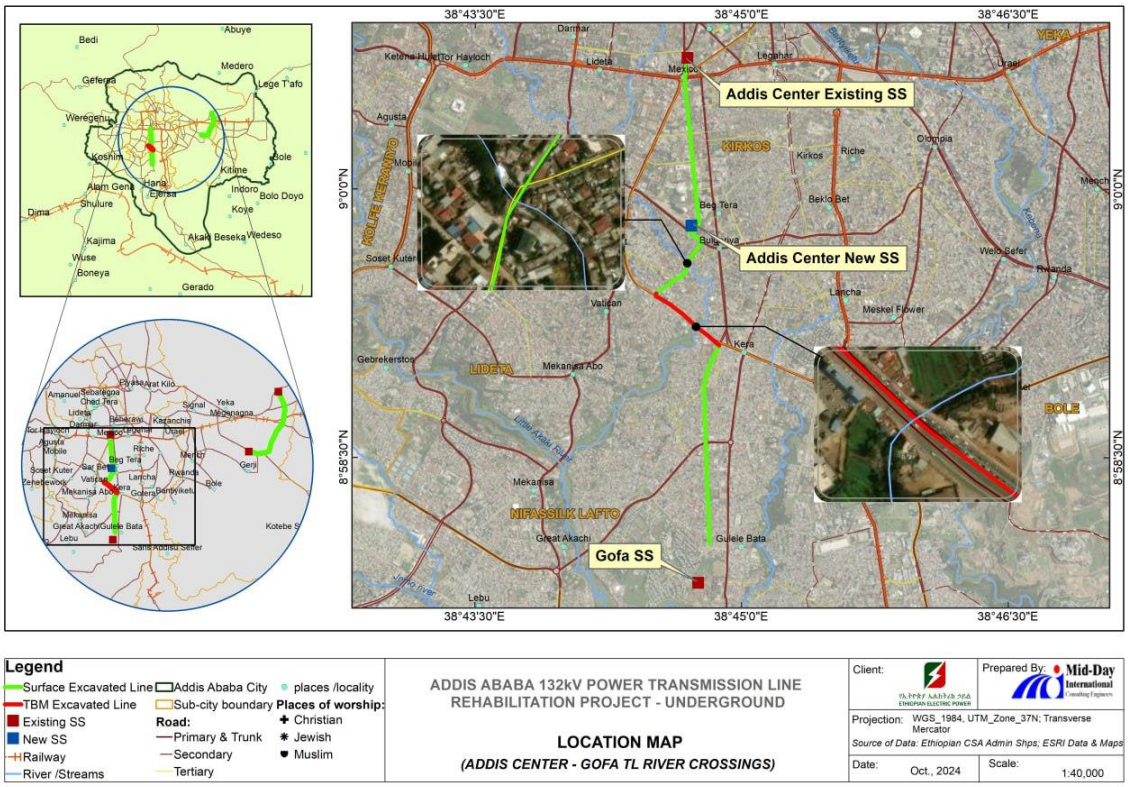


Figure 5.1: Major River Crossings along New Addis Centre to Gofa

Necessary Mitigation Measures

- Execution of excavation works and earth moving activities during the dry season only thereby minimizing erosion or transport of excavated materials by runoff water to water bodies;
- Taking maximum care during excavation works adjacent to or on the banks of streams to avoid excavation or earth materials from entering the water bodies;
- The Contractor is required to prevent entrance or accidental spillage of pollutants and wastes into flowing and/or dry water courses resources.
- Avoidance of depositing excavation materials on the banks of streams and river where they could easily enter the surface watercourses;
- Performing maintenance of construction equipment and vehicles in properly designated servicing areas or garages;
- The contractor is required to prohibit washing of project vehicles and plant in or adjacent to any water sources. All washing to be carried out at designated areas away from water sources;
- Undertaking re-fuelling of equipment and vehicles at standard fuel stations or properly designated dispensing points of fuels and lubricants provided with drip pans or other facilities for catching any spills available.
- Availing appropriate facility to capture and contain any spills both on construction and operational sites;
- Proper storage and handling of hazardous substances (oil, fuel, used oil, paints, cement etc.) to avoid water and soil pollution by accidental spillages;
- Avoidance of washing equipment and vehicles in or near streams and river;

- Most of the mitigation measures proposed for the impacts on soils particularly the measures shown under bullets 6 to 13 are also applicable to avoid or reduce impacts on water resources.
- The contractor is required to make specific and adequate provision for the disposal of sanitary and other liquid and solid wastes in such a way as will not result in any form of pollution or hazard to human or animal health;
- Ensure all hazardous materials are stored in designated areas (i.e. on flat or gently sloping ground) to prevent spillage;
- Ensure appropriate hazardous materials containers are used with seals that are in good condition (i.e. glass containers for corrosive chemicals);
- Ensure employees have appropriate training in safe hazardous materials handling; and
- The contractor is responsible, at his own cost, for cleaning up any pollution caused by his activities and the payment of full compensation to those affected.

The risk rating of impacts on water pollution is classified as *Moderate*, which is environmental impact with some consequences and likely to occur. However, implementation of the proposed mitigation measures will reduce the risk rating to *low*, which is environmental impact with no or limited consequence and less likely to occur.

5.3.2.4 Impacts on Soils

During construction project activities including site clearing and excavation for foundation of towers and poles, construction of sub-surface cables and construction of access roads to the overhead TL have the potential to cause damages to soil structure and expose the soil to runoff water erosion. Excavation of trench for installation of the underground transmission lines will involve removal of both topsoil and subsoil along most sections of the UGTLs that follow existing roads median, and backfilling of the soil material when fixing of the cables is completed. This will affect the soil structure esp. the topsoil used for development of greenery vegetation along road median unless carefully removed, properly stockpiled and backfilled. The excavated soil could be exposed to runoff water and wind erosion and ultimately transported to nearby streams and other drainage channels. This will increase the risk of sedimentation of the recipient water bodies and siltation of drainage channels.

It is expected that existing roads will be used for the whole section of the underground TLs and for most section of the overhead TL. However, new access roads may need to be constructed for the sections between Towers 35 and 40, and between Towers 47 and 52 of the overhead TL. Most are expected to be accessed through existing roads while some Feeders could be accessed through open field during dry periods.

In addition, project activities are likely to cause soil compaction during site clearing, excavation, ground-levelling and other earthworks by heavy duty equipment as well as due to movement of construction vehicles on earth tracks. Compaction of ground surface can lead to an increased rate of surface runoff as the water cannot infiltrate into the ground.

Moreover, there will be a risk of soil contamination from spillages of fuel from equipment and vehicles, and from poor handling of hazardous substances used on site such as paint, fuels or oils.

The impact of construction works on soils has been evaluated to be minor to moderate, localized and temporary without applying any mitigation measures.

During operation phase no significant impacts on soils are expected.

Necessary Mitigation Measures

Impacts on soils (soil erosion, compaction and contamination) will be minimized through the following mitigation measures:

- Carrying out land clearing (vegetation removal) and excavation works in the dry season only to reduce exposure of soil to runoff water erosion;
- Careful removal and proper stockpiling of the topsoil from the underground transmission routes, tower base of overhead TL, and access routes, and re-using it for site restoration when construction works are ended.
- Prevention of the stockpiles of topsoil from water or wind erosion by carefully depositing the soil at areas away from any water channel and by covering with plastic sheets where possible;
- Keeping vegetation clearing to the imperative area required for the construction works.
- Keeping vehicles on defined access tracks to avoid soil compaction and impairment of its use for agriculture and other purposes.
- Reducing the time exposed surfaces or excavated soils remain bare following completion of works by scheduling construction works and restoration measures so that large areas of soil or large volume of excavated soil are not laid bare.
- Reinstating temporarily used access roads to productive state by removing any pavement materials, ripping compacted soils and spreading topsoil over the surfaces.
- Re-establishment of vegetation cover progressively as the construction works are completed through replanting or seeding of suitable grasses such as Kikuyu Grass (Pennisetum clandestinum) and Bermuda Grass (Cynodon dactylon), and shrubs that are capable of binding by increasing its shear resistance;
- Performing regular maintenance of construction equipment and vehicles in standard garages or properly demarcated servicing areas designed to contain fuel and oil spillages;
- Undertaking re-fuelling of equipment and vehicles at standard fuel stations or properly designated dispensing points of fuels and lubricants provided with drip pans or other facilities for catching any spills available;
- Availing appropriate facility to capture and contain any spills both on construction and operational sites;
- Proper storage and handling of hazardous substances (oil, fuel, used oil, paints, cement etc.) to avoid water and soil pollution by accidental spillages;
- Avoidance of leakages from vehicles and equipment by regular and effective maintenance;
- All wastes and hazardous wastes generated through the use of substances like fuel, engine oil and lubricants shall be properly collected, separated according to their waste type and properly disposed of in compliance with the applicable national laws and guidelines or best practice guidelines; and
- Insulating oil as well as transformers will be set in the metal box.

5.3.2.5 Landscape Disturbance

a) Construction phase:

Removal of existing plantation trees and other vegetation found along certain sections of the underground routes and excavation works for laying underground cables have a negative impact on local landscape. In particular the corridor of the BLL – NADC and Weregenu – Kotebe sections of the underground transmission routes contain significant number of potentially affected trees and shrubs that have been planted mainly for town beatification or landscape value (see section 5.3.5.2 for the details).

In addition, mainly temporary impact on landscape can result due to installation of the underground transmission lines that will involve excavation of about 10.04km open trench with an estimated width of 2m. It is expected that most section of this will be reinstated to its original state or prior land use following the installation of conduits for the underground cables. However, short stretches that will be used for construction of manholes where cables shall be connected in appropriate span with a joint box. The size of a manhole can vary from 2m to 4m width and from 8m to 14m length. The land requirement for construction of manholes will be permanent while the rest will be mainly temporary as it can be used for road infrastructure, short rooted greenery vegetation etc.

b) Operation phase:

Demolishment of the existing towers and overhead transmission line along the ADC (Mexico square) to Gofa route and replacement with underground cables will have a positive impact on landscape. On the other hand, permanent loss of existing plantation trees from the UG routes will be a negative impact as deep rooted trees and shrubs can't be replanted above the UG cables.

The impact on landscape is assessed to be low to moderate, localized and temporary to permanent direct impact.

Necessary Mitigation Measures

To control the potential landscape disturbance and erosion problem along the project corridor and especially on access roads and around the tower foundation, the following mitigation measures are necessary:

- restrict land clearing to what is absolutely necessary within the project boundary and along the project access road alignment;
- All sloped areas must be stabilized to ensure proper rehabilitation is effected and erosion is controlled;
- In areas where landscape has been affected due to removal of vegetation and excavation works, restoration of the affected sites through back-filling by materials excavated from the site during construction works, levelling and blending the site to surrounding terrain and spreading topsoil over the surfaces, and finally, re-establishing vegetation cover through replanting of suitable grasses and shrubs;
- Upon completion of construction works, removal of all excess or leftover construction materials and wastes from the site and transporting to places where the materials can be used for another project or disposed of properly. Following removal of all materials, the stockpile areas shall be re-graded as required so that all surfaces drain naturally, blend with the natural terrain, and are left in a condition that will facilitate natural re-vegetation;
- Excavated areas and temporary access roads not required for future maintenance activities shall be rehabilitated and reinstated after completion of the works;

- Preserving topsoil from the project boundary and road cuts for re-use during site restoration on laydown and other areas used for temporary purposes;
- The contractor is responsible to ensure that all cleared surfaces and exposed areas to be re-vegetated to its original state at all worksites after completion of work; and
- Random movement of heavy machinery at construction sites shall be avoided.

The risk rating of impacts from landscape disturbance is classified as Substantial, which is environmental impact with some consequences and likely to occur. Implementation of the above mitigation measures is expected to reduce the risk rating to Low, which is environmental impacts with no or limited consequence and less likely to occur.

5.3.2.6 Impacts from Access Road Construction

Site access roads will be required to provide access to channel all the traffic generated by the construction activities for the safe transport of personnel, equipment and materials.

Access to the transmission line tower location will be using existing public access roads. Access to the tower locations will be gained via a short 'spur' from this track. Therefore, no new access tracks will be constructed.

The principal impacts include the following:

a) *Private land and property expropriation:* the single most important potential direct impact of the project although minor will be the access roads may probably have to traverse cultivated land, with adverse effects on landholders.

b) *Impacts on terrestrial vegetation:* Loss of some privately owned terrestrial vegetation may be unavoidable from construction of the project access road improvements.

Necessary Mitigation Measures

Therefore, in order to reduce the impacts associated with land and property expropriation, it is necessary to adopt the following:

- Give due consideration during route selection and preparation of engineering designs to avoid or minimise land acquisition;
- Consider the location of mature trees during route selection for access road construction and land clearing for construction material sites;
- Payment of full and fair cash compensation, which leaves those affected by relocation at least no worse off than they were previously;
- Compensate in cash for the loss of privately-owned mature trees;
- To prevent high dust near settlements traffic speed shall be reduced to 30km/hr;
- Vehicle speed at village crossing will be limited by instructions to drivers and enhanced by the installation of speed limit signals as appropriate; and
- The design consultants shall ensure that provision is made for suitable and adequate drainage works to reduce flow down cut and fill faces.

5.3.3 Impacts on Community Health and Safety (ESS4)

5.3.3.1 Road Traffic and Safety

The proposed underground transmission lines largely run along the median of main roads, which are mostly busy with high volume of vehicular traffic. The project activities including excavation of trenches using plant (road cutting machine) and equipment (excavator), earthmoving works, transport of materials to site and their handling or storage on site during

installation of electric cables are likely to cause obstruction or disruption to normal traffic flows. The construction works are expected to aggravate the existing traffic jam/congestion problem on the roads particularly along the Weregenu – Jackros –Sahelet Mihret Church – North Bus Terminal Road; Photo 7 below illustrates an example of existing traffic congestion on this road. The other critical location is Mexico square, which is crossed by the BLL – NADC UG TL, and this location is usually congested by high traffic volume.

Construction of the Weregenu – Kotebe UG TL is likely to involve cutting of up to 0.60m width in the road lane adjacent to the median, which has only 0.9m width. This and the requirement for operational space for equipment and plant may entail total blockage of one-way of the road for normal traffic. The median of the road from Mexico square to African Union Office is mostly 4 to 8 m wide and this space can be quite sufficient for construction of the BLL – NADC UG TL.

In addition, construction of the NADC – Gofa underground TL is expected to cause total blockage of vehicular traffic flows along certain sections of internal or community access roads, which mostly have narrow width of 5 to 6m. The impact is associated with excavation of trenches at the centerline of those internal roads to install underground cables and will affect the entire road width for working space and the trench width. That is because the 5 - 6 m road width will be used during construction. This situation would cause damages to part of the carriageway while the project equipment on site would cause additional impediment to movements of vehicular traffic and pedestrians.

The impacts on road traffic and safety during construction are envisaged to be moderate to Substantial, short term and direct adverse impacts.

No appreciable adverse impacts are foreseen to happen on road traffic and safety during the operation phase.

Necessary Mitigation Measures

The impacts on road traffic and safety shall be reduced by implementing appropriate traffic management plan and a number of other mitigation measures including the following:

- Include a clause in the construction contracts to the effect that the contractor must make every reasonable effort to minimize road safety hazards and inconvenience to other road users, resulting from the passage of his, or his subcontractors' haulage vehicles, and shall impose and enforce compliance with speed limits;
- Scheduling and execution of construction works during dry season to avoid or reduce the impacts of project activities that would be aggravated during the wet season;
- Scheduling and execution of construction works outside of the time of high traffic flows;
- Posting proper and clearly visible signs, barricades, reflectors at appropriate locations so that road users (drivers) are aware of the active construction works/site and take precautions while driving through or at nearby project operational area;
- Delineation or fencing of work zone especially risky areas and providing sufficient information about the site through posting of clearly visible signs;
- Setting and enforcing speed limits for vehicular traffic by putting appropriate signals and assigning traffic regulators around project operational area;
- Arrangement of alternative routes for normal traffic and provision of sufficient information for road users through mass media and posting of appropriate and clearly visible signs to divert traffic from construction sites;
- Minimizing the duration of construction works through arrangement of capable and professionally trustful contractor and supervision consultant;

- Reinstatement of the damaged sections of roads as soon as the construction works have been completed;
- At major road intersections and squares that are mostly busy with high traffic volume like the Mexico square and roads around it, and the roads that would be or that are already provided with Bus Rapid Transit (BRT) system, applying pipe jacking/drilling technique or micro-tunneling to install the envisaged underground cables without damaging roads and causing disruption to normal traffic flows; and
- The Contractor to prepare a traffic management plan detailing traffic control procedures, train its personnel traffic management procedures, travel speed limits and related control measures;
- In cases where haul routes pass through rural town or settlements, the construction traffic management plans shall set out clearly steps which will be taken to minimize the impacts of his haulage traffic, including but not limited to the regular watering of unsurfaced sections to suppress dust & the speed limits which will be imposed;
- The contractor shall put speed limits for cars and appropriate traffic signs in and around construction areas;
- Assign a well-trained & adequate number of traffic marshals mainly around a place where sensitive receptors (settlements, schools, health posts, worship areas) exist;
- Develop and implement driver Code of Conduct (CoC);
- Speed governor for each truck;
- Work closely with the local administration office;
- Drivers shall be given induction training at the start of the project, company policy, about road safety and due diligence to ensure safety of other road users; and
- Create awareness for the local people on how to use roads and keep themselves away from traffic accidents.
- During construction phase, work closely with the AAC Road Traffic Management Agency and AA Police Commission or concerned sub-cities Police Offices to obtain technical/professional and material support from the agency for traffic management activities at project sites.

Photo 8 shows traffic congestion on the main road followed by the proposed Weregenu – Connection Point-3 underground transmission line. Section of the main road at south of Mexico square shows one of the two lanes on each side is used as a station for mini-bus taxis and city buses for loading and unloading passengers.

Photo 7: Traffic Congestion on the Main Road Along the Weregenu – Kotebe Underground Section

Photo 8: Near Mexico Square the Road Section used as a Station for City Bus and Taxi

The risk rating of social impacts due to construction traffic is substantial, which is social impact with substantial consequence and likely to occur. However, implementation of the proposed mitigation measures is critical and can reduce the risk rating to Low, which is social impact with limited consequence and less likely to occur.

5.3.3.2 Risks related to Increased Noise, Worsening of Air Quality and Competition for Water Resources

There will be some risks for local communities residing along the project TLs and access roads related to increased noise and worsening of air quality during the construction phase. The risk of increased noise level is expected to be minor for the overhead transmission line and moderate for the underground transmission lines. The details of impact assessment due to increased noise are presented in section 5.3.1.3.

During construction the air quality in the project corridor is expected to deteriorate resulting from dust emission caused by movements of vehicular traffic on unpaved roads and earth moving activities as well as exhaust emissions from construction vehicles and equipment. This may bring some disturbances and health risks for the local population in the project corridor for a short duration. Considering the limited scale and duration of the construction works, the risk of air quality deterioration is anticipated to be minor, localized and temporary for the overhead TL and moderate, localized and temporary for the underground TLs.

During the project construction any conflict or competition for water resources between the Contractor and local communities is not expected as the Contractor is not allowed to withdraw water from existing water supply sources used by the local people.

Mitigation Measures

Details of necessary mitigation meaures for the potential impacts from increased noise and air quality deterioration are provided in sections 5.3.1.3 and 5.3.2.2 respectively. To avoid any potential competition for water resources that will affect the water requirements of the local communities, the following mitigation measures are proopsed:

- The Contractor is responsible to make arrangements to supply the water demand for construction and other purposes in consultation with the concerned water office without affecting the availability of water supply for existing users; and
- The Contractor will need to develop its own water supply sources (i.e. to buy water from licensed suppliers or wells) for the construction requirements;

5.3.3.3 Risk of Gender Based Violence

Due to lack of awareness and understanding on gender and Gender Based Violence (GBV) and Sexual Exploitation and Abuse (SEA)/ Sexual harassment (SH) risks among employers and workers as well as workers with community members. Female workers face difficulties in their workplaces, such as sexual harassment.

Therefore, Project-specific risks that may exacerbate or create SEA/SH include the following:

- Several activities under this project will require contracting of construction companies. This might create a power differential between project workers and communities that may increase risks of women and girls to SEA.
- Female workers in close proximity to male workers with limited supervision. Project activities may involve women working alongside men in offices or Project sites, which increases risks of SH.
- Abuse of power, including SEA/SH in hiring, employment, and retention practices. For example, hiring and employment practices that seek to increase the number of women in different employment positions under the Project may expose women to potential SH, or abuse, either because they are pressured to exchange “favors” for jobs, or because the working environment legitimizes and allows harassment and exploitation.
- Lack of enforcement of SEA/SH policies in the government. Although there are clear statutes prohibiting SEA/SH, enforcement is low and with limited or no information on the issue, staff may have no/limited knowledge in identifying, supporting and reporting SEA/SH-related cases as such may cause more harm than good. In addition, lack of policies may result in a lack of direction and strategies on handling SEA/SH cases, that might contribute to more harm and prevent workers from reporting SEA/SH cases.

Necessary Mitigation Measures

Therefore, the Contractor is required to implement the following measures at the Project level:

- Offer equal employment opportunities to all collaborators based upon their specific professional qualifications and performance without any discrimination;
- Select, hire and manage collaborators according to competence and merit;
- Put in place administrative measures to prevent and minimize GBV with proposed preventive and mitigation strategies;
- Prepare administrative measures (for example through Code of Conduct) to prevent Sexual Harassment in the workplace and GBV;
- Strengthen grievance redress and other monitoring mechanisms to ensure safe and ethical reporting systems to alert cases of GBV and assure them to access adequate response;
- Adopt and implement the SEA/SH Prevention and Response Action Plan (Annex 4) of the PRIME 1 ESMF; and
- Develop TOR and recruit a GBV specialist with SEA/SH monitoring tasks including supervision of signing of Code of conduct, on adequate rollout of SEA/SH sensitive GRM mechanism, on liaison/coordination with GBV services providers. The recruitment shall be specific to PRIME 1 Subprojects.

Special Consideration of GRM for Security-posed GBV

Both physical security measures and security guards can have particularly significant impacts on women, who are likely to be traversing distances for domestic tasks. They may be disproportionately affected by the presence of (typically male and potentially armed) security guards, whom they may encounter daily in following their routine. Hence, the GRM will pay special attention to how allegations of gender-based violence are to be managed.

Adopt and implement the SEA/SH Prevention and Response Action Plan (Annex 4) of the PRIME 1 ESMF.

If security posed gender-based violence or sexual exploitation and abuse issues arise or are alleged, the PIU and Project site focal person must act immediately. Grievances that deal with gender-related allegations must be handled very carefully, with respect for the confidentiality of the complainants, survivors and their families. Among special consideration of the GRM in this regard include:

- The GRM will adopt a survivor centered approach in which the safety and well-being of the SEA/SH survivor is the first priority, the survivor will be treated with dignity and respect, and the survivor's choice and the agency will be respected in all decisions;
- Special procedures for review of complaints or incident reports, including information on the investigation and verification process;
- Confidentiality requirements for dealing with cases (e.g. consent and information sharing protocols);
- Specific protocols to address allegations involving children, incorporating consideration of the best interests of the child, specialist support services, and the role of parents/guardians in the response process; and
- The GRM operates without prejudice to any other complaint mechanisms or legal recourse to which an individual or community may otherwise have access under formal law.

The risk rating of GBV is *Substantial*, which is social impacts with some consequences and likely to occur. However, implementation of the proposed mitigation measures will reduce the risk rating to *Low*, which is social impact with no or limited consequence and less likely to occur.

5.3.3.4 Exposure to Infectious Diseases like HIV/AIDS and other Sexually Transmitted Diseases

The potential public health risks include spread of communicable diseases in the area. The prominent types of such communicable diseases during the construction phase include Sexually Transmitted Diseases (STDs) and particularly HIV/AIDS.

Necessary Mitigation Measures

The potential public health risks will have to be minimized through the employment of preventive and curative measures to reduce transmission of communicable diseases to the workforce and the local population.

Therefore, the Contractor is responsible to provide adequate health services to the construction employees by establishing appropriate health facilities including first aid posts at the construction sites (if established).

Therefore, the following measures are necessary at project level:

- The contractor shall use his best criteria to maximize hire of local labour as far as this is compatible with relevant skills requirements, as the first measure to reduce the risk of STDs and HIV/AIDS infections from spreading;
- Provide specific sexual health training including STIs and HIV/AIDS awareness and prevention program to construction workers;
- Promote collaboration between the project and the AACA and NGOs to share experience on issues related to STDs and HIV/AIDS awareness and prevention.

The risk rating of Social Impacts due to exposure to STDs and HIV/AIDS is *Moderate*, which is - social impacts with some consequences and likely to occur. However, implementation of the proposed mitigation measure will reduce the risk rating to *Low*, which is social impact with no or limited consequence and less likely to occur.

5.3.3.5 Security Risk

The overall objective of the Security Management Plan (SMP) is to protect against and mitigate security risks at the Project level that could threaten communities, employees, facilities, and Project operations in general. The PRIME-1 SMP provides direction, organization, integration, and continuity to the security program. It aims to ensure that the safeguarding of personnel and property of the Subproject is carried out in a manner that avoids or minimizes security risks and adverse impacts in the intervention areas of the PRIME-1.

The findings of the Security Risk Assessment (SRA) suggest that certain security services such as guarding materials at Project construction site or gate keeping require engaging private security personnel. The private security personnel may be Contractors' or Project implementing agency's employees or to be contracted through a third-party security provider company. Depending on the Project area's specific level of security risks, the engagement of private security can range from a single guard or night watchman to a large force of armed guards protecting Project assets at the construction site. Further details are provided in the Security Management Plan prepared for PRIME-1 project.

1) Security Operating Procedures (SOPs)

The SOPs describe the key procedures to be followed in the Project SMP and how these fit together. Common procedures include, if applicable:

- boundary security (perimeter and access control),
- access-point operations (screening of people and vehicles),
- incident response (who will respond, and how),
- security patrols,
- travel security,
- materials storage and control,
- information and communication, and
- Firearms security (firearms policy and procedures for issuing and storing any security firearms, ammunition, and nonlethal weapons).

2) Code of Conduct

In providing protection services for the Project, public security forces are expected to adhere to the Code of Conduct as provided in the national laws, the World Bank's policy, international conventions, and Good International Industry Practice (GIIP). Accordingly, the expected Code of Conduct includes but is not limited to the following:

- The operation of the public security force shall be based on the principle of impartiality.
- Principles and prerequisites for public security forces to perform their duties while respecting and protecting human dignity and human rights.
- Use of force principle, the principle of proportionality means that the intensity of any security response shall correspond to the nature and gravity of the threat or offense. Public security forces shall "not sanction any use of force except when used for preventive and defensive purposes in proportion to the nature and extent of the threat to the Project and staff.
- The public security personnel shall be instructed to exercise restraint and caution and to prioritize peaceful resolution of disputes and the prevention of injuries and fatalities.
- The operation of the public security force shall be based on the principles of accountability and transparency.

3) Grievance Redress Mechanism

Under the World Bank ESF, Bank-supported Projects are required to facilitate mechanisms that address concerns and grievances that arise in connection with a Project. One of the key objectives of ESS 10 (Stakeholder Engagement and Information Disclosure) is to provide Project-affected parties with accessible and inclusive means to raise issues and grievances and allow the implementing agencies to respond and manage such grievances. To this end, the key elements of the project Grievance Redress Mechanism (GRM) are presented in the SMP report.

The risk rating of security risk to the local community is *Moderate*, which is - social impacts with some consequences and likely to occur. However, implementation of the proposed mitigation measures will reduce the risk rating to *Low*, which is social impact with no or limited consequence and less likely to occur.

5.3.3.6 Community Health & Safety Hazards through Live Power Lines, Electric & Magnetic Fields

Potential sources of community health and safety hazards include risks from electrocution of live power lines, exposure to electro-magnetic fields (EMF), and safety risks from operation of project equipment and vehicles including traffic accidents.

Findings of research on the effect of exposure to Electro-Magnetic Fields (EMF) on human health remain largely inconclusive to date. However, this shall not be an excuse for complacence; and all the necessary care and caution needs to be taken to avoid any possible public health risks associated with exposure to EMF over and above certain levels recommended by global health institutions such as the World Health Organization (WHO). Moreover, high voltage transmission lines also entail risks of electrocution during maintenance. For example, if proper safety procedures are neglected, maintenance of high voltage power lines has potential to cause fatal risk of electrocution to line maintenance crew.

The Contractor shall adopt the relevant section from the WBG EHS guidelines for Electric Power Transmission and Distribution (2007).

Necessary Mitigation Measures

- **Exposure to Electro-Magnetic Field and Related Accidents:** The proposed transmission line presents a risk of electrocution to the public, by direct contact with high voltage equipment and lines, and also by induced voltages, especially in the case of vehicles and heavy machinery that transit beneath transmission lines. Humans and animals can also risk electrocution or nuisance shock. Electrocution and potential public health concerns are all related largely to post-construction or operation phase. Such threats to public health and safety arise when inadequate grounding at substations energizes metal objects. Other safety threats include the collapse of transmission towers during storms. Still other public nuisances from EMF include television and radio interference.
- Measures proposed to mitigate EMF and related public health concerns have largely to do with the design and engineering of the TL.
    - As per Article 6 (Directive (No. EEA/1/2005)) for 132 kV line design the overhead high voltage TL to maintain distance from the ground level so as to reduce the effect of excessive exposure of humans and animals to EMF;
    - ensure adequate grounding of towers;
    - Grounding conducting objects (e.g., fences or other metallic structures) installed near power lines, to prevent shock;
    - install anti-climbing devices on the towers to prevent access to the conductors;
    - install danger plates on the towers in Amharic and English language;
    - ensure proper and timely maintenance of the transmission line to reduce potential nuisance to the public as well as electric shocks to maintenance personnel;
    - to reduce occupational hazards and accidents, ensure that maintenance staff strictly follow and comply with safety procedures including use of protective garment and equipment at all times during line maintenance; and
    - Maintain lateral distance between the transmission line and the ROW on the one hand and human settlements and activities on the other, to mitigate the effects of EMF and other health and safety threats related to the TL.

- Disconnect power transmission through the existing lines during construction of the project TL to avoid electrocution risks;
- Delineate or fence work zone or dangerous areas and provide sufficient information about the site through posting of clearly visible signs;
- Post proper and clearly visible signs, barricades, reflectors at appropriate locations so that road users (drivers) are aware of the active construction works and take precautions while driving through or at nearby project operational area;
- Provide awareness training for project workers about the risks related to the project activities and the safety measures they shall take;
- Marking all energized electrical devices and lines with appropriate warning signs;
- Double insulating / grounding all electrical equipment used in environments that are, or may become, wet; using equipment with Ground Fault Interrupter (GFI) protected circuits;
- Appropriate labeling of service rooms housing high voltage equipment ('electrical hazard') and where entry is controlled or prohibited;
- Establish "No Approach" zones around or under high voltage power lines;
- Provide and secure fall prevention and protection provisions for all workers working at heights, including installation of guardrails with mid-rails and toe boards at the edge of any fall hazard area; Proper use of scaffolds and ladders by trained workers, and use of fall prevention devices (safety belt and lanyard travel limiting devices or fall protection devices); and
- Design, construction and operation of the overhead transmission line in such a way that the system would automatically break power transmission in case of cable breaking due to man-made or natural hazards

The risk rating of Social Impacts due to exposure to Electro-Magnetic Fields, electrocution, and accidents caused by equipment and vehicles is *Substantial*, which is social impacts with some consequences and likely to occur. However, implementation of the proposed mitigation measure will reduce the risk rating to *Low*, which is social impact with no or limited consequence and less likely to occur.

Community Health & Safety Hazards operation of equipment and vehicles

Transport of materials to project site, operation of equipment and vehicles, and the activities involved in construction of towers and stringing of electric cables have the potential to cause safety risks including traffic accidents to the people residing or working around the project activities. In addition, they can create safety risks to pedestrians and drivers/normal traffic using the roads or paths crossed or followed by the overhead TL or underground transmission routes.

The socio-economic environment of the project corridor comprises residential, business, social service and industrial areas characterized by dynamic movement of people and vehicles. Therefore, any construction work that involves excavation is likely to cause harm to people and vehicles particularly if pits and trenches are left open during the construction phase without taking proper safety measures.

The possible safety risks include those associated with the operation of vehicles and equipment in close vicinity to nearby residential or business areas and on access roads used by local communities. In addition, there could be potential risks from open foundations of towers and trenches of underground cables. Construction works along the sections of the NADC – Gofa UG TL that runs along community/internal roads (with narrow width) located mainly in dense residential areas, but also where some petty business activities take place,

have the potential to cause more safety risks to nearby residents and road users. In addition, certain sections of the Gofa - Kality 1 overhead TL mainly between Towers 31 & 34, 42 & 44, and 51 & 53 cross dense settlement areas where public safety can be a major concern during construction. Moreover, operation of equipment and vehicles involved in construction of the overhead TL and underground cables along existing roads could pose accident risks to road users.

- Prohibition/avoidance of access of un-authorized persons to the construction sites;
- Fencing or blocking of excavation sites for foundation of towers of the overhead TL and for trenches of underground cables to prevent accidents to local residents, animals and vehicular traffic;
- Provision of training for project workers in safety measures so that they take precautions in operation of equipment and vehicles and avoid infringement into settlement areas, business centres or any other sensitive areas to avoid accident risks to members of local communities, their animals and other properties;
- Provision of awareness training for local communities about the risks related to the project activities and the safety measures they shall take; and
- Design, construction and operation of the transmission line in such a way that the system would automatically break power transmission in case of cable breaking due to man-made or natural hazards.

5.3.3.7 Pressure on Local Medical Services

Although construction phase of the project is likely to attract a large workforce, for this Project no labor influx is expected. Therefore, the project workforce will not exert pressure on the health services.

Necessary Mitigation Measures

The contractor is required to exercise a duty of care towards his workforce in relation to injuries sustained at work. Therefore, the Contractor will establish adequate and well equipped first aid facilities at work sites.

Therefore, it is necessary to:

- Take into account its own healthcare needs (Project staff and construction workforce); the construction contractor must provide a first-aid post at the work site;
- The first-aid post/clinic must be staffed by a qualified paramedical attendant on a full-time basis;
- First aid materials, suitable for dealing with minor injuries, shall be available at all times, at all worksites;
- The Contractor is required to immediately notify EEP and WB, latest within 24-48 hours, in case of occurrence of fatality or a serious injury; and
- The Contractor must prepare emergency communication procedure and maintain it operational at all construction sites.

The risk rating of pressure on local medical services is *Moderate*, which is - social impacts with some consequences and likely to occur. However, implementation of the proposed mitigation measures will reduce the risk rating to *Low*, which is social impact with no or limited consequence and less likely to occur.

5.3.3.8 Fire Hazard

The Contractor shall identify the requirements for fire prevention, fire response and fire management by the Contractor during the course of construction. The Contractor shall have a well formulated and communicated fire prevention plan before the construction activity starts.

The potential causes of fire may include:

- Temporary or permanent heating devices,
- Electric devices,
- Smoking,
- Hot works, including welding etc.,
- Other industry related fires, and
- Mobile equipment.

The Contractor is required to ensure that fire arrest equipment (such as fire extinguishers) are at the site and in good conditions for use in case of emergencies. Also, flammable materials shall be stored away from workstations, offices, and other project activities which might stat fire and will be affected by fire. Further, fire drills shall be conducted to aware workers on procedures to be followed in the event of fire.

The following emergency procedures must be implemented when fire occurrence (or evidence thereof) is noted in the immediate vicinity of the project Area during the construction phase:

- The EHS Manager of the Contractor must be notified;
- Personnel in the immediate vicinity of the fire must be immediately notified;
- All persons located in the area in which the fire is located must be evacuated;
- All doors and windows of buildings and vehicles that are in the immediate vicinity of the fire must be closed;
- The fire must be contained with the correct extinguisher qne those trained to do so;
- Those requiring assistance must be assisted and first aid must be rendered only by those trained to do so; and
- Those confined to an area where there is smoke must move under the level of the smoke and cover their nose/mouth.

5.3.4 Land acquisition, restrictions on land use and involuntary resettlement (ESS5)

Acquisition of the land required for all components of the project will be made as per the procedures of the national legislation governing land acquisition, compensation and resettlement as well as the World Bank ESF and ESS5. As specified in the PRIME-1 Environmental and Social Commitment Plan (ESCP, Jan. 2024) the project will adopt and implement the Resettlement Framework (RF) developed for the PRIME-1 consistent with ESS5 throughout project implementation. In addition, the project will adopt, implement, and update as needed Resettlement Plans (RPs) for each activity in coordination with the local government under the Project for which RPs are required, as set out in the RF, and consistent with ESS5. This will be implemented prior to the commencement of any civil works, including before taking possession of the land and related assets, full compensation has been provided and displaced people have been resettled and moving allowances have been provided. EEP and the local government (City/Sub-city/Woreda administration &

relevant sector offices) will be responsible for undertaking the land acquisition, compensation and resettlement processes.

5.3.4.1 Households and Properties within overhead TL Corridor

The overhead component of the proposed transmission line project affects a total of four woredas found in two sub cities Akaki Kality and Nifas Silk Lafto of Addis Ababa City Administration. The total length of the overhead transmission line is estimated to 9.26km and approximately require 37 towers.

Table 5.2: Administrative Boundaries Crossed by the Overhead TL

PTL Section	Sub-city	Woreda	Length (km)	No. of Towers
Gofa – Kality I 132kV Overhead TL Section	Nifas silk Lafto	W12	1.71	6
		W11	2.35	9
	Akaki Kality	W7	3.39	12
		W12	0.90	6
Total	**2**	**4**	**9.26**	**37**

Inventory of the households and their properties found within 26 m corridor of the overhead transmission line between Kaltity - I substation and Gofa substation was carried out by the Consultant team. The survey has identified 121 households and 21 institutions within 26m corridor of the transmission line. The inventory was done on the following issues:

- Demographic characteristics of the potential affected households.
- Types of properties within 26m TL corridor
- Impact on business and institutions

The following sections briefly describe the results of the inventory on each of the above-mentioned topics/issues.

5.3.4.2 Demographic Characteristics of Potentially Affected Households

The Inventory of the potential affected households identified that 121 households are located within 26 m corridor of the overhead transmission line that runs through Akaki Kality and Nifas Silk Lafto sub-cities. Of the total potentially affected households, 100 of them are found in Akaki Kality sub city (51HHs in Woreda 12 and 49 HHs in Woreda 7), while the remaining 21 HHs are found in Woreda 11 of Nefas Silk Lafto sub city.

In terms of gender, while 87 of project affected household heads are male, whereas the remaining 34 of the households are headed by female and across project affected woredas more female headed households (FHH) are reported in Woreda 12 of Akaki- Kality sub city. Based on the survey data, on average 4.8 family members reside in project affected HHs.

5.3.4.3 Number of Households Impacted by Impact Types

As indicated above, the overhead component of the proposed transmission line project affects different properties belonging to 121 households reside in three project woredas. Among project affected households, majority (76.9%) of the households would lose one type of property/item by the works of the project, while about (19.8%) of them lose two types of properties and the remaining (3.3%) of them would lose three types of properties by the project.

In terms of impacted properties, the proportion of households whose residential houses would be affected by the project constituted (66.1%) from the total project impacted households, followed by trees which accounted for (13.2%) and households lose both residential house and fence (3.3%).

The number of households whose properties would be affected by project, number and types of impacted properties are presented in table below.

Table 5.3: Number of HHs whose properties would be impacted by Woreda

Type of Impacted Properties	Woreda 11	Woreda 12	Woreda 7	All	Percent
Only Fence	0	1	2	3	2.5
Only House	12	37	31	80	66.1
Only Trees	1	0	1	2	1.7
Only Farmland	0	1	7	8	6.6
House & Fence	1	3	0	4	3.3
House &Trees	5	7	4	16	13.2
House & Perennial crop	1	0	2	3	2.5
Farmland & Trees	0	1	0	1	0.8
House, Tree & Perennial crop	0	1	0	1	0.8
House, Fence & Trees	1	0	2	3	2.5
Total	**21**	**51**	**49**	**121**	**100.0**

5.3.4.4 Expropriation of Privately Owned Residential House

According to the inventory survey result along the project corridor, a total of 106 residential houses belonging to almost the same number of households are found within the project overhead transmission line corridor. That means, out of the total 121 project affected households, the proposed project TL affects the residential houses of overwhelming majority (87.6%) of the households. Across project woredas and sub cities, most (100) of the residential houses found within the project RoW are located in Akaki Kality sub city, while the remaining 21 residential houses are located in Woreda 11 of Nifas Silk Lafto sub city.

As depicted in table below vast majority (85.8%) of the residential houses found within the project corridor are made of wood plastered by mud and covered by ICS roofing, while the remaining (14.2%) of the residential houses are constructed with brick/blocket/HCB with ICS roofing. The size of residential houses affected by the proposed TL project is ranging from 12 m^2 to 350m^2. 73.2% of residential houses sizes are found to be below 60m^2.

Table 5.4: Number of Residential Houses Found within the TL Corridor

Housing Material	Woreda 11	Woreda 12	Woreda 7	All	Percent
Blocket /HCB	6	4	5	15	14.2
Woods and Mud	14	44	33	91	85.8
Total	20	48	38	106	100.0
Percent	18.9	45.3	35.8	100.0	

In order to assess the legality of residential houses within the project corridor, the project affected households were asked the ownership status of their residential houses and accordingly, almost half (49.1%) of project affected households reported that they do not have ownership certificate but they paying tax, while 24.5% of them have also no legal document except their affected properites are captured by the 1997 aerial photograph taken by the City Administration to document all houses and structures to document legal status. On the other hand, about (26.4%) of households whose residential houses are within project corridor owned legal ownership certificate. Across the project woredas, the proportion of households owing legal ownership certificate is highest in Woreda 11 of Nifas Lafto sub city with half (50.0%) of the household reported to own legal certificate.

Photo 9: Privately Owned Houses Located Within the Project RoW

Impact due to Expansion and Construction of the Substations

No land acquisition is required for the expansion of the existing SS. Expansion work will be accommodated within the existing SS boundary. Therefore, the expansion will affect no privately owned housing structures.

For the construction of the New Addis Center SS 0.38ha of land will be required and no privately owned properties will be affected.

However, at present the site is temporarily occupied by 45 youths organized under Micro and Small Enterprise (MSE). The youths are currently engaged in four enterprises/activities 2 are operating garages, 1 provide car wash service and 1 group sell sand as a construction material. The specific location of the site is presented under Figure 2.5 above. Therefore, the proposed substation site is currently serving these organized youths to do the mentioned income generating activities.

During the site visit, the study team discussed with the MSE representatives and confirmed that they had already been informed by EEP and local government about the proposed substation site and agreed to leave the site when required for construction. That means, the consulted representatives of the MSE have expressed their willingness to leave the selected substation site with no precondition. The representatives also explained that they have already started discussion with the local government for provision of new replacement site.

Photo 10: Partial View of MSE Activities at the New SS Site

Necessary Mitigation Measures

Therefore, it is necessary to adopt the following set to adequately compensate and properly rehabilitate the affected people:

- As a linear project, impact of the TL works on privately owned houses and land would be confined to the TL corridor and hence it is hoped that both Project Affected Households (PAH) whose shelter is affected would be allowed with residential land that is adequate to relocate their houses;
- To compensate for the loss of privately owned farmland, RAP/LRP shall be prepared and implemented by EEP as per the requirements of the GoE's land expropriation laws and WB's ESS5 on Land Acquisition, Restrictions on Land Use and Involuntary Resettlement;
- All affected persons shall be freely allowed to salvage building materials, trees and other assets on affected land as additional compensation for displacement;
- All of these activities shall be carefully planned and completed well in advance of actual construction to allow enough time for appropriate relocation of PAHs. So as to allow time for PAHs to orderly relocate and construct their new shelter; and
- No construction shall commence until all land and property expropriation procedures have been completed based on the RAP.

Therefore, EEP will prepare a Resettlement Action Plan as per the requirements of GoE's land expropriation laws and WB's ESS5 as well as the Resettlement Framework (RF) developed for PRIME 1, i.e., prior to start of the works.

The risk rating from expropriation of privately owned houses and other structures is Significant, which is - social impacts with significant consequences and likely to occur. However, implementation of the proposed mitigation measure will reduce the risk rating to *Moderate*, which is social impact with some consequences and likely to occur.

5.3.4.5 Expropriation of Privately Owned Farmland

Based on field survey about 252m^2 of farmland belonging to 8 households will be expropriated by the construction of the TL from Gofa to Kality I SS. one HHs is found in Woreda 12 and 7 HHs in Woreda 7 of Akaki – Kality sub city.

Impact due to Expansion and Construction of the Substations

Expansion of the existing and construction of the new SSs work will affect no privately owned farm land.

Photo 11: View of Farmland Located Around a Tower Foundation (left) Within the ROW (right)

Necessary Mitigation Measures

Impact of the project on farmlands within the TL ROW is temporary (construction phase only). Farmers will continue to use agricultural land that falls under the TL as they used to with very little constraints. However, impact on crops during installation of the transmission line shall be compensated as per the RAP to be developed and implemented by EEP. Further, compensation shall be provided for loss of farmlands at the tower foundations based on a RAP to be prepared prior to commencing construction.

The following set of criteria is necessary to be adopted for adequately compensate for the loss of farmland and properly rehabilitating the affected people:

- Compensate farmers for loss of farmland and other land uses as per the Ethiopian federal legislation (Proclamation No.1336/2024).
- The process of compensation shall be preceded by a detailed inventory of individual land.
- The inventory shall include size of individual holdings of agricultural land, homestead and gardens including immovable property.
- Consult and involve project-affected people (PAPs) in the estimation of costs for lost assets.
- Assessment of cash compensation for the forgone benefit from farm land shall be carried out in a wholly transparent manner, resulting in payments which truly reflect current rebuilding costs.
- No construction shall commence until land expropriation procedures have been completed and cash compensation paid as appropriate.
- Allow enough time for PAPs to remove their crops (perennial or annual) and trees.
- Give priority in the employment of casual workers for household members of PAPs that have lost their land for the road construction works.

Therefore, EEP shall prepare a Resettlement Action Plan (RAP) as per the requirements of GoE's land expropriation laws and WB's ESS5 - as well as the Resettlement Framework (RF) developed for PRIME 1 i.e., prior to start of the works.

As is the case in most patrilineal societies, men in the project area are the main decision makers on issues regarding land. Therefore, during compensation, women shall take part in providing consent to the compensation packages and other necessary resettlement related activities of the project.

The risk rating from expropriation of privately owned farmland is *Substantial*, which is - social impacts with Substantial consequences and likely to occur. However, implementation of the proposed mitigation measures will reduce the risk rating to *Low*, which is social impact with no or limited consequence and less likely to occur.

5.3.4.6 Impact on Fence

Based on the inventory survey finding a total length of 103 meter of fence belongs to 11 households would be affected by the TL project of which 5 of the households whose fence would be affected by the project is found in Woreda 12, while 4 of the households found in Woreda 7 and the remaining 2 households are found in Woreda 11 of Nifas Silk Lafto Sub-City. The overall length of fence affected by the project is estimated to 103 meter and about 93 meter of the fences are built with Iron sheet while the remaining 10 meter of the fence is constructed with cement or blocket/ HCB.

Necessary Mitigation Measures

It is necessary to pay full and fair cash compensation. However, the process of compensation shall be preceded by a detailed inventory of individual holding in a wholly transparent manner by involving representatives of PAPs.

5.3.4.7 Impact on Fruit Trees

Along the proposed transmission line corridor 12 perennial crops/fruit trees namely 6 avocado trees, 5 false banana and 1 kashmir fruit tree belongs to five (5) households are found within the TL corridor. Among households whose perennial crops would be affected by the project, 3 HHs are found in Woreda 7 of Akaki Kality sub city, while one (1) household found in Woreda 11 of Nifas Silk Lafto Sub city and another one (1) household in Woreda 12.

Necessary Mitigation Measures

It is necessary to pay full and fair cash compensation. However, prior to compensation for affected perennial crops it is also necessary to carryout proper counting in a wholly transparent manner by involving representatives of PAHs.

Therefore, EEP will prepare a Resettlement Action Plan to address impacts on perennial crops as per the requirements of GoE's land expropriation laws and WB's ESS 5 - Land Acquisition, Restrictions on Land Use and Involuntary Resettlement, i.e., prior to start of the works.

The risk rating from expropriation of privately owned perennial crops is Significant, which is - social impacts with significant consequences and likely to occur. However, implementation of the proposed mitigation measure will reduce the risk rating to *Low*, which is social impact with some consequences and less likely to occur.

Photo 12: Partial View of Perennial Crops Affected by the Tower Foundations

5.3.4.8 Expropriation of Privately Owned Eucalyptus and other Trees

During the proposed project transmission corridor route survey, a total of 81 trees of 9 different species belongs to 21 households reside in 3 project affected woredas are identified. Among identified trees, 43 are eucalyptus tree, 9 Grevilia and 8 tsid (Mexican Cypress) tree.

Among 21 households whose trees would be affected by the project, 8 of them are from Woreda 12, while 7 are in Woreda 7 of Akaki Kality sub city. The remaining 6 households live in Woreda 11 of Nifas silk-Lafto sub city.

Out of a total 81 trees, 36 are found in Woreda 12, while 30 trees are in Woreda 7 and the remaining 15 trees are found in Woreda 11 of Nifas silk-Lafto sub city.

Table 5.5: Number of Eucalyptus & Indigenous Trees Affected by Project Tower & RoW

Name of Trees	Number	Percent
Shewshewe	4	4.9
Acacia	5	6.2
Grevilia	9	11.1
Eucalyptus tree	43	53.1
Juniperus tree	3	3.7
Wanza	3	3.7
Bisana	4	4.9
Tsid	8	9.9
Grawa	2	2.5
Total	**81**	**100.0**

Photo 13: Eucalyptus and other Trees Located Within the TL RoW

Necessary Mitigation Measures

As much as possible it is necessary to avoid this potential impact on the eucalyptus trees and other exotics tree species. If avoiding not possible, it is necessary to pay full and fair cash compensation. However, prior to compensation carryout proper counting in a wholly transparent manner by involving representatives of PAHs.

EPP will prepare a Resettlement Action Plan to address impacts on privately owned eucalyptus and other trees as per the requirements of GoE's land expropriation laws and WB's ESS5 - Land Acquisition, Restrictions on Land Use and involuntary resettlement, i.e., prior to start of the works.

The risk rating from expropriation of privately owned eucalyptus trees and other exotics tree species is *Moderate*, which is - social E&S risks and impacts that are not likely to be significant; temporary, predictable, reversible; low in magnitude and likely to occur. However, implementation of the proposed mitigation measure will reduce the risk rating to *Low*, which is social impact with some consequences and less likely to occur.

5.3.4.9 Temporary Disturbance of Petty Business/Trade Activities

There are some petty trade activities mainly selling of vegetables that are practiced on roadsides at two places along the NADC – Gofa underground transmission line. The geographic coordinates of these places are 472109 E, 994300 N and 472214 E, 991141N. Photo 15 below shows the first location where several people practice petty trade activities on both sides of a cobblestone access road. These small scale economic activities are carried out by low income people as a source of livelihood. These activities are likely to be temporarily affected during construction of the underground TL due to lack of space, dust and noise disturbance and safety risks.

Necessary Mitigation Measures

The temporary impacts on petty trade activities shall be mitigated through arrangement of alternative work places for the traders or payment of cash compensation to traders for loss of income benefits during the construction period. The former mitigation measure shall be implemented by officials of respective Woredas that is Woreda 6 of Kirkos SC and Woreda 6 of Nifas Silk Lafto SC.

Photo 14: View of Roadside Petty Trading Along the NADC - Gofa Underground TL

5.3.4.10 Risk to Vulnerable Groups

Households headed by the elderly, females, the chronically ill, persons with physical disabilities and mental illness are generally more vulnerable than others. Vulnerable households find it difficult to withstand shocks (e.g. land take by the proposed project), bounce back quickly and re-establish their livelihoods unless their livelihoods are cushioned with some sort of targeted special assistance.

There are 45 vulnerable HHHs affected by the project. Their vulnerability include:

- 12 Elderly Male headed households (MHH) (elderly people aged 65 and above)
- 30 Female Headed household (FHH) (labour-short, i.e. no husband/partner to support with farming tasks)
- 3 Elderly & FHH - which make their vulnerability status more serious than others (labour-short, i.e. no husband/partner to support with farming tasks)

Information about vulnerable PAPs will be collected and updated during census survey for the RAP.

Necessary Mitigation Measures

In the interest of protecting lives and livelihoods of these groups, in addition to compensation payment, vulnerable PAPs shall receive special assistance.

These special assistance measures are necessary to cushion vulnerable groups from risks of impoverishment and destitution. It would enable them recover from the shock and re-establish themselves as quickly and effectively as possible. The special assistance measures do not substitute compensation and other income restoration measures to which vulnerable groups are entitled like all other PAPs. They are additional to them.

The types of special assistance needed include:

- Food security assistance; and
- Relocation and house construction assistance

The risk rating of social impacts on vulnerable groups is *Substantial*, which is social impacts with some consequences and likely to occur. However, implementation of the proposed mitigation measure will reduce the risk rating to *Moderate*, which is - social impacts with some consequences and likely to occur.

5.3.4.11 Impact on Privately Owned Business Establishments

Based on inventory taken during the fieldwork for this study, the proposed transmission line would also affect privately owned business establishments. Based on the route survey result, buildings belong to 11 different business establishments are found within the project corridor.

Table 5.6 presents type of business establishments and properties affected by the TL Project.

Table 5.6: Type of Business Establishments and Properties Affected by the TL Project

Type of Business Establishments	Impacted Item
2 Retail Shops	Housing Structure
Dairy Farm	Housing Structure and trees
Grinding Mill	Housing Structure
3 Restaurant and Bar	Housing Structure and trees
2 Clinics	Housing Structure
Woodwork Workshop	Housing Structure
Poultry Farm	Housing Structure and trees

Regarding perennial crops, 3 mango trees and 5 avocados belonging to the Dairy farm will be affected.

A total of 101 different types of trees will be affected by the proposed TL corridor. Among the affected trees, 33 are Grevilia, 31 Eucalyptus trees, 15 acacia trees and 22 are other trees.

Necessary Mitigation Measures

The following set of criteria is recommended to be adopted for adequately compensating the affected business establishments:-

- It is recommended to pay full and fair cash compensation;
- Assessment of cash compensation based on market value resulting in payments which truly reflect current rebuilding costs;
- The process of compensation shall be preceded by a detailed inventory of the affected property; and
- No construction shall commence until land expropriation procedures have been completed and cash compensation paid as appropriate.

5.3.4.12 Impacts on Road Infrastructure and Community Access

The proposed underground and overhead transmission lines traverse or run along the median of a number of main roads. In addition, they travel along or cross several access roads, most of which are built from cobblestone. The roads potentially affected during construction of the transmission lines are described in section4.3.4.3 above. Installation of the underground lines is expected to cause significant damages to the main roads as well as community access roads due to cutting of the roads for burying electric cables. In addition, a community road is potentially affected due to excavation for foundation of tower-base of two towers, namely Tubular Towers 11 and 12. The geographic coordinate of these towers is 472426 E, 988050 N and 472442 E, 987891 N respectively.

Moreover, damages could be caused to the roads specially the cobblestone built community roads used by project vehicles and equipment as access roads during construction. This situation may affect the economic and social activities of the local people resulting in community complaints. The impact on road infrastructure has been evaluated as a major, short term adverse impact.

Necessary Mitigation Measures

The impacts on road infrastructure will be mitigated by taking the following measures:

- Restoration of the damaged sections of the main roads and community roads affected due to the project activities as soon as possible;
- For major road intersections and square mostly busy with high vehicular traffic volume like the Mexico square and roads around it, and the roads that would be provided with new BRT system, applying pipe jacking/drilling technique to install the envisaged electric cables without damaging roads, squares, and underground utilities including water supply pipelines, sewer lines and telecommunication lines; and
- Shifting of the location of Tubular Towers 11 and 12 to either side of the affected community access road to avoid damaging of the road and the obstruction to be created by the towers.

5.3.4.13 Impacts on Public Utilities

There are abundant public utility lines including water supply pipelines, sewer lines, telecommunication lines and electric distribution lines in the corridor of the underground and overhead transmission lines. Several of these are potentially affected during the construction of the transmission lines particularly the underground cables as they intersect the electric lines at many places. In particular the possible impact on water supply network along the BLL – NADC – Gofa and Weregenu – Kotebe underground routes is anticipated to be high because of the high density of water lines and their occurrence at shallow depth. This means the pipelines are easily vulnerable to damages during excavation for installation of electric cables.

Accidental damages of utility lines during construction of the envisaged electric lines could result in unexpected interruption of utility services to users. This situation can lead to complains from the users as well as the service providers. In addition, it can result in wastage of resources or environmental pollution if damages were caused to water lines or sewer lines respectively.

Annex 13 presents the Water supply pipelines and existing sewer lines along/crossed by the Proposed Underground Transmission Routes.

Impacts on public utility networks during construction are judged to be moderate, temporary and direct adverse impacts.

No significant adverse impacts are anticipated to occur on public utilities during the operation phase.

Necessary Mitigation Measures

Potential impacts on public utilities will be avoided or minimized through the following mitigation measures:

- Considering the location or route of major utility lines such as the primary and secondary water supply lines and sewer lines during detail design of the electric lines thereby avoiding or minimizing impacts on existing utility lines;

- If there would be unavoidable impacts, relocation of the potentially affected utility lines by the concerned utility agencies prior to commencement of construction works at the particular locations, or re-connection of the utility line that has been disconnected before the beginning of electric line works as soon as the works have been completed;
- In case of unavoidable interruption of utility services due to the construction works, announcement of the situation to users well ahead of the interruption date; and
- At locations where primary water lines or sewer lines intersect with the underground TLs, adopting pipe jacking/drilling technique to install the envisaged electric cables without causing damages to the water or sewer lines.

5.3.4.14 Management of Abandoned Sites

Construction materials laydown areas and temporary access roads have potential impacts on land use, landscape/ aesthetic quality, drainage systems, erosion, etc. unless all the temporary structures and leftover materials are properly removed and site restoration measures are taken.

Necessary Mitigation Measures

Upon completion of construction works, all excess or leftover construction materials and wastes shall be removed from materials laydown areas and all project sites and transported to places where the materials can be used for another project or disposed of properly. Following removal of all materials, the stockpile areas shall be re-graded as required so that all surfaces drain naturally, blend with the natural terrain, and are left in a condition that will facilitate natural re-vegetation.

5.3.4.15 Impacts Related to RoW Maintenance

Within the RoW, there is restriction of access for certain activities (e.g., trees taller than eight meters, construction of structures including residential houses). However, there is a potential for encroachment of the RoW by opportunistic squatters.

Therefore, courageous and bold actions are required to halt the encroachment, and these include:

- Conduct Regular RoW Corridor Inspection and Administration;
- Carry out regular and systematic environmental and social monitoring at the scale of the required project monitoring activities;
- Conduct Regular monitoring of any unlawful activity inside the RoW corridor;
- Engage in public awareness raising activities about the consequences of such unlawful acts; and
- Engage and work closely with local government authorities and their law enforcement agencies to raise public awareness about the seriousness of the issue as well as bring offenders to justice.

The monitoring results shall ensure failures are sufficiently repaired in time and RoW corridor protected.

5.3.5 Impacts on Natural Habitats and Biodiversity (ESS6)

5.3.5.1 Impacts on Vegetation and Flora: Overhead Transmission Line

Construction phase: Site clearing during excavation for foundation of tower-base and during stretching/ stringing of electric lines is expected to cause removal of some trees, shrubs and other plant communities. Between Towers 23 & 24 about 200m length of the overhead TL crosses through a disturbed forest area that comprises dominantly planted exotic trees and some secondary growth indigenous trees. It is likely that the reinforcement of the TL will involve removal of the trees that have regenerated and grown-up after previous clearings by EEP. In addition, clearing and excavation for foundation of Tower 24, which is located at the southern edge of the forest cover, are expected to affect some medium size trees, shrubs and other vegetation.

Operational phase: For safety of the transmission line and avoidance of increased risk of power outages through contact of trees with electric cables, uncontrolled growth of trees particularly taller trees like Eucalyptus and Grevillea trees that have the potential to grow to the height of the TL need to be removed permanently from the safe clearance zone. As per the Energy Directive No. EEA/1/2005, trees and other vegetation should be kept at a minimum distance of 13m from the overhead TL.

Necessary Mitigation Measures

The overhead TL works and the associated access road are located mostly in built up areas and intensively farmed area that are ecologically less important area. Destruction of trees will be avoided or reduced to the extent possible and all cut trees will be compensated.

The Contractor shall implement the following mitigation measures to minimise removal of trees and other vegetation:

- For the forest cover between Towers 23 & 24 of Gofa – Kality 1 overhead TL, following the route of the existing TL and taking maximum care during stringing of cables will avoid or minimize impacts on the trees located outside of the TL right-of-way;
- Adhere to principles of environmental conservation during the construction in order to avoid unnecessary destruction of vegetation and disturbance of land in the construction area;
- Avoid unnecessary destruction of trees and other vegetation by restricting land clearing to what is absolutely necessary within the project boundary and along the access road alignment;
- Consider the location of mature trees during route selection for the access road construction and land clearing for quarry/borrow sites if required;
- Rehabilitation of temporary construction sites shall be done with suitable native grasses and other plants;
- Reinstate and rehabilitate all damaged areas upon completion of the construction;
- Compensate in cash for the loss of privately-owned mature trees; and
- The contractor is responsible for the conduct of his workforce in relation to environmental protection matters and to specifically prohibit unnecessary felling of trees.

The risk rating of impacts on flora due to the reinforcement of the overhead TL is classified as *Low*, which is environmental impact with limited consequences. Implementation of the proposed mitigation measures will reduce the risk rating to *negligible*, which is environmental impact with no or minimal consequence and less likely to occur.

Re-vegetate to Compensate Impact on Vegetation Cover

Therefore, the following specific and additional re-vegetation measures shall be implemented to compensate vegetation loss in areas disturbed by construction and related activities:

a) Re-vegetation of all worksites disturbed by construction activities will be implemented and addressed by the contractor and re-vegetation management plan shall be prepared by the contractor as part of contractor's ESMP (C-ESMP);

b) The contractor will be responsible to ensure that all cleared surfaces and exposed areas to be re-vegetated to its original state at all worksites after completion of work;

c) Re-vegetation works will be planned in advance to ensure sustainable worksite rehabilitation including methods, plant species to be used and their origins and activity schedule;

d) Progressive re-vegetation shall be implemented where practical to reduce the amount of disturbed habitat during Project implementation and will include closure of disturbed area, planting, active seeding to promote vegetation growth, stabilize the substrata, reduce potential soil erosion and enhance natural recovery of original vegetation;

e) The species used for re-vegetation shall be suitable for the local environmental and social and climatic conditions, and species selected for re-vegetation or replantation shall not be invasive species for the proposed Project area and its surrounding;

f) Planting and sowing of native seeds or planting of tube-stock shall consider where native vegetation was present prior to disturbance or consider existing seed sources adjacent to disturbed areas (retained native vegetation);

g) Re-vegetate disturbed area with native trees, shrubs and herbaceous plants. This shall compensate for impact and minimize colonization by invasive species; and

h) Implement proper monitoring on re-vegetation activities including re-seeding, replanting, and watering activities.

5.3.5.2 Impacts on Vegetation and Flora: Underground Transmission Line

Construction phase: Excavation for laying underground cables will require removal of many trees, shrubs and other plants planted along the proposed BLL – NADC – Gofa and Weregenu – Kotebe transmission routes. During the current assessment about 442 ornamental trees (large = 23, medium = 70, small = 349) were identified from the road median proposed to be followed by the BLL – NADC – Gofa UGTL and these are potentially affected. 94% of the trees are exotic species of about 7species while only 6% are indigenous trees of 3 species. The potentially affected trees are dominated by four exotic tree species, including *Araucaria heterophylla* (Norfolk Island pine), *Grevillea robusta (Silky Oak), Cypress (Cupressus* sp.) and *Phoenix canariensis (*Canary Island Date Palm) comprising 25%, 22%, 20% and 11% respectively.

Similarly about 168 trees (2 large, 101 medium and 65 small) are potentially affected from the road median followed by the proposed Weregenu – Kotebe UG TL. All the potentially affected trees are exotic species and they are dominated by *Grevillea robusta* (Silky Oak) comprising 63%. The impacts on flora during the construction phase are predicted as moderate, localized and temporary to permanent direct negative impact. The impact on deep rooted trees and shrubs will be permanent as the plants can't be replanted above the UG TL. Partial view of the potentially affected ornamental trees at the road median the underground power transmission cables are shown in Photos 16.

a) Acacia and Norfolk Island Pine trees along the BLL-NADC UG power transmission route

b) Norfolk Island Pine trees along the BLL-NADC UG power transmission route

c) Grevillea trees planted at the road median along the Weregenu-Kotebe UG transmission route

d) Grevillea trees planted at the road median along the NADC-Gofa UG transmission route

Photo 15: Partial View of potentially affected ornamental trees planted at the road median along the UG power transmission routes

Operation phase: For safety of the underground cables, deep rooted trees and shrubs shall not be replanted along the UG TL. Impacts on flora and fauna during the operation phase are considered as negligible.

Necessary mitigation measures

The impacts of the underground transmission lines on flora will be mitigated through the following measures:

- If the BLL – NADC – Gofa UG TL would be located at the road median, restoration of the greenery affected during construction of the line through replanting of shallow rooted shrubbery and herbaceous plants above the underground cables and on the rest part of the median.

- For the Weregenu – Kotebe UG TL - development of greenery vegetation above the underground cables through replanting of shallow rooted shrubbery and herbaceous plants to compensate for the trees lost and for aesthetic value of the site.
- To compensate for the trees lost due to construction of the UG TL, implementing replacement tree planting at a suitable area to be proposed by the Addis Ababa City or the Bole and Kirkos Sub City Beautification and Green Areas Development Office. It is recommended that the tree replanting program to include transplanting of the trees affected from the medians as appropriate

The risk rating of impacts on flora due to the construction of the proposed underground lines is classified as *Moderate,* which is environmental impact with some consequences and likely to occur. Implementation of the proposed mitigation measures will reduce the risk rating to *low*, which is environmental impact with no or limited consequence and less likely to occur.

5.3.5.3 Impacts on Wildlife due to Disturbance of Habitat and Accidents

a) Impacts of Overhead Transmission Line

There are no ecological sites or wildlife habitats considered to be either critical, fragile or of high value within the corridor of the project power line. In addition, there are no protected wildlife areas such as national parks, wildlife reserves, sanctuaries in and around the project area.

Construction phase: As with the vegetation, the original wildlife habitat along the project routes has been totally transformed by human activities. Therefore, there will be no major habitat destruction or fragmentation resulting from project activities. The rehabilitation of the Gofa – Kality 1 overhead TL will take place along the route of the existing TL, and tower foundations will be constructed mostly at the location of existing towers where the surrounding habitat is already highly degraded by human activities including settlement, cultivation and road construction activities. Therefore, project activities will cause minimal impacts on habitats supporting wildlife except some habitats used by certain terrestrial and water birds.

During construction of the overhead TL, project activities are likely to cause some disturbances to the habitats that support terrestrial and water birds and the birds themselves. Some important birdlife habitats are found along Akaki river (between Towers 23 & 24 and Towers 37 & 39), around the Kality wastewater treatment plant located at nearby Towers 39 to 43, and a wetland spot located at 8º53'51"N, 38º45'12"E.

Noise and vibration caused by operation of heavy machinery, concrete mixing plant and compressor for excavation and construction of the foundation of the towers located in the above mentioned habitats may cause temporary disturbances to the birds inhabiting in those habitats. The birds are expected to move away from the disturbed areas, and likely will come back when disturbances cease. The area of habitats that would be affected by project activities will be relatively small compared to the total area of habitats available in the project area and surroundings.

Operation phase: As the majority of the birds occurring in the corridor of the OH TL are low-flying birds and the height of the line will be high enough, the risk of bird strike is expected to be low.

b) Impacts of Underground Transmission Lines

Construction phase: As the habitats along the underground transmission routes has been completely converted to built-up areas, and are highly disturbed by noise pollution created by vehicular traffic, they don't contain significant faunal species including birds. Therefore, project construction activities will cause minor impacts on fauna.

Operation phase: Impacts on habitat and fauna during the operation phase are considered as negligible.

Necessary Mitigation Measures

Although the potential risks are considered minor, the following measures are necessary to avoid any potential risk posed to fauna and their habitats by the construction of the project:

- Taking maximum precaution during construction of the overhead transmission line sections that traverse important birdlife habitats along the Akaki river, the Kality WWTP, wetland spot found at 8º53'51"N, 38º45'12"E, and hilltop around Tower 50;
- Avoid locating access roads through the above indicated habitats to avoid disturbance of habitats and the birds that depend on those habitats;
- Posting appropriate signs in the important birdlife areas and applying speed limits (20km/hr) for sections passing in the vicinity of those areas;
- Restore habitats which may be affected by project activities which will have a positive outcome on wildlife of the area; and
- The Contractor shall organize on-job "awareness creation" training so that the construction workers refrain as much as possible from adversely affecting the birds and wild animals occurring in the project area.

5.3.5.4 Risk to Birds and Bats

Power transmission lines pose a number of threats to a variety of birds, particularly to vultures, bustard, and crane species, including migratory birds. Mortalities from collisions with power lines and electrocutions on poles are documented (Jalkotzy et al. 1997). Those bird species most vulnerable to collision are generally "poor'' fliers such as the ducks and geese, while electrocution victims are usually birds of prey.

The project corridor is not contiguous with any of the nationally or internationally recognized Important Bird Areas (IBA). There is an IBA, namely Akaki-Aba Samuel IBA, which is located at a minimum distance of 2km southwest of the Gofa – Kality-1 overhead TL; the location of the IBA and project TL is shown in Figure 4.7 under section 4.2.4.The IBA site is not affected by the project activities.

In addition, there is no any migratory birds' flyway crossed by the overhead TL. Therefore, the project TL is not expected to cause a risk of collision to migratory birds.

The construction of the overhead transmission line although minor will potentially impact birds and bats by creating barrier effects. The three major impacts on bird species include:

- Mortality through collision with power lines
- Mortality through electrocution
- Habitat disturbance (Displacement)

The main types of risk to birds that would result from the development of the proposed power line are discussed below.

a) Birds Mortality through collision and electrocution

Electrocution and collision are probably the biggest single threat posed among the medium-sized and large birds. The risk of avian collisions with Gofa – Kality 1 132 kV TL Project and structures would be moderate and long-term. The risk of collision and electrocution of birds shall be minimized through consideration of the mitigation measures shown below in the design and implementation of the subproject.

b) Habitat Disturbance and Displacement

During the construction phase and maintenance of power lines and substations, ROW has to be cleared of excess vegetation at regular intervals in order to allow access to the line for maintenance, to prevent vegetation from intruding into the legally prescribed clearance gap between the ground and the conductors and to minimize the risk of fire under the line, which can result in electrical flashovers. These activities may have an impact on birds breeding, foraging and roosting in or in close proximity of the servitude through transformation of habitat, which could result in temporary or permanent displacement. For this project, the extent of impact on vegetation and impact on birds due to loss of vegetation will be minor.

Particulars for Greater Spotted Eagle

Power transmission lines cause electrocution and collision risks for Greater Spotted Eagle, which is a Vulnerable species. Electrocution causes mortality of birds where the birds touch energized wires and grounded parts simultaneously. Collisions with power lines can also occur, especially for young or inexperienced birds.

Eagles can be electrocuted when they land on a pylon and touch two conductors at the same time or a conductor and a grounded component. Birds can also be affected due to collision with overhead power lines especially during low visibility conditions. Eagles could face significant risks of collision and electrocution due to their large size or wingspan, hunting behavior, flight patterns, and tendency to perch on electric poles. These conditions can make them vulnerable to contact with energized wires when flying near or landing on power lines, especially when flying near or between poles in low visibility conditions.

Necessary Mitigation Measures

It has been already identified that birds collision with transmission lines is the main adverse impact associated with construction of such project. In general, collision usually happens at night or at dawn and desk when visibility is low.

Therefore, the mitigation measures include:

a) Necessary Mitigation for Electrocution

The mitigation measures include:

- Use of insulated conductors which is considered the most efficient method with zero risk of electrocution;
- Installing high-visibility flight diverters on wires that can make them more noticeable to birds, significantly reducing collisions;
- If the TL would have the neutral cable high above the conductor cables, it shall be made clearly visible by suitable markers because most bird collision accidents occur at the thin neutral cable. As markers for better visibility of the neutral cable, vertically hanging black and white plastic flaps have proved most effective.
- Use of supports with safe cross-arm configurations that minimise electrocution risk when building new power lines (See Figure 5.4). The basic characteristics of these safe configurations must comply with the minimum safety distances (Appendix A, IUCN 2022). Critical distances depend on the largest birds present susceptible to being electrocuted mostly raptors wing span of 2.8 meters. Therefore, the size of the larger raptors shall be considered. Whenever possible, it is recommended to use supports with suspended insulators that move the phases away from the perching area;
- To design an avian-safe power pole to minimize bird electrocution risk by providing sufficient separation between energized phase conductors and between phases and

grounded hardware to accommodate at least the wrist-to-wrist or head-to-foot distance of a bird;

- Installing elements that increase the gap between the conductors on the cross-arm. This can be done by increasing the number of glass or porcelain insulators in the string, or even by using polymer insulators. These insulators either have a special shape to prevent birds landing on them or they are used with devices that stop them landing;
- Installing elements that discourage or prevent birds from perching on dangerous parts (anti-perching devices such as vertical rods, vertical metal plates, rods with swivel heads that turn in the wind, etc.) to stop birds using the pylons for building their nests or perching; and
- The use of a tower structure with sufficient clearance would minimize electrocution risks to avifauna; and cross-arms, insulators and other parts of the power lines can be constructed so that there is no space for birds to perch where they can be proximate to energized wires.

Special accessories for Tower: Bird Guard is equipped on the suspension tower to prevent contamination of suspension insulator discs from birds' feces. This Bird Guards shall be installed in all the lattice towers. This Bird Guard is also equipped in the new Tubular tower in the city where part of the overhead transmission line passes through areas where birds live.

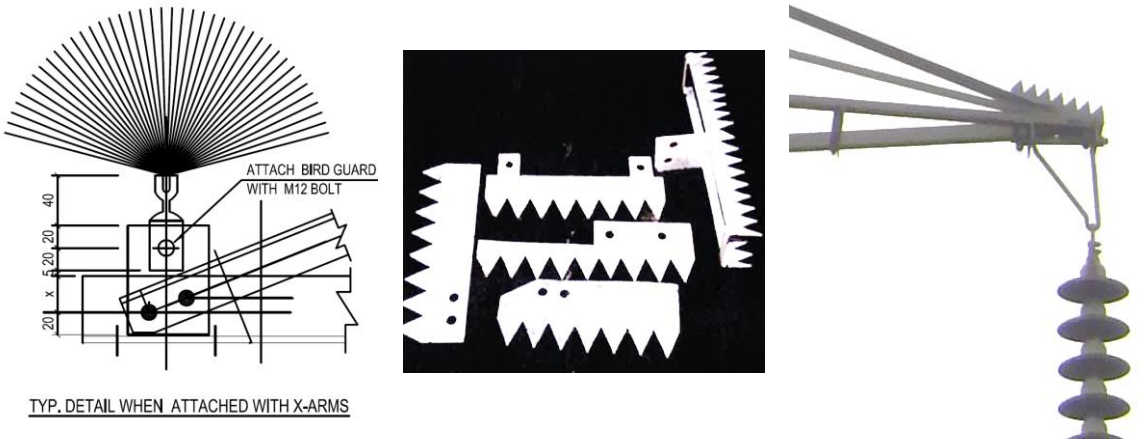


Figure 5.2: Bird Guard

b) Necessary Mitigation Measure for Collision

The addition of different types of line markers or bird flight diverters can reduce collisions between birds and power lines. A variety of types of material have been tested: different sizes of PVC spiral, plastic or neoprene strips, fixed and rotating reflective hanging plastic plates, metal photoluminescent marker spheres (‘aviation balls’) in two contrasting colours, lighting devices powered by the conductor itself, etc... These markers are installed on sections where collisions have occurred and preventatively on sections that are potentially dangerous or high risk (IUCN 2022).

Mitigation options considered necessary include fitting this wire with markers - brightly colored ‘aviation’ balls, thickened wire coils, luminescent, shiny or hinged flashing or flapping devices. The assumption is that birds collide with overhead cables because they cannot see them. Hence, making power line more visible to birds (line marking) or high-visibility markers shall be installed to make the lines more visible to birds.

c) Necessary Mitigation Measure for Habitat Disturbance

Major habitat destruction is not expected during the construction phase and maintenance of power lines and substations. Some habitat destruction and alteration inevitably takes place. Hence, the mitigation measures include:

- Habitat management at site level shall be considered, such as, to avoid establishing ponds or waste disposal storage sites within and in close proximity to the TL corridor;
- As much as possible vegetation cover that may support small mammals, rodents, reptiles, amphibians and other birds, which attract raptors, must be removed;
- Retain existing low-lying vegetation ground cover along the transmission line ROW thereby minimizing vegetation clearing.

The risk rating of impacts on avifauna and their habitats is classified as *Moderate*, which is environmental impact with some consequences. Implementation of the proposed mitigation measure will reduce the risk rating to *Low* which is environmental impact with no or minimal consequence and less likely to occur.

5.3.5.5 Impacts on Ecosystem and Ecosystem Functions

There are no sensitive natural ecosystems in the corridor of the transmission lines and feeders other than those described above. Project activities are not anticipated to bring significant impacts on ecosystems or ecosystem functions. Thus, no mitigation measures required.

5.3.5.6 Risks to National Parks, IBAs, Nature Reserves and other Protected Areas,

The TL Corridor and the substations are neither contiguous with, nor in close proximity with any of the nationally, regionally, and locally protected areas including National Parks, , Nature Reserves and other Protected Areas. However, it is in close proximity with an IBA - Akaki - Aba Samuel IBA, which is described in the baseline section.

Necessary Mitigation Measures

Therefore, no mitigation measure is necessary.

5.3.6 Impacts on Cultural Heritage (ESS8)

5.3.6.1 Impacts on Cultural Heritage Resources

On the basis of site surveys and review of relevant documentation there are no any physical cultural heritage sites within the direct impact zone of the project sites.

However, there are some historical sites and several worship places (churches & mosques) close to the corridor of the overhead and underground transmission lines. However, none of these would be affected by the project activities.

There is also an Epiphany Site belonging to an Orthodox church which is located within the OH Transmission Line.

The list of main historical and religious places is shown in the table 5.7.

Table 5.7: List of Main Historical and Religious Sites in the Corridor of the Overhead and Underground TLs

Name of Historical/ Religious Site	Type	Name of Nearest Project Site	Minimum Distance from Project Site	Sub-city/ Woreda
Kidus Mikael Church (St. Michael Church) at south of African Union)	Worship place	NADC SS & NADC – Gofa Underground TL	200m Southwest	Kirkos SC, Woreda 6
Lafto Kidus Mikael Church (St. Michael Church) at east of Tubular Tower-1)	Worship place	Kality 1 – Gofa Overhead TL	70m East	NSL, W. 12
Hana Maryam Church (St. Mary Church)	Historical Church/ Worship place	Kaliti 1 – Gofa Overhead TL	800m West	NSL, W. 11
Salo Giorgis Church (St. George Church)	Historical Church/ Worship place	Kaliti 1 Substation & Kaliti 1 – Gofa Overhead TL	>500m East	Akaki Kaliti SC, Woreda 4
Sahelete Mihret Church (St. Mary Church)	Worship place	Weregenu – Kotebe Point 3 UG TL	>300m East	Bole SC, Woreda 7

The presence or absence of any archaeologically or culturally important properties underneath of the transmission lines is not very sure at this stage, and assets of archaeological or cultural value may become apparent during excavation for the tower-base of the overhead TL or for underground cables. Therefore, it is important that the Contractor is aware of this situation and take necessary precautions during the construction works and take necessary actions (as recommended below) if any properties of cultural value are uncovered.

Necessary Mitigation Measures

Mitigation measures recommended for any potential impacts on cultural heritage sites include the following:

- At locations nearby religious sites, activities producing excessive noise levels shall be avoided during the time when spiritual programs are underway.
- Around the Epiphany Site, the project shall avoid locating any project activities, such as, the erection of towers, transportation of construction equipment and vehicles, construction of access roads, and buildings as well as any activities requiring soil clearing (excavation), levelling and dumping of construction disposal.
- In the event of accidental discovery of any archaeological remains or properties of cultural value, the Contractor shall immediately halt works at that particular section or spot and notify the Supervision Consultant/ Engineer and shall protect and keep same intact until the relevant authority like the ARCCH or the AAC/ the relevant Sub-city Culture and Tourism Office takes delivery thereof. The Contractor sets up rapid response system for physical cultural resources findings with concerned authorities.
- *Induction Training* to Construction Workers: In addition, the Contractor is responsible to provide Cultural Heritage Training programme on intangible Cultural Heritage for all its staffs that join the project. It helps to create awareness among the project management and staffs about the culture and intangible heritage of the people (including graveyards).

A chance finds procedure has been considered and presented in this report (see Annex 7).

5.3.6.2 Impacts on Burial Sites within SS and along the TL Corridor

Ground survey was conducted by making car transect and foot surveys and no Burial Sites were identified and documented during the archaeological/cultural heritage survey within the project impacted areas by the tower foundation and the SS works.

Necessary Mitigation Measures

Therefore, no mitigation measure is necessary.

6. Analysis of Alternatives & Design Options

6.1 General

A comprehensive environmental and social impact assessment requires not only the evaluation of the impacts resulting from the proposed project at a specific location resulting from construction process, but also a complete environmental and social impact assessment cycle requires a detailed assessment of possible alternatives to achieve the expected results.

Therefore, alternative analysis is carried out with the objective to address the optimal match between the required technical specifications and site conditions, as well as addressing any concerns for environmental, social, and economic features in each location.

Therefore, for the 132 kV transmission lines between New Addis Center and Kality - 1 Substations, three alternatives have been identified:

Alternative 1: "No-Project" or "do-nothing"

Alternative 2: Project Alternatives

a) Alternative 2.1: A combination of Underground and Overhead Transmission Line

b) Alternative 2.2: Overhead Transmission Line for the all Sections

c) Alternative 2.3: Underground transmission line is applied for all sections

The above alternatives were evaluated in terms of their significance or preference with respect to the following criteria:

- Biophysical conditions
- Socio-economic benefits
- Consistency with city planning
- Economic (Project Implementation and E&S cost)

The following sections provide a description of the project alternatives and analysis of the same with respect to environmental, social and economic features.

6.2 "No-Project" Reinforcement Alternative

The no-project alternative is a "do-nothing" approach, which allows only the existing transmission system to be functional. This alternative is the least biophysically damaging alternative due to the fact that no works will be done at the site and thus there will not be any interference with the biophysical environment. Nevertheless, this alternative will result in no value addition or socio-economic benefits, apart from that is obtained from the existing establishment.

6.3 Description of the Proposed Alternatives

According to the AADMP prepared by the AfDB in 2015, the power demand in Addis Ababa Capital Region is expected to continuously increase from 800MW in 2014 to 3,600MW in 2034. However, the utilization ratio of distribution transformers and most of the medium voltage distribution network is beyond 100 % of the rated capacity. Moreover, the capacity of power network including the substations has already reached the breaking point.

Accordingly:

1) Approximately 19% loss in distribution system occurs due to lack of capacity and equipment deterioration;
2) Capacity of transformers and distribution line is getting overloaded because of the rapid increase in demand; and
3) Degradation due to aging of equipment, are causing problems of frequent power outage and voltage drop in the distribution network. For example, in Addis Ababa, a frequency of power outage was more than 20,000 times and total duration was more than 20,000 hours during the year of 2017.

Therefore, it is planned to upgrade the transmission and substations, and rehabilitate the distribution network.

6.3.1 Alternative 2.1: It is the Proposed Project - combination of Underground and Overhead Transmission Line

Overhead transmission line (9.26km) and Underground transmission line (10.0km) are combined: underground transmission line between BLL substation, through NADC SS, and the connection point at Gofa substation, and between Weregenu SS & Kotebe SS, plus overhead transmission line between the connection point at Gofa substation and Kality-1 substation.

6.3.2 Alternative 2.2: Overhead Transmission Line for all Sections

Overhead transmission line (19.26km) is applied for all sections between Black Line substation and Kaliti-1 substation as well as between Weregenu SS and Kotebe SS.

6.3.3 Alternative 2.3: Underground Transmission Line is Applied for all Sections

Underground transmission line (19.26km) is applied for all sections between Black Line substation and Kaliti-1 substation, and between Weregenu SS and Kotebe SS.

6.4 Alternatives Comparison and Result

6.4.1 Project Alternative to “No-project” Alternative

Under EEP’s grid expansion plan, the electricity coverage will increase from the existing 32% to 61% and the number of customers from 2.5 million to 7.0 million.

Reliable power supply and improved service associated with it are fundamental to meeting the country’s development goals and achieving the full benefits of other development initiatives.

Therefore, although the “no-project” Reinforcement Alternative has no additional environmental and social impacts it offers the least socio-economic benefits.

6.4.2 Project Implementation Alternative Comparison and Results

The three transmission alternatives as presented in the Feasibility Report are evaluated in terms of their technical, environmental, and social performances and the summary results are presented in Table 6.1.

Table 6.1: Comparison of proposed alternatives for 132 kV transmission lines between NDC and Kality-1 Substations

Item	Alternative 2.1	Alternative 2.2	Alternative 2.3
Consistency with city planning	Alternative 2.1 is consistent with the city planning.	According to the Addis Ababa City Planning, it is not allowed to construct new overhead transmission lines within the City center.	Alternative 2.3 is consistent with the city planning.
Impact on natural environment	Temporary impact on the surrounding environment is expected during the construction such as noise and vibration. On the other hand, no impact is expected during the operation. About 730 trees (dominantly exotic species) of different sizes (large, medium & small) are potentially affected or to be removed during the subproject construction. That means this Alt. will cause moderate impact on trees as compared to Alt. 2.2 & Alt. 2.3	Temporary impact on the surrounding environment is expected during the construction such as noise and vibration. On the other hand, no impact is expected during the operation. Around 250 trees (dominantly exotic species) of different sizes are estimated to be removed during the subproject construction through Alt. 2.2. That means this Alt. will cause low impact on trees as compared to Alt. 2.1 & Alt. 2.3	Temporary impact on the surrounding environment is expected during the construction such as noise and vibration. On the other hand, no impact is expected during the operation. It is estimated that implementation of the subproject with Alt. 2.3 will affect about 1100 trees (dominantly exotic species) of different sizes. That means this Alt. will cause substantial impact on trees as compared to Alt. 2.1 & Alt. 2.2
Impact on social environment	No involuntary resettlement and land acquisition is expected for the UG Line. For the OH Line, however, for the Gofa and Kality-1 substation section, the construction is done within the existing ROW. However, there are 106 HHs that illegally settled within the existing ROW and these HHs need to be resettled from the OHTL ROW. Impact on traffic is predicted during the construction. In the operation stage, the landscape is maintained in the city area by applying underground cable.	For the most part between the BLL and the connection point at Gofa substation, the line is within the road median. Therefore, resettlement impact is minimized. However, for the Gofa and Kality-1 substation section, the construction is done within the existing ROW. However, there are 106 HHs that illegally settled within the existing ROW and these HHs need to be resettled from the OHTL ROW. Impact on traffic is also predicted during the construction.	For the most part between the BLL and the connection point at Gofa substation, the line is within the road median. Therefore, resettlement impact is avoided. For the Gofa and Kality-1 substation section has lesser impact than overhead TL which needs a 26 m RoW. For the underground TL, the corridor required during installation of the line is much lower. The number of potentially affected HHs by this Alt. hasn't been determined at this stage, However, it is expected to be much lower as installation of underground TL will require much lower RoW.

Item	Alternative 2.1	Alternative 2.2	Alternative 2.3
			Impact on traffic is predicted during the construction. In the operation stage, the landscape is maintained by applying underground cable.
Project cost	The project cost is lower than Alternative 2.3, because the distance of underground transmission line is shorter. However, compared to alternative 2.2 the project implementation cost is much higher.	Compared with Alternative 2.1 and 2.3, the project cost is relatively much lower, because Alternative 2.2 does not include the construction of underground cable.	Compared with Alternative 2.1 and 2.2, the project cost is very high, because the construction of UG TL is much more expensive than that of overhead transmission line.
Evaluation	Alternative 2.1 is recommended from the viewpoints of environmental and social impacts.	Alternative 2.2 is NOT recommended from the viewpoints of city planning and social and environmental impacts.	Alternative 2.3 is NOT recommended from the viewpoints of project implementation cost.

6.5 Conclusion and Recommendation

Alternative 2 is acceptable from the viewpoints of environmental and social impacts as well as city planning and project cost. Therefore, this alternative is recommended to be considered for the proposed construction of 132 kV transmission line between Black Line and Kaliti-1 substations.

As presented in Table 6.1, the three transmission options were evaluated in terms of their environmental and social performances.

Therefore, implementation of the proposed Alternative 2: Addis Ababa Power Supply Reinforcement Project by constructing a 132/33 kV line combination of 10.0km underground and 9.26km overhead transmission and construction of the new Addis Center SS and expansion of 3 existing SSs is preferable.

Electric power supply in Addis Ababa is suffering interruption and are under voltage. Present electric power supply condition to the consumers at and around towns have been evaluated in the Feasibility Study. The prime purpose of this project is to supplying reliable power for industrial, commercial, public, and domestic users for Addis Ababa City and its surrounding areas.

With the “no-project” alternative, the development objectives for the country and expectations of the community around the project-impacted area will be compromised and slowed down.

Construction of the Alternative 2: Addis Ababa Power Supply Reinforcement Project is feasible, indeed attractive, from the technical, economic and environmental viewpoints.

Therefore, implementation of the proposed project as presented in Chapter 2: Project Description Chapter is preferable to Alternative 3 and 4 and “No-project” alternative.

7. Cumulative Impact Assessment

The ToR requires that incremental impacts not only from existing projects, but also from planned or reasonably defined developments in the project area of influence be identified and evaluated during the ESIA process.

The WB ESF states a cumulative impact of the project is the incremental impact of the project when added to impacts from other relevant past, present, and reasonably foreseeable developments as well as unplanned but predictable activities enabled by the project that may occur later or at a different location. Cumulative impacts can result from individually minor but collectively significant activities taking place over a period of time.

Therefore, the cumulative impacts which could results from incremental impacts from other known existing and/or planned developments in the area based on currently available information has been investigated. The project area of influence is defined in Section 2.3 of the ESIA. The cumulative impact assessment considers, at a minimum, the indirect project area of influence which is a much wider corridor than the direct impact zone which is confined mainly with in the TL RoW.

Within the corridor of the transmission lines of the current project, there were two road infrastructure development projects. Construction of these road projects is completed and will not interfere with the construction of the AATLRUP. The road construction projects are located along the route of existing Towers 12 to 20 which is followed by the proposed NADC – Gofa UG TL, and along the Kaliti 1 – Gofa overhead TL between Towers 25 and 31.

The road projects are expected to bring more significant adverse impacts than the transmission line project due to the nature and scale of new road construction works. The significant cumulative impacts likely to occur with respect to the construction of the overhead and underground transmission lines and the road construction works are shown in the Table below:

No.	Potential Adverse Impact	Main Receptors	Significance of Cumulative Impact
1	Air and noise quality impacts arising from construction works and haulage of construction and spoil materials	Local communities	Major
2	Impacts on road traffic and safety	Local communities & road users	Moderate
3	Competition for land use – there could be competition for development space between the TL project & the road projects	EEP & AACRA	Minor for UG TL & Moderate for OH TL sections
4	Impacts on soils – road construction involves extensive excavation works that will cause destruction to soil structure and expose the soil to runoff water erosion	Soils in the direct impact zone	Major
5	Impacts on road infrastructure – construction of new roads may affect two existing major roads and several community access roads that are crossed by the new road alignments.	2 asphalt and 6 access roads (cobblestone roads)	Major
6	Impacts on public utilities – many water supply pipelines, some sewer lines, telephone cables and electric distribution lines are likely to be affected during constriction the new roads.	Water supply, sewer, telephone and electric distribution lines	Major

No.	Potential Adverse Impact	Main Receptors	Significance of Cumulative Impact
7	Impacts on community health and safety – road construction works have the potential to cause safety risks including traffic accidents to local communities including roadside residents and road users (pedestrians & drivers) resulting from operation of equipment and vehicles.	Local communities, and road users	Moderate
8	Waste disposal – the road projects are likely to generate bulk quantities of spoil materials (excavation soil materials) that need to be transported and disposed of at approved disposal sites.	Local communities, road users & disposal site	Moderate to Major

Necessary Mitigation Measures

It is expected that proper implementation of the mitigation measures proposed in this ESIA study and the ESIA studies of the road projects will minimize the majority of the potential adverse impacts to acceptable levels. In addition, implementation of the TL project ahead of the road construction works will avoid or reduce a number of potential impacts. For example, demolishment of the existing towers and construction of the NADC – Gofa UG TL will save much space for road construction while avoiding potential impacts of construction of UG electric cables on the new road along the transmission route if the road construction precedes installation of the TL.

8. Stakeholder Engagement and Information Disclosure (ESS10)

8.1 Rationale: Why Stakeholder Consultation and Disclosure

Why do we undertake Public Consultation and disclosure with stakeholders and particularly with PAPs and communities in the case of infrastructure projects like the Addis Ababa Power Supply Reinforcement Project that inevitably involve displacement of people and hence involuntary resettlement? Is Public Consultation a means to an end or an end by itself? In the case of Ethiopia, disclosure of relevant information and undertaking consultation with persons and communities directly affected by any development project that entails displacement of people and loss of property is a constitutional right stipulated as:

> *"People have the right to full consultation and to the expression of their views in the planning and implementation of environmental policies and projects that affect them directly". Article 92 of the Federal Democratic Republic of Ethiopia's Constitution.*

The Ethiopian EIA Guidance also identifies that all interested and affected parties have the opportunity to participate meaningfully in the ESIA processes.

Similarly, ESS10 recognizes the importance of open and transparent engagement between the Borrower and project stakeholders as an essential element of good international practice. Effective stakeholder engagement can improve the environmental and social sustainability of projects, enhance project acceptance, and make a significant contribution to successful project design and implementation.

The standard is relevant to the proposed project since stakeholder engagement and information disclosure is a priority for planning, implementing and ensuring sustainability of the proposed Addis Ababa Power Supply Reinforcement Project.

Box 1: Contextual Definition of Terms

Consultation: is the process through which the project consults stakeholders with particular emphasis to project affected persons and communities about expected undesirable social and environmental impacts of the project and solicit their support in designing sound mitigation measures and/or changing undesirable impacts to desirable ones. It is one of the key instruments in the process of ensuring social and environmental sustainability of the project. Project affected persons and communities are expected to contribute their share in terms of offering their indigenous knowledge and practices in the areas of social assets and resources that would enhance the better designing of resettlement and livelihood restoration plans and implementation.

Disclosure: is the process through which the project gives detailed information on the nature, intention, scale and implications of the project to stakeholders with particular emphasis to project affected persons and communities. The nature of the project entails information on the characteristics, behavior, and magnitude. While the intention of the project deals with information on the purpose, objective, and aspirations of the project; the implications of the project include information on the desirable and undesirable environmental and social impacts and possible mitigation measures, opportunities brought with the project, and the potential for transforming undesirable impacts to desirable ones.

Therefore, in response to the requirements of the national laws and regulations and the WB's ESS10, a series of Public Consultation meetings were conducted with local government officials, PAPs and members of project-affected communities including women in the Project area.

The project crosses and influences 7 Sub-Cities and 15 Woredas in Addis Ababa City Administration. The administration map along the TL corridor and substation is shown in Figure 2.1 above.

This public consultation chapter is intended to describe in a more transparent manner the depth and breadth of the consultative meetings and the methods used – how, why, when, where, and with whom the meetings were conducted. The chapter also highlights key issues raised during and core findings of the meetings with various stakeholder groups.

8.2 Objectives and Methods

8.2.1 Objectives

The overarching objective of the consultations was to disclose accurate Project related information to project affected households, communities and other stakeholders residing in the Project influence area that could influence the Project or be influenced by the construction of the Project in one way or another and document their views and concerns with the proposed project. With regard to Addis Ababa Power Supply Reinforcement Project, stakeholders were identified and consulted during field visit with following specific objectives:

- Inform and discuss about the nature and scale of the project with the project affected households, community members and other stakeholders and ensure that they were able to understand the Project and its associated implications;
- Accommodate the stakeholders' concerns during the Project implementation processes;
- Present adverse impacts and identified remedial measures in a more transparent and direct manner so that their views and proposals are mainstreamed to formulate mitigation and benefit enhancement measures;
- Establish the social implications of the Project to the different stakeholders;
- Maintain the rights of stakeholders in respect to policies and practices that affect their livelihoods, as per the national and donor policy and legal framework requirements; etc.
- Gather information on preferred modalities for compensation payment and issues related to land acquisition;
- Identify and prioritize local development needs of project-affected communities;
- Identify perceptions and attitudes of the PAHs and local community members towards the Project; and
- Lay the foundation for establishing and maintaining a platform for a constructive dialogue and collaborative engagement with PAHs, local officials and project-affected communities throughout the project cycle.

In line with the above objective, a series of Focus Group Discussions (FGDs) and consultation meetings were held with identified stakeholders. The consultation took place at Sub City, Woreda and community levels.

8.2.2 Approaches and Methods

Considering the nature of the project and its potential impact, the study team identified project affected households, community members residing in project influence area, local authorities at Sub City and Woreda administrations levels. Attempt was made to engage majority of project affected households in the consultation meetings to ensure inclusiveness

of the consultation processes the study team was also tried to involve other community members (representatives of community members, women, youth, and influential community elders) in the consultation meeting. Separate FGDs were also conducted with women household members affected by the proposed project. As far as consultations with local government officials is concerned, consultation meetings were held with key officials and relevant elected representatives at Sub City and Woreda levels. In ideation to that non-governmental organizations working in project woredas are consulted.

All consultation meetings kicked-off with introduction and dissemination information about the proposed project as well as the purpose of the meeting to all participants. The study team ensured the following information to the participants at the beginning of each consultation meeting.

- The Project objectives and justification;
- Potential (positive and negative) impacts;
- Compensation strategy and mitigation measures;
- Entitlement categories;
- Future studies related to the Project.

Scope: Following initial stakeholder mapping and analysis, a number of consultation was conducted with a wide range of stakeholders including local public officials, persons that are likely to be adversely affected by the project, cross-sections of communities inside the TL corridor, religious leaders, elders, women and vulnerable groups.

Meeting Place/Venue: In consideration of the communities' culture and livelihood activities, every meeting was conducted on the representatives own preferred meeting venue and time.

Language Issue: During all the consultation meetings with project affected households and community members, the medium of communication was Amharic.

Consultation Records: Minutes of all meetings were recorded and kept as evidence as well as for further information processing. Sample scanned copies of the minutes of the consultations held are presented in Annex 5.

The chapter begins by a description of rationale, objectives of and methodologies employed in conducting public consultation and disclosure of the Project. In the following sections, Summary findings of Public Consultation meetings conducted with Sub City, Woreda, PAHs/communities and women groups are presented. Sample copies of minutes of all consultation meetings along with respective list of meeting participants are presented in the Annex 4 & 5.

8.3 Consultation and Engagement Activities Held

For this particular project several consultations meetings were held from October 14 - 22, 2024 and 16 May 2025 within project impact sub cities and woredas.

A total of 10 different public and stakeholder consultation meetings were conducted, of which 6 of the consultation meetings were conducted with local authorities (Addis Ababa City, Sub city and Woreda administration), while 4 consultation meetings with affected community members, of which 2 of the meetings were focused on women groups. Concerning participants' numbers, about 98 people were consulted, of which 32 were local officials at Addis Ababa City and Sub city and Woreda administration levels. About 66 community members, of which 26 were women participants. The numbers of participants are summarized in Table 8.1 below.

Table 8.1: Number of Participants and Consultation Meetings Conducted

Types of consultation	Number of Events	Number of Participants		
		Men	Women	Total
Sub city Administrations	4	16	5	21
Woreda Administrations	2	8	3	11
PAPs & Community Members	2	40	7	47
Women	2	0	19	19
Total	**10**	**64**	**34**	**98**

In this section, key points raised during the discussion and core findings of both the consultative meetings and FGDs with the respective groups are presented. An extensive list of issues and agendas related to the proposed substation and transmission line Project were raised and covered during the consultative meetings with consulted stakeholders. Some of the most important agenda points that were discussed include:

- Knowledge and information about the proposed project,
- PAPs' and other community members' expectation of beneficial impacts associated to the Project,
- Potential adverse impacts, major risks, anxieties, fears, concerns, and uncertainties of the proposed project by the eyes of PAPs and other community members,
- Differential impacts of the project on members of disadvantaged or vulnerable groups,
- Access to social services, infrastructure and common property resources in project-affected communities.

8.4 Consultation Meeting with Addis Ababa City Administration and Bureau Officials

The proposed Addis Ababa Power Supply Reinforcement Project traverses and influences certain sub-cities and woredas under Addis Ababa City Administration. Hence, Addis Ababa city administration, Mayor office and relevant sectorial offices in the city administration are the primary stakeholders of the proposed project. Accordingly, stakeholder consultation meeting was held with officials from Addis Ababa mayor office, Addis Ababa water & sewerage authority, Addis Ababa Transport Bureau, Addis Ababa City Road authority, Addis Ababa Environmental Protection Authority and project manager & EHS manager from Ethiopian Electric Power (EEP). The aim of this stakeholder consultation was to provide information regarding the proposed project, purpose, detail design and route, environmental and social impacts and mitigation measures. At the same time the consultation was conducted to get important feedback and advice from consulted stakeholders on how to implement the proposed project in line with the several development initiatives in the city particularly with the corridor development.

Information About the project

The consultation meeting was started by providing basic information about the proposed project by the project manager, Mr. Abinet to the consultation participants. According to the project manager, the proposed project is planned to do the reinforcement work in 19 sites in Addis Ababa city administration to enhance and provide reliable power supply to the city residents and other costumers until 2032. Mr. Tadesse, EHS manager added, the socioeconomic importance of the proposed project in terms of supplying reliable power supply to Addis Ababa and the surrounding Shager cities. Therefore, in the coming next 10

years a lot of upgrading and reinforcement activities including construction of new substations around AAU as well as Gurara area to supply power to Chaka project will take place

Concerns raised with the Project

In addition to construction of two new substations, the proposed project involves the construction of new overhead and underground transmission line cables, replacing of existing overhead transmission line into underground transmission cable in selected locations. In fact, the project is planned in such a way that the implementation of the project will not causes any significant impact on the city's beatification initiatives, corridor development and other ongoing development project in the city. For this purpose, the project planned to use underground transmission line using road median particularly in urban busy centers. For example, one of the original plan of the project was. The Construction of a double circuit 132 kV underground transmission cables between Wereganu substation and Kotebe, however, due to the construction of the corridor development in this section which already reached around Jakros area, the project has planned an alternative underground transmission line route through Egezhabairab - Lamberet - Kotobe Biretabert.

Another concern with the implementation of the proposed project, according to the project Manager is related to the presence of illegal settlement area within the Overhead transmission line Right of Way in some locations in Addis Ababa which will pose great risk on people residing within the project RoW during construction and operational phase as well as making project construction activities somewhat challenging during construction phase and need crucial intervention from relevant stakeholders.

Moreover, project affected households be it informal or formal settlers, they should be compensated for the project impact to meet environmental and social standard that required by financing institution -World Bank and this information was also disseminated and discussed with relevant local authorities at Sub city and Woreda levels but the issue was challenging for the local authorities to reach on consensus with regard to compensation payment particularly for informal settlers having no legal documentation. Such kind of issues need higher level decision and acceptance at city administration level to actualize the proposed project activities and related benefits to the city residents.

Reflecting on the Issues raised, Mr. Melse from Addis Ababa City Road Authority emphasized the importance of planning to use underground transmission line cable for the project, however, the project design should be in line with the ongoing corridor development projects and need detail planning in coordination with relevant department responsible for the implementation of the corridor development projects.

Mr. Henok from Addis Ababa water & sewerage Authority explained as there is no objection on the necessity of the proposed project for the city and this consultation meeting is also as first platform to be informed about the proposed project. However, the project should present detail construction methodology for the next discussion. Moreover, EEP should provide the detail project design and routes to Addis Ababa water & sewerage authority, so that the office will carry out field assessment along the proposed underground transmission line route to make sure the implementation of proposed project would not have impact on the water & sewerage system.

Mr. Natenael from Addis Ababa Transport Authority stated that his office has already started 15.3km express bus line project that starts from Jomo area with 8.5 million Euro. According to the official this express bus project is center based project and may be overlap with the proposed transmission and distribution line project around Gofa and kera areas. Moreover, other utility lines and facilities could be also be affected by the project and therefore, the proposed underground transmission and distribution line design should be assessed in

detail with express bus line project as well as other utility lines.

BR2 project will be around Jomo area and there is a plan to substitute the diesel power supply into electricity supply but there is a shortage of power supply in the area and the proposed project should consider to solve this issue too.

According to the official from city administration mayor office - Mr. Mola, it is important to provide data of project affected houses, number of project affected households and estimated compensation cost to the office and relevant stakeholders. He also stressed the importance of avoiding impact on the ongoing corridor development project. Mr. Mola also asked whether the proposed project is informed to the city Mayor for future meeting particularly on issue need high level discussion and decision.

Photo 16: Consultation with Akaki-Kality Sub-City (left) and Woreda 7 (right) Officials

Response for raised Issues from Participants

In response to concerns and issues raised by consulted stakeholders, Mr. Abenet, project manager of the proposed project, confirmed that the project design and construction technologies gave strong emphasis not to overlap and impact the corridor project by reducing excavation as much as possible and instead planned to apply tunnel borring technologies along the road median. With regard to project construction methodology and techniques detail and further discussion will be held with relevant stakeholders.

Ato Taddese EHS manager also emphasized the importance of sharing project related information and data among relevant stakeholders and institutions for successful implementation of the proposed project. On the other hand, he provided project related impact information as per stakeholders' request. Accordingly based on ESIA assessment the proposed project will affect about 136 houses and compensation cost was estimated to 98 million birr and the cost can be reduced to 87 million birr with the updated design.

With regard to project information to the city Mayor, Ato Tadesse informed that his office is already prepared official letter to arrange meeting between higher officials of EEP and the city mayor in near future. As the new amended compensation proclamation gave responsibility of paying compensation for development project to the city administration it need high level discussion and consensus.

Finally, Ato Mola from Addis Ababa administration mayor office stated that it is highly recommended that the project will be compatible with corridor project and city's master plan particular it would be better if the project is integrated with the second corridor development project plan to reduce the pressure the office has been facing with first round corridor development project.

8.5 Consultation Meeting with Sub City and Woreda Administration Officials

Local authorities are important and stakeholders to the projects. They are key in the process of this ESIA both in strategic as well as operational terms. Strategically, as a democratically elected bodies, local public officials are representatives of their respective constituencies, and as such, they are the ultimate owners of the Project who would also shoulder public responsibility of not only ensuring smooth and successful completion of the proposed project during construction, but also to protect the infrastructure (towers, substation) built by the Project.

A total of 5 consultation meetings were conducted with local officials, 3 of the consultation meetings were conducted at sub city administration levels (Akaki-Kality, Nifas Silk Lafto and Kirkos), while two consultation meetings were conducted with officials at Woreda administration level (Woreda 7 and 12).

Regarding participants, a total of 21 local authorities were consulted of which 10 were at sub city level, while 11 participants were local authorities at Woreda administration levels.

Photo 17: Consultation with Kirkos Sub-City Officials

Table 8.2: Number of Participants and Consultation Meetings Conducted

Types of consultation	Number of Events	Number of Participants		
		Men	Women	Total
Sub city Administrations	3	7	3	10
Woreda Administrations	2	8	3	11
All	**5**	**15**	**6**	**21**

The main findings of the consultation meetings with all consulted stakeholders are summarized and presented in Table 8.3.

During consultation meetings with stakeholders, the participants in each project impact woredas and communities forwarded different questions to the study teams for answer as well as clarification. The summary of the questions raised from consultation participants and responses given by the ESIA team is presented in the Table 8.3.

Table 8.3: Consultation with Local Officials from Akaki Kality, Nifasilk- Ilafto and Kirkos Sub cities and Woreda 7 and 12 Administration in Akaki Kality sub city

Main issues & concerns raised by Stakeholders	Action Recommended by stakeholders	Response given by ESIA team	Observations & Relevant information collected

▪ The local officials had no prior information about the proposed project.
▪ However, all consulted officials in Woreda 7 & 12 have adequate knowledge about informal settlement in TL influence woredas
▪ The project will improve power supply & Solve power interruption
▪ Improve service delivery
▪ Address the power demand of different industries in Akaki sub city
▪ The underground TL will minimize the risks associated with wire failure and make them less vulnerable to theft compared to overhead TL. It looks cost effective considering its durability.
▪ Underground TL will meet modern city standard and with no visible impact
▪ Participants were concerned about the future of local population residing within proposed project corridor
▪ Potential crisis and unrest due to displacement of households residing with project RoW
▪ Concerns were raised with regard to mode of compensation for PAPs b/c most of them are illegal
▪ It will disrupt the livelihood of some HHs. There are people who get income from residence house and shop, doing petty trade on their doorstep and urban agriculture and this project will affect income from stated sources
▪ Concern for health and safety of residents during construction due to increase in
	▪ The project affected households should be at least compensated for their properties.
	▪ EEP is also responsible for not acting while the TL RoW invaded by settlement at beginning, therefore, it pays compensation for all PAPs
	▪ EEP shall pay compensation for crops affected by project construction activities.
	▪ The project shall consider the new compensation proclamation (No. 1336/2024) for project impact
	▪ Compliance with government proclamation is mandatory for addressing project affected households.
	▪ The city administration will give land for affected HH but only for those who are eligible. Land replacement is possible in the following two cases:
	  ○ If the project affects the house of farmers or their children even if they do not have legal certificate or plan
	  ○ If the affected houses are captured by the 1997 aerial photograph taken by the City Administration to document all houses and structures constructed in the city.
	▪ Trees that will be cleared along the lines should be replaced.
	▪ The project shall also consider supporting vulnerable households
	▪ It's better to check the proposed project not to overlap with the corridor development project in the area.
	▪ The project requires higher level discussion and decision making involving key stakeholder such as the City Administration Mayor and the City beautification Office.
	▪ It should be built without affecting the green corridor.
	▪ The project shall work in coordination with water, telecommunication, road and different stakeholder.
	▪ The project owner shall award the contract to a company that can deliver the project with high
		▪ It is not legal to build houses within the TL RoW.
		▪ It is true that EEP had to do a lot to protect the TL RoW before being crowded by settlement.
		▪ We will inform EEP about your comments against the company.
		▪ The contractor/s will be advised to take strict safety measures during construction phase to avoid risk of accidents and other public safety issues '
		▪ We will inform EEP to notify power interruption in advance during project construction.
		▪ The new proclamation No. 1336/2024 regarding expropriation of land holdings for public purpose, payments of compensation and resettlement will be applied for this project.
		▪ The proposed action for vulnerable HHs shall be considered in RAP if the project will involve resettlement of such groups or impacts on livelihood of those groups.
		▪ Maximum efforts will be made to avoid or minimize loss of ornamental trees and other
			▪ Explained that most of the settlement in Chiri and Wolo sefer are illegal settlement.
			▪ Still no decision is given on those households without legal ownership document
			▪ Some of the households in the two-settlement areas have ye 97 aerial photograph.
			▪ There are family of farming households who also reside in the area
			▪ There is plan from the government side to provide replacement land for family of farming households in Woreda 7 and 12 of Akaki Kality sub city
			▪ Officials at Woreda level confirmed as they have no authority to decide on the future fate of residents without legal documents.
			▪ In fact, the Woreda administration is prohibited from new construction activities without legal permission.
			▪ The local officials explained that the government is asking the sub city to prepare land for

Main issues & concerns raised by Stakeholders	Action Recommended by stakeholders	Response given by ESIA team	Observations & Relevant information collected
heavy traffic & limited access road in some illegal settlement area ▪ The recently completed green corridor development project between Mexico and Addis Center SS might be affected, causing residents to doubt the sustainability of development projects constructed by the city administration. According to Kirkos subcity officilas, the city administration has invested a lot of effort and capital for these projects. ▪ Construction of the proposed underground electric transmission line at the road median would cause removal of trees and other vegetation that have been planted and managed for beautification of the city. Loss of trees will reduce the beauty or aesthetic value of the area. ▪ Temporary black out during project kickoff ▪ Increased traffic congestion in the area ▪ Consulted Official attitude towards the project is positive	standards, quality and in a short period of time. In addition, the organization shall impose strict penalties failing to deliver in specific standard and time frame outlined on the contract. ▪ Plan carefully so that your project construction activities do not worsen the traffic congestion and roadblock particularly during rush hours. ▪ Provide Information to the community members when power would interrupt for construction purpose in advance ▪ EEP should complete the project with short period of time ▪ If the project implementer and decision maker at a higher level agree to give substitute land for any PAPs (eligible & non eligible) within project RoW, the sub cities are willing to facilitate the arrangement. ▪ The Local authorities are also willing to support the project implementation by taking part in ▪ Awareness raising ▪ Facilitating/paving the way for project implementation. ▪ Guaranteeing peace and security in the project area. ▪ Resolving issues arise during the implementation	vegetation during final route selection ▪ Yes, EEP will discuss with AA city administration and Beautification offices as suggested. ▪ EEP will cover for project impact on trees planted along the street by City Administration or/and corridor development project. ▪ We will advise EEP to work closely with utility companies. ▪ EEP will give due attention to facilitate completion of project construction within the original schedule by commissioning the project to competitive contractors and with diligent supervision mechanism. ▪ We will consider and inform your suggestion to EEP ▪ It's very good to have your involvement (as key stakeholder) for the successful completion of the project.	people affected by projects carried out by the city administration. At the same time this TL project will displace people from their residential area. All these put the sub city under great pressure to find/provide replacement land for PAPs. ▪ The consulted officials strongly blamed EEP for not providing adequate information about the TL RoW to the local authorities as well as the community members. If they were provided information, about the need to protect the ROW. They could have worked closely with EEP to protect the issue of land encroachment within the RoW avoided the current impact on privately owned houses and structures..

8.6 Consultation Meetings with PAPs & Other Community Members

Community members including project affected households and other members of the community were identified as main stakeholders of the proposed TL project and consulted. Accordingly, two consultation meetings were carried out with community members consisting of project affected households, elderly youth and other influential members of the communities found in two highly affected project woredas.

A total of 47 community members including project affected households participated in the consultation meetings. Among consultation participants 26 were from Woreda 7, while 21 members of the community participated in the consultation meeting conducted at Woreda 12 of Akaki Kality Sub City.

Table 8.4: Number of Participants and Consultation Meetings with community Members

Types of consultation	Number of Events	Number of Participants		
		Men	Women	Total
Woreda 7	1	22	4	26
Woreda 12	1	18	3	21
Total	**2**	**40**	**7**	**47**

Photo 18: Consultation with community members in Woreda 12 (left) and Woreda 7 (right)

8.7 Consultation Meetings with Women Community Members

In order to incorporate the views of women in the stakeholder consultation, women members of the community and project affected women were identified as stakeholder and consulted during the field level assessment. Accordingly, two separate consultation meetings were conducted with women participants in two project woredas located within in Akaki Kality subcity and a total of 19 women were participated in the consultation meetings and most of them are female head of households who would be affected by the proposed project overhead transmission line component.

Table 8.5: Number of Consultation Participants Conducted with women group

Types of consultation	Number of Events	Number of Participants		
		Men	Women	Total
Woreda 7	1	0	8	8
Woreda 12	1	0	11	11
Total	**2**	**0**	**19**	**19**

Photo 19: Consultation with Women Group in Woreda 12 (left) and Woreda 7 (right)

Summary of Key Issues /Concerns Raised and Responses

The potentially affected communities and key stakeholders raised several questions, issues and concerns. The key issues/concerns raised, the actions or mitigation measures proposed to address the issues, and the responses provided by the ESIA Team are summarized in Table 8.6.

Table 8.6: Consultation with Community members, women group in Woreda 7 and Woreda 12 of Akaki Kality sub city

Main issues & concerns raised by Stakeholders	Action Recommended by stakeholders	Response given by ESIA team	Observations & Relevant information collected
▪ Implementation of the project will enhance the power supply of the city ▪ They anticipated that; the implementation of the project would solve the existing power interruption in the city ▪ However, there is high concern among the participants about the project impact on residential houses. ▪ Fear of displacement from their residential area due to right-of- way especially by those HHs who do not have legal document. ‘ ▪ Interruption of Social ties that they had established with their current communities (Idir, religious association) ▪ Fear of not getting replacement land ▪ Loss or damage of farmland due to project construction ▪ Blamed EEP not to respond or protect its TLP – RoW when people started building houses within the transmission RoW. ▪ Fears of accidents, such as tower or conductor failure or fires, particularly these days due to earth quick. ▪ They explained as they preferred to relocate to another place than living with anxiety in TL corridor.	▪ Strongly proposed to the government and EEP to arrange land replacement or residential house for project impact on residential house. ▪ The participants strongly suggested that they do not want to live within the project corridor and want to relocate in other place if government provide them replacement land. ▪ Recommended adequate compensation for project impact on farmland. ▪ Plead the government & responsible bodies not to abandon them without compensation payment. ▪ Since we had not been cautioned by EEP or local government while constructing our house it was not only our fault. EEP and the government are equally responsible. ▪ If the government does not provide replacement land/residential house, it’s better to change the TL route. ▪ EEP can use plastic covered live wire technology to avoid accidents so that relocation may be avoidable. ▪ For the people earning their livelihood from pity trade and renting their houses, alternative sources of livelihood shall be created for them at the new settlement area or at	▪ The ESIA team explained to the participants that EEP and the Design Consultant will make possible efforts to avoid or minimize impact on residential houses. ▪ According to the Ethiopian law, all legal property ownership shall be compensated for any impact due to development project projects ▪ In oreder to minimize the potential impacts, the TL is designed along the existing line keeping the same corridor. Therefore, changing the TL route is not possible. ▪ We will inform EEP to consider plastic covered live wire technology if possible. ▪ Regarding replacement land for project impact, we will discuss it with relevant authorities. ▪ Safety of local communities will be given due attention and necessary mitigation measures such as awareness training for local communities and equipment operators and prevention of access to	▪ The community members explained that they had prior information about the proposed project. ▪ Some of the participants were also consulted in relation to this TLP some five years ago. ▪ Almost all the consultation participants are project affected households ▪ Most of the residential houses within TL corridor are illegal. ▪ Few HHs owned legal ownership certificate, while majority of them do not have legal ownership certificate. ▪ Almost all the residents pay land tax to the government, connected to electricity, have a potable water supply, telephone service. ▪ Majority of the houses are built with wood plastered with mud and ICS roofing. ▪ The settlement is very congested with narrow access roads. ▪ Petty trade is the main livelihood of the community. ▪ Few households who considered as family of farming households

Main issues & concerns raised by Stakeholders	Action Recommended by stakeholders	Response given by ESIA team	Observations & Relevant information collected
▪ Potential risk of accident to human and properties during installation of big towers ▪ The project interrupt urban agriculture practiced in project influence corridor ▪ Existing cobblestone roads could be damaged during the project construction period. Potential damage to public utilities (like electric distribution lines, water supply systems, telephone lines) found within the 30m corridor and other project operation areas such as access roads and materials stockpile or laydown areas. ▪ When does the project start? ▪ The participants expressed that they would fully support the proposed project as far as they would be provided with adequate compensation for what they would lose and supported in restoration of their means of living	reasonable distance from where they live. ▪ If we relocate into areas where there is no infrastructure and social services, the project proponent and government should provide all the basic infrastructure and facilities. ▪ Women shall be supported particularly project affected female headed households need support from the project ▪ How EEP compensates people engaged in urban agriculture like honey production and affected by the project. ▪ All safety measures shall be to be taken by contractors to avoid accident during construction activity	construction sites will be taken. ▪ Special consideration will be given to vulnerable households including female headed households ▪ Care will be taken during construction time to avoid damage of public utilities, and unavoidable damages will be repaired by the service providers while EEP will cover the costs.	are reported to have special privileges than other residents in the area ▪ Most families of farming households owned legal ownership certificate. ▪ Almost all non-farming households bought land from farmers and built houses, therefore, the majority of them do not have legal documents. ▪ The community members had no prior information about the potential adverse impacts of residing within the TL RoW when they purchased the land and built houses. The proportion of non-farming household without legal document is higher than family of farming households within project corridor.

8.8 Consultation with Micro and Small Enterprise at the New Substation Site

At present the new substation site is occupied youths organized under Micro and Small Enterprise (MSEs) and engaged in four enterprises/activities

- Rohobot car wash
- MiG car wash
- Sisay & Endashaw's friends Garage
- Abe-Malekes and friends Sand sale

A total of 45 youths are currently working in the four enterprises and do income generating activities from the above Micro and small Enterprise (MSEs).

During the site visit the study team managed to discuss with representatives of the enterprises. The discussion is summarized with bulletin below.

- The consulted representatives had all the information about the proposed substation project in the area.
- They confirmed that the site was already allocated to substation and under EEP but the sub city and woreda provided us the site/place for the youths organized under MSEs temporarily until site needed for construction by EEP
- The MSEs representative also explained that they have already started to discuss with the sub city administration about new site provision for the MSEs and they are doing their best to find a new working place for the youths currently working at the proposed substation site.
- The consulted representatives of the MSEs have shown their willingness to leave the selected substation site with no precondition.
- It was almost five years since EEP hired guard in the site

According to the ESAO Director, EEP has an ownership certificate for the land from the City Administration. However, there is no written formal formal agreement with members of the SME group, they are informed and are ready to leave the land with no precondition.

8.9 Consultation with Concerned Addis Ababa City Organizations

A number of concerned Addis Ababa city organizations have been contacted and consulted during the ESIA review and updating process. These include the Addis Ababa City Urban Beautification & Green Areas Devt Bureau, the Addis Ababa City Road Authority, and public utility companies including the Addis Ababa Water Supply and Sewerage Authority (AAWSSA), the Ethiopian Electric Utility (EEU), and Ethio-telecom. The topics or issues discussed with the organizations include existing and planned infrastructures and green areas or greenery vegetation within the impact zone of the proposed power transmission lines project, potential impacts on those infrastuctures and proposed mitigation measures. The findings of those consultations are summarized in Table 8.7 below. In addition, the list of authroities and professionals participated in the meetings is presented in Annex 5.5.

Table 8.7: Findings of Consultation Meetings with Concerned Addis Ababa City Organizations

Name of Organization	Main Issues & Concerns raised by Stakeholders	Measures Recommended by the Stakeholders to address the Issues
▪ Ethiopian Electric Utility (EEU)	▪ There are medium voltage (MV) underground electric lines along most of the roads followed by the proposed BLL-NADC-Gofa and Weregenu-Kotebe underground transmission lines. None of the MV lines are located along the road medians followed by the UGTLs, but they are mostly located along pedestrian walkways. ▪ However, there are some MV lines that intersect the route of the proposed UGTLs at some locations. Therefore, those MV lines could be affected during construction of the UGTLs unless sufficient protection measures are taken. ▪ There would be safety and power interruption concerns if damages occur to the MV lines that cross the route of the UGLTLs. ▪ Underground power distributions lines including the MV lines are buried at a maximum of 1m depth.	▪ EEP or the TL project office to work closely with EEU so that necessary measures would be taken to avoid or minimize damages to the MV or distributions lines intersecting the project TLs. ▪ Installing project UGTLs at depths below MV or other distribution lines thereby avoiding damages to distribution lines by adopting drilling or other appropriate techniques for construction at the intersection points. ▪ Taking maximum care during the construction of both underground and overhead transmission lines to avoid damages to distribution lines and causing power interruption and safety risks to local residents and project workers.
▪ Addis Ababa City Roads Authority (AACRA)	▪ Construction of the proposed underground transmission lines is likely to cause damages to existing roads followed or crossed by the TLs. ▪ The TL construction activities may deter normal vehicular traffic flows and cause traffic jam or aggravate existing traffic jam problem on the roads followed or crossed by the TL project. ▪ AACRA will provide permission for construction of PTLs along or across existing roads provided that EEP's commitment for rehabilitation of the damaged road sections is guaranteed. However, permission may not be provided for the section running along the median or carriageway of the Sarbet – Kera road, which is recently upgraded and accommodates high traffic volume unless the TL is installed through micro-tunneling technique. ▪ For the rest sections, locating the proposed UGTLs along road medians is preferred to locating them along pedestrian walkways as the latter are mostly occupied by	▪ EEP to work closely with AACRA starting from the detail design stage so that measures required to reduce damages to existing roads are taken and arrangement for rehabilitation of damaged road sections is incorporated in the TLs planning and implementation program. ▪ Rehabilitation of the road sections damaged during construction of the proposed TLs. ▪ Inclusion of the above activity in the Contractor's contract of the TL project. ▪ Installing the UGTLs at deeper depths (at min. depth of 2m) to avoid potential damages to the underground electric cables during maintenance or reconstruction of the roads along or across the power TLs.

Name of Organization	Main Issues & Concerns raised by Stakeholders	Measures Recommended by the Stakeholders to address the Issues
	public utilities including water, sewer, telecommunication and electric distribution lines. ▪ Applying drilling technique or micro-tunneling at major road crossings and squares is highly appreciated as this would avoid or reduce damages to existing roads and minimize disruption of normal traffic flows.	
▪ Addis Ababa Water Supply and Sewerage Authority (AAWSSA)	▪ The proposed UGTLs cross several water supply lines as well as sewer lines. Therefore, construction of the PTLs may affect those water supply and sewerage infrastructures unless necessary protective measures are taken during the TLs design and construction stages. ▪ Major sewer lines are installed at a minimum depth of 2m. Laying of the envisaged UGTLs at similar depths may affect existing sewer lines that cross or run along the route of the TLs.	▪ EEP to provide AAWSSA with the final route and depth of the proposed UGTLs so that AAWSSA would sort out the potentially affected pipelines and sewer lines and propose appropriate mitigation measures. ▪ AAWSSA to assign appropriate professionals who will work closely with EEP and provide necessary advice and technical support on measures to be taken to avoid or minimize impacts on water lines as well as sewer lines.
▪ Addis Ababa City Urban Beautification and Green Areas Development Bureau (UBGADB)	▪ Construction of the proposed underground transmission lines along road median will affect ornamental trees, shrubs and herbaceous plants that are planted and managed by the UBGADB for urban beautification. ▪ Construction of the proposed UGTLs may affect the fertile topsoil used for greenery vegetation development at the road medians to be used for the PTLs installation.	▪ UBGADB shall assign one of its staff specialized in urban beautification development who will work closely with EEP and facilitate the removal of trees and other vegetation from the corridor to be utilized for installation of the proposed power transmission lines as well as the arrangement of mitigation measures for the affected greenery vegetation. ▪ The UBGADB shall transplant the potentially affected ornamental trees and shrubs to other places before commencement of the UGTLs construction. ▪ EEP or the PTL project contractor shall carefully remove and proper stockpile the topsoil found at the road medians to be used for installing UGTLs, and UBGADB shall re-use the topsoil for restoration of the greenery vegetation affected by the TL project activities. ▪ Upon completion of the PTLs installation, the UBGADB shall redevelop the affected road medians through planting of shallow rooted ornamental plants (appropriate shrubs and grasses). ▪ EEP or the TL Project shall cover the costs of the above indicated mitigation measures.

8.10 ESIA Report Disclosure and Clearance

8.10.1 Background

From the outset it is emphasized that the Addis Ababa Power Supply Reinforcement Project shall involve a multitude of stakeholders including the AACA and Federal governments, EEP the Project developer and the WB the project financier.

Project like this usually attract the attention of various stakeholders and hence are often prone to various scrutiny, including criticisms. This is especially true in today's highly globalized world. Therefore, it is crucially important for the Project to encourage views and comments from all players and address them properly and adequately regardless of their sources, types and motives.

EEP as the Project developer is responsible to provide all stakeholders at all levels with accurate and up-to-date information about this ESIA.

Methods and modalities for public disclosure can take different forms depending on what is intended to be achieved. The bottom line, however, is the participation of all key players at all levels – Federal, AACA, local as well as international ones. The following methods will be adopted for the public disclosure of specific Project information.

8.10.2 Disclosure Plan

The Addis Ababa Power Supply Reinforcement Project will use a variety of communication techniques to announce major project milestones and decisions points, information about the project, its impact, and mitigation measures, and these are discussed below.

Consultative Meetings upon Completion of the ESIA

Upon completion of preparation of the ESIA, EEP will organize a consultative workshop before the start of construction. Stakeholders identified and consulted during the initial phase of the public consultation process would be called to the next phase of consultative meetings. They will be invited to discuss on the contents of the ESIA and contribute to its finalization.

The purpose of the meetings will include:

- present the initial findings on the consultative meetings; and
- Update them with new Project information.

The required information on Project objectives, descriptions, and potential impacts will be shared with the Stakeholders to make them aware about the Project impacts, and the likely mitigation measures to be pursued and implemented. The participants will be encouraged to forward ideas, questions and comments to facilitate the implementation.

The results of these discussions will be incorporated in the final ESIA Report for future consideration and implementation.

Prepare Project Information Package

A dedicated Project Information Package shall be prepared by EEP with tools adapted to the communities. It is envisaged to embark on the package preparation prior to the start of the actual implementation of project activities in the project implementation areas.

The information packages shall include a summary of ESIA findings:

(i) the purpose, nature, and scale of the Project;

(ii) duration of the proposed project activities;

(iii) any risks to and potential impacts on communities and relevant mitigation measures;

(iv) the envisaged stakeholder engagement process; and

(v) The grievance mechanism.

The Project Information Package will be prepared in *English and Amharic*.

8.10.3 Environmental Clearance and Disclosure on EEP's and WB External Websites

Project documents including the ESIA will be uploaded on EEP's[13] and WB's websites[14] as part of the public disclosure process.

These electronic mediums will serve as a permanent promotion, information and public relations forum for the Project making it easier to reach out to both national and international stakeholders and address concerns, exchange views, experiences and information on matters related to the Project. The disclosure of project information on the websites will provide interested parties with accurate and up-to-date information about the Project and its progress.

The ESIA will be submitted to the WB for review and clearance. The ESIA document will then be submitted to the Federal Environment Protection Authority (EPA) for their review and approval.

The ESIA shall be disclosed by EEP through its website. The cleared document will be disclosed on the World Bank External website, which then remains subject to continued improvement as/if need be.

[13] https://www.eep.com.et/

[14] At https://projects.worldbank.org/en/projects-operations/project-detail/P176731 under "Documents"

9. Environmental and Social Management Plan

9.1 General

Environmental and social protection of the proposed project and its immediate surroundings is achieved through enhancement of project benefits and avoidance or mitigation of potential adverse impacts associated with the project.

Unless the mitigation and benefit enhancement measures identified in this ESIA get fully implemented, the prime function of the ESIA, which is to provide a basis for shaping the project so that overall environmental and social performance of the proposed project is enhanced, cannot be achieved.

In order for the ESMP to be effective, it must be fully integrated with the overall project management effort at all levels, which itself shall be aimed at providing a high level of quality control, leading to a project that has been properly designed and constructed and functions efficiently throughout its life.

On this basis, Table 9.1 sets out, in summary form, the management measures to be taken with regard to controlling the risks and potential impacts which could occur during the construction and operational phases of the project. It also indicates who is responsible for taking the management actions.

Executive responsibility for project management commonly involves several organisations, each with specific responsibilities for particular aspects, and this project is no exception. Therefore, the major responsibility for environmental and social management will be split between several organisations, depending on their respective activities, which are being executed at various stages (EPA Offices at Federal and AACA levels). EEP, as the implementing agency of this Addis Ababa Power Supply Reinforcement Project has the overall responsibility for the implementation of the recommended ESMP.

9.2 Pre-construction Phase

The pre-construction phase includes the study and design phase, tendering phase and the time before the contractors' mobilisation and commencement of the works. Therefore, prior to the Contractor mobilization and the commencement of construction, environmental and social management will be concerned with the following principal groups of activities:

- Ensure that all National and WB requirements and procedures relating to ESIA are complied with;
- Submit ESIA report to EPA for review and approval;
- Ensure that environmental and social considerations are explicitly contained in the bidding and contract documents, referencing the relevant E&S management instruments that shall be complied with;
- Preparation of detailed designs (i.e. during tower micro sighting) which incorporate specific features aimed at minimizing adverse impacts and enhancing beneficial impacts;
- Review of contractor's plans, method statements etc. must be completed before main construction works commence;

- Pre-construction contractor environmental and social awareness briefing must take place at the start of the contractor mobilisation period, prior to commencement of any construction;
- Site monitoring and inspections to commence when contractor starts site mobilisation and to continue throughout the construction period until close of the work sites;
- Review and update of environmental and social inspection checklists, procedures etc. must be completed approximately 2 months after start of construction; and
- Review of environmental and social management and monitoring shall take place approximately 4 months into the main construction period.

EEP will be responsible for ensuring that the environmental and social requirements of this project are fully met, including its own E&S requirements.

The Detail Design and Tender Document (DD and TD) Consultant to be appointed by EEP will have primary responsibility for the quality and content of the design and tender documents. This will include ensuring that the adverse impact minimization and benefit enhancement measures set out in the ESIA are given due consideration in the preparation of designs and tender documents.

9.3 Construction and Closeout of Works Phase

It is important to recognize that successful mitigation of construction impacts can only be achieved if the environmental and social protection measures, as set out in the construction contract and in this ESIA/ESMP document, are properly enforced.

The main responsibility for this task lies with the Contractor and the Supervision Consultant. The Supervision Consultant shall constantly monitor and ensure the ESMP is fully enforced. Further, the supervising consultant has the responsibility of identifying emergency environmental and social problems/risks and taking immediate actions, which are within the scope of its capabilities.

The Contractor is responsible for implementing all actions indicated in the ESMP and immediate measures proposed by the Supervision Consultant. In addition to the Contractor and the Supervision Consultant, EEP's Environmental and Social Affairs Office (ESAO) shall actively participate in the process and shall conduct periodic assessment of the implementation of the ESMP and of other environmental issues.

Environmental and Social Inspector will be responsible for environmental and social management. His role in the management chain is crucial to achieve effective impact control.

Other responsible bodies include the AACA's EPA, local administration (respective Sub City and Woreda Administrations) and the community. As most environmental and social impacts will be reflected on the local community and administration, they shall actively participate in the management plan and contribute their share of the efforts towards protecting the environment and the local community.

Major tasks to be accomplished before commissioning or closeout of works of the Project include:

- The contractor shall clean up the Project site and its immediate environment from all construction refuse, wastes and surplus construction materials;
- The contractor shall properly dismantle construction plant, machinery, storage facilities, offices and other temporary structures;

- The contractor shall loosen all compacted earth at the temporary facilities sites and access roads. Further, such sites shall be rehabilitated to their pre-construction condition as possible; and
- In general, all environmental and social requirements (to be indicated in the Contract Document) shall be satisfied.

The contractor is responsible for conducting all the tasks listed above. However, the Supervision Consultant and the Project owner have the responsibility of monitoring, evaluating and approving the actions of the Contractor, to ensure that it complies with the above requirements.

9.4 Operation & Maintenance Phase

For the successful implementation of the planned Project, routine and periodic environmental and social management must be carried out in a timely manner and this would, in the meantime, ensure the (environmental, social and economic) sustainability of the Project.

Some of the main environmental and social issues of concern during Project operation include:

- Occupational, Health and Safety risks;
- Alteration to the bio-physical, social and health characteristics of the recipient environment; and
- Determination of long term and residual effects and identification of Project specific cumulative environmental and social effects and recommend site specific management plan as required.

EEP's ESAO and the concerned AACA's authorities are key actors for ensuring the implementation of management and constant updating of the ESMP.

9.5 Decommissioning Phase

Because of its long life cycle, the circumstances under which the line might ultimately be decommissioned and abandoned are difficult to foresee. Towers may be upgraded/renewed based on cost/benefit analysis and new technologies.

However, if decommissioning is undertaken, EEP shall be required to prepare specific Decommissioning Management Plan at the time. Therefore, the decommissioning procedure shall include site-specific rehabilitation plans for the footprint of the Project.

The plan shall define the environmental and social management plan requirements of the time for use throughout the duration of the Project decommissioning phase. All regulatory requirements will be complied with for the decommissioning phase.

9.6 The ESMP Table

Major Environmental and Social Management Plan (ESMP) activities planned to be undertaken at different phases of the Project are listed in Table 9.1

Table 9.1: Environmental and Social Management Plan

Environmental and Social Risks and Impacts	Main Management Measures	Time/Frequency of Implementation	Implementing Body	Monitoring Body	Budget for Implementing (in Birr)
I. Preconstruction Phase (Design and Tender Document Preparation)					
Review of designs/tender documents to check that specific environmental protection clauses are included in the contract documents and enforcing compliance with them during construction	Must be complete before Tendering	Before Tendering	Design and Tender Document Consultants	EEP/ESAO	Covered in Design Review Consultant's Contract
Preparation of environmental briefing notes for tenderers' pre-bid conference	To be completed by the time the tendering process commences	Onset of Construction	Supervision Consultant	EEP/ESAO	Covered in Design Review Consultant's Contract
II. Construction and Closeout of Works Phase					
Impacts on Labor and Working Conditions (ESS2)					
Occupational Health and Safety (OHS) risk to workers involved in the project implementation	**General** ▪ Implement OHS. ▪ Prohibit access by unauthorized personnel into the construction site. ▪ Erect a perimeter fence to enclose the construction site. ▪ Provide personal protective equipment (PPE) including shock resistant gloves, shoes, and other protective gears to workers handling electricity and related components. ▪ Make arrangements for the regular inspection of all temporary structures, excavations, machinery, and equipment to ensure safe operation. ▪ To the extent possible, reduce or minimize noise at work sites. ▪ In the case of manual handling of loads, advise/train workers to assess the associated risks carefully and provide information about the size and distribution of loads. ▪ Place warning signs around the construction areas. ▪ Maintain adequate traffic control measures throughout the construction phase. ▪ Ensure that safety procedures are followed at all workplaces. ▪ Provide training regarding health and safety to the workers.	During construction phase	Contractor	Supervision Engineer (Resident Engineer (RE)/Environmental Inspector (EI))	Included in Contract with Contractor cost

Environmental and Social Risks and Impacts	Main Management Measures	Time/Frequency of Implementation	Implementing Body	Monitoring Body	Budget for Implementing (in Birr)
	▪ Develop a site-specific OHS Plan. ▪ Develop and implement an ESHS management system and review timely or after a major accident or incident. **Live Power Lines** ▪ Only allowing trained and certified workers to install, maintain, or repair electrical equipment. ▪ Deactivating and properly grounding live power distribution lines before work is performed on, or in proximity, to the lines. ▪ Ensuring that live-wire work is conducted by trained workers with strict adherence to specific safety and insulation standards. Safe work procedures include distinguish live parts from other parts of the electrical system; determine the voltage of live parts; understand the minimum approach distances outlined for specific live line voltages; and ensure proper use of special safety equipment and procedures when working near or on exposed energized parts of an electrical system. ▪ Workers shall not approach an exposed energized or conductive part even if properly trained unless: the worker is properly insulated from the energized part with gloves or other approved insulation; the energized part is properly insulated from the worker and any other conductive object; or the worker is properly isolated and insulated from any other conductive object (live-line work). ▪ Where maintenance and operation are required within minimum setback distances, specific training, safety measures, personal safety devices, and other precautions shall be defined in a health and safety plan. ▪ Workers not directly associated with power transmission and distribution activities who are operating around power lines or power substations shall adhere to local legislation, standards, and guidelines relating to minimum approach distances for excavations, tools, vehicles, pruning, and other activities. ▪ Minimum hot stick distances may only be reduced provided that the distance remaining is greater than the distance between the energized part and a grounded surface. ▪ Delineate or fence work zone or dangerous areas and provide sufficient information about the site through posting of clearly visible signs. ▪ Post proper and clearly visible signs, barricades, reflectors at appropriate locations so that road users (drivers) are aware of the active construction				

Environmental and Social Risks and Impacts	Main Management Measures	Time/Frequency of Implementation	Implementing Body	Monitoring Body	Budget for Implementing (in Birr)
	works and take precautions while driving through or at nearby project operational area. ▪ Marking all energized electrical devices and lines with appropriate warning signs. ▪ Double insulating / grounding all electrical equipment used in environments that are, or may become, wet; using equipment with Ground Fault Interrupter (GFI) protected circuits. ▪ Appropriate labeling of service rooms housing high voltage equipment ('electrical hazard') and where entry is controlled or prohibited. ▪ Establish "No Approach" zones around or under high voltage power lines. **Work at Height** ▪ Testing structures for integrity prior to undertaking work. ▪ Implementation of a fall protection program that includes training in climbing techniques and use of fall protection measures; inspection, maintenance, and replacement of fall protection equipment; and rescue of fall-arrested workers, among others. ▪ Establishment of criteria for use of 100 percent fall protection (typically when working over 2 meters above the working surface, but sometimes extended to 7 meters, depending on the activity). The fall protection system shall be appropriate for the tower structure and necessary movements, including ascent, descent, and moving from point to point. ▪ Installation of fixtures on tower components to facilitate the use of fall protection systems. ▪ Hoisting equipment shall be properly rated and maintained and hoist operators properly trained. ▪ Safety belts shall be of not less than 16 mm two-in-one nylon or material of equivalent strength. Rope safety belts shall be replaced before signs of aging or fraying of fibers become evident. ▪ When operating power tools at height, workers shall use a second (backup) safety strap. ▪ Signs and other obstructions shall be removed from poles or structures prior to undertaking work. ▪ An approved tool bag shall be used for raising or lowering tools or materials to workers on structures.				

Environmental and Social Risks and Impacts	Main Management Measures	Time/Frequency of Implementation	Implementing Body	Monitoring Body	Budget for Implementing (in Birr)
	Lifting ▪ All lifting work whether heavy or light shall be inspected prior to job execution. ▪ All the loose and fixed lifting tools, tackles and equipment shall be inspected and shall be done in an if and when required basis. ▪ Weight of the sections to be lifted shall be pre-decided. ▪ Proper care shall be taken to avoid over loading or overturning of forklift trucks. ▪ All lifting works shall be suspended during heavy wind or rain. **Electric and Magnetic Fields** ▪ Identification of potential exposure levels in the workplace, including surveys of exposure levels and the use of personal monitors during working activities. ▪ Training of workers in the identification of occupational EMF levels and hazards. ▪ Establishment and identification of safety zones to differentiate between work areas with expected elevated EMF levels compared to those acceptable for public exposure, limiting access to properly trained workers. ▪ Implementation of action plans to address potential or confirmed exposure levels that exceed reference occupational exposure levels developed by international organizations such as the International Commission on Non-Ionizing Radiation Protection (ICNIRP), and the Institute of Electrical and Electronics Engineers (IEEE). Personal exposure monitoring equipment shall be set to warn of exposure levels that are below occupational exposure reference levels (e.g., 50 percent). Action plans to address occupational exposure may include limiting exposure time through work rotation, increasing the distance between the source and the worker, when feasible, or the use of shielding materials.				
Working condition for construction workers	▪ The Contractor shall provide reasonable working conditions and terms of employment to all construction workers. ▪ EEP in association with the local Woreda/Sub City authorities shall monitor to ensure all persons under the age stipulated in the country's Labor Law and also according to WB's requirements are not employed.	During construction phase	Contractor	Supervising Engineer (RE/EI); EEP; local labor office	Included in Contract with Contractor cost

Environmental and Social Risks and Impacts	Main Management Measures	Time/Frequency of Implementation	Implementing Body	Monitoring Body	Budget for Implementing (in Birr)
	▪ The Contractor shall adopt and implement labor management procedures and a Code of Conduct (CoC) compliant with the LMP. ▪ The Contractor shall establish workers Grievance Redress Mechanism (GRM) under the contractor framework. ▪ As the national law recognizes workers' rights to form workers' organizations without interference and to bargain collectively (including express their grievances and protect their rights regarding working conditions and terms of employment), the Contractor shall comply with the law.				
Impact of noise and vibration	▪ Develop job specific noise and vibration management plan (as part of C-ESMP) where noise and/or vibration issues can be expected.	Prior to commencement of construction & during construction phase	Contractor	Supervising Engineer (RE/EI)	Included in Contract with Contractor cost
	▪ Use modern mechanical plant, equipment and vehicles fitted with effective noise silencers, mufflers, and their regular maintenance to minimize noise levels. ▪ Restrict activities producing excessive noise levels to the daytime and avoid performing such works during nighttime, on weekends and holidays. ▪ Locate plants, machinery, and site installation considerably away from high human traffic areas. ▪ Minimize worker exposure to noise and vibration by providing appropriate PPE, hearing protection equipment (earplugs) and noise control device for workers in vicinity of noise emissions. ▪ Controls shall be undertaken to reduce exposures to >80 dBA, including layout of equipment, selection of quieter machines, isolation of workers from noise source etc. ▪ Limit working time within extreme sound emissions and comply with best practice guidelines. ▪ Carry out noisy construction activities in the vicinity of sensitive areas during normal working hours only. ▪ Switch off equipment & vehicles when not in use to avoid noise emission. ▪ Conduct job-specific training for machinery and heavy vehicle operators to cover the importance of noise control and available noise reduction measures.	During construction phase	Contractor	Supervising Engineer (RE/EI)	

Environmental and Social Risks and Impacts	Main Management Measures	Time/Frequency of Implementation	Implementing Body	Monitoring Body	Budget for Implementing (in Birr)
Safety risks to workers and local communities from natural hazards	▪ Provide awareness and training for project workers and local community about risks related to natural hazards and the measures they shall take to minimize risks. ▪ Undertake project construction works during the dry season to avoid safety risks that might be caused by flood incidents and heavy rainfall. ▪ Do not undertake construction and installation work during heavy rainfall, storm, or other extreme weather events. ▪ Relocate the people living within the TL right-of-way (30m width) and the vicinity of the substation to safe places through local government and project support.	During construction phase	Contractor	Supervising Engineer (RE/EI)	Included in Contract with Contractor cost
Impact on child labor	▪ Require careful documentation and registry of the minimum age of 18 years of all contracted workers. ▪ Take strict measures against employment of children. ▪ Work closely with local authorities to prevent employment of underage children in the construction works. ▪ The Contractor shall not employ children in any manner that is economically exploitative, or is likely to be hazardous, or to interfere with the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral, or social development. ▪ Put in place administrative measures to prevent and minimize violence against children with proposed preventive and mitigation strategies. ▪ Strengthen grievance redress and other monitoring mechanisms to ensure safe and ethical reporting systems to alert cases of GBV and violence against children and assure them to access adequate response	During construction phase	Contractor	Supervising Engineer (RE/EI); project affected Woreda administration office	Included in Contract with Contractor cost
Forced labor	▪ Require contractor, sub-contractor, and suppliers to not employ forced labor. ▪ Ensure workers have the right to resign or to leave the job freely.	During the project implementation period	Contractor	Supervising Engineer (RE/EI); project affected Woreda administration office	Included in Contract with Contractor cost
Conflict among project workers and between project workers and local communities	▪ Maximize local hire of labor, in so far as this is compatible with the contractor's skill requirements. ▪ Train all construction workers on the local culture with the objective to protect the authentic culture and heritage of the people of the project area.	During construction phase	Contractor	Supervising Engineer (RE/EI)	Included in Contract with Contractor cost

Environmental and Social Risks and Impacts	Main Management Measures	Time/Frequency of Implementation	Implementing Body	Monitoring Body	Budget for Implementing (in Birr)
	▪ Assign the responsibility to liaison with local communities and local authorities to a named individual from the contractor's organization and to require effective liaison to promote social integration, and the development of mutually satisfactory solutions to problems affecting local communities.				
Spread of culturally unacceptable behavior	▪ Maximize local hire of labor, in so far as this is compatible with the contractor's skill requirements. ▪ Employees shall receive compulsory induction training at the time of employment. The training includes company policies and code of conducts to make the employees aware. ▪ Train all construction team about the local culture with the objective to protect the authentic culture and heritage of the people of the project area. ▪ Assign the responsibility to liaison with local communities and local authorities to a named individual from the contractor's organization and to require effective liaison to promote social integration.	During construction phase	Contractor	Supervising Engineer (RE/EI)	Included in Contract with Contractor Cost
Resource Efficiency and Pollution Prevention (ESS3)					
Pollution from solid wastes (hazardous and non-hazardous wastes)	▪ Develop project-specific hazardous and non-hazardous wastes management plan and procedures. ▪ Avoid side-tipping of excavation materials on adjacent areas where it may affect road infrastructure, storm-water drainage systems, crops, trees/other vegetation or green areas through proper collection and dumping of the materials only in approved disposal sites. ▪ Adopt the following waste minimization hierarchy: reduce the overall amount of waste, reuse or recycling of any wastes that are unavoidably created and consider disposal as a last resort. ▪ Employ technologies that are least polluting and technically feasible. ▪ Construction wastes shall not be accumulated on the construction site but promptly collected, removed, and disposed regularly from the site. ▪ Strictly prohibit indiscriminate disposal of solid waste. ▪ Implement proper waste segregation procedures. ▪ Collect properly and store waste materials in suitable containers, maintain storage areas and containers in a sanitary condition and properly cover to prevent spreading of wastes by wind or animals. ▪ Waste which is unable to be reused or recycled shall be disposed at a	During construction phase	Contractor	Supervising Engineer (RE/EI)	Included in Contract with Contractor cost

Environmental and Social Risks and Impacts	Main Management Measures	Time/Frequency of Implementation	Implementing Body	Monitoring Body	Budget for Implementing (in Birr)
	landfill or designated waste disposal site, approved by the concerned local authorities. ▪ Construction wastes shall not be allowed to accumulate on the construction site but shall be collected promptly and removed regularly from the site. ▪ Sufficient garbage bins and containers shall be made available at all construction areas. Waste bins shall be labelled in Amharic and English in account of potential language use of project workers which might come from other areas of the country and expat workers, as well as the language of the communities in the project area. ▪ Waste management by burning is prohibited. ▪ Clean up any pollution caused by project activities and pay full compensation to those affected. ▪ Awareness-raising on e-waste generation and management. ▪ Monitor waste pollutant releases to air, land, and water. **Hazardous Waste** ▪ Respect, as minimum requirements of national and international laws, codes and guidelines and apply the strictest standards everywhere feasible. These include Proclamation 513/2007: Solid Waste Management and Proclamation 300/2002: WB's ESS3 Resource Efficiency and Pollution Prevention and Management and WBG General EHS Guidelines. ▪ All hazardous waste shall be disposed of in accordance with the national legislative requirements. ▪ Immediate remedial action will be taken following any spill or incident of hazardous wastes at disposal sites. These will include: o Site operators must ensure that spilled material/products are immediately cleaned to prevent seepage of the same into the nearby river and groundwater. o Establish temporary and permanent spill containment structures as necessary. o Ensure appropriate PPE is provided and used. o Know the location and proper use of clean-up material. o Develop and implement emergency preparedness & response plan.				

Environmental and Social Risks and Impacts	Main Management Measures	Time/Frequency of Implementation	Implementing Body	Monitoring Body	Budget for Implementing (in Birr)
	Medical Waste ▪ All medical wastes shall be strictly segregated from other waste types to avoid cross contamination and temporarily stored in secured and labelled containers. ▪ All waste from the medical center and the first aid posts shall be packed in containers designated for that purpose and discarded according to the rules and regulations established for the disposal of medical waste. ▪ The Contractor shall establish collaboration agreement with the Black Lion and Tirunesh Bejing Hospitals to share the available facility for medical wastes (such as needles and other sharp objects) disposal. ▪ All personnel handling medical waste shall wear appropriate PPE.				
Air pollution through dust and emissions from machinery	▪ Control of traffic speed on site and on access roads to reduce dust emission; it shall be reduced to maximum of 20km/hr at villages/ settlement areas and other sensitive receptors like schools, health units & religious institutions, and this will be enhanced by installing speed limit signs at appropriate locations. ▪ Regular spraying of water on unpaved access roads used by the project vehicles to suppress dust emission. ▪ Concrete mixing plants and associated machinery installed for project activities will be equipped with suitable pollution control (dust suppression equipment) arrangements. ▪ Construction machinery shall be well maintained regularly to minimize excessive gaseous emissions. ▪ Prevent the occurrence of smoke emissions or fumes from fuel oils. ▪ Avoid exposing any volatile chemical to the atmosphere. ▪ Avoid burning materials like tires, plastic, rubber or other materials which produce toxic gases or create heavy smoke or nuisance odor. ▪ Monitor exhaust emissions to ambient air quality, waste pollutant releases to land and water.	During construction phase	Contractor	Supervising Engineer (RE/EI)	Included in Contract with Contractor cost
Impact on water resources (including water pollution)	▪ Implement an effective water management system. ▪ Execute excavation works and earth moving activities during the dry season only thereby minimizing erosion or transport of excavated materials by runoff water to water bodies ▪ Ensure the proper sealing of all pipelines, valves, and vessels to avoid water loss.	During construction phase	Contractor	Supervising Engineer (RE/EI)	Included in Contract with Contractor Cost

Environmental and Social Risks and Impacts	Main Management Measures	Time/Frequency of Implementation	Implementing Body	Monitoring Body	Budget for Implementing (in Birr)
	▪ Avoid water pollution by spillages of hazardous substances (oil, fuel, used oil and cement) through proper storage and handling of the substances. ▪ Ensure that waste effluents will not be released into water channels – based on the General EHS Guidelines on Wastewater and Ambient Water Quality. ▪ All wastewater discharges are to meet applicable country laws/ regulations and WB EHS Guidelines. ▪ Train workers on not releasing wastes into the environment including water sources, cultivation fields or critical habitat. ▪ Prohibit washing of project vehicles and plant in or adjacent to any water sources, and all washing to be carried out at designated areas away from water sources. ▪ Construct sufficient cross and longitudinal drainage structures to allow for the proper passage of runoff or flood water within the SS compound and along the access road. ▪ Clean up any pollution caused by project activities and pay full compensation to those affected. ▪ Monitor waste pollutant releases to air, land, and water.				
Competition for water resources	▪ The Contractor to find his own water supply sources for construction works in such a way that he will not affect the water requirements of local communities or existing users.	During construction phase	Contractor	Supervising Engineer (RE/EI)	Included in Contract with Contractor cost
Impacts on soils (soil erosion, compaction & pollution)	▪ Carry out land clearing (vegetation removal) and excavation works in the dry season only to reduce exposure of soil to runoff water erosion. ▪ Careful removal and proper stockpiling of the topsoil from the UG transmission routes, tower base of overhead TL, and access routes, and re-using it for site restoration when construction works are ended. ▪ Prevent the stockpiles of topsoil from water or wind erosion by carefully depositing the soil at areas away from any water channel and by covering with plastic sheets where possible. ▪ Keep vegetation clearing to the imperative area required for the construction works. ▪ Keep vehicles on defined access tracks to avoid soil compaction and impairment of its use for agriculture and other purposes. ▪ Reduce the time exposed surfaces or excavated soils remain bare	During construction phase	Contractor	Supervising Engineer (RE/EI)	Included in Contract with Contractor cost

Environmental and Social Risks and Impacts	Main Management Measures	Time/Frequency of Implementation	Implementing Body	Monitoring Body	Budget for Implementing (in Birr)
	following completion of works. ▪ Reinstate temporarily used access roads to productive state by removing any pavement materials, ripping compacted soils and spreading topsoil over the surfaces. ▪ Re-establish vegetation cover progressively as the construction works are completed through replanting or seeding of suitable grasses and shrubs that are capable of binding by increasing its shear resistance. ▪ Perform regular maintenance of construction equipment and vehicles in standard garages or properly demarcated servicing areas designed to contain fuel and oil spillages. ▪ Undertake re-fuelling of equipment and vehicles at standard fuel stations or properly designated dispensing points of fuels and lubricants provided with drip pans or other facilities for catching any spills available. ▪ Avail appropriate facility to capture and contain any spills both on construction and operational sites. ▪ Proper storage and handling of hazardous substances (oil, fuel, used oil, paints, cement etc.) to avoid water and soil pollution by accidental spillages. ▪ Avoid leakages from vehicles and equipment by regular and effective maintenance. ▪ All wastes and hazardous wastes generated through the use of substances like fuel, engine oil and lubricants shall be properly collected, separated according to their waste type and properly disposed of in compliance with the applicable national laws and guidelines or best practice guidelines. ▪ Insulating oil as well as transformers will be set in the metal box.				

Environmental and Social Risks and Impacts	Main Management Measures	Time/Frequency of Implementation	Implementing Body	Monitoring Body	Budget for Implementing (in Birr)
Landscape disturbance	▪ Locate the BLL–NADC UGTL on one side of the median or under the last right lane of the carriageway where there is no any other utility to save the trees located at the centreline of the road median. ▪ Restore the affected sites by back-filling with materials excavated from the site, levelling and blending the site to surrounding terrain and spreading topsoil over the surfaces, and, re-establish vegetation cover through replanting suitable grasses and shrubs. ▪ Upon completion of construction works, removal of all excess or leftover construction materials and wastes from the site and transporting to places where the materials can be used for another project or disposed of properly. Following removal of all materials, the stockpile areas shall be re-graded as required so that all surfaces drain naturally, blend with the natural terrain, and are left in a condition that will facilitate natural re-vegetation. ▪ Within the project boundary and along the project access road alignment, restrict land clearing to what is absolutely necessary. ▪ All sloped areas must be stabilized to ensure proper rehabilitation is effected and erosion is controlled. ▪ For all access road sections and around the tower foundations, the design shall ensure that provision is made for suitable and adequate drainage facilities. ▪ Excavated areas and temporary access roads not required for future maintenance activities shall be rehabilitated and reinstated after completion of the works. ▪ The contractor will be responsible to ensure that all cleared surfaces and exposed areas to be re-vegetated to its original state at all worksites after completion of work. ▪ Random movement of heavy machinery at construction sites shall be avoided; ▪ Preserving topsoil from the project boundary and road cuts for re-use during site restoration on laydown and other areas used for temporary purposes.	During construction phase	Contractor	Supervising Engineer (RE/EI)	Included in Contract with Contractor cost

Environmental and Social Risks and Impacts	Main Management Measures	Time/Frequency of Implementation	Implementing Body	Monitoring Body	Budget for Implementing (in Birr)
Impacts from access road construction	▪ Give due consideration during route selection and preparation of engineering designs to avoid or minimize land acquisition, and follow existing tracks and roads to the extent possible. ▪ Payment of full and fair cash compensation, which leaves those affected by land acquisition at least no worse off than they were previously. ▪ To prevent high dust near settlements traffic speed shall be reduced to 20km/hr. ▪ Vehicle speed at village crossing will be limited by instructions to drivers and enhanced by the installation of speed limit signals as appropriate.	During construction phase	Contractor	Supervising Engineer (RE/EI)	Included in Contract with Contractor cost
Impacts on Community Health and Safety (ESS4)					
Increased traffic congestion and traffic/road accidents	▪ Include a clause in the construction contracts to the effect that the contractor must make every reasonable effort to avoid or minimize road safety hazards and inconveniences to other road users.	During pre-construction phase	EEP	EEP's ESAO	Included in Contract with Contractor cost
	▪ Prepare a traffic management plan detailing traffic control procedure; train Contractor's personnel traffic management procedures, travel speed limits and related control measures.	During pre-construction phase	Contractor	Supervising Engineer (RE/EI)	Included in Contract with Contractor cost
	▪ Scheduling and execution of construction works during dry season to avoid or reduce the impacts of project activities that would be aggravated during the wet season. ▪ Scheduling and execution of construction works outside of the time of high traffic flows; ▪ Posting proper and clearly visible signs, barricades, reflectors at appropriate locations so that road users (drivers) are aware of the active construction works/site and take precautions while driving through or at nearby project operational area. ▪ Delineation or fencing of work zone esp. risky areas and providing sufficient information about the site through posting of clearly visible signs. ▪ Setting and enforcing speed limits for vehicular traffic by putting appropriate signals and assigning traffic regulators around project operational area. ▪ Arrangement of alternative routes for normal traffic and provision of sufficient information for users through mass media and posting of	During construction phase	Contractor; local traffic police office	Supervising Engineer (RE/EI); local traffic police offices	Included in Contract with Contractor cost

Environmental and Social Risks and Impacts	Main Management Measures	Time/Frequency of Implementation	Implementing Body	Monitoring Body	Budget for Implementing (in Birr)
	appropriate and clearly visible signs to divert traffic from construction sites. ▪ Minimizing the duration of construction works through arrangement of capable and professionally trustful contractor and supervision consultant. ▪ Reinstatement of the damaged sections of roads as soon as the construction works have been completed. ▪ At major road intersections and squares that are mostly busy with high traffic volume and the roads, applying pipe jacking/drilling technique to install the envisaged underground cables without damaging roads and causing disruption to normal traffic flows; the major locations that will require this construction technique include Mexico square and roads around it, the cross-roads at Sahlite Mehret Church, the Goro junction at Jacros, and the crossing of Sarbet-Kera road; ▪ During construction phase working closely with the AAC Road Traffic Management Agency and AA Police Commission or concerned sub-cities police office to obtain technical/professional and material support from the agencies for traffic management activities at project sites; ▪ Mount GPS tracker for each vehicle. ▪ Develop and implement driver Code of Conduct (CoC). ▪ Speed governor for each truck. ▪ Drivers shall be given induction training at the start of the project, company policy, about road safety and due diligence to ensure safety of other road users.				
Impact on public health	▪ Provide to construction workers specific sexual health training including HIV/AIDS and other STDs awareness and prevention program. ▪ Provision of condoms in suitable locations for free. ▪ Avoid the presence of pools of standing water and any containers full of water and remove discarded items that could contain water in and around the office/site installations. ▪ Promote collaboration between the project and the Addis Ababa City Health Bureau and NGOs to share experience on issues related to STDs and HIV/AIDS awareness and prevention.	During construction phase	Contractor	Supervising Engineer (RE/EI)	Included in Contract with Contractor cost

Environmental and Social Risks and Impacts	Main Management Measures	Time/Frequency of Implementation	Implementing Body	Monitoring Body	Budget for Implementing (in Birr)
	▪ Relocate the people living within the TL right-of-way (26m width) to safe places.	During construction phase	EEP, relevant Woreda administration	RE/ESI/ESAO Woreda Administrations	Covered by EEP in the RAP/LRP budget
Community health and safety hazards through live power lines, electric & magnetic fields, and operation of project equipment and vehicles including traffic accidents	▪ Prohibit un-authorized persons entering construction sites. ▪ Fence excavation sites for foundation of towers of the overhead TL and for trenches of underground cables to prevent accidents to local residents, animals and vehicular traffic; ▪ Provide training for project workers in safety measures so that they take precautions in operation of equipment and vehicles and avoid infringement into settlement areas, business centres or any other sensitive areas to avoid accident risks to members of local communities, their animals and other properties. ▪ Provide awareness training for local communities about the risks related to the project activities and the safety measures they shall take. ▪ Disconnect power transmission through the existing lines during construction of the project TL to avoid electrocution risks. ▪ Delineate or fence work zone or dangerous areas and provide sufficient information about the site through posting of clearly visible signs. ▪ Post proper and clearly visible signs, barricades, reflectors at appropriate locations so that road users (drivers) are aware of the active construction works and take precautions while driving through or at nearby project operational area. ▪ Marking all energized electrical devices and lines with appropriate warning signs. ▪ Double insulating/grounding all electrical equipment used in environments that are, or may become, wet; using equipment with Ground Fault Interrupter (GFI) protected circuits; ▪ Appropriate labeling of service rooms housing high voltage equipment (‘electrical hazard’) and where entry is controlled or prohibited; ▪ Establish “No Approach” zones around or under high voltage power lines; ▪ Provide and secure fall prevention and protection provisions for all workers working at heights, including installation of guardrails with mid-rails and toe boards at the edge of any fall hazard area; Proper use of scaffolds and ladders by trained workers, and use of fall prevention devices (safety belt and lanyard travel limiting devices or fall protection	During construction phase	Contractor	RE/ESI/ESAO	No additional cost

Environmental and Social Risks and Impacts	Main Management Measures	Time/Frequency of Implementation	Implementing Body	Monitoring Body	Budget for Implementing (in Birr)
	devices);				
	▪ Design and construct the transmission line in such a way that the system would automatically break power transmission in case of cable breaking due to man-made or natural hazards.	During design and construction phases	Design consultant; contractor	EEP/RE/ESI	No additional cost
Conflict between local and migrant workers	▪ Maximize local hire of labor, in so far as it is compatible with the contractor's skill requirements. ▪ Ensure fair and transparent hiring and staff management procedures and work closely with project Woreda, Kebele administration and local community representative. ▪ Assign the responsibility for liaison with local communities and local authorities to a named individual from the contractor's organization. ▪ The contractor, along with the local administration and the local community, shall identify a community representative who shall support the project to avoid conflict between local and migrant workers.	During construction phase	Contractor	Supervising Engineer (RE/EI); community liaison officer; project affected Woreda offices	No additional cost
Pressure on local medical services	▪ The contractor shall consider its own healthcare needs (project staff and construction workforce); the construction contractor must provide a first-aid post at the work site. ▪ The first-aid post/clinic must be staffed by a qualified paramedical attendant on a full-time basis. ▪ First aid materials, suitable for dealing with minor injuries, shall be always available at all worksites. ▪ It is also necessary the Contractor to provide an ambulance service at the construction site to transport seriously injured persons. The ambulance must be made available on-site for 24 hours or first aid post for emergency situations. ▪ Contractor to liaison and sign an agreement with one of the standard medical centers or hospitals nearest to the project sites for the case of emergency. ▪ The Contractor is required to immediately notify EEP and WB, latest within 24-48 hours, in case of occurrence of fatality or a serious injury. ▪ The Contractor must prepare emergency communication procedure and maintain it operational at all construction sites.	During construction phase	Contractor	RE/ESI/ESAO	Included in Contract with Contractor cost
Risk of SEA/SH	▪ Offer equal employment opportunities to all collaborators based upon their specific professional qualifications and performance without any discrimination.	During construction phase	Contractor	RE/ESI/ESAO	Included in Contract with Contractor cost

Environmental and Social Risks and Impacts	Main Management Measures	Time/Frequency of Implementation	Implementing Body	Monitoring Body	Budget for Implementing (in Birr)
	▪ Select, hire and manage collaborators according to competence and merit. ▪ Put in place administrative measures to prevent and minimize GBV with proposed preventive and mitigation strategies. ▪ Prepare administrative measures (for example through Code of Conduct) to prevent Sexual Harassment in the workplace and GBV. ▪ Strengthen grievance redress and other monitoring mechanisms to ensure safe and ethical reporting systems to alert cases of GBV and assure them to access adequate response. ▪ Develop TOR and recruit a GBV specialist with SEA/SH monitoring tasks including supervision of signing of Code of conduct, on adequate rollout of SEA/SH sensitive GM mechanisms, on liaison/coordination with GBV services providers.				
Impact on vulnerable groups	▪ Provide cash support to vulnerable groups. ▪ Medical support (for those who are sick and or physically impaired). ▪ Create project-related employment opportunities to vulnerable groups.	During construction phase	EEP	EEP/ESAO/ local administration	Covered in the RAP/LRP budget
Security risk	▪ Implement the Security Management Plan (SMP). ▪ Regular observation of project areas designated as high or substantial for security risks. ▪ Areas where there have been incidents involving security in the course of project implementation. ▪ Check records of grievances involving security or public unrest ▪ Ensure that the security profile of the project shall not change for the worse.	During construction phase	Contractor, public security	Supervising Engineer (RE/EI)	Included in Contract with Contractor cost
Fire hazard	▪ Separately store flammable materials, away from construction offices, accommodations, workstation, etc. ▪ Provide fire arrest equipment (such as fire extinguishers) proportionate to flammable materials available in the construction site. ▪ Conduct fire drills and aware the project workers on risk of fire and how to arrest fire.	During construction phase	Contractor	Supervising Engineer (RE/EI)	Included in Contract with Contractor cost

Environmental and Social Risks and Impacts	Main Management Measures	Time/Frequency of Implementation	Implementing Body	Monitoring Body	Budget for Implementing (in Birr)
Land Acquisition, Restrictions on Land Use and Involuntary Resettlement (ESS5)					
Impacts on farmland, housing/ structures, and some exotic & indigenous trees; displacement of people mainly from the overhead TL right-of-way	▪ Prepare detailed RAP and LRP. ▪ Conduct a detailed inventory of affected agricultural lands, perennial crops, trees, immovable properties, and other assets legitimate for compensation. ▪ Carry out valuation of affected farmlands and other properties as per the applicable law (Proc. No. 1161/2019) & regulations (Reg. No. 472/2020) and the WB ES5 requirements. ▪ Conduct consultation meetings with project affected persons. ▪ Implement compensation payment to the affected households. ▪ Ensure timely compensation for loss of property and land use.	During pre-construction phase	Woreda administrations through compensation committee and EEP	EEP's ESAO; Woreda administrations	Covered by EEP in the RAP/LRP budget
	▪ Relocate the people living within the TL right-of-way (30m width) and the substation & the buffer zone to safe places.	During pre-construction phase	EEP; relevant Woreda administration	EEP's ESAO; Woreda administrations	Budget to be covered by EEP
Impacts on Natural Habitats and Biodiversity (ESS6)					
Impact on vegetation and flora due to reinforcement of overhead transmission line	▪ To avoid or minimize impacts on the forest cover between Towers 23 & 24 particularly on the trees located outside of the TL right-of-way, follow the route of the existing TL and take maximum care during stringing of cables. ▪ Adhere to principles of environmental conservation during the construction in order to avoid unnecessary destruction of vegetation and disturbance of land in the construction area. ▪ Avoid unnecessary destruction of trees and other vegetation by restricting land clearing to what is absolutely necessary within the project boundary and along the access road alignment. ▪ Consider the location of mature trees during route selection for the access road construction and land clearing for quarry/borrow sites if required. ▪ Rehabilitate temporary construction sites with suitable native grasses and other plants. ▪ Reinstate and rehabilitate all damaged areas upon completion of the construction. ▪ Compensate in cash for the loss of privately-owned mature trees.	During construction phase	Contractor	RE/ESI/ESAO	No additional cost

Environmental and Social Risks and Impacts	Main Management Measures	Time/Frequency of Implementation	Implementing Body	Monitoring Body	Budget for Implementing (in Birr)
	▪ The contractor is responsible for the conduct of his workforce in relation to environmental protection matters and to specifically prohibit unnecessary felling of trees.				
Impact on vegetation and flora due to construction of underground transmission lines	▪ For the BLL – NADC UG TL - locating the electric transmission route either on one side of the median or under the last right lane of the road carriageway where there is no any other utility. The former option will save the trees located at the centreline of the median while the latter option will totally avoid the impact on the whole green area including the trees.	Preconstruction phase	EEP & Design Consultants	RE/ESI/ESAO	No additional cost
	▪ If the above proposal wouldn't be practicable, implementing replanting of same or similar trees in another suitable area to be proposed by the Kirkos Sub City Beautification and Green Areas Development Office to compensate for the trees lost due to construction of the UG TL. ▪ If the BLL – NADC – Gofa UG TL would be located at the road median, restoration of the greenery affected during construction of the line through replanting of shallow rooted shrubbery and herbaceous plants above the underground cables and on the rest part of the median.	During construction phase	Contractor	ESAO/ Kirkos SC EPO	870,000
	▪ For the Weregenu – Kotebe UG TL - development of greenery vegetation above the underground cables through replanting of shallow rooted shrubbery and herbaceous plants to compensate for the trees lost and for aesthetic value of the site. ▪ To compensate for the trees lost due to construction of the Weregenu – Kotebe UG TL, implementing replacement tree planting at a suitable area to be proposed by the Bole Sub City Beautification and Green Areas Development Office.	During construction phase	Contractor	ESAO/ Bole SC EPO	160,000
Impacts on wildlife due to disturbance of habitat and accidents	▪ Take maximum precaution during construction of the overhead tranismission line sections that traverse important birdlife habitats along the Akaki river, the Kality WWTP, wetland spot found at 8º53'51"N, 38º45'12"E, and hilltop around Tower 51. ▪ Avoid locating access roads through the above indicated habitats to avoid disturbance of habitats and the birds that depend on those habitats. ▪ Post appropriate signs in the important birdlife areas and apply speed limits (20km/hr) for sections passing in the vicinity of those areas. ▪ Restore habitats which may be affected by project activities which will have a positive outcome on wildlife of the area. ▪ Organize on-job "awareness creation" training so that the construction	During construction phase	Contractor	RE/ESI/ESAO	No additional cost

Environmental and Social Risks and Impacts	Main Management Measures	Time/Frequency of Implementation	Implementing Body	Monitoring Body	Budget for Implementing (in Birr)
	workers refrain as much as possible from adversely affecting the birds and wild animals occurring in the project area.				
Avifauna mortalities	▪ Use of insulated and twisted conductors to ensure that the risk of collision and electrocution is very low, simply due to the presence of a single, very visible element. ▪ If the TL would have the neutral cable high above the conductor cables, it shall be made clearly visible by suitable markers because most bird collision accidents occur at the thin neutral cable. ▪ Maintaining 1.5 meter spacing between energized components and grounded hardware or, where spacing is not feasible, covering energized parts and hardware. To design an avian-safe power pole to minimize bird electrocution risk by providing sufficient separation between energized phase conductors and between phases and grounded hardware to accommodate at least the wrist-to-wrist or head-to-foot distance of a bird. ▪ Use of supports with safe cross arm configurations that minimize electrocution risk when building new power lines. The basic characteristics of these safe configurations must comply with the minimum safety distances (Appendix A, IUCN 2022). Critical distances depend on the largest birds present susceptible to being electrocuted mostly raptors wingspan of 2.8 meters. Therefore, the size of the larger raptors shall be considered and whenever possible, it is highly recommended to use supports with suspended insulators that move the phases away from the perching area. ▪ Installing elements that increase the gap between the conductors on the cross arm. This can be done by increasing the number of glass or porcelain insulators in the string, or even by using polymer insulators. These insulators either have a special shape to prevent birds landing on them or they are used with devices that stop them landing. ▪ Installation of insulating elements and deterrent devices which consists of increasing the distance between danger points or preventing their use by birds without making structural changes to the cross arm. ▪ Installing elements that discourage or prevent birds from perching on dangerous parts (anti-perching devices such as vertical rods, vertical metal plates, rods with swivel heads that turn in the wind, etc.) to stop birds using the pylons for building their nests or perching. ▪ The use of a tower structure with sufficient clearance would minimize	During Design and construction phases	Contractor	RE	Included in Contract with Contractor cost

Environmental and Social Risks and Impacts	Main Management Measures	Time/Frequency of Implementation	Implementing Body	Monitoring Body	Budget for Implementing (in Birr)
	electrocution risks to avifauna; and cross-arms, insulators and other parts of the power lines can be constructed so that there is no space for birds to perch where they can be proximate to energized wires.				
	▪ Install bird guards on the transmission structures to: ○ Prevent birds (especially larger birds) from nesting on the transmission structures; ○ Help prevent deaths of birds due to electrocution and fire; and ○ Positively impact the conservation of many bird species especially larger birds of prey.	During Design and construction phases	Contractor	RE/ESI/ESAO	Included in Contract with Contractor cost
	▪ As per the 132 kV TL tower design, to avoid electrocution of birds, the clearance between the live is 4.5m. Therefore, the Contractor is required to ensure this adequate distance between grounded and energized components.	During Design and construction phases	Contractor	RE/ESI/ESAO	Included in Contract with Contractor cost
Impacts on Cultural Heritage (ESS8)					
Cultural Heritage and Archaeological Finds through Chance Finds/	▪ Upon discovery of a heritage site or an archaeological chance find, construction shall be stopped, and the site shall be restricted using tapes or local materials, and relevant authorities including local administration officers shall be informed for further instructions.	During construction phase	Contractor	RE/ESI/ESAO AACA/ Federal ARCCH	Included in Contract with Contractor cost
Closeout of Works					
Site clearance inspection and certification on completion of the works	▪ Check the completed works for any outstanding E&S issues and address the issues prior issuing site clearance. ▪ Ensure that all waste is cleared from the construction area and restore the work areas to an acceptable condition. ▪ Participate the concerned local authorities to inspect the completed site and issue clearance. ▪ Carry out on a rolling basis as each major section of works is completed	During construction and closeout of works phase	Contractor	RE/ESI/ESAO	Included in Contract with Contractor cost
III. Operation and Maintenance Phase					
Impacts on Labour and Working Conditions (ESS2)					
Occupational health and safety (OHS)	▪ Provide awareness training regarding health and safety to EEP workers involved in operation and maintenance works of the power project about the safety risks and the measures they shall take.	During operation and maintenance phase	EEP	EEP's ESAO	Included in EEP's O&M budget

Environmental and Social Risks and Impacts	Main Management Measures	Time/Frequency of Implementation	Implementing Body	Monitoring Body	Budget for Implementing (in Birr)
	▪ Provide PPE including shock resistant gloves, shoes and other protective gears to workers handling electricity and related components. ▪ Develop and implement Health, Safety and Environment (ESHS) management system and review timely or after a major accident or incident. ▪ Disconnect power transmission through the project TL and other lines during the line/lines maintenance to avoid electrocution risks. ▪ Provide and secure fall prevention and protection provisions for all maintenance workers working at heights including proper use of scaffolds and ladders, and use of fall prevention devices (safety belt and lanyard travel limiting devices or fall protection devices).				
Health risks to workers due to lack of proper collection and disposal of domestic and sanitary wastes as well as hazardous wastes (including e-waste) within the substation compound	▪ Do not discharge wastewater on open lands. ▪ Provide proper drainage and sewerage system. ▪ Equip workshops, stores, offices, and other buildings with septic tank/wastewater treatment system. ▪ Remove and dispose wastes from septic tanks at appropriate interval and at designated sites to avoid overflow and prevent contamination of the ground or surface drainage. ▪ Collect and treat storm water runoff from open workshop servicing and repairs and other areas in bunded storage areas before discharging into receiving drainage and waterways. ▪ All waste storage areas shall be clearly identified and marked as hazardous waste storage areas. ▪ All hazardous wastes shall have adequate labelling and secured. ▪ E-waste shall be stored separately with follow-up action of reuse or recycling of parts. ▪ Maintain records of e-waste generated.	During operation and maintenance phase	EEP	EEP's ESAO	Included in EEP's O&M budget
Resource Efficiency and Pollution Prevention (ESS3)					
Soil, water, and air pollution from hazardous and non-hazardous solid wastes	▪ Prevent SF6 emissions and PCBs releases through proper handling procedures by properly trained personnel and best-practices. ▪ Recovery and reuse of SF6 waste. ▪ Train workers on not releasing wastes into the environment. ▪ Strictly prohibit indiscriminate disposal of solid waste. ▪ Provide substation site with good drainage systems.	During operation and maintenance phase	EEP	EEP's ESAO	Included in EEP's O&M budget

Environmental and Social Risks and Impacts	Main Management Measures	Time/Frequency of Implementation	Implementing Body	Monitoring Body	Budget for Implementing (in Birr)
	▪ Regularly maintain SS compound access road and drainage system. ▪ All waste areas are to be clearly identified and marked as hazardous waste storage areas. ▪ All hazardous wastes shall have adequate labelling and security at the facility. ▪ E waste shall be stored separately ▪ Place in strategic places signs against littering and dumping of wastes. ▪ Maintain records of e-waste generated.				
Oil spills hazards	▪ Install oil trapping equipment in areas where there is a likelihood of oil spillage e.g., during maintenance of vehicles. ▪ In case of an oil spill, immediate clean up measures will be instituted. ▪ The substations shall be designed with spill prevention and detection systems to protect the environment especially where the transformers will be located. ▪ Design appropriate protection devices against accidental discharge of transformer oil substances. ▪ The substations design shall provide adequate storage areas for the transformer oil. ▪ Drains shall be routed through an oil/water separator. ▪ Frequent inspection and maintenance of the transformers shall be done to minimize spilling. ▪ A written substations response plan shall be prepared and retained on the site and the workers shall be trained to follow specific procedures in the event of a spill. ▪ The substations operator shall ensure the proper containment or collection and disposal for the waste oil or used oil. ▪ All waste oils from maintenance of transformers and other associated equipment shall be segregated and disposed properly by a reputable/registered waste handler in accordance with the waste disposal plan. ▪ Storage and liquid impoundment areas for fuels, raw and in-process material solvents, wastes and finished products shall be designed with secondary containment to prevent spills and the contamination of soil, ground and surface water.	During operation and maintenance phase	EEP	EEP's ESAO	Included in EEP's O&M budget

Environmental and Social Risks and Impacts	Main Management Measures	Time/Frequency of Implementation	Implementing Body	Monitoring Body	Budget for Implementing (in Birr)
Impacts on Community Health and Safety (ESS4)					
Community health and safety risks due to transmission line snapping and transmission tower collapse and long-term exposure to EMF	▪ Prevent encroachment of people into TL right-of-way and the buffer zone around the substations for establishing residence and living there. ▪ Operate the transmission line in such a way that the system would automatically break power transmission in case of cable breaking due to man-made or natural hazards. ▪ Evaluating potential exposure to the public against the reference levels developed by the International Commission on Non-Ionizing Radiation Protection (ICNIRP). Average and peak exposure levels shall remain below the ICNIRP recommendation for General Public Exposure. ▪ If EMF levels are confirmed or expected to be above the recommended exposure limits, application of engineering techniques shall be considered to reduce the EMF produced by power lines, substations, or transformers. Examples of these techniques include shielding with specific metal alloys; burying transmission lines; increasing height of transmission towers; and modifications to size, spacing, and configuration of conductors.	During operation and maintenance phase	EEP; Woreda administrations	EEP; local environmental protection office	Included in EEP's O&M budget
Electrocution from live power lines or electric equipment	▪ Put in place a maintenance system to ensure physical integrity of project equipment is maintained. ▪ Access to the substations shall only be by authorization and trained personnel. ▪ Erect a perimeter fence to deny unauthorized people access the substations. ▪ Clear warning signs to be placed on strategic places. ▪ Conduct periodic awareness and sensitization campaigns for the neighbouring communities. ▪ Conduct education and awareness campaigns to dispel fear among community on the effects of electrostatic and magnetic forces.	During operation and maintenance phase	EEP	EEP; local labor office	Included in EEP's O&M budget
Impacts on Natural Habitats and Biodiversity (ESS6)					
Impacts on vegetation and habitats	▪ Implement tree replanting program to compensate for the indigenous trees removed; the number of mature trees affected will be recorded during the construction phase. ▪ Plant up to 10 seedlings to compensate for each mature tree lost. ▪ Consult the relevant Sub City Environmental Protection Offices (EPO) to	Immediately after completion of construction, but during the wet season	EEP, Woreda natural resource offices	Local environmental protection office	Included in EEP's O&M budget

Environmental and Social Risks and Impacts	Main Management Measures	Time/Frequency of Implementation	Implementing Body	Monitoring Body	Budget for Implementing (in Birr)
	arrange appropriate sites and native tree species for the planting program. ▪ Carry out monitoring of propagation of non-native invasive plant species or the spread of existing invasive plants in the project area.				
Right-of-way maintenance	▪ Implementation of an Integrated Vegetation Management (IVM) approach. The selective removal of tall-growing tree species and the encouragement of low-growing grasses and shrubs is the common approach to vegetation management in transmission line rights-of-way. Alternative vegetation management techniques shall be selected based on environmental and site considerations including potential impacts to non-target, endangered and threatened species. ▪ Removal of invasive plant species, whenever possible, and cultivating native plant species. ▪ Observing manufacturer machinery and equipment guidelines, procedures regarding noise, and oil spill prevention and emergency response. ▪ Avoiding use of machinery in the vicinity of watercourses.	During operation and maintenance period	EEP	EEP's ESAO	Included in EEP's O&M budget
Impacts on birds and avifauna mortality	▪ Undertake monitoring of the birds and their flyway on regular basis. ▪ Conduct monitoring of impact on birds due to electrocution and collision. ▪ Keep record of bird mortalities through collision and electrocution.	During operation and maintenance phase; during the annual migration season (winter) of migratory soaring birds	Bird Specialist to be assigned by EEP	EEP's ESAO	Included in EEP's O&M budget
Propagation of non-native invasive plant species	▪ Carry out monitoring of any establishment of non-native invasive plant species or the spread of existing invasive plants.	Once per year during operation and maintenance phase	EEP's ESAO	Local environmental protection office	Included in EEP's O&M budget
Impact on avifauna	▪ Undertake monitoring of the birds and their flyway on regular basis. ▪ Conduct monitoring of impact on birds due to electrocution and collision. ▪ Keep record of bird mortalities through collision and electrocution.	During operation and maintenance phase	EEP	EEP's ESAO	Included in EEP's O&M budget
IV. Decommissioning Phase					
Impacts on Labor and Working Conditions (ESS2)					
Increased noise and vibration	▪ Provide proper PPEs such as earplugs and earmuffs for workers involved in demolishing work Restrict demolishing activities during the	Decommissioning phase	Decommissioning contractor	EEP's ESAO	Included in EEP's decommissioning budget

Environmental and Social Risks and Impacts	Main Management Measures	Time/Frequency of Implementation	Implementing Body	Monitoring Body	Budget for Implementing (in Birr)
	daytime and avoid performing such works during night times, on weekends and holidays. ▪ Implement noise abatement measures in sections where the TL crosses residential areas. ▪ Demolish mainly during the day. The time that most of the neighbors are out working. ▪ Co-ordinate with relevant agencies and neighboring communities regarding all demolition activities.				
Resource Efficiency and Pollution Prevention (ESS3)					
Air pollution	▪ Implement dust control and suppression measures including regular application of water on or near settlement areas to reduce dust generation. ▪ Traffic speeds shall be restricted, and water regularly sprayed on gravel roads to suppress dust levels near settlement areas. ▪ Cover all trucks hauling soil, sand and other loose materials or require all trucks to maintain at least two feet of freeboard. ▪ Reduce duration of demolition activities resulting in more dust generation and prefer working hours based on the mobility of people.	Decommissioning phase	Decommissioning contractor	EEP's ESAO	Included in EEP's
Generation of exhaust emission	▪ Regular maintenance of diesel-powered machinery and vehicles to reduce excessive exhaust emissions.	Decommissioning phase	Decommissioning contractor	EEP's ESAO	decommissioning budget
Demolition waste	▪ Use of an integrated solid waste management system (i.e., through a hierarchy of options: source reduction, reusing, recycling, incineration, and sanitary land filling).	Decommissioning phase	Decommissioning contractor	EEP's ESAO	Included in EEP's
	▪ All machinery, equipment, structures, and partitions that will not be used for other purposes must be removed and recycled/reused as far as possible or they be taken to a licensed waste disposal site.	Decommissioning phase	Decommissioning contractor	EEP's ESAO	decommissioning budget
	▪ Dispose waste more responsibly by contracting a registered waste handler who will dispose the waste at designated sites or landfills only and in accordance with the existing laws.	Decommissioning phase	Decommissioning contractor	EEP's ESAO	Included in EEP's
Oil spills hazards	▪ Install oil trapping equipment in areas where there is a likelihood of oil spillage e.g., during maintenance of construction facility and vehicles. ▪ In case of an oil spill, immediate clean up measures will be instituted. ▪ Close surveillance of the fuel and cooling oil store.	Decommissioning phase	Decommissioning contractor	EEP's ESAO	decommissioning budget

Environmental and Social Risks and Impacts	Main Management Measures	Time/Frequency of Implementation	Implementing Body	Monitoring Body	Budget for Implementing (in Birr)
Environmental pollution from demolition waste	▪ Implement an integrated solid waste management system including reuse and recycling. ▪ Implement proper waste segregation and disposal at the designated waste disposal sites. ▪ Sale all recyclable and other equipment and materials to appropriate recyclers and users; and ▪ All machinery, equipment, structures and partitions that will not be used for other purposes must be removed and recycled/reused or they shall be taken to designated waste disposal site by licensed companies involved in collection, transportation and management of such wastes.	Decommissioning phase	Decommissioning contractor	EEP's ESAO	Included in EEP's decommissioning budget
Impacts on Workers and Community Health and Safety (ESS2 & ESS4)					
Workers and community health and safety risks due to decommissioning phase activities	▪ Ensure strict compliance with the OSH & ensure that all health & safety measures are put in place to prevent accidents. ▪ Inform the workers and local community about the duration of decommissioning phase work. ▪ Provide and use all necessary Personal Protection Equipment (PPE) to workers during demolition work. ▪ Undertake dismantling activities with care. ▪ Place warning signs where necessary.	Decommissioning phase	Decommissioning contractor	EEP's ESAO	Included in EEP's decommissioning budget
Impacts on Natural Habitats and Biodiversity (ESS6)					
Alteration of habitats due to destruction of vegetation cover	▪ Implement appropriate re-vegetation and rehabilitation program to restore the site to its original state	Decommissioning phase	Decommissioning contractor	EEP's ESAO	Included in EEP's decommissioning budget
Rehabilitation of project site	▪ Once all the facilities have been removed, as far as possible restore the land to its original state. ▪ Implement an appropriate re-vegetation program to restore the site to its original status; and ▪ Consider use of indigenous plant species in re-vegetation.	Decommissioning phase	Decommissioning contractor	EEP's ESAO	Included in EEP's decommissioning budget
Site clearance inspection and certification on completion of the works	▪ Check the decommissioned site for any outstanding E&S issues and address the issues prior issuing site clearance. ▪ Ensure that all waste is cleared from the project area and restore the work areas to an acceptable condition. ▪ Participate the concerned local authorities to inspect the decommissioned site and issue clearance.	Decommissioning phase	Decommissioning contractor	EEP's ESAO	Included in EEP's decommissioning budget

10. Environmental & Social Monitoring Plan

10.1 General Considerations

Environmental and social monitoring is an essential tool in relation to environmental and social management as it provides the basis for rational management decisions regarding impact control. Monitoring shall be performed during all stages of the Project, pre-construction, construction, commissioning the new infrastructure, decommissioning of the construction works, operation and maintenance, and decommissioning of the physical infrastructure once it has completed useful life, to ensure that the identified risks are mitigated and impacts remain under control as expected through a proper implementation of the C-ESMP, and to verify the actual impacts. The monitoring program will indicate where changes to procedures or operations are required, in order to reduce impacts on the environment or local population.

The monitoring program will be primarily undertaken by EEP to meet the following objectives:

- to monitor the environmental and social conditions of the Project influence area as impacted by the construction and operation of the SS and TL;
- to check on whether mitigation and benefit enhancement measures have actually been implemented, and are proving effective in practice;
- to provide a means whereby any impacts which were subject to uncertainty at the time of preparation of this ESIA, or which were unforeseen, can be identified, and to provide a basis for formulating appropriate additional impact control measures; and
- to provide information on the actual nature and extent of key impacts and the effectiveness of mitigation and benefit enhancement measures which, through a feedback mechanism, can improve the planning and execution of future similar Projects.
- There are two basic forms of monitoring:
    - *Compliance monitoring:* which checks whether prescribed actions have been carried out, usually by means of inspection or enquiries; and
    - *Effects monitoring:* which records the consequences of activities on one or more environmental and social components, and usually involves physical measurement of selected parameters or the execution of surveys to establish the nature and extent of induced changes.

The Contractor is required to carry out both compliance and effects monitoring. However, construction compliance monitoring will play a primary role in checking whether the necessary impacts mitigation and environmental and social management plans have been carried out or not. This is because most impact controls take the form of measures incorporated in Project designs and contract documents, and the extent to which requirements on these matters, as set out in the ESIA/ESMP, are complied with, plays a major part in determining the overall environmental and social performance of the Project. However, the Resident Engineer /EPP will request effects monitoring at any moment in case compliance monitoring results do not prove satisfactory.

The Contractor and the Resident Engineer will submit monthly monitoring reports on ESHS performance to EEP in accordance with the metrics specified in the respective bidding documents and contracts, and the EEP will report the ESHS performance to the World Bank.

10.2 Monitoring during Pre-construction Phase

Monitoring during the pre-construction phase of the Project will be concerned with two aspects:

- Checking that the Project designs and specifications incorporate appropriate measures to minimise negative impacts and to enhance beneficial impacts
- Checking that the appropriate environmental protection clauses have been included in the contract documents to allow control of actions by the contractor which are potentially damaging to the environment.

These activities have been carried out as part of the preparation of designs and tender documents for the Project.

10.3 Monitoring during Construction and Closeout of Works Phases

Environmental and social monitoring during the construction phase will comprise two principal groups of activities:

- review the Contractors' plans, method statements, temporary works designs, and arrangements so as to ensure that environmental and social protection measures specified in the contract documents are adopted and that the contractor's proposals provide an acceptable level of impact control; and
- systematic observation on a day-to-day basis of all site activities and the contractors' offsite facilities including transmission route and tower erection sites, storage areas, Project offices facilities, access road, quarry and spoil areas, etc. as a check that the contract requirements relating to environmental and social matters are in fact being complied with, and that no impacts foreseen and unforeseen are taking place.

These activities will be fully integrated with other construction supervision and monitoring activities carried out by the construction supervision consultant. The Resident Engineer (RE) (i.e. as part of his duties connected with general site supervision) is responsible to ensure adequate level of environmental and social monitoring is carried out. Actual monitoring on a day-to-day basis will be carried out by Environmental and Social Inspector from the construction supervision consultant, under the direction of the RE.

The majority of monitoring will comprise visual observations, carried out at the same time as the engineering monitoring activities. Site inspections will take place with emphasis on early identification of any environmental and social problems and the initiation of suitable remedial action. Where remedial actions have been required on the part of the Contractor, further checks will need to be made to ensure that these are actually being implemented in the required form and to the agreed schedule. As experience of the principal problem areas is gained, attention will be concentrated on locations and activities which are known to be the most troublesome, with a lower frequency of inspections at problem-free locations. Nevertheless, each construction activity site need to be formally inspected from an environmental and social viewpoint at least once every week.

The RE will decide on the appropriate course of action to be taken in cases where unsatisfactory reports are received from his field staff regarding environmental and social matters. In the case of relatively minor matters, advice to the contractor on the need for remedial action may suffice, but in all serious cases, the RE shall either recommend an appropriate course of action to the Engineer, or shall issue a formal instruction to the contractor to take remedial action, depending on the extent of his delegated powers.

In addition to visual observation, it is particularly important that monitoring shall also include limited informal questioning of the local community and their elected leaders who live in the Project area, since they may be aware of matters which are unsatisfactory, but which may not be readily apparent or recognized during normal site inspection visits.

Environmental and social inspection checklists for site use will be developed by the RE and the Environmental and Social Inspector to be assigned by the Supervision Consultant, prior to the commencement of construction, so as to facilitate systematic monitoring and recording. These may require modification in the light of site experience, and it is recommended that a review of their adequacy and ease of use shall be carried out approximately 2 months after the commencement of works.

The Environmental and Social Inspector will review the effectiveness of environmental and social management and monitoring approximately 3 months into the construction period, and will introduce improved procedures as required in the circumstances.

10.4 Monitoring during Operation and Maintenance Phase

EEP's ESAO shall also monitor and prepare periodic reports on the status of the Project operation and maintenance. Post-construction phase monitoring will be concerned with identification of the need for routine and periodic maintenance to towers and stringings, and maintaining ROW, together with checking that the maintenance works are being carried out properly and do not result in OHS or CHS issues or environmental damage.

During Project operation and maintenance, EEP's ESAO shall undertake the monitoring activities.

The monitoring office shall regularly report the results and the report shall be made available for review by all concerned bodies. Contents of the report shall include:

- Results of key parameters monitored;
- Results or status on implementation of the environmental and social management plan;
- Description of any incidents which could potentially result into a non-compliance of the ESMP and actions taken to improve the situation; and
- Proposed solutions for any outstanding/unforeseen issues and impacts detected during the monitoring.

The Environmental and Social Monitoring Plan is presented in Table 10.1.

10.5 E&S Monitoring Plan during Decommissioning Phase

Prior to decommissioning activities, and as a part of the Site-Specific Decommissioning Plan, a Monitoring Plan shall be developed and submitted by EEP's ESAO to the Project Management Office for approval and receive no-objection from the Competent Authority. The plan is to cover proposed monitoring during and after the closure of the facility.

Table 10.1: Environmental and Social Monitoring Plan

No	Issues to be Monitored	Location	Methods of Monitoring	Monitoring Indicators	Time and Frequency Monitoring	Purpose	Institutional Responsibility	Cost (in Birr)
During Construction and Closeout of Works Phase								
Impacts on Labour and Working Conditions (ESS2)								
1	Specific safety management plan (C-ESMP)	Contractor's & Sup. Consultant's Site Office	Observation & review	OHS elements (training, awareness education, PPE etc.)	Before onset of construction & quarterly during construction	To reduce OHS risks to workers	RE/ESI/ESAO	No cost
2	Occupational health and safety risks	All work places (Construction sites, materials production sites, workshops)	Observation, inspection and reporting; SHE training programs; records of any incident, accident; investigation and corrective actions; PPE provided; warnings posted	Number, type and level of accidents/incidents and injuries occurred; Presence of safety signals, barricades, reflectors, hazard markings etc. at appropriate locations	Weekly, monthly	To ensure compliance with Regulation on Occupational Health and Safety with the Health and Safety Plan/ To reduce safety risks to workers	Contractor (HSE) and RE/ESI/ESAO	300,000
3	Fall prevention and protection provisions	TL route esp. tower erection sites & SS site	Observation & inspection	Use of use of safety equipment (scaffolds, ladders, safety belt and lanyard etc.)	Weekly	As above	Contractor (HSE) and RE/ESI/ESAO	300.000
4	Workers' grievance mechanism	Contractor's & Sup. Consultant's Site Office	Record keeping and reporting	Number and type of complaints	Continuous throughout construction period	To ensure compliance with Ethiopian legislation/ Regulation	Contractor HR Manager	No cost
5	Workers' medical insurance	Contractor's & Sup. Consultant's Site Office	Record keeping and reporting	Number and type of beneficiaries	Continuous throughout construction period	To ensure compliance with Workers' medical insurance as per Ethiopian legislation/ Regulation/standard	Contractor HR Manager	No cost

No	Issues to be Monitored	Location	Methods of Monitoring	Monitoring Indicators	Time and Frequency Monitoring	Purpose	Institutional Responsibility	Cost (in Birr)
Resource Efficiency and Pollution Prevention (ESS3)								
4	Noise and vibration	Construction sites, materials production sites, access roads & near settlement areas	Inspection, noise level measurement using Sound Level Meter; reports on log of vehicle and machine servicing; PPE provided; and sensitization meetings held	Noise level in dB (>80 dBA); Noise silencers & mufflers on plant, equipment & vehicles; Provision & use of PPE	Monthly, upon complaints by residents near settlement sites and as necessary	To reduce risks to receptors; To ensure compliance with Regulation on the assessment and management of the environmental noise	Contractor (HSE) and RE/ESI/ESAO	150,000
5	Air pollution	At construction sites, materials production sites, and access roads	Observation, record keeping and reporting	Particulate matter level of 150 µg/m^3 for PM_{10} and 75 µg/m^3 for $PM_{2.5}$ for 24-hr averaging time; Gaseous pollutants such as SO_2 (125 µg/m^3) and NO_2 (200 µg/m^3 for 24-hr and 1-hr averaging time respectively	Occasionally throughout construction period (alternating locations)	To ensure compliance with Air Pollution Control Regulation/standard	Contractor (HSE) and RE/ESI/ESAO	150,000
6	Soil erosion	Construction sites, access roads	Observation & reporting provisions in erosion Control Plan	Soil erosion and sediment/turbidity status in surface water bodies or stormwater drainage channels	Twice per month and monthly reporting	To reduce the risk of erosion; To improve soil erosion control measures	Contractor (HSE) and RE/ESI/ESAO	300,000
7	Soil pollution	At construction sites and materials storage areas	Observation, soil quality testing & analysis, record keeping and reporting	pH, oil/grease, heavy metals, cations, anions	Once quarterly	To ensure compliance with relevant regulations	Contractor (HSE) and Supervising Engineer (RE/EI)	150,000
8	Competition for water resources	At construction sites, settlement areas	Observation, inspection, record keeping and reporting	Number of complaints by water users, Number/adequacy of water supply sources provided for the project requirements	Occasionally throughout construction period (alternating locations)	To ensure compliance Regulation/standard	Contractor (HSE) and RE/ESI/ESAO	No cost

No	Issues to be Monitored	Location	Methods of Monitoring	Monitoring Indicators	Time and Frequency Monitoring	Purpose	Institutional Responsibility	Cost (in Birr)
9	Solid waste management	At construction sites, materials laydown facilities areas	Reports on waste management plans developed; types & amounts of waste generated; facility provided for handling and storage of waste; methods employed for waste disposal; training meetings held,	Type and quantity of waste generated, properly handled and disposed	Monthly	To ensure compliance with relevant regulations	Contractor (HSE) and RE/ESI/ESAO	200,000
10	Landscape Disturbance/ Erosion of Earthworks/	All construction sites	Visual observation, testing, and reporting provisions in erosion control plan, record keeping and reporting	Sediment load and turbidity to the nearby surface water bodies; visual observation of gully formations; number and type of erosion protection measures or structures constructed	Continuous and monthly reporting	To reduce the risk of erosion and landscape disturbance	ESI/ESAO/ Contractor (HSE)	150,000
Impacts on Community Health and Safety (ESS4)								
10	Road traffic and safety at construction sites	Construction sites, access roads	Observation, inspection, record keeping and reporting	Safety of work zone maintained through fencing, posting signs, barricades, reflectors etc.; traffic management at & around construction sites damaged road sections reinstated after construction; number of accidents reported	Daily during Construction	To enhance the safety of workers and road users; minimize traffic flow obstruction; minimize accident risk on the local community, project workers and road users	Contractor (HSE) and RE/ESI/ESAO	300,000
11	Construction traffic accident	In and around TL corridor, access roads, settlement areas	Record keeping, analysis and reporting	Number of accidents reported	Continuous during Construction	To enhance the safety of workers; minimize accident risk on the local community	Contractor (HSE) and RE/ESI/ESAO	250,000
12	Exposure to HIV/AIDS & STD	Store/site installation and nearby villages	Awareness creation and Condom distribution	Number of awareness training conducted	Monthly	To prevent the spread of HIV/AIDS	Contractor, ESAO and	250,000

No	Issues to be Monitored	Location	Methods of Monitoring	Monitoring Indicators	Time and Frequency Monitoring	Purpose	Institutional Responsibility	Cost (in Birr)
		along the TL corridor					Woreda health office	
13	Community Health & Safety Hazards Through Live Power Lines, Electric & Magnetic Fields	Near construction sites, SS and along the TL corridor	Electrocution incidences	Reports on maintenance system developed; electrocution accidents occurrence and corrective measures taken; visitors and employees access to the substations log; progress on construction of the perimeter wall; warning signs posted; sensitization workshops held	Occasionally throughout energization period	To ensure compliance of Regulation/standard	Contractor (HSE) and RE/ESI/ESAO	125,000
			Perceived danger of Electrostatic and Magnetic force	Report on training and awareness campaign held				75,000
14	Community safety risks associated with operation of project vehicles and equipment	Construction sites nearby residential or business areas and access roads	Visual inspection, record keeping & reporting	Number of incidents & accidents reported; Number of complaints	Weekly throughout construction sites and along access roads	To ensure safety of local community; To ensure compliance with relevant regulations	Contractor (HSE) and RE/ESI/ESAO	100,000
15	Fire Hazard	Equipment fuelling and maintenance areas, Workshop and garage	Visual inspection	Presence of fire fighting equipment	Monthly	To ensure compliance with relevant regulations	Contractor (HSE) and RE/ESI/ESAO	100,000
16	Conflict between Local and Migrant Workers	At construction sites/TL Corridor	Observation and inspection	Number of complaints	Occasionally throughout construction period (alternating locations)	To ensure compliance Regulation/standard	Contractor/ ESI/ESAO and Woreda Social Office	No cost

No	Issues to be Monitored	Location	Methods of Monitoring	Monitoring Indicators	Time and Frequency Monitoring	Purpose	Institutional Responsibility	Cost (in Birr)
17	Child Labour	At construction sites	Observation, record keeping & reporting	A contracted worker deployed as child labour (Yes/No); Target: *No*	Continuous and monthly reporting	To prevent fire hazard and ensure compliance with National Labour Law and Labour Management Procedures (LMP)	Contractor/ ESI/ESAO and Woreda Social Office	No cost
18	Forced Labor	At construction sites	Observation, record keeping & reporting	A contracted worker deployed as forced labour (Yes/No); Target: *No*	Continuous and monthly reporting		Contractor/ ESI/ESAO and Woreda Social Office	No cost
Land Acquisition, Restrictions on Land Use and Involuntary Resettlement (ESS5)								
19	Impacts on agricultural land & other assets, and displacement of people due to maintenance of the overhead TL right-of-way	As necessary in the RAP report and implementation including compensation for land, structures and crop/trees damage					EEP/ESAO	Included in the RAP budget
Impacts on Natural Habitats and Biodiversity (ESS6)								
20	Disturbance to wildlife species	Along the overhead TL corridor (mainly along Akaki R. between TR 23 & 24, and TR 38 & 39)	Reports on wildlife sighted, vegetation clearing	Number of wildlife identified/ reports on incidents of accidents	During Construction of the indicated sections	To ensure ecosystem stability	Contractor (HSE) and RE/ESI/ESAO	50,000
21	Impact on Natural Vegetation	Along the overhead TL corridor (mainly along Akaki R. bn TR 23 & 24),	Visual inspection/ landscaping programme on revegetation implemented	Number of trees removed and disturbed vegetation by type & areas	Continuous during Construction	To ensure ecosystem stability	Contractor (HSE) and RE/ESI/ESAO	50,000
22	Impact on ornamental	Road median along BLL –	Visual inspection/ landscaping	Number & type of trees and other plants affected;	Continuous during Construction	To ensure rehabilitation of the	RE/ESI/ESAO/ SC EPO	50,000

No	Issues to be Monitored	Location	Methods of Monitoring	Monitoring Indicators	Time and Frequency Monitoring	Purpose	Institutional Responsibility	Cost (in Birr)
	trees & other vegetation	NADC – Gofa & Weregenu – Kotebe UG TLs,	programme on trees & other vegetation implemented	Number & type of trees and other plants planted to compensate for the lost trees and other plants;		landscape affected by project construction		
23	Avifauna mortalities	Gofa – Kality-1 OHTL corridor and vicinity	Visual inspections, Observation, record keeping & analysis	Number of birds identified/ affected/ mortality due to electrocution and collision with power lines, transformers, switchyards, etc. Reports on wire marking and incidents of bird strikes	Biannual at least for the first three years of operation	Reduced injury and mortality attributable to collision impact	ESAO/ EWCA	500,000
			Person involved in monitoring shall walk or drive all along the power line and record if any bird	Evidence of feathers, bones, carcasses etc. lying under the transmission line or towers shall be considered as mortality		Electrocution or collision occurred or any other animal mortality has occurred		
				for evidence of birds nesting on the pylons		to confirm if other adaptive mitigation may be required		
25	Rehabilitation of project site	All construction sites	Reports on re-vegetation implementation: number and species of trees planted	Reports on re-vegetation programme developed and implemented; area/number and species of trees planted	Progressive rehabilitation	To ensure ecosystem stability	As above	200,000
26	Visual and aesthetic impacts	All construction sites	Reports on public consultation held; landscaping programme designed and implemented		Continuous and monthly reporting	To ensure ecosystem stability	ESAO/Contractor	150,000

No	Issues to be Monitored	Location	Methods of Monitoring	Monitoring Indicators	Time and Frequency Monitoring	Purpose	Institutional Responsibility	Cost (in Birr)
Impacts on Cultural Heritage (ESS8)								
27	Chance finds of culturally significant artefacts or sites	Excavation and quarry sites and all other installation sites	Visual observation for accidental discovery of culturally significant artefacts on site	Reports on heritage areas and archaeological finds found and number of chance-finds procedures initiated	Continuous during Construction	To limit Project delay from chance finds (and to limit impact to chance find themselves)	ESAO/AACA and Federal ARCCH	No cost
28	Training and Capacity Building for Contractor's and Project Engineer's Personnel	All project sites	Review of records and interview of trained workers	Number of trainings provided and workers attended the training	Monthly	To ensure that non-local staff respect the cultural resources of the local populations	Contractor/ESAO	150,000
During Operation and Maintenance Phase								
1	Loss of resident avifauna (collisions, barrier effect and displacement)	Overhead Transmission line corridor and vicinity	Bird and bat carcasses Visual inspections, Number of avifaunal carcass, record keeping & analysis	Number of mortality/injured birds identified / affected & species of carcass found, *Condition:* whole carcass, decomposed, partial carcass, etc.); coordinate, photo documentation	Monthly	Reduced injury and mortality attributable to collision impact	EEP and local environmental protection office	EEP's O&M Budget
2	Domestic/ Solid/Sanitary Waste	At the project site	Observation, record keeping and reporting	Type and quantity of domestic /sanitary waste properly handled and disposed	Monthly	To ensure compliance with relevant regulations	EEP and local environmental protection office	EEP's O&M Budget
3	Hazardous Waste	At the project site	Observation, record keeping and reporting	Type and quantity of waste hazardous properly handled and disposed	Monthly	To ensure compliance with relevant regulations	EEP and local environmental protection office	EEP's O&M Budget
4	Generation of E-Waste	At the project site	Observation, record keeping and reporting	type and quantity of E-waste properly handled and disposed	Monthly	To ensure compliance with relevant regulations	EEP and local environmental protection office	EEP's O&M Budget

No	Issues to be Monitored	Location	Methods of Monitoring	Monitoring Indicators	Time and Frequency Monitoring	Purpose	Institutional Responsibility	Cost (in Birr)
5	Occupation, Health and safety risks	At the project site	Observation, record keeping and reporting	Number, type and level of injury/ incidents occurred	Continuous and monthly reporting	To ensure compliance with regulation on occupational health and safety with the health and safety plan	EEP and local environmental protection office	EEP's O&M Budget
3. During Decommissioning phase								
1	Noise and Vibration	At demolition site and near settlement areas	Observation, record keeping and reporting	Noise level in dB	Upon complaints by nearby residents	To ensure compliance with relevant regulations	EEP's Environmental, Social, Health and Safety (ESHS) Officer	EEP's O&M Budget
2	Air Pollution	At Demolition sites and access roads	Observation, record keeping and reporting	Particulate matter level of in $\mu g/m^3$	Occasionally throughout decommissioning phase (alternating locations)	To ensure compliance with relevant regulations	EEP's Environmental, Social, Health and Safety (ESHS) Officer	EEP's O&M Budget
3	Demolition waste	At demolition sites and access roads	Observation, record keeping and reporting	type and quantity of demolished wastes properly handled and disposed	Continuous & monthly reporting	To ensure compliance with relevant regulations	EEP's Environmental, Social, Health and Safety (ESHS) Officer	EEP's O&M Budget
4	Vegetation disturbance	Along the Demolition corridor	Observation, inspection, record keeping and reporting	Cleared vegetation by type and area	Continuous & monthly reporting	To ensure compliance with relevant regulations & ecosystem rehabilitation and restoration	EEP's Environmental, Social, Health and Safety (ESHS) Officer	EEP's O&M Budget
5	Occupational and community health and safety risks	Project site	Observation, inspection, record keeping and reporting	number, type, and level of injury/ incidents occurred	Continuous until all discarded facilities are removed and monthly reporting	To ensure compliance with regulation on occupational health and safety with the health and safety plan	EEP's Environmental, Social, Health and Safety (ESHS) Officer	EEP's O&M Budget

11. Grievance Redress Mechanism (GRM)

11.1 Community Grievance Redress Procedure

11.1.1 Purpose and Scope

Proclamation No. 1161/2019 and WB's ESS10 (as part of the SEP) require the establishment of a Grievance Redress Mechanism (GRM) to receive and facilitate resolution of affected communities' concerns and grievances about the Project's environmental and social performance or any other aspect related to the Project. The GRM shall resolve concerns promptly, using an understandable and transparent consultative process, and at no cost to its users. The mechanism shall not impede access to judicial or administrative remedies.

The GRM shall be adequately disseminated among affected communities in the course of the stakeholder engagement process and its access shall be adapted to the social and cultural context.

A public complaint or grievance is an issue, concern, problem, or claim (perceived or actual) that an individual stakeholder or community group has related to EEP and its contractors' operations and activities that might give grounds for complaint.

Any person or group who is affected by Project activities has a right to raise a grievance and EEP has the responsibility to respond within a reasonable time period. Therefore, EEP who is the Project developer has developed a Grievance Redress Mechanism (GRM) to receive, review and address affected communities' concerns and complaints. However, as a general policy, EEP will work proactively towards preventing grievances through the implementation of impact mitigation measures (as identified and recommended in this ESIA) and by keeping various communication channels open to invite questions and concerns before they escalate to grievances.

This Grievance Procedure provides guidance to all Project employees, contractors and the communities on receiving, registering, assessing and resolving any type of community feedback, complaints or grievances emanating from the construction activities. The fundamental objective of this procedure is to:

- Provide a predictable, transparent, and credible process to all parties for facilitating communication related with the works and resolving doubts and grievances, resulting in outcomes that are seen as fair, effective, and lasting;
- Build trust as an integral component of broader community relations activities;
- Enable more systematic identification of emerging issues and trends, facilitating corrective action and pre-emptive engagement; and
- Meet requirements of relevant international good practice.

This GRM outlines EEP's approach to accepting, assessing, resolving, and monitoring grievances from those affected by EEP and its contractor's activities in relation to the Addis Ababa Power Supply Reinforcement Project. The aim is to identify and manage grievances from individual stakeholders or stakeholder groups. Timely responses and redress or resolution of such grievances is vital to ensure successful implementation of the Project.

11.1.2 Sources of Public Complaints/Grievance

Grievance can emerge from Project activities as discussed below. Some of the likely Project activities which give rise to potential grievances directly or indirectly are attributed to:

- Mishandling of the land acquisition process (pre-construction);
- Damage to private and common assets and properties;
- Restriction of access to natural and common property resources;
- Air, water and land pollution and waste and spoil disposal;
- Noise of construction works (construction);
- Community health and safety, for instance in relation to impacts of increased traffic (construction);
- Practices that endanger the health, safety and security of employees working on the Project;
- Failure to meet the labour rights of employees working on the Project; and
- Lack of meaningful consultation;

As indicated above, comments and information requests will also be accepted, responded and recorded in the same way as grievances and will be answered by EEP's Project Coordination Office.

11.1.3 Guiding Principles for Grievance Management

The guiding principles for GRM are presented below:

Impartiality: All parties have the right of expressing their viewpoints. Any assumptions or actions shall be taken until all relevant information has been collected and considered. All parties have access to support or representation if they want or need it.

Confidentiality: Only the worker directly involved in the grievance, or in sorting it out, can have access to information about the grievance. Information goes on an employee's personnel file only if he/she is disciplined as part of sorting out the grievance.

Non-retaliation: Management takes necessary steps to make sure that workers involved in a grievance are not victimized by anyone for coming forward with the grievance or for helping to sort it out. Any retaliations shall lead to disciplinary action. However, if the grievance procedure is used by an employee to lie about someone, the employee too can be disciplined.

Timeliness: All grievances shall be dealt with as quickly as possible. There are time limits for the different steps. The aim is to sort out all grievances within four weeks if at all possible.

Confidentiality: All grievance recipients and anyone handling the SEA/SH-related grievances must maintain absolute confidentiality in regard to the case. Maintaining confidentiality means not disclosing any information at any time to any party without the informed consent of the person concerned. There are exceptions under distinct circumstances, for example: a) if the survivor is an adult who threatens his or her own life or who is directly threatening the safety of others, in which case referrals to lifesaving services shall be sought; b) if the survivor is a child and there are concerns for the child's health and safety. The survivors need to be informed about these exceptions.

11.1.4 Grievance Management Processes

Anyone will be able to submit a grievance, comments, or suggestions to the Project Coordination Office if they believe the construction activity is having a detrimental impact on the environment, community or on their quality of life in any way.

The grievance resolution process shall involve the following main steps:

- *Receipt of grievances:* anyone from the affected communities or believing to be affected by the project can submit a grievance (written, verbal, telephone, etc. as chosen by the complainant). Anonymous complaints will also be accepted.
- *Registering the complaint:* Any comments or concerns can be brought to the attention of the Project verbally or in writing or by filling in a grievance form, including anonymously. The focal point who received the complaint will use the GRM logbook for registering.

Grievance information will be recorded in a grievance log. This information will include:

i) Stakeholder name and contact details;

ii) Details of the nature of the grievance;

iii) Date received, responded to and closed out; and

iv) How it was submitted, acknowledged, responded to and closed out.

- *Referral and examination of complaints:* a GRM Committee shall be established at Sub City level.
- *Notifying the complainant:* the decision/solution/action by the grievance committee shall be communicated to the complainant, 8-15 days from receipt of the grievance).
- *Closing the complaint:* where the decision/solution of the complaint is accepted by the complainant, or the complaint is not related to the Project or any of its components, or the complaint is being heard by the judiciary, the complaint will be closed following the appropriate procedure as set out in Table 11.1 below.

Amharic version of the form is presented in Table 11.1. The grievance form will be made available at all Sub City and Woreda Administration Offices traversed by the TL, at EEP's Head Office and Project Site Offices.

Grievances during construction will be categorized based on validity and risk level by EEP/ ESAO and their Community Liaison Officer (CLO). Where investigations are required, Project staff and outside authorities as appropriate, will assist with the process. The CLO will collaborate with EEP/ESAO/Contractor to review the issue raised and to decide whether it is Project related or whether it is more appropriately addressed by a relevant authority outside the Project.

Table 11.1: Public Feedback/Grievance Form

Public Feedback/Grievance Form የህዝብ ቅሬታ ማቅረቢያ ቅጽ				
Case No (for office use): የመዝገብ ቁጥር /በቢሮ ሰራተኛ የሚሞላ/፤				
Contact Information የአድራሻ መረጃ (ማንነትዎ እንዳይታወቅ ቅሬታ መግለጽ ከፈለጉ ስምና አድራሻዎን አይስጡ) (Please leave this information blank, in case of preference for anonymous grievance/feedback)	Name ስም፤			
	Address አድራሻ፤			
	Telephone ስልክ፤			
	Fax ፋክስ፤			
	Email ኢሜይል፤			
Please state whether you wish for your details to remain confidential ማንነትዎ እንዳይታወቅ ከፈለጉ ይግለጹ	☐ I wish to raise my comment/grievance anonymously ማንነቴ ሳይገለጽ ቅሬታዬን መግለጽ እፈልጋለሁ			
	☐ I request not to disclose my identity without my consent ካለእኔ ፈቃድ ማንነቴን ለሌላ እንዳይገልጹ እጠይቃለሁ			
	☐ I don't wish my details to be confidential ማንነቴ ለሌላ ቢገለጽ ችግር የለብኝም			
[Note that we may need to contact you regarding your comment/grievance but will not share your details with a third party without your permission.] ቅሬታዎን በተመለከተ አስፈላጊ ሆኖ ሲገኝ ልናናግርዎ እንችላለን፤ ይሁን እንጂ የሰጡንን መረጃ ለሌላ ሶስተኛ ወገን ካለእርስዎ ፈቃድ አሳልፈን አንሰጥም				
How would you prefer to be contacted? Please tick a box በምን መንገድ እንድናገኝዎ ይፈልጋሉ፤ ሳጥኑ ራይት ያድርጉ	☐ By Post በፖስታ	☐ By Phone በስልክ	☐ By E-mail በኢሜይል	☐ In person በግንባር
What is your preferred Language for communication የትኛውን ቋንቋ ይመርጣሉ	☐ Amharic አማርኛ	☐ English እንግሊዘኛ	☐ Other, Specify ሌላ ከሆነ ይጥቀሱ	
Comments አስተያየቶች				
Please provide your comment. አስተያየትዎን እዚህ ያስፍሩ				
If this comment needs a resolution, what is your suggested resolution? ይህ አስተያየትዎ መፍትሄ የሚሻ ጉዳይ ከሆነ መፍትሄው ምን ቢሆን ብለው ይመክራሉ?				
Grievances ቅሬታዎች				
Please provide details of your grievance, include description of the problem, who it happened to, when, where and how many times, as relevant. ቅሬታዎን በዝርዝር ያቅርቡ፤ ችግሩ ምን እንደሆነ፣ ማንን እንደጎዳ፣ መቼ፣ የት እና ስንት ጊዜ እንደተከሰተ፤ እንደየ አግባብነቱ				
What is your suggested resolution for the grievance, if you have one? ለቅሬታው የመፍትሄ ሀሳብ ካለዎት ይግለጹ				

Public Feedback/Grievance Form የህዝብ ቅሬታ ማቅረቢያ ቅጽ	
How to submit this form to EEP ይዜን ቅጽ ለኢኤፓ በምን መንገድ እንደሚልኩ	☐ By post / በፖስታ፤ Ethiopian Electric Power, PO Box 15881, Addis Ababa, Ethiopia. ኢትዮጵያ ኤሌክትሪክ ኃይል፤ ፖ/ሳ/ቁጥር 15881፣ አዲስ አበባ ኢትዮጵያ።
	☐ By hand በእጅ፤ Ethiopian Electric Power Head Office or Project Site Office or Woreda Liaison Office ኢትዮጵያ ኤሌክትሪክ ኃይል ዋና መስሪያ ቤት ወይም ፕሮጀክት ሳይት ቢሮ ወይም ወረዳ ላይዘን ቢሮ፡ Kotebe Metal ToolsFactory, Ethiopian Electric Compound Yeka Sub City, Woreda 9 P.O.Box 15881, Addis Ababa, Ethiopia Tel. +251 115 580 631, +251 115 580 607
	Tadesse Biru Odda Environment, Health & Safety Director Phone: +251 116 676 393 Mobile: +251 911 771 230 Mail to: tadesse.odda@gmail.com
Date ቀን	
Signature ፊርማ	

11.1.5 Investigating a Grievance

All feedback/grievances will be acknowledged within 3 days. If immediate corrective action is available it will be taken within 3 days. If no immediate corrective action is available, a response will be provided within 7 days unless there are exceptional circumstances.

The following steps shall be performed in a timely manner to avoid delaying resolution of a feedback/grievance:

- Obtain as much information as possible from the person who received the complaint, as well as from the complainant to gain a first-hand understanding of the issue/grievance.
- Undertake a site visit, if required, to clarify the parties and issues involved. Gather the views of other stakeholders including Project employees. If necessary, identify initial options for settlement that parties have considered.
- Determine whether the grievance is eligible. Eligible grievances include all those that are directly or indirectly related to the Project.
- Ineligible complaints may include those that are clearly not related to the Project or its contractors' activities, whose issues fall outside the scope of the GRM or where other community procedures would be more appropriate to address the issue/grievance.
- If the issue/grievance is deemed ineligible it can be rejected. However, a full explanation as to the reasons for this must be given to the complainant and recorded in the Grievance Database.
- If the feedback/grievance is eligible, determine its severity level. This will help to determine whether it can be resolved immediately or requires further investigation and whether senior management will need to be informed of the grievance.

- If the grievance concerns physical damage (e.g., crop, house, community asset), take a photograph of the damage and record the exact location.
- Enter the findings of the investigation in the Grievance Database.

Once the issue/grievance has been investigated, the complainant will be contacted with the findings and EEP's proposed response. The CLO will explain in writing (or where literacy is an issue orally) the manner in which the review was carried out, results of the review, any changes to activities that will be undertaken to address the grievance and how the issue is being managed to meet appropriate environmental and social management systems and requirements.

As a last resort, aggrieved parties have a right to take legal action. This is a more formal rights-based approach that shall only be taken if all other approaches have failed or when there are serious conflicts about facts and data. The final decision will be taken by the arbitrator or court based on compliance with laws, policies, standards, rules, regulations, procedures, past agreements, or common practice.

11.1.6 Grievance Redress Committee

Grievance management and reporting is entirely the responsibility of the EEP through its Environment and Social Affairs Office (ESAO). However, Grievance Redress Committees (GRCs) will be established at the Sub City level. The main function of the GRCs will be arbitration and negotiation based on a transparent and fair hearing of the cases of the parties in dispute. They are responsible to hear the grievances of PAPs and other stakeholders and arbitrate disputes in order to arrive at amicable solutions based on negotiation and in a transparent and fair manner.

The GRCs will be independent and careful selection of the members is crucial to ensure its autonomy. Presence of female members on the GRCs is crucial in order to ensure better consideration of gender aspects for grievance resolution. With the help of their leaders, Project affected community members will democratically elect and nominate their representatives. The composition of the GRCs is shown in Table 11.2.

Table 11.2: Composition of Sub City Grievance Redress Committees

1	Representative of Chief Sub City Administration Office	Chair-Person
2	Representative from Women, Children & Social Affairs Office	Secretary
3	Representative from Sub City Land Administration Office	Member
4	Representative from appellant Kebele Administration	Member
5	Male PAP Representative from appellant Kebele	Members
6	Female/Vulnerable PAP Representative	Members
7	Witness NGO/CBO (Active within the Project Affected Woredas)	Member
8	Representative from EEP	Members
	Total	**8**

EEP/GRC will be responsible for the implementation of external grievance management and reporting with differentiated channels for different stakeholders. The following are among key tasks and responsibilities of the Grievance Redress Mechanisms to be carried out by GRC:

- Regularly record all grievances received and how they have been addressed;
- Ensure that the Project Contractor regularly register grievances and redressing actions (EEP will monitor, record and report);

- Document all actions agreed during grievance redressal process and follow up the implementation (EEP in collaboration with GRC);
- Prepare an annual report on grievance management (EEP in collaboration with GRC);
- Regularly give feedback and updates to communities with adapted methods.
- Develop and keep updated a record of all consultations with stakeholders" and
- Regularly prepare and file minutes of meetings.

11.1.7 Documenting, Monitoring and Reporting

A formal and documented procedure is required that gives evidence to any interested parties, including third parties and the communities themselves, on any complaint taken into consideration and, where founded, promptly addressed. This will allow a satisfactory resolution of grievances and response to communities' requests, by the developer (EEP) and/or lender (WB), if pertinent. Therefore, while the channels to receive complaints may be informal as adapted to the cultural context and to facilitate communities' access to the mechanism, EEP shall ensure regular recording of all grievances and documentation on how they are addressed.

During construction, a number of grievances are expected, to be mostly related to construction activities. EEP is therefore required (i) to regularly record all grievances and how they are solved and (ii) to monitor that all grievances involving the project activities are duly recorded and followed up.

EEP/CLO will monitor grievances routinely as part of the broader management of the Project. This entails good record keeping of complaints raised throughout the life of the construction and operation of the Project.

Monthly internal reports will be compiled by the CLO and distributed to the management team. These grievance reports will include:

- The number of grievances logged in the proceeding period by level and type.
- The number of grievances resolved between the Project and complainant, without accessing legal or third party mediators, by level and type.
- The number of grievances unresolved after 30 days by level and type.
- EEP's responses to concerns raised by the various stakeholders.
- Measures taken to incorporate these responses into Project design and construction.
- An appropriate grievance report shall be part of EEP's quarterly reporting. These reports and other records will be made available for external review if required and the WB.

EEP is required to regularly prepare subproject construction monitoring reports, which are internal reports. In addition, EEP regularly reports to external stakeholders on the Subproject E&S performance, including consultation activities and grievance management. Therefore, EEP shall disclose the ESHS performance reports to EPA, Addis Ababa city Government Environmental Protection Authority, and to different stakeholders including communities with adapted methods.

In addition, a Stakeholder Engagemnt Plan (SEP) is prepared and the plan includes a mechanism by which people can raise concerns, provide feedback, or make complaints about subproject activities financed by the PRIME-1 funding. Therefore, the SEP is applicable for this subproject.

11.1.8 World Bank Group (WBG) Grievance Redress Service

According to World Bank Grievance Redress, communities and individuals who believe they are adversely affected by a Bank-supported project/ project may submit complaints to existing project-level grievance redress mechanisms or the Bank's Grievance Redress Service (GRS).

The GRS ensures that complaints received are promptly reviewed to address Project-related concerns and impacts. Project affected communities and individuals may submit their complaint to the Bank's Independent Inspection Panel, which determines whether harm occurred, or could occur, because of the Bank's noncompliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the Bank's attention and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the Bank's corporate GRS, see *http://www.worldbank.org/GRS*, and Bank's Inspection Panel, see *www.inspectionpanel.org*.

11.1.9 Communication of the GRM

Project Affected Persons (PAPs) and other potential complainants shall be fully informed of the GRM, its functions, procedures, timelines, and contact persons both verbally and through written materials (use Woreda notice boards for posting and information brochures), during consultations meetings and other stakeholder engagement activities. EEP's Social expert/s assigned from ESAO at Head Office and at each PIU level will keep a log of the complaints at hand. The grievance redress mechanism will be widely and regularly publicized throughout the duration of the public consultation exercise, through meetings and the distribution of fliers.

Complainants can seek redress from the judicial system at any time. The step-by-step process of this GRM does not deter them from approaching the courts. All grievance-related correspondence shall be documented, and the grievance resolution process will be systematically tracked and reported to the WB.

The EEP shall assign Subproject Social Risk Management experts for PRIME-1 to oversee the management and reporting of GRM related issues of the Subproject. The complaint, to be filed, shall be related to the PRIME-1 activities implementation and management EEU.

The Project Social Risk Management expert/s shall proactively inform affected communities and the wider stakeholder group of the details of the GRM. The CLO shall provide the information in a format and languages that are readily understandable by the local population and/or orally in areas where literacy levels are low during routine stakeholder engagement.

11.2 Workers' Grievance Redress Mechanism (GRM)

According to Ethiopian Labor Proclamation No. 1156/ 2019, Workers' GRM for addressing and managing workers and employment-related conflicts or a complaint as well as GBV is mandatory, as well as under ESS2. Labor Proclamation No. 1156/ 2019, Chapter 3, Article 141, has also introduced that employers and workers or their respective associations may use social dialogue to prevent and resolve labor disputes amicably. Article 141, chapter 3.

11.2.1 Objective

The Project will provide for a grievance mechanism for all direct workers and contracted workers (and, where relevant, their organizations) to raise workplace concerns. Such workers will be informed of the grievance mechanism at the time of recruitment and the measures put in place to protect them against reprisal for its use. Measures will be put in place to make the grievance mechanism easily accessible to all such Project workers. The objective of the Workers' Grievance Redress Mechanism (Workers' GRM) is to settle the

grievance between an employer and employee or between employees bilaterally before resorting to formal dispute resolution, except in cases where the grievance constitutes a criminal offense that requires notifying law enforcement. The Workers' GRM are in accordance with the provisions of ESS2 and apply to all direct, contracted and supply workers.

Assess and Clarify. Workers will be informed of this grievance mechanism at the time of recruitment and the measures put in place to protect them from any reprisal for its use. Contractors induct the employee on the applicable workers' grievance redress mechanism. Induct all Project workers to be aware of their rights. All records of induction shall be kept and made available for inspection by the PIUs.

Workers will further receive easily accessible information on the contractual details, as well as CoC included. They can further request clarifications on any contractual issues from the employer at any time during the deployment. The provided information will allow the worker to assess whether her or his concern is valid and shall be taken up with the employer.

The PIU shall contract only contractors with registered CoC or who sign an undertaking to comply with the provisions of the Labor Act for contracted workers.

Intake, Acknowledge and Follow-Up. In case of a perceived violation, the aggrieved employee must capture and present the details of the grievance to the person they report to or the supervisor's superior in case of conflict of interest. The supervisor or the supervisor's superior will acknowledge the reception of the reported grievance to the employee.

In case of risk of retaliation, the employee may immediately escalate to the court system. The Project can provide assistance with referrals to legal aid organizations. If confidentiality is requested, the PIUs will ensure it to avoid any risk of retaliation, including in its follow-up actions.

11.2.2 Verify, Investigate and Act

The supervisor or the supervisor's superior will verify the details and seek to address the matter within the shortest time (up to 48 hours). They will escalate the matter if not resolved within 48 hours if a resolution is not found.

Where no resolution is found, the employee can escalate the matter to the sector specific institutions or courts who will resolve the matter between employer and employee. The Supreme Court's decision is final, where it has exercised lawful jurisdiction.

Where the formal courts are not accessible, do not exist in an area, or cannot render a judgment, the matter shall be reported to and handled by the PIUs, for example through the Project GRM. The PIUs, in this case, will accommodate a fair agreement between the worker and the contractor.

11.2.3 Monitor, Evaluate and Feedback

The contractor shall keep records of all proceedings of grievance redress that are within their jurisdiction and furnish PIU as part of the periodic progress reporting. The PIUs will provide analytical synthesis reports on a quarterly basis, which include the number, status and nature of grievances. These reports will form the basis of all regular reports to the WB.

The PIUs will further provide an excel sheet summary of the feedback and grievances reported, which will be linked to the Project's Management Information System (MIS) and to the Results Framework. They will further maintain a documented record of stakeholder engagements, including a description of the stakeholders consulted and a summary of the feedback/grievances received during community consultations.

For grievances related to sexual nature, please refer to the above GRM.

12. Institutional Arrangement, Capacity Development and Training and Reporting

12.1 Institutional Arrangement for Implementing the ESMP

The key institutions to be involved in the implementation of the ESMP and their main responsibilities are briefly described below.

Effective Environmental and Social Management will be achieved only if it is undertaken as a fully integrated part of the overall Project management. In order to effectively implement a comprehensive ESMP, the coordination of efforts of the various stakeholder agencies is necessary.

The key institutions to be involved in the implementation, coordination and administration of the present ESIA/ESMP and their main responsibilities are briefly described below in Table 12.1.

12.1.1 Environment Protection Authority

The Federal and AACA Environmental Protection Authority (EPA) are the key institution at the Federal and City Administration level with the mandate to coordinate activities to ensure that the environmental and social objectives provided under the Constitution, standards and guidelines are implemented.

Therefore, EPA is the key institution responsible for all environmental and social protection and management activities. EPA in collaboration with other environmental institutions is responsible for the following:

- Establish a system at the Project level to monitor, audit, coordinate and ensure that this ESMP and related activities of the Project are implemented in accordance with national policies, regulations, standards and guidelines; and
- Follow up and ensure that all environmental and social study and related activities at different phase of the Project including Environmental and Social Inspection and Auditing are properly undertaken by competent Consultants/firms having competence certificate from the Federal or AACA EPA.

The EPA will work closely with EEP and conduct periodic monitoring and inspection of the implementation of the C-ESMP.

12.1.2 Ethiopian Electric Power

EEP will be responsible for ensuring integration of environmental mitigation measures in the detail design and inclusion of environmental and social considerations in the tender document for contractors, and finally, in the contract document with the successful contractor. EEP will also be responsible for submission of the final version of the ESIA/ESMP/RAP to all implementing parties.

In addition, EEP will be responsible for developing and implementing public relations and communications for the project to ensure the continuation of consultation process, ensure transparency and build trust and confidence in the project. EEP will make known details of the project and its time schedule, impacts and mitigation measures, and grievance procedures for host communities, especially those measures relating to compensation.

Table 12.1: Agencies and Organizations Responsible for Implementation of the ESMP

Organization or Agency	Role in the Project	PC*	C*	O*	Responsibility in ESMP
EEP/ESAO	Project Developer/Owner	X	X	X	▪ All aspects of the Project from design, mobilization, construction, operation and decommissioning; ▪ Ensure compliance with the ESSs, ESMP and all the environmental and social management instruments; ▪ Coordination with other agencies; ▪ Provide backstopping services for various committees involved in the execution of the ESIA/ESMP; ▪ Effect all ESMP costs including compensation payments; ▪ Implement the LRP, as recommended in the RAP reports; ▪ Monitoring of the ESMP; and ▪ Implementation of mitigation measures during operational phase.
PIU	Project Construction Management	X	X	X	▪ Ensure compliance with the relevant E&S management instruments; ▪ Monitor implementation of mitigation measures by the Contractor; ▪ Coordination with other agencies; ▪ Work closely with the Grievance Redress Committees (GRCs) and local stakeholders; and ▪ Monitor, evaluate & review environmental & social plans and implementation work.
Consultant/Engineer	Project Construction Supervision		X		▪ Day-to-day supervision; ▪ Executive responsibility for ensuring that all site environmental and social management and monitoring aspects are dealt with promptly and properly; ▪ Implement safety program elements and ensure compliance with the C-ESMP requirements; ▪ Establishing procedures and mechanisms for effective environmental and social management and monitoring and will ensure that these are fully incorporated in, and integrated with; ▪ Ensure the facilities, equipment, work areas, and work processes comply with the C-ESMP requirements; and ▪ Participate in safety review meetings.
Contractor	Contractor (for construction of the transmission line and substation)		X		▪ Implementation of mitigation measures at construction sites; ▪ Assigning EI for self-monitoring (for the construction phase); ▪ ; ▪ Prepare C-ESMP and various site specific ESMPs;

Organization or Agency	Role in the Project	PC*	C*	O*	Responsibility in ESMP
					▪ Prepare monthly and quarterly Site Inspection and Progress Reports; ▪ Assigning personnel responsible for implementation and monitoring of the ESMP; ▪ Ensure all aspects of the construction comply with both the ESMP and other relevant environmental and social legislation and regulations; and ▪ Follow the recommended chance find procedures as and when required.
Federal & AACA EPA	Agency responsible for monitoring/auditing of environmental pollution	X	X	X	▪ Issue Environmental and Social Clearance; ▪ Enforcing implementation of the environmental policies and legislation and the ESIA process; ▪ Monitor, audit, coordinate and ensure that recommendations of ESIA/ESMP are implemented; and ▪ Monitoring & auditing for compliance with federal/AACA environmental regulations.
ARCCH	Agency responsible for preservation of cultural and historical assets		X	X	▪ In coordination with other agencies responsible for the protection, recovery, and preservation of archaeological or cultural resources discovered during construction.
Ministry of Labour and Skills/AACA Labour and Social Affairs Bureau	Agency responsible for occupational health and safety		X	X	▪ Monitoring/auditing of labor and working conditions; ▪ Monitoring compliance with the occupational health and safety measures; and ▪ Coordination with contractor regarding local employment opportunity.
AA Sub-City/ Woredas Administrations	Responsible to actively participate in Complaint Hearing Body and Appeal Hearing Councils		X	X	▪ In collaboration with EEP, assign a representative to Complaint Hearing Body and Appeal Hearing Councils.
AACA Bureau of Women, Children and Social Affair	Offices responsible to safeguard the rights of Women, children and youth		X	X	▪ Monitoring the inclusiveness of women in employment opportunity; and ▪ Enforcing implementation of the ESMP.
Project Stakeholders and Affected Communities	To be consulted and participate at different stages of the Project	X	X	X	▪ Consent and collaborate for Project sustainability (as required). ▪ Responsible for forwarding their grievances or complaints through the GRM

Note: PC= Pre-construction C= Construction O= Operation

Prior to contractor's mobilization and the commencement of construction, EEP's Environmental and Social Affairs Office (ESAO) will be responsible with the following principal activities:

- ensuring that all government and funding agency requirements and procedures relating to ESIA/ESMP are complied with;
- Implementation of land and property acquisition procedures including the payment of compensation;
- As the Project promoter, EEP will be responsible for submitting the ESIA to EPA for evaluation according to national procedures. In addition, EEP will ensure the following are implemented;
- Ensuring that all the necessary environmental and social protection measures and Project components are incorporated during the design and tender document preparation phase of the planned Project;
- Ensure a qualified environmental and safety expert is assigned in the supervision consultant's and contractor's team;
- Review environmental and social monitoring and status reports prepared by the supervision consultant and take necessary follow-up actions;
- Conduct periodic Project site supervision to oversee environmental and social performance of the Project or status of ESHS protection measures and, if required, provide guidance for the supervision consultant's team;
- Carry out environmental and social monitoring by ESAO and other Units within EEP during the operation of the Project, ensuring failures are sufficiently repaired in time;
- Improve the ESMP according to lessons learnt during all phases of the Project;
- Implement follow-up public consultations and disclosure plan;
- Liaison with other stakeholders including the local communities, government offices and NGOs; and

Project Operators

EEP will operate and maintain both the overhead and underground transmission lines and substations once commissioned.

EEP is responsible to prepare an Operational Environmental and Social Management Plan (OHSEMP) for the project facilities in order to ensure that environmental management is implemented during the operation phase.

The OHSEMP shall be incorporated into the overall EEP Operations and Maintenance Manuals (OMM). The OHSEMP requirements shall be enforced by the EEP operation Site Managers. EEP is also responsible to implement regular audit by ESAO's team. All workers taking part in operation and maintenance works shall be informed of their responsibilities with regards to the OHSEMP and be trained to comply with its requirements.

12.1.3 The Supervision Consultant

The main responsibilities of the Supervision Consultant/Owner Engineer are to review the C-ESMP, and sub-ESMP thereof, work plans, method statements, and their approval, making sure that these and other environmental protection requirements included in the contract are fully complied with. In addition, the Supervision Consultant/Owner Engineer is responsible for mobilizing an Environmental, Social and Safety Expert for day-to-day monitoring of the contractor's works and during major construction activities. If unforeseen issues observed, the Supervision Consultant/Owner Engineer will recommend appropriate

actions to the Contractor to overcome or mitigate the problem.

12.1.4 The Contractor

The Contractor is responsible for incorporating and implementing appropriate environmental and social management measures during the construction and commissioning phases of the Project.

The Contractor is responsible for designing a comprehensive Contractor's Environmental and Social Management Plan (C-ESMP) and method statements for specific tasks, which will be provided for the supervision consultant's approval. The Contractor's plan shall be in-line with this ESIA and WB's standards.

The ESHS Manager will be responsible for effective ESHS management and monitoring and will ensure that these are fully incorporated in, and integrated with, the overall construction supervision and monitoring framework. This aspect will cover matters such as the development of checklists of key points which will be monitored on a routine basis during construction and reporting mechanisms for ensuring that appropriate remedial action is taken, shall monitoring reveal that this is necessary.

- Assign a qualified ESHS Officer in the team; and
- Carry out ESHS inspection during the construction phase of the Project and ensure failures are repaired properly and in time.

All workers taking part in the construction works shall be informed of their responsibilities during implementation of the C-ESMP and they will be trained to comply with its requirements.

12.1.5 Environmental & Social Inspector

The RE shall appoint an Environmental & Social Inspector (ESI) as a member of the construction supervision team. The ESI will be responsible for reviewing and commenting on environmental and social aspects of work plans prepared by the Contractor during the mobilization period, as well as in developing site-specific environmental and social management procedures etc. in collaboration with the RE.

During the actual construction period, the ESI will provide advice and assistance to the RE, as and when required, on all aspects of ESHS management. He will also be responsible for periodic overviews of environmental and social monitoring during the construction period and report directly to the Engineer.

12.2 Institutional Capacities Building and Training

12.2.1 Training and Capacity Building for EEP's ESAO & PIU Team

EEP's Environmental and Social Affairs Office (ESAO) is responsible to address the major environmental and social issues in the power sector development. The team works to make the power generation and transmission construction environmentally and socially sound.

The major task of the ESAO is to conduct periodic monitoring in power Projects and operational activities of EEP, ESIA/ESMPs, and Resettlement Action Plans (RAPs). The team ensures whether or not the EEP power Projects are complying with the approved ESMPs and undertake appropriate mitigation measures accordingly. It is currently staffed by one experienced manager and seven experienced social and environmental experts.

The training programme is to strengthen EEP's PIU and ESAO Team capability in the area of environmental and social impact/risk management and monitoring. This shall include short- term specialized trainings and additional and specialized training related to High

voltage Transmission line Project.

Training shall be provided on:

- Environmental and Social Management Framework (ESMF) and Resettlement Framework (RF) of the Project
- Preparation and implementation of site-specific environmental and social risk management instruments (ESIAs, ESMPs, RAP/LRPs, BMP, etc.)
- Specific aspects of environmental and social risk assessment
- Stakeholder mapping and engagement
- Emergency preparedness and response
- OHS and community health and safety
- GBV, SEA, and SH prevention and response
- Monitoring and evaluation of (sub)Projects
- Environment and social management performance audit
- Training on resettlement framework including compensation, valuation, procedures, and grievance handling mechanisms for members of Compensation and Grievance Redress Committees.

Federal or AACA EPA and Addis Ababa University's Center for Environmental Science may be consulted for such training.

12.2.2 Training and Capacity Building for Contractor's and Project Engineer's Personnel

The Contractor is responsible to train employees and subcontractors of their environmental and social obligations, and for ensuring that employees are adequately experienced and properly trained to conduct the works in a manner to minimize social and environment impact. Upon arrival on site, all new employees, including the Project administrators, security personnel and subcontract personnel shall be given ESMP and ESHS induction training, carried out by ESHS Manager or his representative. Therefore, the Contractor shall:

- Ensure employees are familiar with the ESHS requirements of the Project.
- Develop and provide employees job safety training specific to their jobs.
- Ensure continuous development of its human resource through training and awareness raising.
- Develop and implement a mechanism for a continuous assessment of competence of the workforce.
- Maintain all training records by the ESHS Office and produced them on request.

12.3 Reporting and Reviewing

A complete set up to handle and manage information generated from the management plan and other monitoring activities will be established. Therefore, ESAO shall maintain all necessary records related to ESHS management and monitoring,

The expected reports to be submitted by the Contractor include: C-ESMP and Monthly Site Inspection, monitoring and Progress Reports.

12.3.1 Contractor's Environmental and Social Management Plan Report

The construction scale of this Project demands preparation of a comprehensive Contractor's - Environmental and Social Management Plan (C-ESMP) by the Contractor for the major activities. The C-ESMP report will provide for each construction site a description of the area, how the ESHS measures will be adapted to the site, and the design of typical measures. Development of this plan will form the basis of continued improvement of ESHS performance.

Therefore, in line with the ESMP, the Contractor shall prepare C-ESMP and these include the following specific management plans:

1) Occupational Health and Safety Plan
2) Community Health and Safety Management Plan, including Traffic Management Plan
3) Site Rehabilitation and Restoration Plan
4) Project Staff Health and Safety Programme
5) Environmental and Safety Training for Construction Workers Plan
6) Construction Waste Management Plan
7) Security Risk Management Plan
8) Dust Emission Control Plan
9) Water Quality Management Plan
10) Spoil Disposal and Waste Management Plan
11) Landscaping and Re-vegetation Plan
12) Emergency Preparedness and Response Plan
13) Incident Notification Procedure
14) Code of Conduct for Project Workers
15) Gender/ Action Plan
16) SEA/SH Prevention and Response Action Plan to Prevent and Respond to Gender-Based Violence, Sexual Exploitation and Abuse, Sexual Harassment and Violence against Children (GBV, SEA/SH/ VAC)
17) Labour Influx Management Plan
18) Stakeholder Consultation and Engagement

The Contractor is required to use the Incident Reporting forms as presented in Annex 12.

12.3.2 Site Environment & Social Inspection Report

Environmental and social monitoring of site activities is undertaken, and the findings will be presented through a monthly Environmental and Social Inspection Reports (ESIRs) and incident forms.

The ESIR will be regularly issued and shall be supported by photographic evidence and provides the following:

- A description of construction activities that may affect the biophysical and social environment;
- Remedial actions which have been initiated, and whether or not the resultant action is having the desired result;
- Identify any unforeseen ESHS concerns and recommend suitable additional actions;
- Tracking of issues causing ESHS concern; and
- Amendments to the ESMP if required

12.3.3 Monthly Progress Report

Monthly reports prepared by the Contractor shall contain a brief section referring to ESHS. Environmental issues shall be discussed at dedicated meetings with the Employer, Resident Engineer (RE), the Contractor and the Environmental and Social Inspector.

The ESHS summary shall provide the following:

- Summary of ESHS performance for the month;
- Summary of the related actions taken;
- Details of any ESHS incidents or accidents;
- Objectives and targets for strengthening ESHS management for the following month; and
- Non-Conformances, Corrective Actions and Preventive Actions.

12.3.4 Environmental, Social, Health & Safety Compliance Audit

EEP is responsible to carryout end of project Environmental, Social, Health and Safety Compliance Audit (ESHS-CA). Therefore, it is recommended that EEP employs an independent Environmental Auditor that will conduct an independent external monitoring of the implementation of the project facilities.

The main purpose of the ESHS-CA is to identify and justify the Project's compliance and non-compliance with applicable national policies, legislations guidelines, and regulations; and international norms, and standards, WB in particular as well as the ESIA, RAP/LRP prepared for this project.

Furthermore, the ESHS-CA is intended to assess the environmental, social, health and safety concerns associated with non-compliance, propose corrective measures including associated cost estimates and recommend timetable for their implementation.

12.4 Information and Communication Strategy

The ESAO shall maintain all necessary records, concerning ESHS management and monitoring, and will prepare regular progress reports. These reports shall summaries principal activities and findings, problems encountered, solutions to problems, and conclusions.

Monthly Progress Report and Environmental and Social Inspection Report shall be prepared by Environmental & Social Inspector and distributed to Federal and AACA EPA, EEP's Project Management Office and the WB.

13. Resources and Budget for Environmental and Social Mitigation, Management and Monitoring

13.1 Implementation Cost

The total environmental and social mitigation, compensation, management, monitoring and training costs are summarized in Table 13.1 and amounts to some 139.17 million Birr (1.21 M USD) (For the cost comparison an exchange rate of 115.0 birr equivalent to 1 US$ was used). This amount will be allocated to cover implementation of the environmental and social mitigation, management, monitoring and training programmes described in Chapters 5, 10, 11, and 12 respectively. Of this amount, 87.95% corresponds to RAP/LRP costs.

Most of the project environmental management activities will be carried out during the construction phase, since this is when most impacts can be expected to arise. Management will very largely be concerned with controlling impacts which may result from the actions of the Contractor, through enforcement of the construction contract clauses related to protection of the environment and social resources as a whole and of the components within it. In this respect, it is important to recognize that successful mitigation and management of construction impacts can only be achieved if the environmental and social protection measures, as set out in the construction contract, and enforcing compliance during construction.

The Environmental and Social Clauses to be included in Procurement & Contract Documents are presented in Annex 6 of this report and these are general clauses to be included in works procurement and contract documents. These clauses are complemented with this ESIA/ESMP which shall also be integrated in the works procurement and contract documents.

Costs associated with several environmental and social mitigation and management plans shall be incorporated in unit rates and bill items and will thus be included in construction costs and cost estimates, and no separate budget is necessary to cover these aspects.

Therefore, the inclusion of the below clauses (as listed in Annex 6 of this report) in the construction contracts (it makes it clear that the contractor at his own cost will be responsible) has been assumed in the preparation of the Environmental and social Compensation, Mitigation, Management and Monitoring costs.

- A clause shall be included in the construction contracts which makes it clear that all personnel assigned on this project shall be provided by the Contractor and/or any sub-contractor with required Personal Protective Equipment (PPE) that meets the work requirements with international and local certification;
- The construction contracts shall contain a clause to the effect that all construction sites where works are being undertaken are deemed to be part of the site, so that the powers and authority of the Resident Engineer extend to them in the same way as to other areas where works are being undertaken;
- A clause shall be included in the construction contract requiring, on completion of construction and maintenance period activities, to reinstate all construction sites, leaving them as far as possible in a clean and tidy condition, and suitable for the purposes for which they were used prior to occupation by the contractor;
- Separate nominated lump sum items shall be included in the Bills of Quantity for the reinstatement of all construction sites;

- Birds perching on power lines is a common problem across the country. Therefore, the Contractor is required to install a bird guard on all towers along the 9.26km long Gofa – Kality line to serve as a barrier to prevent birds from perching on the transmission structures. It is a simple structure with consists of a square base with upright prongs made from hard-wearing, weather-proof, non-conductive material. Therefore, the BOQ shall incorporate the unit rates and bill items and will thus be included in construction costs and cost estimates;
- Avian electrocution occurs when a bird's wingspan completes a circuit between energized and/or grounded structures, conductors, hardware or equipment. However, none of the species will have potential risk of electrocution as their wingspan is less than the distance between energized and grounded components. As per the 132 kV TL tower design, to avoid electrocution of birds, the clearance between the live is 4.5m. Therefore, the Contractor is required to ensure this adequate distance between grounded and energized components. Therefore, no mitigation measure cost is required;
- Institutional Strengthening, Training and Capacity Building (Costs of salaries, administration and function of the environmental unit paid by the Contractor and/or any sub-contractor) will be incorporated in unit rates and bill items and will thus be included in construction costs and cost estimates;
- The construction contract shall contain a clause requiring contractors to prepare detailed Environmental and Social Management Plan (C-ESMP) consistent with this ESIA/ESMP, for approval by the Engineer, prior to commencement of any site development, and to execute all work at the sites in accordance with the plan;
- The Project Engineer is responsible to check and ensure that all appropriate environmental protection clauses have been included in the contract documents to allow control of actions by the contractor; and
- Environmental monitoring to be carried out by the construction supervision consultant's (Project Engineer) and staff shall be an integral part of general supervision duties and will be covered by normal construction supervision cost estimates.

Environmental Mitigation, Management and Monitoring costs will be an integral part of specific items incorporated in the overall project budgets and will be covered by EEP. Such items comprise:

- EEP is responsible for providing the cost required for all activities related to implementation of the RAP/LRP. The total Compensation cost for loss of privately-owned farmland and other properties is Birr 103.74 million. These budget estimates for loss of properties are indicative and further to be valued and presented by the RP to be prepared for the Project.
- Costs which will be incurred in connection with management duties related to the expropriation process, the payment of compensation and implementation of the resettlement plan will be covered by EEP.
- There is no direct mitigation for the loss of natural vegetation cover due to this project. However, the vegetation resources assessment has recommended a compensation measure on resource-to-resource approach. EEP is responsible to compensate for mature tree that will be removed along and within the TL corridor (i.e. ROW). Accordingly, the total estimated Compensatory Afforestation costs is 1.5 million Birr and this is included in the project budget.

- Environmental monitoring to be carried out by the Environmental and Social Specialist from ESAO Team is an integral part of general supervision duties and will be covered by normal construction supervision cost and ESAO's operation cost.

Table 13.1: Environmental & Social Mitigation, Management & Monitoring Plan Costs (in ETB)

S/N	Compensation Item	Amount (Birr)
1	**Compensate for loss of privately-owned farmland and other properties**	
1.1	Compensation for permanent loss of farmland and grazing lands	192,182
1.2	Compensation for permanent loss of Houses & Other Structures	92,729,500
1.3	Compensation for loss of perennial, Eucalyptus and other trees	307,250
	Sub-Total (1)	**93,228,932**
2	Special Assistance for Vulnerable HHs	**3,456,000**
3	Tree replanting to compensate for the trees lost due to installation of underground cables	1,500,000
4	Environmental and Social Management Plan	1,500,000
5	Environmental and Social Monitoring Plan	3,750,300
6	Training and Capacity Building (workshop)	1,500,000
7	Environmental, Social, Health & Safety Compliance Audit (ESHS-CA) (Independent Consultant)	2,500,000
	Sub-Total (2)	**10,750,300**
	Grand Total (1+2)	**117,942,732**
8	Administration Cost During Implementation (3.0%)	**3,538,282**
9	Contingency (15%)	**17,691,410**
	Grand Total	**139,172,423**

13.2 Funding Mechanism

The total funding needed for identified activities is presented in Table 13.1. The Contractor is required to comply with environmental and social protection clauses and cover the costs associated with environmental and social mitigation and management measures associated with the construction activities. These shall be an integral part of the construction contract (to be incorporated in unit rates and bill items), and no separate budget is necessary to cover these aspects.

EEP is responsible for providing the cost required for all activities related to implementation of the RAP/LRP.

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14. Conclusion and Recommendations

14.1 Conclusion

In this report, the potential beneficial and adverse impacts of the construction of Addis Ababa Power Supply Reinforcement Project on the physical, biological and socio-economic environment are identified and discussed. The report also identifies and recommends appropriate benefit enhancement and/or mitigation measures.

Improved power transmission will boost electricity supply capacities of the national grid making it not only accessible physically, but also affordable financially. In the medium to long term, improved electricity transmission, by enhancing supply and curbing transmission losses, will facilitate rural electrification and make it possible for rural communities in Ethiopia as a whole to gain access to electricity – modern and affordable energy – an important milestone to achieving the National Electrification Program Goals.

However, like all other infrastructure development project, notwithstanding the far-reaching social and economic benefits, admittedly, the project would also have adverse impacts on the biophysical and socio-economic environment that need to be accounted for and avoided or mitigated when and wherever feasible. On the bases of the Feasibility routing and engineering design:

- Although there is a possibility of new access roads for construction of the overhead transmission line, it will not considered creating a new access to previously undeveloped areas.
- There are no significant areas of natural or semi-natural forest all along the project corridor, and no designated or protected areas of terrestrial ecological interest that will be affected by the proposed construction activities.
- A terrestrial vegetation survey confirms that no locally or regionally endangered species will be affected as a result of land clearing along the TL corridor. Therefore, no special mitigation measures or Biodiversity Management Plan will be required.
- There are no endangered or rare species entirely dependent on the project corridor.
- There are no wildlife species with restrictive habitat preferences within the project influence corridor that suffer the consequence of land clearing for the implementation of the project. Therefore, no special mitigation measures or Biodiversity Management Plan will be required.
- The project corridor is neither contiguous with, nor in close proximity with any of the nationally protected areas.
- According to EWNHS, there is one nationally designated Important Bird Areas (IBAs) along the OHTL.
- The study also shows that there are no known and observable archaeological and cultural heritage sites within the project corridor. Nevertheless, the possibility exists for the discovery of buried archaeological remains during excavation and site clearance. If that happen, as part of the mitigation program, the Authority for Research and Conservation of Cultural Heritage, ARCCH will conduct additional surveys during the construction and quarrying to determine if any potential site exist.
- No property belonging to religious institutions is located along the proposed Transmission Line route. Therefore, no mitigation or compensation measure is recommended.
- No burial site is located within the SS boundary and along the RoW.

- There are no disadvantaged, marginalized or ethnic minorities groups of people in and around the project area whose traditional lifestyles could become compromised by developing the proposed project. Therefore, no indigenous people development plan will be required.

However, significant impact is anticipated and these are briefly presented below:

- The project is expected to affect a total of about 610 ornamental trees that have been planted for city beautification
- 106 residential houses that belong to the same number of households (106) are found within the 26m corridor.
- The Gofa – Kality-1 overhead transmission line will cause permanent loss of 288m^2 of farmland.
- A total of 189 trees of 11 different species that belong to 21 households will potentially be affected.
- Buildings belong to 11 different business establishments will be affected by the OHTL project. A total of 101 different types of trees belonging to these business establishments will also be affected.
- There are some petty trade activities mainly selling of vegetables that are practiced on roadsides at two places along the NADC–Gofa UG TL. These activities are likely to be temporarily affected during construction of the TL.
- Installation of the underground power lines is expected to cause significant damages to a number of main roads as well as community access roads due to cutting of the roads for burying electric cables. It is likely to entail damages to 14 major road intersections (cross-roads) and 6 major junctions, as well as 37 other road intersections and junctions.
- There are abundant public utility lines including water supply pipelines, sewer lines, telecommunication lines and electric distribution lines in the corridor of the underground and overhead transmission lines. Several of these are potentially affected during construction of the transmission lines particularly the underground cables as they intersect the electric lines at many places.
- In the assessment of vulnerable households, we have identified 45 vulnerable household heads and therefore they require special assistance during implementation of the Resettlement Plan (RP).

Construction of the planned Addis Ababa Power Supply Reinforcement Project is feasible, indeed attractive, from the technical, economic and environmental and social viewpoints. These adverse environmental and social impacts are all such that they are capable of control within acceptable limits, provided that the recommended mitigation measures are adopted.

Construction phase impacts will also be mitigated by specific environmental and social protection clauses to be included in the construction contract documents, and enforcing compliance with them during construction supervision. Monitoring of the contractor's works will be carried out by the supervising consultant, who will ensure that good civil/environmental engineering practices are followed.

Therefore, it is concluded that, provided the benefit enhancement and mitigation measures as recommended in this ESIA report are adopted and a RAP is prepared and implemented, there are no environmental and social grounds for not proceeding with implementation of the project in the form presently envisaged.

14.2 Main Commitments

The Addis Ababa Power Supply Reinforcement Project is technically feasible and economically attractive. If the benefit enhancement and mitigation measures included in this ESIA/ESMP are adopted and a Resettlement Action Plan (RAP) is prepared and implemented, there are no environmental and social grounds for not proceeding with implementation of the project in the form in which it is presently envisaged. Such a worthwhile scheme, which will bring net benefits to the nation in general and the local communities in particular, shall be implemented at the earliest possible date.

However, it is recommended for EEP to implement the following:

1) *Resettlement Action Plan:* Results of the property surveys along the TL route revealed that privately owned farmland, residential houses, and eucalyptus trees will be affected by the Project. Therefore, EPP will prepare a Resettlement Action Plan once the project is committed for construction and implement it to mitigate the land acquisition impact of the project as per the requirements of GoE's land expropriation laws and WB's ESS 5 - Land Acquisition, Restrictions on Land Use and voluntary Resettlement, i.e., prior to start of the works.
2) *Project Designs, Specifications, and Contract Documents:* EEP will ensure that project designs and specifications incorporate appropriate measures to minimise negative impacts and enhance beneficial impacts.

   It will also ensure that the appropriate ESHS protection clauses are included in the contract documents to allow control of actions by the contractor, which are potentially damaging to the environment, the community and construction workers.
3) *Maintain Ongoing Stakeholders Engagement:* Maintaining ongoing and transparent discussions and consultations both with members of affected communities and their administrations is in the best interest of the Power project. Such platforms shall be used to disclose information about the project and create shared understanding and trust between parties involved in the process.

15. Annexes

Annex 1: List of Documents Collected and Reviewed

Abebe, Y. D., & Geheb, K. (2003). Wetlands of Ethiopia. In *Proceedings of a seminar on the resources and status of Ethiopia's Wetlands.* https: //portals.iucn.org/library /sites /library/files/documents/WTL-028.pdf

Ash, J. & Atkins, J. 2009. Birds of Ethiopia and Eritrea: an atlas of distribution. Christopher Helm, London.

Assessment, M. E. (2005). *Ecosystems and human well-being: wetlands and water*. World resources institute.

Bagli, S., Geneletti, D., Orsi, F., 2011. Routeing of power lines through least-cost path analysis and multicriteria evaluation to minimise Environmental and Social impacts. Environ. Impact Assess. Rev. 31, 234–239

Bateman, B. L., Moody, G., Fuller, J., Taylor, L., Seavy, N., Grand, J., Belak, J., Wilsey, C., & Rose, S. (2023). *Birds and Transmission: Building the Grid Birds Need*.

Bibby, C., Jones, M., & Marsden, S. (2000). Bird Surveying Manual. In *BirdLife International* (p. 139).

BirdLife International (2020). *Guidelines for the application of the IBA criteria, Final version, July 2020*. *July*.

BirdLife International (2024). Important Bird Area factsheet: Koffe Swamp. Downloaded from https://datazone.birdlife.org/site/factsheet/koffe-swamp-iba-ethiopia on 24/08/2024.

BirdLife International (2024). Important Bird Area factsheet: Tiro Boter-Becho forest. Downloaded from https://datazone.birdlife.org/site/factsheet/tiro-boter--becho-forest-iba-ethiopia on 24/08/2024.

Clements, J.F., Schulenberg, T.S., Iliff, M.J., Fredericks, T.A., Gerbracht, J.A., Lepage, D., Billerman, S.M., Sullivan, B.L., and Wood, C.L. (2022). The eBird/Clements checklist of birds of the world: v2022. Downloaded from https://www.birds.cornell.edu/clementschecklist/download/. (Accessed 15 April 2023).

D'Amico, M., Catry, I., Martins, R. C., Ascensão, F., Barrientos, R., & Moreira, F. (2018). Bird on the wire: Landscape planning considering costs and benefits for bird populations coexisting with power lines. *Ambio*, *47*(6), 650–656. https://doi.org/10.1007/s13280-018-1025-z

Davis, T. J., Blasco, D., & Carbonell, M. (1997). *The Ramsar Convention manual: a guide to the Convention on wetlands (Ramsar, Iran, 1971)*.

del Hoyo, J., Elliott, A. & Christie, D.A. eds. 1992-2011. Handbook of the Birds of the World. Vol 1-16. Lynx Edicions, Barcelona.

EAPP (2016)."The Eastern Africa Power Pool (EAPP)". Addis Ababa: Eastern Africa Power Pool (EAPP).

Environmental Protection Authority (EPA) (1996), Conservation Strategy of Ethiopia, Addis Ababa, Ethiopia.

Environmental Protection Authority (EPA) (1997), Environmental Policy of Ethiopia: Addis Ababa, Ethiopia.

Environmental Protection Authority (EPA) (2000), Guideline Document: Environmental Assessment and Management; EPA, Addis Ababa, Ethiopia

Ethiopia: Country Gender Profile, 2006

Ethiopian Wildlife and Natural History Society. 2001. Ethiopia. In: Fishpool, L. D. C., & Evans, M. I. (eds). Important Bird Areas in Africa and associated islands: priority sites for conservation. Pisces Publications and BirdLife International, Newbury and Cambridge.

Ethiopian Electric Power, Preparatory Survey on Addis Ababa Transmission and Distribution System Rehabilitation and Upgrading Project, FINAL REPORT, November 2018, Japan International Cooperation Agency

EWNHS, (1996) Important Bird Areas of Ethiopia: Ethiopian Wildlife and Natural History Society. Addis Ababa, Ethiopia.

FDRE 1995. The Constitution of the Federal Democratic Republic of Ethiopia. Addis Ababa

FDRE Planning and development. (2020). *Ethiopia's long-term low emission and climate resilient development strategy (2020-2050)*. 6–108.

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

Federal Democratic Republic of Ethiopia. (1995), Proclamation for the Establishment of Environmental Protection Authority. Proclamation No. 09/1995. Addis Ababa, Ethiopia.

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

Federal Negarit Gazeta, (2005) Regulation No. 163/2008. Wildlife Development, Conservation and Regulation, Council of Ministers, Addis Ababa, Ethiopia.

Federal Negarit Gazeta, (2008) Proclamation No. 575, Ethiopian Wildlife Development and Conservation Authority Establishment Proclamation. Addis Ababa, Ethiopia.

Federal Negarit Gazta, (2007) Proclamation No. 541/2007, Development, Conservation and Utilization of Wildlife.

Feed the Future Ethiopia, 2018, Gender and Youth Action Plan.

Gedeon, K., Marcel, S., Chemere Zewdie, and Till, T. (2022). A Draft Birds of Ethiopia - Checklist and Range Maps. V3.

Gill, F. &Donsker, D. eds. 2018. IOC World Bird Names (v. 8.1).

Green Climate Fund (GCF), 2019, Gender Policy and Gender Action Plan 2020 - 2023,

Hsieh, T. C., Ma, K. H., & Chao, A. (2016). iNEXT: an R package for rarefaction and extrapolation of species diversity (Hill numbers). *Methods in Ecology and Evolution*, 7(12), 1451–1456. https://doi.org/10.1111/2041-210X.12613

IBC-Institute of Biodiversity Conservation (2005). Biodiversity Strategy Action Plan. Addis Ababa, Ethiopia.

IUCN (2001). IUCN Red list categories and criteria version 3.1. Gland, Switzerland.

IUCN (2003) Red list of threatened species. www.redlist.org

IUCN, (1994) International Union for the Conservation of Nature and Natural Resources, Gland, Switzerland.

Jobson, B., Allinson, T., Sheldon, R., Vansteelant, W., Buechley, E., Oppel, S., & Jones, V. (2021). Monitoring of migratory soaring birds in the East African-Eurasian flyway: a review and recommendations for future steps. *Sandgrouse*, *43*(1), 2–23. https://www.researchgate.net/publication/350689092

Karra, Kontgis, et al. "Global land use/land cover with Sentinel-2 and deep learning." IGARSS

2021-2021 IEEE International Geoscience and Remote Sensing Symposium. IEEE, 2021.

King, W. B., & Avery, M. L. (1979). Impacts of Transmission Lines on Birds in Flight. *Bird-Banding*, *50*(3), 291. https://doi.org/10.2307/4512473

M'Cormack-Hale, F. A. O., & Beoku-Betts, J. (2015). General introduction. *African and Asian Studies*, *14*(1–2), 8–17. https://doi.org/10.1163/15692108-12341327

Martín Martín, J., Garrido López, J.R., Clavero Sousa, H. and Barrios, V. (eds.) (2022). Wildlife and power lines. Guidelines for preventing and mitigating wildlife mortality associated with electricity distribution networks. Gland, Switzerland: IUCN

Martins, R. C., Bernardino, J., & Moreira, F. (2023). A review of post-construction monitoring practices used in the evaluation of transmission power line impacts on birds and mitigation effectiveness, with proposals for guideline improvement. Environmental Impact Assessment Review, 100(January), 107068. https://doi.org/10.1016/j.eiar.2023.107068

Ministry of Finance and Economic Development (MoFED), Building on Progress: A Plan for Accelerated and Sustained Development to End Poverty (PASDEP) 2005/06 – 2009/10, 2005

Ministry of Women Affairs (MoWA), 2006, National Action plan for gender equality (NAP-GE) 2006-2010, Addis Ababa

Mohr, P (1964). The Geology of Ethiopia. University college of Ethiopia

MOLSA.1996. Developmental Social welfare policy. Addis Ababa.

Nikolaus, G. 1987. Distribution atlas of Sudan's birds with notes on habitat and status. Bonner ZoologischeMonographien, 25. ZoologischesForschungsinstitut und Museum Alexander Koenig, Bonn.

Nikolaus, G. 2006. Commentary: where have the African vultures gone? *VultureNews*: 65-67.

Redman, Nigel, Terry Stevenson, and J. F. (2016). Birds of the horn of Africa: Ethiopia, Eritrea, Djibouti, Somalia, and Socotra-revised and expanded edition. In *Diversity and Distributions* (Vol. 13, Issue 2). Princeton University Press.

Secretariat, C., Nations, U., & Programme, E. (2019). *CoP18 Doc. 79 – p. 1*. 1–10.

Shaw, J. M., Jenkins, A. R., Smallie, J. J., & Ryan, P. G. (2010). Modelling power-line collision risk for the Blue Crane Anthropoides paradiseus in South Africa. *Ibis*, *152*(3), 590–599. https://doi.org/10.1111/j.1474-919X.2010.01039.x

Sutherland, W. J., Newton, I., & Green, R. (2007). Bird Ecology and Conservation. *Bird Ecology and Conservation*, 17–56. https://doi.org/10.1093/acprof:oso/9780198520863.001.0001

UNDP. (2006). Mainstreaming conservation of migratory soaring birds into key productive sectors along the Rift Valley/Red Sea flyway. *UNDP Project Document*, 1–125.

UNESCO, 1972. Convention Concerning the Protection of the World Cultural and Natural Heritage. Adopted by the General Conference at its seventeenth session, Paris, 16 November 1972.

UNESCO, 2003. Convention for safeguarding intangible cultural Heritage. Adopted by the General Conference at its seventeenth session, Paris, 17 October 2003

World Bank (2021) Environmental and Social Framework Environmental and Social Standards (ESSs)

Annex 2: List of Flora Identified from Project Routes Corridor

Sl/N	Scientific Name	Family Name	Local Name		Habit	IUCN Status[15]	Notes
			Amharic	Oromiffa			
1	*Acacia abyssinica*	Fabaceae	Girar	Lafto	Tree	NE	Native
2	*Acacia decurrens*	Fabaceae	Akacha		Tree	LC	Introduced
3	*Acacia mearnsii*	Fabaceae			Tree	LC	Introduced
4	*Acacia melanoxylon*	Fabaceae			Tree	LC	Introduced
5	*Acacia saligna*	Fabaceae	Saligna	Saligna	Tree	LC	Introduced
6	*Acacia sieberiana*	Fabaceae		Lafto-Adi	Tree	LC	Native
7	*Achyranthes aspera*	Amaranthaceae	Telej		Herb	NE	Native
8	*Agave sisalana*	Agavaceae	Kacha	Kacha	Succulent	NE	Succulent plant
9	*Ageratum conyzoides*	Asteraceae			Herb	LC	Native
10	*Albizia schimperiana*	Fabaceae	Sassa	Ambabessa	Tree	LC	Native
11	*Amaranthus caudatus*	Amaranthaceae			Herb	NE	Native
12	*Araucaria heterophylla*	Araucariaceae	Norfolk Island pine (Eng.)		Tree	Vu	Introduced; ornamental tree
13	*Argemone mexicana*	Papaveraceae			Herb	NE	Introduced; weed plant
14	*Arundo donax*	Poaceae	Shembeko	Shembeko	Herb	LC	Native; Giant Reed
15	*Beta vulgaris*	Amaranthaceae	Key Sir		Herb	NE	Introduced; Edible veg.
16	*Bidens macroptera*	Asteraceae			Herb	NE	Native
17	*Bidens pilosa*	Asteraceae	Ye-setan Merfe		Herb	NE	Native
18	*Bidens prestinaria*	Asteraceae			Herb	NE	Native
19	*Brassica carinata*	Brassicaceae	*Abesha Gomen*	*Rafuu*	Herb	NE	Native; Edible vegetable
20	*Brassica nigra*	Brassicaceae	*Gomen*	*Rafuu*	Herb	LC	Native; Edible vegetable
21	*Buddleja polytschaya*	Loganiaceae	Anfar		Tree	NE	Native
22	*Callistemon pallidus*	Myrtaceae	Bottle-brush (Eng.)		Shrub	NE	Introduced; ornamental
23	*Calpurna aurea*	Papilionaceae	Digita	Cheka	Shrub	LC	Native
24	*Carduus ellenbeckii*	Asteraceae	Yeahiya Eshoh		Herb	NE	Native
25	*Carica papaya*	Caricaceae			Tree	DD	Fruit tree
26	*Carissa edulis*	Apocynaceae	Agam		Shrub	LC	Native
27	*Casimiroa edulis*	Rutaceae	Kazmir		Tree	LC	Introduced, fruit edible
28	*Casuarina cunninghamiana*	Casuarinaceae	Shewshewe		Tree	LC	Introduced
29	Cenchrus purpureus	Poaceae	Yezihon Sar		Herb	LC	Introduced; *Elephant Grass*
30	*Chenopodium murale*	Chenopodiaceae			Herb	NE	Native
31	*Cordia africana*	Boraginaceae	Wanza	Wodesa	Tree	LC	Native
32	*Croton macrostachyus*	Euphorbiaceae	Bisana	Makanisa	Tree	LC	Native

[15] The IUCN Red List of Threatened Species. Version 2024-1. <www.iucnredlist.org> Accessed in October 2024

Sl/N	Scientific Name	Family Name	Local Name		Habit	IUCN Status[15]	Notes
			Amharic	Oromiffa			
33	*Cucumis abyssinicus*	Cucurbitaceae			Herb	NE	Native
34	*Cupressus lusitanica*	*Cupressaceae*			Tree	LC	Introduced
35	*Cynodon dactylon*	Poaceae	Serdo	Chekorsa	Herb	NE	Indig.; Common grass
36	*Cyperus rigidifolius*	Cyperaceae			Herb	LC	Sedge; In wetland habitat
37	*Cyperus rotundus*	Cyperaceae	Engcha		Herb	NE	Sedge
38	*Datura stramonium*	Solanaceae			Herb	NE	Native
39	*Digitaria abyssinica*	Poaceae		Ura	Herb	NE	Native; Grass
40	*Dovyalis abyssinca*	Flacourtiaceae	Koshim		Shrub	LC	Native; used as live fence
41	*Duranta erecta*	Verbenaceae	Golden dewdrop		Shrub	LC	Introduced; ornamental
42	*Echinops hispidus*	Asteraceae			Herb	NE	Native
43	*Echinops pappii*	Asteraceae			Herb	NE	Native
44	*Echinops pappii*	Asteraceae			Herb	NE	Native
45	*Ehretia cymosa*	Boraginaceae	Game	Ulaga	Tree	LC	Native
46	*Eleusine floccifolia*	Poaceae	Akrima	Dagoo	Herb	LC	Native; Grass
47	*Ensete ventricosum*	Musaceae	Enset	Kocho	Herb	LC	Abyssinian banana; cultivated crop
48	*Eragrostis cilianensis*	Poaceae			Herb	NE	Native grass
49	*Eragrostis papposa*	Poaceae			Herb	NE	Native; Grass
50	*Eragrotis tef*	Poaceae			Herb	NE	Native grass; cultivated crop
51	*Eucalyptus camaldulensis*	Myrtaceae	Key Barzaf	Barzafi-dima	Tree	NT	Introduced tree
52	*Ficus sur*	Moraceae	Sholla	Harbu	Tree	LC	Native
53	*Ficus sycomorus*	Moraceae	Sholla	Oda	Tree	LC	Native
54	*Ficus vasta*	Moraceae			Tree	LC	Native; Big canopy tree
55	*Grevillea robusta*	Proteaceae			Tree	LC	Introduced
56	*Guizotia scabra*	Asteraceae			Herb	NE	Native, weed
57	*Hyparrhenia anthistirioides*	Poaceae			Herb	NE	Native, Grass
58	*Hyparrhenia rufa*	Poaceae			Herb	NE	Native, Grass
59	*Hyparrhenia sp.*	Poaceae			Herb	NE	Native, Grass
60	*Ipomoea indica*	Convolvulaceae	Squar Dinch		Herb	DD	Introduced, edible root
61	*Ipomoea purpurea*	Convolvulaceae			Herb	NE	
62	*Ipomoea tenuirostris*	Convolvulaceae			Herb	NE	Native
63	*Jacaranda mimosifolia*	Bignoniaceae	Jacaranda	Jacaranda	Tree	Vu	Introduced; Ornamental tree
64	*Justicia adhatoda (J. schimperiana)*	Acanthaceace	Sensel	Tumuga	Shrub	LC	Shrub, usually planted as live fence
65	*Lathyrus sativus*	Fabaceae			Herb	NE	*Grass pea (crop)*
66	*Leucaena leucocephala*	Fabaceae	Lukina	Lukina	Tree	CD	Small tree; Planted as

Sl/N	Scientific Name	Family Name	Local Name		Habit	IUCN Status[15]	Notes
			Amharic	Oromiffa			
							ornamental tree
67	*Lippia adoensis* var. koseret[E]	Verbenaceae	Koseret		Shrub	NE	Native, endemic
68	*Melaleuca citrina*	Myrtaceae			Shrub	NE	Introduced; scarlet bottlebrush, ornamental
69	*Melia azedarach*	Meliaceae	Neem	Neem	Tree	LC	Introduced; Ornamental tree
70	*Millettia ferruginea*[E]	Papilionaceae	Birbira	Sotellu	Tree	LC	Native, endemic to Eth.
71	*Musa sp.*	Musaceae	Muz	Muzi	Herb		Bananas
72	*Myrica salicifolia*	Myricaceae			Shrub	LC	Native
73	*Nerium oleander*	Apocynaceae	Oleander (Eng.)		Shrub	LC	Introduced; Ornamental shrub
74	*Olea europaea subsp. cuspidata*	Oleaceae	Weyra		Tree	NE	Native
75	*Orobanche minor*	Orobanchaceae			Herb	NE	Native
76	*Parthenium hysterophorus*	Asteraceae			Herb	NE	Introduced; Invasive species
77	*Penisetum thunbergii*	Poaceae	Guba	Migra Sare	Herb	NE	Native; Grass sp.
78	*Pennisetum clandisetum*	Poaceae			Herb	NE	Native; Grass sp.
79	*Pennisetum polystachion*	Poaceae			Herb	LC	Native; Grass sp.
80	*Pennisetum sphacelatum*	Poaceae	Sendedo, Sebez	Migra	Herb	LC	Native; Grass sp.
81	*Pennisetum villosum*	Poaceae			Herb	LC	Native; Grass sp.
82	*Persea americana*	Lauraceae	Avocado		Tree	LC	Avocado, fruit tree
83	*Persicaria microcephala*	Polygonaceae			Herb	NE	Weed
84	*Persicaria senegalensis*	Polygonaceae			Herb	LC	Weed
85	*Phoenix canariensis*	Arecaceae (Palmae)	Canary Island Date Palm		Tree	LC	Introduced; Ornamental tree
86	*Phoenix reclinata*	Arecaceae	Zenbaba	Meti	Tree	LC	Native; Wild date palm
87	*Phytolacca dodecandra,*	Phytolaccaceae	Endod		Shrub	NE	Native, African soapberry
88	*Polygonum senegalense*	Polygonaceae			Herb	LC	Native
89	*Psidium guajava*	Myrtaceae	Zeytun	Zeytuni	Tree	LC	Guava, edible fruit
90	*Pterolobium stellatum*	Fabaceae	Kontir	Kajima	Shrub	NE	Native
91	*Reichardia tingitana*	Asteraceae			Herb	NE	
92	*Rhamnus prinoides*	Rhamnaceae	Gesho	Gashoo	Shrub	LC	Native; used for making local beer (*Tela*)

Sl/N	Scientific Name	Family Name	Local Name		Habit	IUCN Status[15]	Notes
			Amharic	Oromiffa			
93	*Rhus glutinosa*	Anacardiaceae	Embus	Tatessa	Shrub	LC	Native
94	*Ricinus communis*	Euphorbiaceae	Gulo	Koboo	Shrub	NE	Native
95	*Rosa abyssinica*	Rosaceae			Shrub	N\E	Native, Ornamental plant
96	*Rumex abyssinicus*	Polygonaceae			Shrub	NE	Native
97	*Rumex nepalensis*	Polygonaceae			Herb	NE	Native
98	*Rumex nervosus*	Polygonaceae	Imbachwo		Shrub	NE	Native
99	*Salvia nilotica*	Lamiaceae			Herb	NE	Native
100	*Schinus molle*	Anacardiaceae	Qundo Berbere		Tree	LC	Introduced; Ornamental
101	*Senecio gigas*	Asteraceae			Tree	NE	
102	*Senna didymobotrya*	Fabaceae			Shrub	LC	Native
103	*Sesbania sesban*	Fabaceae	Sesbania	Sesbania	Shrub	LC	Native; fodder plant
104	*Setaria incrassata*	Poaceae			Herb	NE	Native, Grass
105	*Setaria pumila*	Poaceae			Herb	NE	Native, Grass
106	*Sida schimperiana*	Malvaceae	Chifrig		Shrub	NE	Native
107	*Solanum incum*	Solanaceae	Hidi	Hidi	Shrub	NE	Shrub
108	*Solanum nigrum*	Solanaceae		Hidi	Shrub	NE	Shrub
109	*Spathodea campanulata*	Bignoniaceae			Tree	LC	Introduced; Ornamental
110	*Spinacia oleracea*	Amaranthaceae	Kosta		Herb	NE	Introduced; Edible veg.
111	*Sporobolus pyramidalis*	Poaceae			Herb	NE	Native, Grass
112	*Tagetes minuta*	Asteraceae			Herb	NE	Introduced
113	*Typha latifolia*	Typhaceae			Herb	LC	Native; In wetland hab.
114	*Urtica simensis*[E]	Urticaceae	Sama		Herb	NE	Native
115	*Vernonia amygdalina*	Asteraceae			Tree	NE	Native
116	*Xanthium spinosum*	Asteraceae	Ye-set Milas		Shrub	NE	Native
117	*Xanthium strumarium*	Asteraceae			Herb	NE	Introduced
118	Zea mays	Poaceae	Bekolo	Boqoloo	Herb	LC	Cultivated crop

Key to IUCN Status:

Vu	Vulnerable	CD	Lower Risk/ Conservation Dependent
NT	Near Threatened	DD	Data Deficient
LC	Least Concern	NE	Not Evaluated yet

Annex 3: List of Birds in the Project Corridor

No.	Scientific Name	Common Name	Common Name (Amharic)	IUCN Status[16]
1	*Alopochen aegyptiacus*	Egyptian Goose	Yegebets Zey	LC
2	*Anas undulata*	Yellow-billed Duck	Bicha Menkur Dakiye	LC
3	*Anthus similis*	*Long-billed Pipit*		LC
4	*Aquila clanga*	Greater Spotted Eagle		Vu
5	*Aquila rapax*	Tawny Eagle	Bunama Nisir	LC
6	*Bostrychia carunculata*	Wattled Ibis*	Yedega Gagano	LC
7	*Bostrychia hagedash*	Hadada Ibis	Hadada Gagano	LC
8	*Bubulcus ibis*	Cattle Egret	Yekept Sabisa	LC
9	*Bucorvus abyssinicus*	Abyssinian Ground-hornbill	Erkum	LC
10	*Buphagus erythrorhynchus*	Red-billed Oxpecker	Key Menkur Chiri	LC
11	*Camaroptera brachyura*	Grey-backed Camaroptera		LC
12	*Chalcomitra senegalensis*	Scarlet-chested Sunbird		LC
13	*Colius striatus*	Speckled Mousebird	Megot Wof/Ayto	LC
14	*Columba guinea*	Speckled Pigeon	Yetara Irigib	LC
15	*Corvus albus*	Pied Crow	Bure Kura	LC
16	*Corvus crassirostris*	Thick-billed Raven*	Rase-boka Kura	LC
17	*Corvus rhipidurus*	Fan-tailed Raven	Bale-degafi Chira Kura	LC
18	*Creatophora cinerea*	Wattled Starling	Wemay	LC
19	*Dicrurus adsimilis*	Fork-tailed Drongo		LC
20	*Egretta garzetta*	Little Egret	Tinishu Sabisa	LC
21	*Euplectes franciscanus*	Northern Red Bishop		LC
22	*Falco naumanni*	Lesser Kestrel		LC
23	*Galerida theklae*	*Thekla's lark*		LC
24	*Himantopus himantopus*	Black-winged Stilt	Rejimie	LC
25	*Lagonosticta senegala*	Red-billed Firefinch	Yeguaro Dinbit	LC
26	*Lamprotornis chalybaeus*	Greater Blue-eared Starling	Teraw Wemay	LC
27	*Laniarius aethiopicus*	Ethiopian Boubou**		LC
28	*Lanius collaris*	Common Fiscal		LC
29	*Merops pusillus*	Little Bee-eater	Tinishu Neb-bel	LC
30	*Merops variegatus*	Blue-breasted Bee-eater		LC
31	*Milvus aegyptius*	Yellow-billed Kite	Bicha Menkur Chilifit	LC
32	*Nectarinia tacazze*	Tacazze Sunbird		LC
33	*Nettapus auritus*	African Pigmy-goose	Dinkiye Zey	LC
34	*Passer swainsonii*	Swainson's Sparrow		LC
35	*Ploceus baglafecht*	Baglafecht Weaver		LC
36	*Ploceus cucullatus*	Village Weaver	Rase-tikur Yemender Chereba	LC

[16] The IUCN Red List of Threatened Species. Version 2024-1. https://www.iucnredlist.org. Accessed in October 2024

No.	Scientific Name	Common Name	Common Name (Amharic)	IUCN Status[16]
37	*Pycnonotus barbatus*	Common Bulbul		LC
38	*Quelea quelea*	*Red-billed Quelea*		LC
39	*Scopus umberetta*	Hamerkop	Yewoz Ametie	LC
40	*Serinus tristriatus*	Brown-rumped Seedeater		LC
41	*Streptopelia capicola*	Ring-necked Dove	Debene	LC
42	*Streptopelia lugens*	Dusky Turtle Dove		LC
43	*Streptopelia semitorquata*	Red-eyed Dove	Kuku Melekote	LC
44	*Streptopelia senegalensis*	Laughing Dove	Sakita Wane	LC
45	*Tchagra* senegalus	Black-crowned Tchagra		LC
46	*Terpsiphone viridis*	African Paradise Flycatcher	Key Rejim-jirat Zenibe-bel	LC
47	*Thamnolaea cinnamomeiventris*	Mocking Cliff Chat	Tera Yekuatign Wof	LC
48	*Threskiornis aethiopicus*	African Sacred Ibis	Nechu Gagano	LC
49	*Turdus abyssiincus*	Abyssinian Thrush	Ye-abyssinia Chiri	LC
50	*Ureginthus bengalus*	Red-cheeked Cordon-bleu	Key Joro Dinbit	LC
51	*Vanellus spinosus*	Spur-winged Lapwing	Tikur Joro Kulilit	LC
52	*Vidua chalybeata*	Village Indigobird		LC
53	*Vidua macroura*	Pin-tailed Whydah		LC

* = Endemic; ** = Near Endemic

Key to IUCN Status: VU =Vulnerable; LC = Least Concern

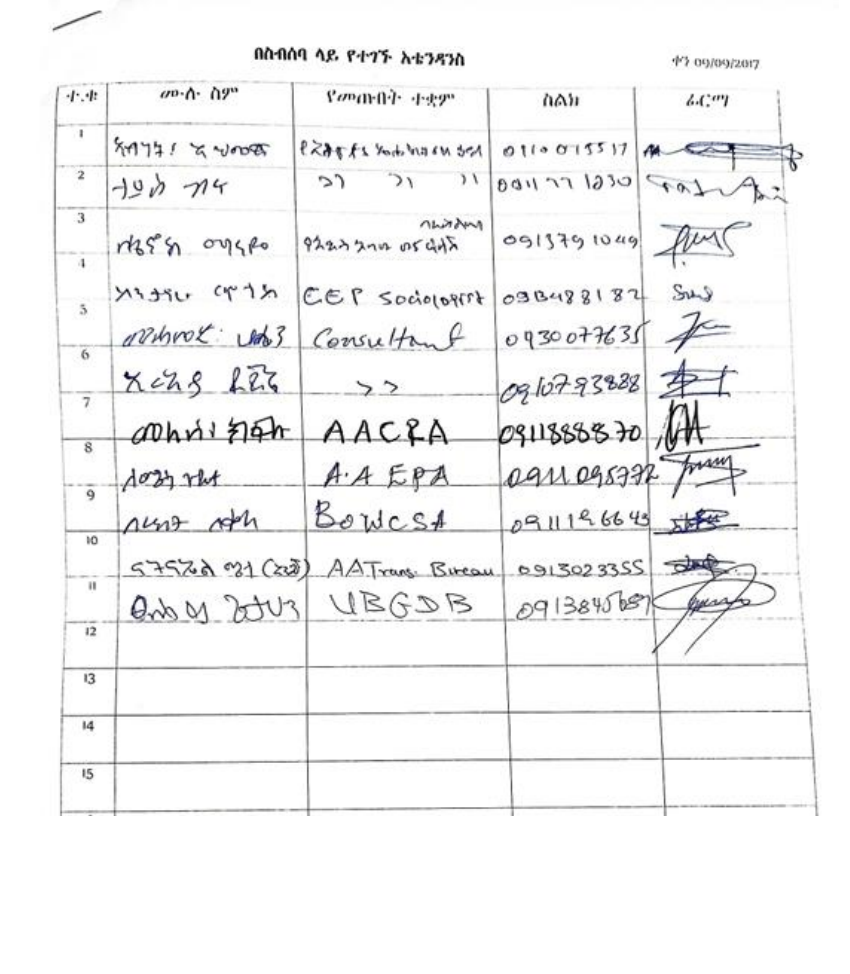
Annex 4: Persons Contacted and Institutions Visited

Name		Position	Phone
Addis Ababa City Administration			
1	Abenet Ahmed	Project Manager, EEP	0910015517
2	Tadesse Biru	EHS Manager, EEP	0911771230
3	Henok Menaye	Representative of A.A City Water & Sewerage Authority	0913791049
4	Sintayew Moges	Sociologist, EEP	0913488182
5	Mohammed Hussen	Consultant	0930077635
6	Areaya Dejene	Consultant	0910793888
7	Meles Kefelu	Representative of A.A City Road Authority	0911888870
8	Lemsa Gudeta	Representative of A,A City Environmental Protection Authority	0911095772
9	Bereket Bekele	BOWCSA	0911196643
10	Natenael Chala	Representative of AA transport Authority	0913023355
11	Tsehay Getahun	UBGDB	0913845681
Nifas Silk Lafto Sub City			
11	Asfaw Fura	Environmental Protection Office Head	
12	Adane Ergeno	Urban Beautification & Green Development Office Head	0912441611
13	Lidia Gelesa	Sub City Complaint Office Head	
14	Teref Manaye	Sub City General Manager	
Akaki Kality Sub City			
15	Manaye Chane	Sub City General Manager	0920774297
16	Abay Seifu	Land Development & Management Office Head	
17	Samrawit Amare	Environmental Protection Office Head	
Kirkos Sub City			
18	Alemayehu Hailu	Sub City Manager Office Coordinator	
19	Mulualem Meskele	Environmental Protection Officer	
20	Etsegenet Demeke	Urban Beautification & Green Development Office Team Leader	
Woreda 7 Administration			
21	Tegegn Temesgen	Woreda Land Management Bureau Officer.	0924490719
22	Tesfaye Guche	Woreda Chief Executive Bureau Head	0917319578
23	Million Tibebu	General Manager	0920734307
24	Buzayehu Shimelis	Woreda Housing Management Bureau Head	0923780790
25	Asnake Getachew	City Beautification & Environment Development Office Head	0915957755

Name		Position	Phone
Woreda 12 Administration			
26	Dagmawi Molla	Woreda Land Management Bureau Head	0920677573
27	Daniel Debele	Woreda Construction & Permit Officer	0912413400
28	Kuri Mideksa	City Beautification & Environment Development Bureau Head	0910468664
29	Wondimu Kejela	Woreda Chief Executive	0911460691
30	Mesfin Geda	Deputy Executive	0928411378
31	Samrawit H/Silasie	Woreda Housing Management Bureau	0920740577

Annex 5: Sample Minutes of Public Consultation Meetings

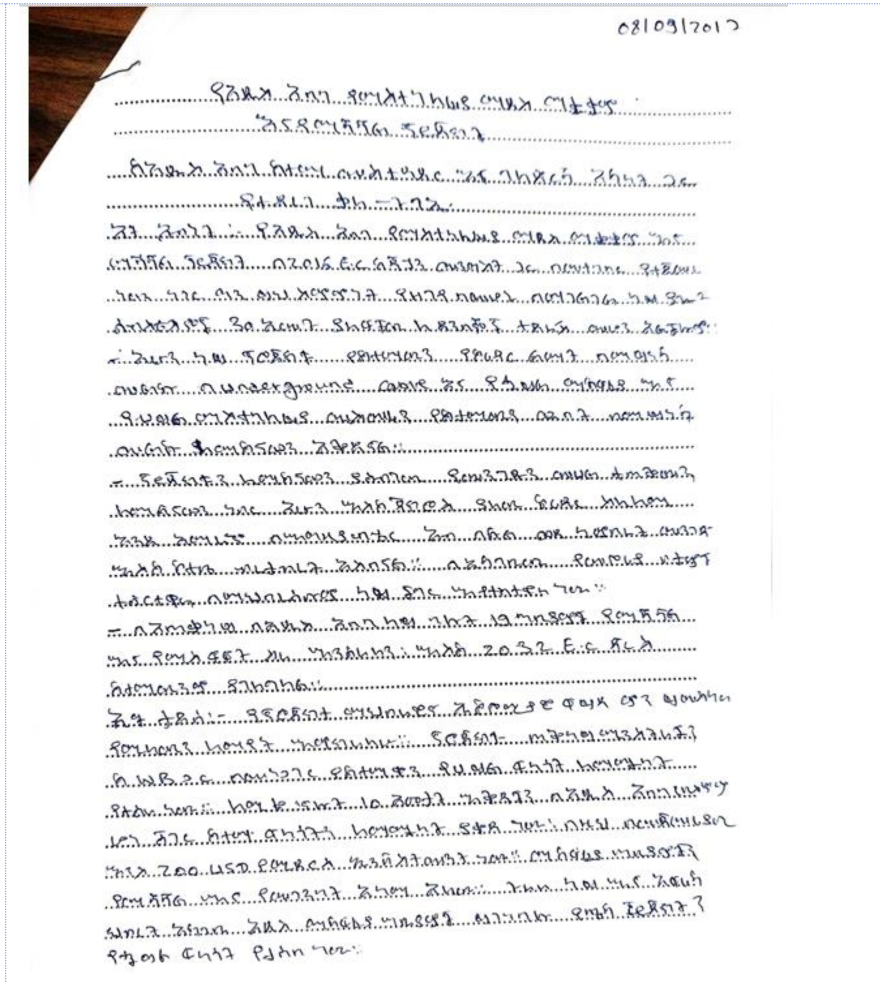
Annex 5.1: Sample Minute of Consultation Meeting with Addis Ababa City Administration



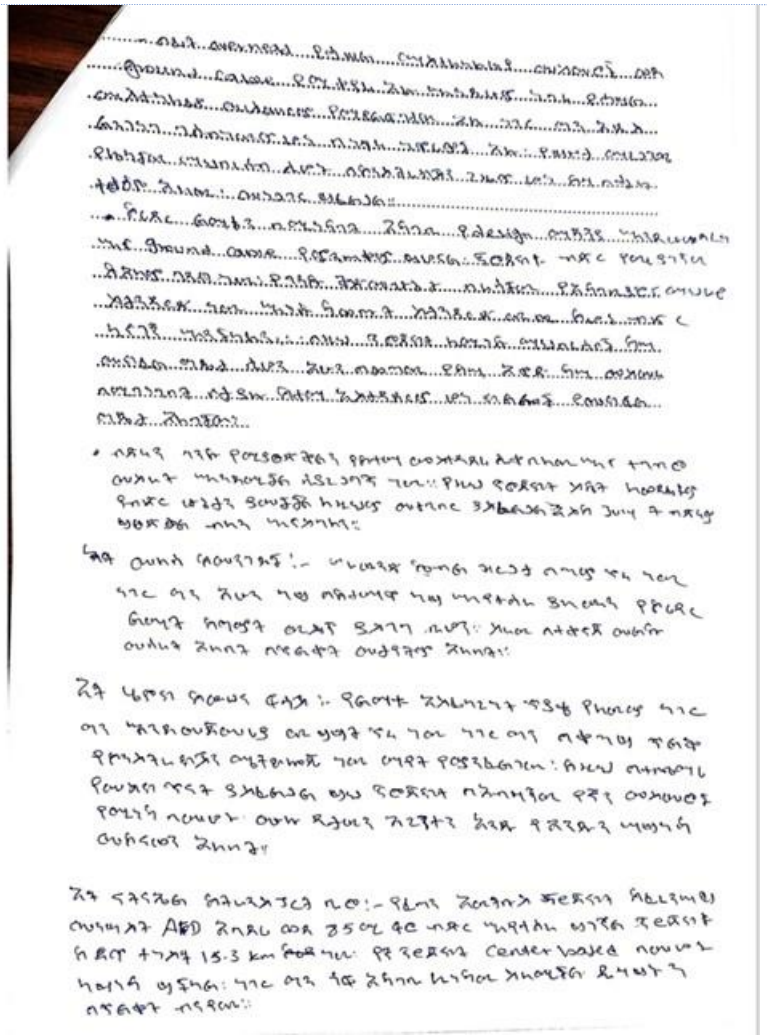
በስብሰባ ላይ የተገኙ አቴንዳንስ

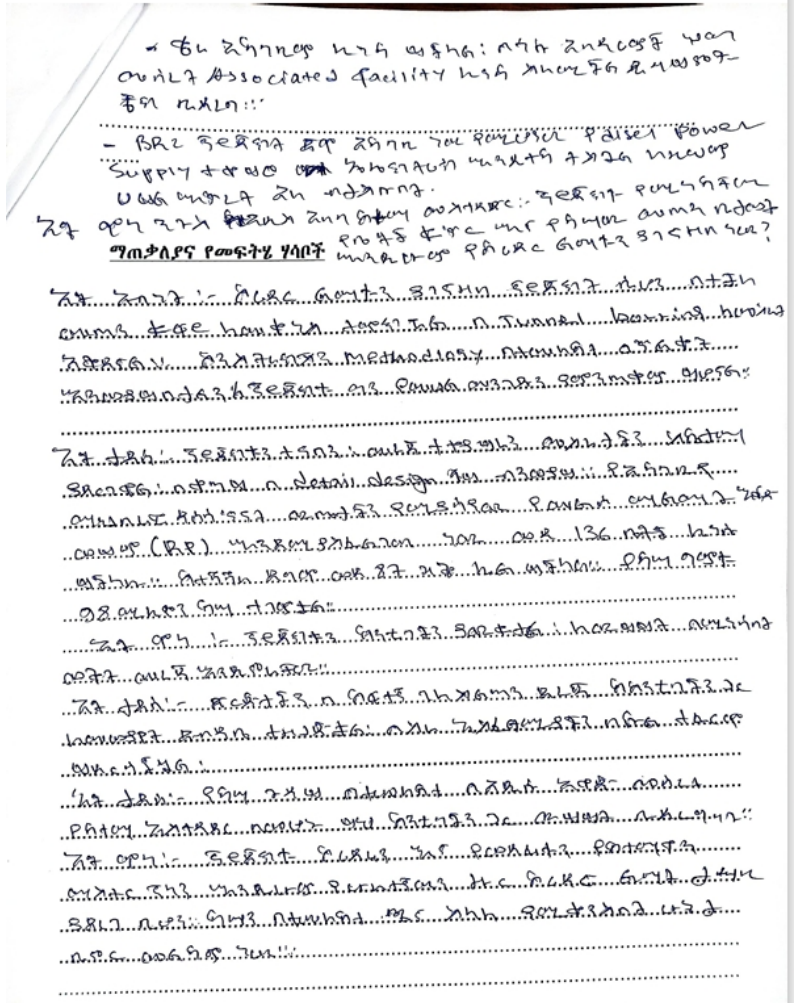
ቀን 09/09/2017

ተ.ቁ	ሙሉ ስም	የመጡበት ተቋም	ስልክ	ፊርማ
1	[illegible]	[illegible]	0110 015517	
2	[illegible]	,, ,, ,,	0911 77 1230	
3	[illegible]	[illegible]	0913791049	
4	[illegible]	CEP Sociologist	0938488182	
5	[illegible]	Consultant	0930077635	
6	[illegible]	,,	0910793888	
7	[illegible]	AACRA	0911888870	
8	[illegible]	A.A EPA	0911095792	
9	[illegible]	BOWCSA	0911196643	
10	[illegible]	AA Trans. Bureau	0913023355	
11	[illegible]	UBGDB	0913845687	
12				
13				
14				
15				

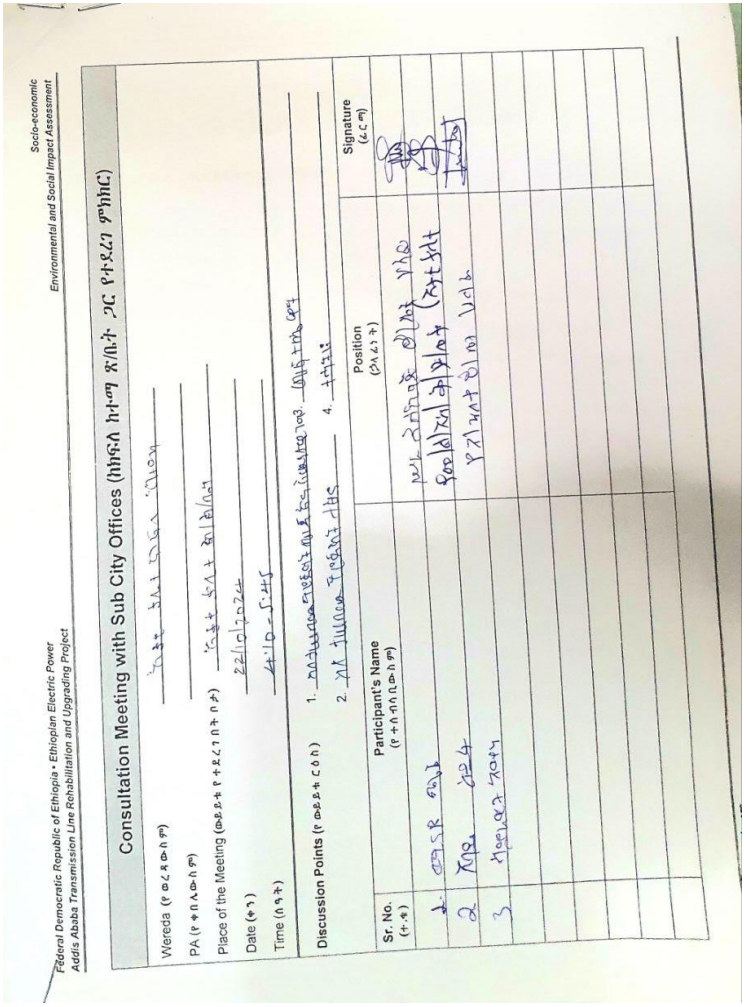


08/09/2017





Annex 5.2: Sample Minute of Consultation Meeting with Local Authority at Sub city Administration Level



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Addis Ababa Transmission Line Rehabilitation and Upgrading Project

Socio-economic
Environmental and Social Impact Assessment

Consultation Meeting with Sub City Offices (ከክፍለ ከተማ ጽ/ቤት ጋር የተደረገ ምክክር)

Wereda (የወረዳ ስም) _____

PA (የቀበሌ ስም) _____

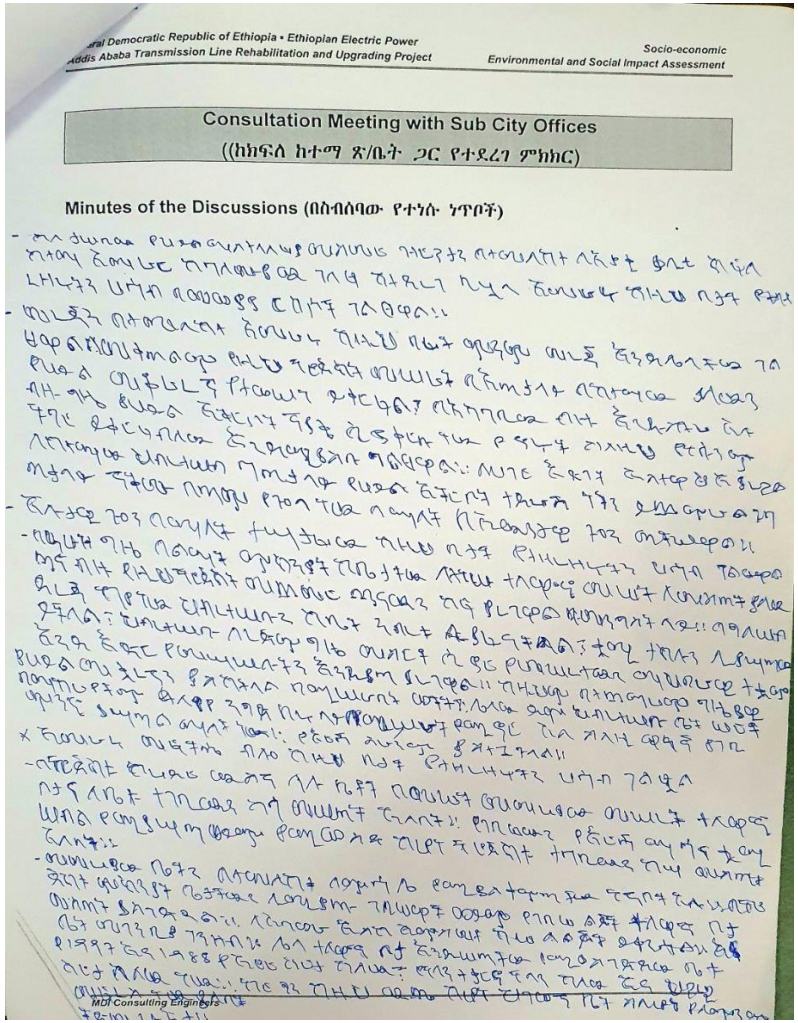
Place of the Meeting (የስብሰባው የተደረገበት ቦታ) _____

Date (ቀን) _____

Time (ሰዓት) _____

Discussion Points (የውይይት ርዕስ) 1. _____ 2. _____ 4. _____

Sr. No. (ተ.ቁ)	Participant's Name (የተሳታፊው ስም)	Position (ኃላፊነት)	Signature (ፊርማ)
1			
2			
3			



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Environmental and Social Impact Assessment

Consultation Meeting with Sub City Offices
((ከክፍለ ከተማ ጽ/ቤት ጋር የተደረገ ምክክር)

Minutes of the Discussions (በስብሰባው የተነሱ ነጥቦች)

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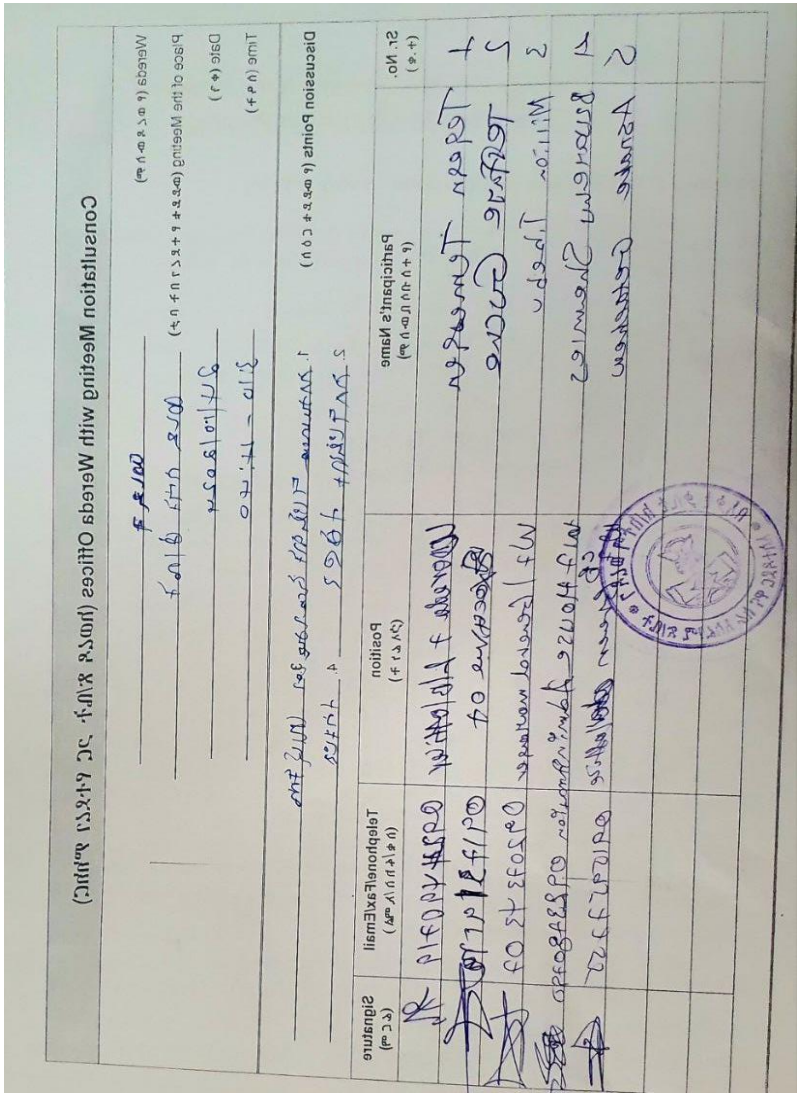
Annex 5.3: Sample Minute of Consultation Meeting with Local Authority at Woreda Administration Level



Consultation Meeting with Wereda Offices (ከወረዳ ጽ/ቤት ጋር የተደረገ ምክክር)

Date (ቀን) ____

Time (ሰዓት) ____

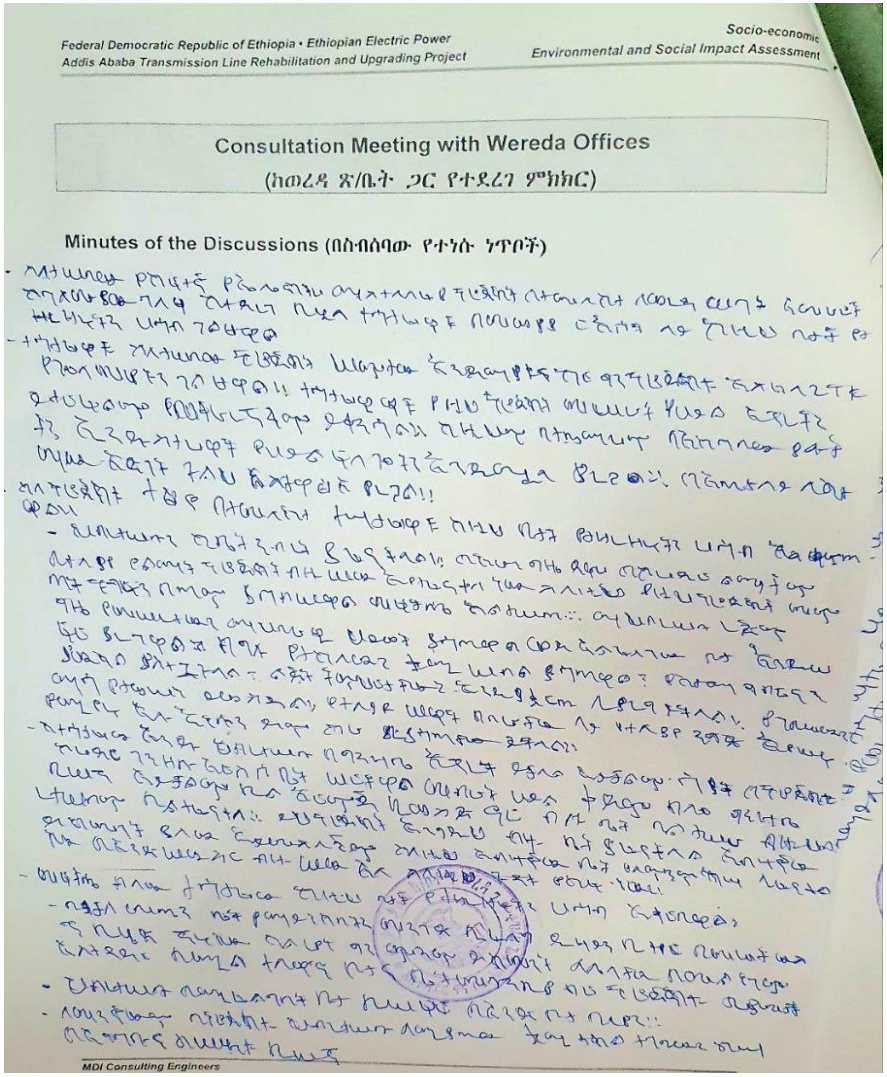
Place of the Meeting (ስብሰባው የተካሄደበት ቦታ) ____

Wereda (ወረዳ) ____

Discussion Points (የውይይት ነጥቦች)

1. ____
2. ____

Sr. No. (ተ.ቁ)	Participant's Name (የተሳታፊዎች ስም)	Position (የስራ ኃላፊነት)	Telephone/Email (ስልክ/ኢሜይል)	Signature (ፊርማ)
1				
2				
3				
4				
5				



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Consultation Meeting with Wereda Offices
(ከወረዳ ጽ/ቤት ጋር የተደረገ ምክክር)

Minutes of the Discussions (በስብሰባው የተነሱ ነጥቦች)

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Annex 5.4: Sample Minutes of Consultation Meetings with Community Members


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Socio-economic
Environmental and Social Impact Assessment

Consultation Meeting with Communities/Focal Group
(ከህብረተሰቡ ጋር የተደረገ ምክክር)

Wereda (የወረዳው ስም): Woreda 7
PA (የቀበሌው ስም): Chefi
Place of the Meeting (ውይይቱ የተደረገበት ቦታ)
Date (ቀን): 19-10-2014
Time (ሰዓት): 3:30 - 5:30

Discussion Points (የውይይት ርዕስ):
1. Proposed Project Information
2. Positive & Negative impact
3. Mitigation Measures

Sr. No. (ተ.ቁ)	Participant's Name (የተሳታፊው ስም)	Position (ኃላፊነት)	Signature (ፊርማ)
1	[illegible]	Resident	
2	[illegible]	"	
3	[illegible]		
4	[illegible]	"	
5	[illegible]	"	
6	[illegible]		
7	[illegible]	"	
8	[illegible]		
9	[illegible]		
10	[illegible]		
11	[illegible]		
12	[illegible]		
13	[illegible]		
14	[illegible]	"	
15	[illegible]		
16	[illegible]	"	
17	[illegible]		
18	[illegible]		
19	[illegible]	"	

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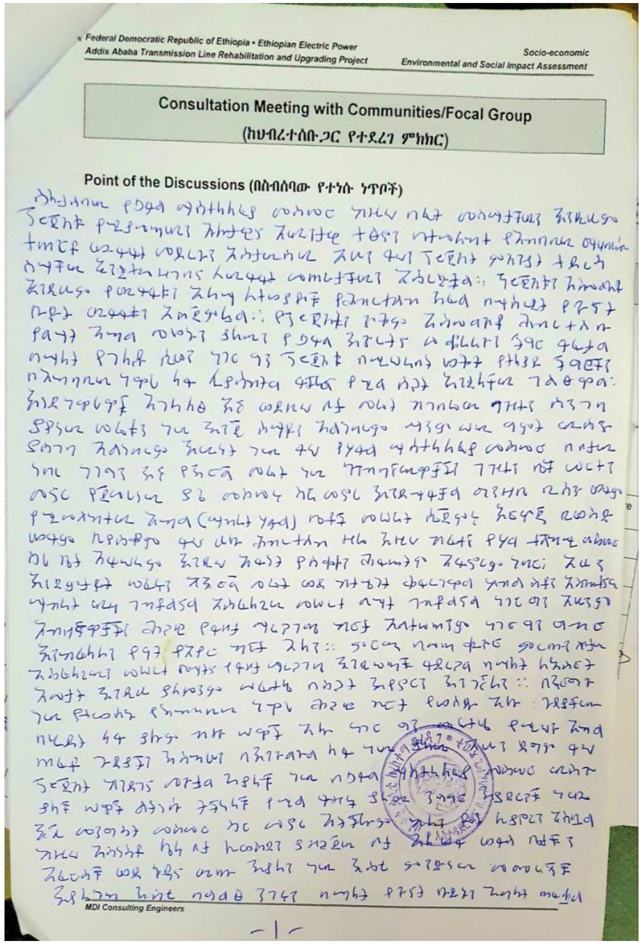
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Socio-economic
Environmental and Social Impact Assessment

Consultation Meeting with Communities/Focal Group
(ከህብረተሰቡ ጋር የተደረገ ምክክር)

Point of the Discussions (በስብሰባው የተነሱ ነጥቦች)

[illegible]

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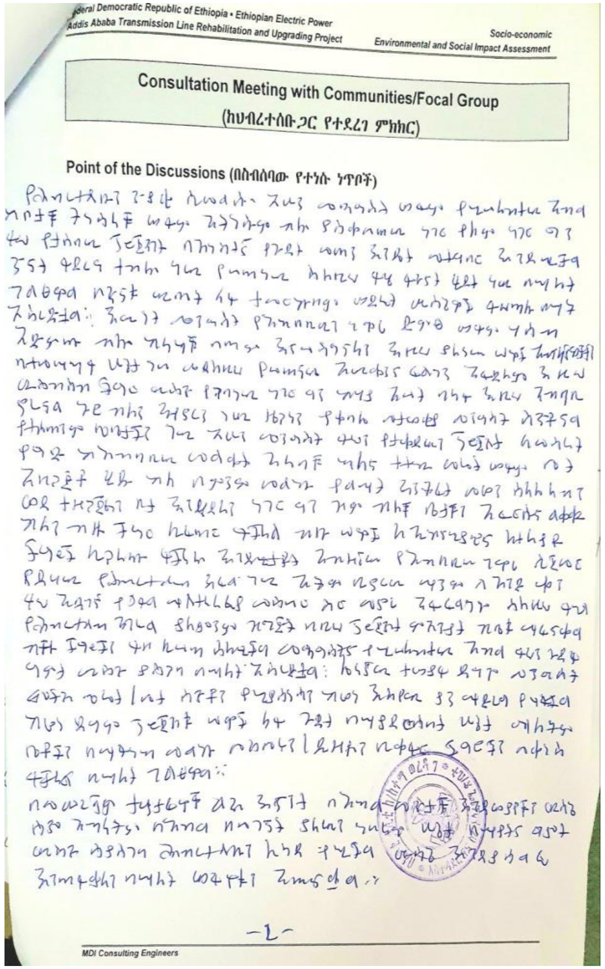
-1-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Addis Ababa Transmission Line Rehabilitation and Upgrading Project
Socio-economic
Environmental and Social Impact Assessment

Consultation Meeting with Communities/Focal Group
(ከህብረተሰቡ ጋር የተደረገ ምክክር)

Point of the Discussions (በስብሰባው የተነሱ ነጥቦች)

[illegible]

-2-
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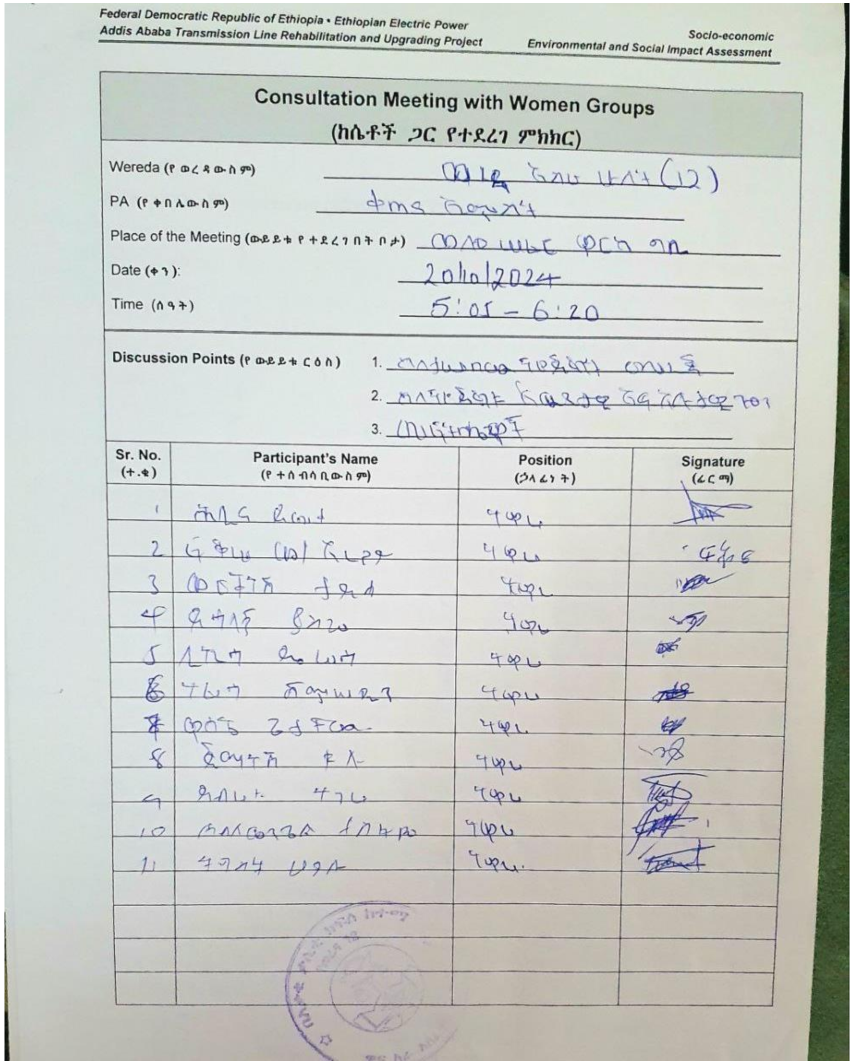
Annex 5.5: Sample Minutes of Consultation Meetings with Women Group



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Socio-economic
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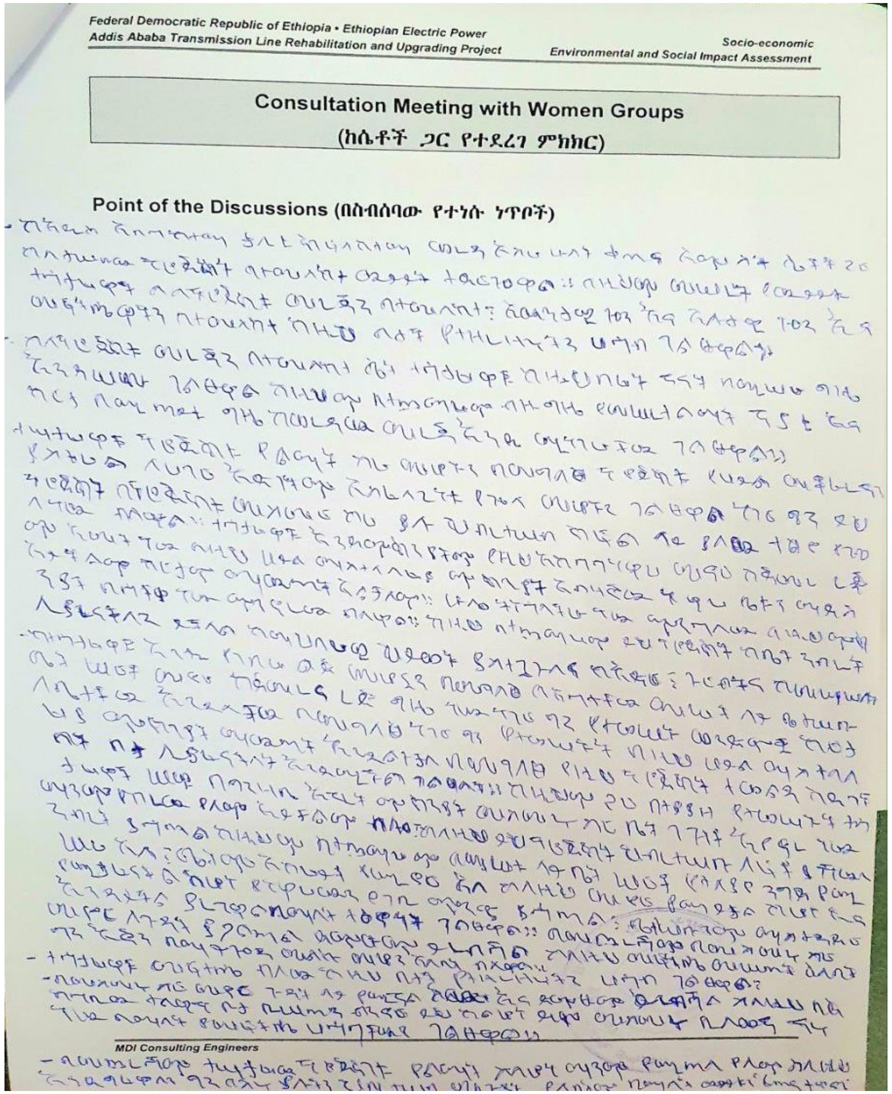
Consultation Meeting with Women Groups
(ከሴቶች ጋር የተደረገ ምክክር)

Wereda (የ ወረዳው ስም): [illegible] (12)
PA (የ ቀበሌው ስም): [illegible]
Place of the Meeting (ውይይቱ የተደረገበት ቦታ): [illegible]
Date (ቀን): 20/10/2024
Time (ሰዓት): 5:05 – 6:20

Discussion Points (የ ውይይቱ ርዕስ)
1. [illegible]
2. [illegible]
3. [illegible]

Sr. No. (ተ.ቁ)	Participant's Name (የ ተሰብሳቢው ስም)	Position (ኃላፊነት)	Signature (ፊርማ)
1	[illegible]	ነዋሪ	[signature]
2	[illegible]	ነዋሪ	[signature]
3	[illegible]	ነዋሪ	[signature]
4	[illegible]	ነዋሪ	[signature]
5	[illegible]	ነዋሪ	[signature]
6	[illegible]	ነዋሪ	[signature]
7	[illegible]	ነዋሪ	[signature]
8	[illegible]	ነዋሪ	[signature]
9	[illegible]	ነዋሪ	[signature]
10	[illegible]	ነዋሪ	[signature]
11	[illegible]	ነዋሪ	[signature]



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Environmental and Social Impact Assessment

Consultation Meeting with Women Groups
(ከሴቶች ጋር የተደረገ ምክክር)

Point of the Discussions (በስብሰባው የተነሱ ነጥቦች)

[illegible]

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Annex 5.6: List of Officials and Professionals participated in Consultations conducted with Concerned AAC Orgainizations

ADDIS ABABA TRANSMISSION LINE REHABILITATION AND UPGRADING PROJECT

Stakeholder Meetings: Participants Attendance Register

	Name	Organization	Position	Telephone No.	Date	Signature
1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
2	[illegible]	[illegible]	Director	[illegible]	[illegible]	
3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
5	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
6	[illegible]	Ethiopia Electric [illegible]	[illegible]	[illegible]	[illegible]	
7	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
8	Abonesh Bayou	A.A.W.S.A	[illegible]	[illegible]	[illegible]	
9	ZELALEM KETEMA	AAWSA	[illegible]	[illegible]	[illegible]	
10	Moges Kassa	AAWSA		[illegible]	[illegible]	
11	Sultan Sermolo	EEU	Design Head Network	0917820623	02/05/17	
12	TESFAYE TSEGAYE	EEU	Design network	0911440296	05/05/17	
13	Beyene Bedane	EEU	Design network	0922830954	11	

Annex 6: Environmental & Social Clauses to be Included in Procurement & Contract Documents

***Note** – The below are general clauses to be included in works procurement and contract documents. These clauses shall be complemented with the ESIA/ESMP which shall also be integrated in the works procurement and contract documents.*

Clause A6.1: General

The major adverse impact by the Project occurs during the Project construction phase, and the principal responsible actor is the Project construction Contractor. Therefore, the construction contract document shall include legally binding environmental and social clauses to minimize adverse impacts and enhance the positive ones.

This clause presents specific items found out to be crucial based on the Environmental and Social Impact Assessment (ESIA) findings, and therefore shall be included in the construction contract agreement for the Substation (SS) & power Transmission Line (TL) works.

a) The Contractor shall comply with the Environmental and Social Management Plan (ESMP) included in the referred ESIA and shall prepare a specific Contractor ESMP (C-ESMP) to detail and operationalize the ESIA ESMP. The Contractor shall study the ESIA/ESMP and the Environmental and Social Standards (ESS) of the World Bank and prepare his C-ESMP in compliance with the same.

b) The Contractor shall prepare method statements indicating the period within which he/she shall maintain status on site after completion of civil works to ensure that significant adverse impacts arising from such works have been appropriately addressed.

c) The Contractor shall adhere to the proposed activity implementation schedule, the C-ESMP and its respective monitoring plan to ensure effective feedback of monitoring information to project management so that impact management can be implemented properly, and if necessary, adapt to changing and unforeseen conditions.

d) Besides the regular inspection of the sites by the Supervising Engineer (SE) for adherence to the contract conditions and specifications, EEP shall appoint an E&S Inspector to oversee the compliance with these E&S Clauses and the necessary measures presented in the ESIA/ESMP reports.

e) Federal and AACA EPAs or other relevant stakeholders are mandated to carry out regular construction site inspection.

f) The Contractor shall implement all measures necessary to avoid undesirable adverse environmental and social impacts wherever possible, restore work sites to acceptable standards, and abide by any environmental performance requirements specified in an ESMP.

g) If the Contractor fails to implement the approved ESMP after written instruction by the Supervising Engineer (SE) to fulfill his obligation within the requested time, EEP reserves the right to arrange through the SE for execution of the missing action by a third party on account of the Contractor.

Clause A6.2: Location for Construction Facilities and Waste Management

a) Carefully select location for Project facility (office, store, workshop, etc.) in consultation with local authorities, SE and with EEP's ESAO, and community representative of the area;

b) All vessels (drums, containers, bags, etc.) containing oil/fuel/surfacing materials and other hazardous chemicals shall be banded in order to contain spillage. Used oil and hydraulic fluid generated on the construction sites must be collected in a closed container and stored temporarily in a safe place and sent to an authorized recycling depot.

c) All drainage and effluent from storage areas, and workshops sites shall be captured and treated before being discharged into the drainage system in line with applicable government water pollution control regulations.

d) The contractor shall take all possible steps to prevent pollution of streams, rivers, and other water supplies, at or in the vicinity of the site and shall comply with applicable laws, orders and regulations in force in the country of the works concerning the control and abatement of water pollution.

e) Entry of runoff to the site shall be restricted by constructing diversion channels or holding structures such as banks, drains, dams, etc. to reduce the potential of soil erosion and water pollution.

f) Construction waste shall not be left in stockpiles along the road but removed and reused or disposed of on a daily basis.

g) If disposal sites for clean spoil are necessary, they shall be located in areas, approved by the SE, for landfill and where they will not result in material being easily washed into drainage channels. Whenever possible, spoil materials shall be placed in low-lying areas and shall be compacted and dressed with top soil and then planted with species indigenous to the locality.

h) Adequate potable water supply shall be provided at the site for the workers' consumption.

Clause A6.3: Contractor's Environmental and Social Management Plan (C- ESMP)

a) The contractor shall prepare site-specific C-ESMP prior to commencing any construction activity. The C-ESMP has to be approved by the SE, EEP's ESAO.

b) Management and monitoring action plan and checklist for monitoring indicators shall be prepared and submitted to the engineer for approval and for later use.

The Contractor's C-ESMP will serve two main purposes:

1. For the Contractor, for internal purposes, to ensure that all measures are in place for adequate ESHS management, and as an operational manual for his staff, and,
2. For EEP, supported where necessary by SE, to ensure that the Contractor is fully prepared for the adequate management of the ESHS aspects of the project, and as a basis for monitoring of the Contractor's ESHS performance.

The Contractor's C-ESMP shall provide at least:

a. a description of procedures and methods for complying with these general environmental and social risk management conditions, and any specific conditions specified in an ESMP;

b. a description of specific mitigation measures that shall be implemented in order to minimize adverse impacts;

c. a description of all planned monitoring activities (e.g. sediment discharges from borrow areas) and the reporting thereof; and

d. The internal organizational, management and reporting mechanisms put in place for such.

Therefore, within 6 weeks of signing the Contract, the Contractor shall prepare C-ESMP to ensure the adequate management of the health, safety, environmental and social aspects of the works, including implementation of the requirements of the general conditions and any specific requirements of an ESMP for the works. The Contractor's C-ESMP will be reviewed and approved by the EEP and SE before start of the works. This review shall demonstrate if the Contractor's C-ESMP covers all of the identified impacts and has defined appropriate measures to counteract any potential impacts.

Clause A6.4: Air Pollution Control

a) The Contractor shall minimize the effect of dust on the surrounding environment resulting from earth moving sites, vibrating equipment, temporary access roads, etc. to ensure safety, health and the protection of workers and communities living in the vicinity of dust producing activities.

b) The Contractor shall regularly maintain vehicles and equipment to minimize smoke from motor exhausts.

c) During the performance of the work and any operations appurtenant thereto, the Contractor shall carry out proper and efficient measures, such as sprinkling with water or other means, whenever necessary to reduce the dust nuisance, and to prevent dust which has originated from his operations from damaging crops, cultivated fields, and dwellings or causing a nuisance to persons. The Contractor will be held liable for any damage resulting from dust originating from his operations.

d) Burning of waste and/or garbage is prohibited.

e) Traffic speeds shall be restricted, and water regularly sprayed on dusty roads to suppress dust levels near settlement areas.

f) Prevent the occurrence of smoke emissions or fumes from fuel oils.

g) Avoid exposing any volatile chemical to the atmosphere.

h) Avoid burning of materials such as tires, plastic, rubber products or other materials which produce toxic gases or create heavy smoke or nuisance odor.

i) Monitor exhaust emissions to ambient air quality, waste pollutant releases to land and water.

Clause A6.5: Noise due to Construction Activities

The Contractor shall ensure the noise levels emanating from machinery, vehicles and noisy construction activities (e.g., excavation, blasting) are kept at a minimum for the safety, health and protection of workers within the vicinity of sources of high noise levels and nearby communities.

The national noise limit standard for the residential area in daytime is 55 dB while at night is 45 dB.

a) Use modern mechanical plant, equipment and vehicles fitted with effective noise silencers, mufflers, and their regular maintenance to minimize noise levels.

b) Restrict activities producing excessive noise levels to the daytime and avoid performing such works during nighttime, on weekends and holidays.

c) Locate plants, machinery, and site installation considerably away from high human traffic areas.

d) Minimize worker exposure to noise and vibration by providing appropriate PPE, hearing protection equipment (earplugs) and noise control device for workers in vicinity of noise emissions.

e) Controls shall be undertaken to reduce exposures to >80 dBA, including layout of equipment, selection of quieter machines, isolation of workers from noise source etc.

f) Limit working time within extreme sound emissions and comply with best practice guidelines.

g) Carry out noisy construction activities in the vicinity of sensitive areas during normal working hours only.

h) Switch off equipment and vehicles when not in use to avoid noise emission.

i) Conduct job-specific training for machinery and heavy vehicle operators to cover the importance of noise control and available noise reduction measures.

Clause A6.6: Water Resources Pollution and Management

a. The Contractor shall at all costs avoid conflicting with water demands of local communities.

b. Abstraction of both surface and underground water shall only be done with consultation of the local community and after obtaining a permit from the relevant Water Authority.

c. Abstraction of water from wetlands shall be avoided. Where necessary, permission has to be obtained from relevant authorities.

d. The Contractor shall take all possible steps to prevent pollution of streams, rivers, and other natural water bodies / reservoirs such as discharging construction water containing spoils or site effluent, especially cement and oil, etc. into natural water drainage courses.

e. The Contractor shall ensure the existing water flow regimes in rivers, streams and other natural or irrigation channels are maintained and/or re-established where they are disrupted due to works being carried out. For example, wash water from washing of equipment shall not be discharged into water courses without treatment.

f. Site spoils and temporary stockpiles shall be located away from the drainage system, and surface runoff shall be directed away from stockpiles to prevent erosion that may increase sedimentation in the nearby water bodies.

Clause A6.7: Chance Finds and Protection of Archeological and Historical Sites

a) Upon discovery of ancient heritage, relics or anything that might or is believed to be of archeological or historical importance during the execution of works, immediately suspend the works and report such findings to the SE so that the appropriate authorities may be expeditiously contacted for fulfillment of the measures aimed at protecting such historical or archaeological resources.

b) The Contractor shall take the necessary measures for preventing that any person or equipment may damage the article or things and shall provide barricades, fences, and signals and, if necessary, protect against atmospheric agents, as directed by the Engineer. Also, guard service may be required by the Engineer.

c) The SE shall take the following measures:

- Notify the relevant department of antiquities,

- Request for representative to make site inspection,
- Secession of work in the vicinity of the find until the visit of representative; and
- Decision by the department of antiquities on possible salvage or excavation within 48-72 hours of notification.

Clause A6.8: Vegetation and Wildlife

a) Avoid impact on vegetation resources by locating access road alignment along a route that has been already disturbed or that has relatively less vegetation cover.

b) Include a clause in the construction contract which requires the contractor to compensate by planting seedlings for every mature tree that will be removed by the project.

c) Where possible, consider installation of transmission lines above existing vegetation to avoid land clearing.

d) Minimize clearing of indigenous trees by carrying out thorough site planning and modifying the transmission line route where technically feasible.

e) Consider the location of mature trees during route selection for the access road construction and land clearing for quarry/borrow sites.

f) Avoid unnecessary destruction of trees and other vegetation by restricting land clearing to what is absolutely necessary.

g) Locate access roads along existing roads and tracks that have removed existing vegetation or contain relatively less vegetation cover.

h) Employ selective bush clearing to ensure sapling regrowth.

i) Rehabilitate all temporary construction sites and access roads with suitable native grasses, trees, and other plants.

j) Include a clause in the construction contract which requires the contractor to compensate by planting ten seedlings for every mature tree that will be removed by the project.

k) Design and implement an appropriate landscaping program for the substation site.

l) The project work force shall be instructed to avoid harassment and disruption of wildlife.

m) The Contractor shall implement special and strong regulation and enforcement measures on its own construction workers against hunting wildlife that move in search of alternative shelters.

n) Wildlife can be killed or disturbed by vehicles unless speed limits are obeyed on the roads. Therefore, it is necessary to introduce speed limit within the project area of influence.

o) Awareness creation training to construction workers at toolbox meetings, so that they contribute to the effort of protection of wildlife.

p) Carryout periodic monitoring of habitat integrity of the area to check if any wildlife and their habitats are identified and ensure these are safe and secure.

q) Rehabilitate all areas damaged or disturbed during construction of tower foundation and access roads upon completion of the construction works.

Clause A6.9: Avifauna

a) Use of insulated and twisted conductors to ensure that the risk of collision and electrocution is very low, simply due to the presence of a single, very visible element.

b) Use bird flight diverters, marker balls, bird deterrents, and other visibility enhancements on the power lines to help birds detect and avoid the lines, reducing collision risks.

c) To minimize collisions, undertake wire marking to alert birds to the presence of power lines, allowing them time to avoid the collision. As markers for better visibility of the neutral cable, vertically hanging black and white plastic flaps proved most effective.

d) If the TL would have the neutral cable high above the conductor cables, it shall be made clearly visible by suitable markers because most bird collision accidents occur at the thin neutral cable.

e) Maintaining 1.5 meter spacing between energized components and grounded hardware or, where spacing is not feasible, covering energized parts and hardware. To design an avian-safe power pole to minimize bird electrocution risk by providing sufficient separation between energized phase conductors and between phases and grounded hardware to accommodate at least the wrist-to-wrist or head-to-foot distance of a bird.

f) Use of supports with safe crossarm configurations that minimize electrocution risk when building new power lines. The basic characteristics of these safe configurations must comply with the minimum safety distances (Appendix A, IUCN 2022). Critical distances depend on the largest birds present susceptible to being electrocuted mostly raptors wingspan of 2.8 meters. Therefore, the size of the larger raptors shall be considered and whenever possible, it is highly recommended to use supports with suspended insulators that move the phases away from the perching area.

g) Installation of insulating elements and deterrent devices which consists of increasing the distance between danger points or preventing their use by birds without making structural changes to the crossarm.

h) Installing elements that increase the gap between the conductors on the crossarm. This can be done by increasing the number of glass or porcelain insulators in the string, or even by using polymer insulators. These insulators either have a special shape to prevent birds landing on them or they are used with devices that stop them landing.

i) Installing elements that discourage or prevent birds from perching on dangerous parts (anti-perching devices such as vertical rods, vertical metal plates, rods with swivel heads that turn in the wind, etc.) to stop birds using the pylons for building their nests or perching.

j) The use of a tower structure with sufficient clearance would minimize electrocution risks to avifauna; and cross-arms, insulators and other parts of the power lines can be constructed so that there is no space for birds to perch where they can be proximate to energized wires.

Clause A6.10: Rehabilitation and Soil Erosion Prevention

a) To the extent practicable, the Contractor shall rehabilitate the site progressively so that the rate of rehabilitation is similar to the rate of construction.

b) Always remove and retain topsoil for subsequent rehabilitation. Soils shall not be stripped when they are wet as this can lead to soil compaction and loss of structure.

c) Topsoil shall not be stored in large heaps. Low mounds of no more than 1 to 2 m high are recommended.

d) Re-vegetate the stockpiles with recommended grass species to protect the soil from erosion, discourage weeds and maintain an active population of beneficial soil microbes.

e) The Contractor shall reinstate natural drainage patterns, to the extent practicable, to the state prior to intervention.

f) Backfill excavated areas with soils or overburden that are free of foreign material that could pollute groundwater and soil.

g) Identify potentially toxic overburden and screen them to prevent mobilization of toxins through erosion.

h) Ensure reshaped land is formed so as to be inherently stable, adequately drained and suitable for the desired long-term land use and allow natural regeneration of vegetation.

i) Compacted surfaces shall be deep ripped to relieve compaction unless subsurface conditions dictate otherwise.

j) Re-vegetate with plant species that will control erosion, provide vegetative diversity and, through succession, contribute to a resilient ecosystem. The choice of plant species for rehabilitation shall be done in consultation with local forest department, research institutions and the local people.

Clause A6.11: Traffic Management

a. Upon the completion of civil works, all access roads shall be ripped and rehabilitated.

b. Access roads shall be watered regularly to suppress dust emission.

Clause A6.12: Traffic Safety

The Contractor shall be responsible for the safety along the roads related to the sites, and he shall take all necessary precautions for the protection of the work and the safety of the public on the roads affected by his activities. To this effect:

a. Include a clause in the construction contracts to the effect that the contractor must make every reasonable effort to avoid or minimize road safety hazards and inconveniences to other road users.

b. Prepare a traffic management plan detailing traffic control procedure, train Contractor's personnel traffic management procedures, travel speed limits and related control measures.

c. Where haul routes pass through town sections or rural settlements, the construction traffic management plan shall set out clearly steps which will be taken to minimize the impacts of his haulage traffic, including regular watering of unpaved roads to suppress dust & the speed limits which will be imposed.

d. Put speed limits for construction traffic and appropriate traffic signs in and around construction areas and along access roads.

e. Post traffic signs and hazard markings at all critical locations including junction of the project sites (substation, TL route) and existing roads, access roads, etc.

f. Assign a well-trained & adequate number of traffic marshals mainly around a place where sensitive receptors (town sections, settlements, schools, health posts, worship areas) exist.

g. Avoid night driving of project vehicles and putting headlights on at dawn and dusk.

h. Mount GPS tracker for each vehicle.

i. Develop and implement driver Code of Conduct (COC).

j. Provide speed governor for each truck.

k. Work closely with the local administration and traffic police offices.

l. Provide induction training for drivers at the start of the project about road safety and due diligence to ensure safety of other road users; and

m. Create awareness for the local people on how to use roads and keep themselves away from the traffic accident.

Clause A6.13: General Public Health

a. The Contractor shall ensure the availability of first-aid service to the workers.

b. The Contractor shall undertake, through his dedicated staff or a sub-contractor for this activity, prevention, and control of the spread of STDs, especially the HIV/AIDS pandemic, in the workplaces of the Project.

c. In case of traversing a malaria-prone area, precautionary measures shall be taken to avoid possible health risk through environmental health and hygiene management and availing clinic, providing chemically treated mosquito nets and medicines for the workers.

d. The Contractor shall not contribute to malaria outbreak by creating temporary and/or permanent water holding areas which favor mosquito breeding. Particular attention shall be paid to proper restoration of borrow pits and quarry areas that avoid breeding sites for mosquito,

e. The Contractor shall provide clinics with all necessary medications in major construction areas, and first-aid kits at all major working sites.

f. Chemicals shall be stored under favorable climatic conditions depending on the characteristics of the chemical under consideration,

g. The Contractor shall provide safe (potable) water and appropriate waste disposal facilities including the provision of sanitary latrines in the within the construction facilities;

h. The Contractor shall provide health education mainly focusing on the HIV control and prevention, avoiding stigma and discrimination in workplaces due to HIV/AIDS as found appropriate; and

i. The Contractor shall provide education to his personnel on OHS procedures and emergency response plans associated with their task.

Clause A6.14: Occupational Health and Safety

For all construction Projects (SS & TL works), the Contractor is required to adopt OHS Plan as briefly presented below:

a. The Contractor shall assign an exclusive and permanent OHS expert on site.

b. The Contractor shall follow and adopt the standard hazard control measures in a decreasing hierarchy: avoidance, substitution, isolation, engineering design, administrative and provision of Personal Protective Equipment (PPE). It shall be noted that provision of PPEs is the last preferred measure.

c. The Contractor shall ensure that the project adheres to the World Bank Group Environmental, Health and Safety Guidelines in the C-ESMP.

d. In advance of the construction work, the Contractor shall mount an awareness and hygiene campaign. Workers and local residents shall be sensitized on health risks, and particularly of HIV/AIDS.

e. Construction vehicles shall not exceed maximum speed limit of 3km per hour in the project Area.

f. Only allowing trained and certified workers to install, maintain, or repair electrical equipment.

g. Deactivating and properly grounding live power distribution lines before work is performed on, or in proximity, to the lines.

h. Ensuring that live-wire work is conducted by trained workers with strict adherence to specific safety and insulation standards. Safe work procedures include distinguish live parts from other parts of the electrical system; determine the voltage of live parts; understand the minimum approach distances outlined for specific live line voltages; and ensure proper use of special safety equipment and procedures when working near or on exposed energized parts of an electrical system.

i. Workers shall not approach an exposed energized or conductive part even if properly trained unless: the worker is properly insulated from the energized part with gloves or other approved insulation; the energized part is properly insulated from the worker and any other conductive object; or the worker is properly isolated and insulated from any other conductive object (live-line work).

j. Where maintenance and operation are required within minimum setback distances, specific training, safety measures, personal safety devices, and other precautions shall be defined in a health and safety plan.

k. Workers not directly associated with power transmission and distribution activities who are operating around power lines or power substations shall adhere to local legislation, standards, and guidelines relating to minimum approach distances for excavations, tools, vehicles, pruning, and other activities.

l. Minimum hot stick distances may only be reduced provided that the distance remaining is greater than the distance between the energized part and a grounded surface.

m. Delineate or fence work zone or dangerous areas and provide sufficient information about the site through posting of clearly visible signs.

n. Post proper and clearly visible signs, barricades, reflectors at appropriate locations so that road users (drivers) are aware of the active construction works and take precautions while driving through or at nearby project operational area.

o. Marking all energized electrical devices and lines with appropriate warning signs.

p. Double insulating / grounding all electrical equipment used in environments that are, or may become, wet; using equipment with Ground Fault Interrupter (GFI) protected circuits.

q. Appropriate labeling of service rooms housing high voltage equipment ('electrical hazard') and where entry is controlled or prohibited.

r. Establish "No Approach" zones around or under high voltage power lines.

s. Testing structures for integrity prior to undertaking work.

t. Implementation of a fall protection program that includes training in climbing techniques and use of fall protection measures; inspection, maintenance, and replacement of fall protection equipment; and rescue of fall-arrested workers, among others.

u. Establishment of criteria for use of 100 percent fall protection (typically when working over 2 meters above the working surface, but sometimes extended to 7 meters, depending on the activity). The fall protection system shall be appropriate for the tower structure and necessary movements, including ascent, descent, and moving from point to point.

v. Installation of fixtures on tower components to facilitate the use of fall protection systems.

w. Hoisting equipment shall be properly rated and maintained and hoist operators properly trained.

x. Safety belts shall be of not less than 16 mm two-in-one nylon or material of equivalent strength. Rope safety belts shall be replaced before signs of aging or fraying of fibers become evident.

y. When operating power tools at height, workers shall use a second (backup) safety strap.

z. Signs and other obstructions shall be removed from poles or structures prior to undertaking work.

aa. An approved tool bag shall be used for raising or lowering tools or materials to workers on structures.

bb. All lifting work whether heavy or light shall be inspected prior to job execution.

cc. All the loose and fixed lifting tools, tackles and equipment shall be inspected and shall be done in an if and when required basis.

dd. Weight of the sections to be lifted shall be pre-decided.

ee. Proper care shall be taken to avoid over loading or overturning of forklift trucks.

ff. All lifting works shall be suspended during heavy wind or rain.

gg. Identification of potential exposure levels in the workplace, including surveys of exposure levels in new projects and the use of personal monitors during working activities.

hh. Training of workers in the identification of occupational EMF levels and hazards.

ii. Establishment and identification of safety zones to differentiate between work areas with expected elevated EMF levels compared to those acceptable for public exposure, limiting access to properly trained workers.

jj. Implementation of action plans to address potential or confirmed exposure levels that exceed reference occupational exposure levels developed by international organizations such as the International Commission on Non-Ionizing Radiation Protection (ICNIRP), and the Institute of Electrical and Electronics Engineers (IEEE). Personal exposure monitoring equipment shall be set to warn of exposure levels that are below occupational exposure reference levels (e.g., 50 percent). Action plans to address occupational exposure may include limiting exposure time through work rotation, increasing the distance between the source and the worker, when feasible, or the use of shielding materials.

Clause A6.15: Disposal of Unusable Elements

a. Unusable materials and construction elements such as electrical equipment, accessories, and demolished structures will be disposed of in a manner approved by the SE. The Contractor has to agree with the SE which elements are to be surrendered to the Client's premises, which will be recycled or reused, and which will be disposed of at approved landfill sites.

b. Unsuitable and demolished elements shall be dismantled to a size fitting on ordinary trucks for transport.

Clause A6.16: Compensation for and Repair of Property

The Contractor shall in accordance with the Laws of Ethiopia, and any other Regulations in force from time to time in Ethiopia, pay compensation for loss or damage suffered in consequence of any accident or injury or disease resulting from his/her work to any workman or other person in the employment of the Contractor or any Sub-Contractor. That is,

a. Compensations for and form of property to be adversely affected by the work shall be compensated for prior to commencement of works as per the applicable law of the country.

b. Shall the Contractor, intentionally or inadvertently, damage private property, he shall repair the property to the owner's satisfaction and at his own cost. For each repair, the Contractor shall obtain from the owner a certificate that the damage has been addressed satisfactorily to indemnify EEP from subsequent claims.

Clause A6.17: Facilities for Staff and Labour

Save insofar as the Contract otherwise provides, the Contractor shall provide and maintain such accommodation and amenities as he/she may consider necessary for all his staff and labour, employed for the purposes of or in connection with the contract, including all fencing, water supply (both for drinking and other purposes), electricity supply, sanitation, cookhouses, fire prevention and fire-fighting equipment, air conditioning, cookers, refrigerators, furniture and other requirements in connection with such accommodation or amenities. On completion of the contract, unless otherwise agreed with EEP and the local authorities, the temporary facilities constructed by the Contractor shall be removed and the site reinstated to its original condition, all to the approval of the Engineer.

Clause A6.18: Disorderly Conduct

The Contractor shall at all times take all reasonable precautions to prevent any unlawful, riotous or disorderly conduct by or amongst his/her staff and labour and take all reasonable precautions for the preservation of peace and protection of persons and property in the neighbourhood of the works against the same.

Clause A6.19: Foreign Personnel

The Contractor shall be responsible for the return to the place where they were recruited or to their domicile of all such persons as he recruited and employed for the purposes of or in connection with the contract, and shall maintain such persons as are to be so returned in a suitable manner until they shall have left the site or, in the case of persons who are not nationals of and have been recruited outside Ethiopia shall have left Ethiopia or the site, as appropriate.

If the Contractor shall fail to observe this condition, the EEP may maintain and return as soon as possible said persons and recover the cost thereof from the Contractor.

Clause A6.20: Supply of Foodstuffs

The Contractor shall arrange/facilitate for the provision of a sufficient supply of suitable food at reasonable prices for all his staff and labour, or his/her Sub-contractors, for the purposes of or in connection with the contract.

Clause A6.21: Supply of Water

The Contractor shall, so far as is reasonably practicable, having regard to local conditions, provide on the site an adequate supply of water for drinking and other uses for the Engineer's Representative and his/her staff, the Contractor's staff and labour.

Clause A6.22: Measures against Insect and Pest Nuisance

The Contractor shall at all times take the necessary precautions to protect all staff and labour employed on the site from insect nuisance, rats, and other pests and reduce the dangers to health and the general nuisance caused by the same. The Contractor shall provide his/her staff and labour with suitable prophylactics for the prevention of malaria and take steps to prevent the formation of stagnant pools of water. He/She shall comply with all the regulations of the local health authorities in these respects and shall in particular arrange to spray thoroughly with approved insecticide all buildings erected on the Site. Such treatment shall be carried out at least once a year or as instructed by the Engineer. The Contractor shall warn his staff and labour of the dangers of other water-borne diseases like bilharzia and wild animals.

Clause A6.23: Alcoholic Liquor or Drugs

The Contractor shall not, otherwise than in accordance with the Statutes, Ordinances and Government Regulations or Orders for the time being in force, import, sell, give, barter, or otherwise dispose of any alcoholic liquor or drugs, or permit or suffer any such importation, sale, gift, barter or disposal by his Sub-contractors, agents, staff, or labour.

Clause A6.24: Employment Records of Workers

The Contractor shall keep proper wages books, in the language stipulated in the Appendix to Bid, showing the time worked and wages paid to all employees in and about the execution of the works, together with such other records as are required by any Statute, Ordinance, Law, Regulation or Byelaw in force in the country will govern the employment of labour. He shall be bound, whenever required, to produce such wages books and other records for the inspection of any persons authorised by the Engineer.

Clause A6.25: Use of Child Labor

The contractor shall abide by the Ethiopian and international laws that limit the minimum age for labor. That is, he/she shall not recruit children for the type of labour not suitable for their age.

The WB ESS2 states that the minimum age of employment is 14 years while the newly revised Ethiopian Labor Law has extended the minimum year of employment to 15 years. However, both WB and Ethiopian law prohibits the engagement of children under 18 years of age in works that have hazardous nature. Therefore, as presented in Annex 9 of the ESMF, the project will not allow employment under the age of 18.

Therefore, the Contractor is required to comply with minimum age set for all types of work (in compliance with national laws and ESS2 and document age of workers upon hiring.

Clause A6.26: Forced Labor

Forced labor takes place in Ethiopia, hence there is a risk that forced labor will be deployed under the Project.

Forced labor is prohibited under the Constitution of Ethiopia and is a punishable offense under the Criminal Code 5.

Therefore, the Contractor is required to prevent the use of all forms of forced labor. The Contractor is also required to raise awareness of communities/suppliers to not engage in forced labor.

Clause A6.27: Gender-Based Violence

Due to lack of awareness and understanding on gender and gender-based violence (GBV) among employers and workers, female workers face difficulties in their workplaces, such as GBV, sexual exploitation and abuse (SEA) and sexual harassment (SH). Therefore, the following actions shall be taken by the Contractor:

a. Provision and availability of separate sanitation facilities for women, the provision of women friendly safety equipment and materials,

b. Assigning women in works that do not affect their biological condition,

c. Ensure that women construction workers do not encounter any type of GBV and SEA/SH,

d. In the contract document for the employment of construction workers the Contractor has to ensure the safety and security of women construction workers and protect them from GBV/SEA/SH in the construction site,

e. Contract document for workers shall incorporate measures to be taken against those workers who commit GBV/SEA/SH,

f. Establish a standard code of conduct that will be produced and signed by all workers including international and subcontract workers,

g. The potential impact and enhancement measures of Gender Mainstreaming and prevention of GBV/SEA/SH and its components shall be properly addressed through the works contract,

h. Issue a strong Workers Code of Conduct (CoC) that sufficiently addresses the issues and take appropriate actions on workers violating the CoC,

i. Include in the employment contract for construction workers that any GBV/SEA/SH against women or any other workers will lead to administrative measures and also legal actions,

j. The Contractor is required to design gender core labour standards and employment and contract procedures; and also design gender responsive workers' manuals, and

k. Contractor to employ Gender expert on intermittent basis to follow up Gender Mainstreaming activities.

Clause A6.28: Epidemics

In the event of any outbreak of illness of an epidemic nature, the Contractor shall comply with and carry out such regulations, orders and requirements as would be made by the Government or the local medical or sanitary authorities, for the purpose of dealing with and overcoming the same.

Clause A6.29: Festivals and Religious Customs

The Contractor shall in all dealings with his staff and labour have due regard to all recognised festivals, days of rest and religious and other customs.

Clause A6.30: Reporting

The Contractor shall prepare monthly progress reports to the SE on compliance with the provisions herein, the Project ESMP, and his own C-ESMP. It is expected that the Contractor's reports shall include, but are not limited to, information on:

- Status of C-ESMP (i.e., for all project ESHS risk management team members during the contract period);
- ESHS management actions/measures taken, including approvals from local or national authorities;
- Lack of compliance with contract requirements from the Contractor's side with corresponding reasons;
- Changes of assumptions, conditions, measures, designs and actual works in relation to ESHS aspects;
- Observations, concerns raised and/or decisions taken with regard to ESHS management during site meetings; and
- Problems encountered in relation to ESHS aspects (incidents, including delays, cost consequences, etc., as a result thereof).

Regarding incident/accident reporting, it is advisable that reporting of significant ESHS incidents/accidents be done "as immediately as practicable". Such incident reporting shall therefore be done for each individual incident/accident. The Contractor shall keep systematic records of health, safety and welfare of persons, and damage to property.

Details of ESHS performance will be reported to the Client through the SE's reports to the Client.

Clause A6.31: Training of Contractor's Personnel

The Contractor shall provide sufficient training to his/her own personnel to ensure that they are all aware of the relevant aspects of these general conditions, any Project ESMP, and his own C-ESMP, and are able to fulfill their expected roles and functions. Specific training shall be provided to those employees that have particular responsibilities associated with the implementation of the C-ESMP.

Training shall be provided to implementing agencies EEP, ESAO, PIU staff, Project workers, stakeholders, and communities.

Training shall be induction (upon recruitment of workers) and continuous on-the-job trainings. Major areas of trainings include, but are not limited to:

- Environmental and Social Management Framework (ESMF) and Resettlement Framework (RF) of the Project
- Preparation and implementation of site-specific environmental and social risk management instruments (ESIAs, ESMPs, RPs, BMP, etc.)
- Specific aspects of environmental and social risk assessment
- Stakeholder mapping and engagement
- Emergency preparedness and response
- OHS and community health and safety
- GBV, SEA, and SH prevention and response
- General site regulations;
- Proper use of PPEs;
- Prevention of spread of HIV/AIDS and other sexually transmitted deseases (STDs), and any other communicable desease;
- Relations between the workforce and the host communities;
- Defensive Driving and use of seat belts;
- Incidents/accidents reporting
- Monitoring and evaluation of (sub)Projects
- Environment and social management performance audit.

Additional training needs will be identified during Project implementation.

Training on resettlement framework including compensation, valuation, procedures, and grievance handling mechanisms for Woreda Compensation Committees and Grievance Redress Committees.

Clause A6.33: Observance by Sub-Contractors

The Contractor shall ensure that all sub-contractors engaged upon the works observe all the requirements of the contract.

Clause A6.34: Cost of Compliance

It is expected that compliance with these conditions is considered part of standard good workmanship and state-of-the-art as generally required under this contract. An item corresponding to “Compliance with Environmental Management Conditions” shall be considered in the Bill of Quantities to cover such costs. A reasonable proportion of payments to the Contractor shall be withheld if the SE and EEP believe that EHS measures have not been implemented to the level of their satisfaction.

Annex 7: Chance Finds Procedure

The Project will have no impact on known archaeological sites and artefacts as well as on cultural heritage. Nevertheless, the possibility exists for discovery of unexplored sites of cultural/historical and archaeological importance sites during excavation and site clearance.

Necessary Mitigation Measures

The purpose of these requirements is to assist in the event that an unexpected deposit or remains are encountered. The construction workforce will appropriately be informed to be vigilant in the detection and reporting of, and the prevention of disturbance and damage to objects and sites of physical cultural resource. Through the orientation program the contractor will ensure that all workers are aware of the criteria for identification of possible sites: Chance Find Procedure is disseminated among workers during induction trainings.

Upon identification of suspected archaeological or cultural remains, the following steps will be taken:

- The location must not be disturbed, operations will immediately cease in the affected area and activities that create ground disturbance will be minimised in and adjacent to the affected area;
- The discovered site will be delineated as "no work zone";
- Unauthorized entry will be prohibited and the site secured to prevent any damage or loss of removable objects;
- Discoveries will be reported to the EEP who will contact the Federal ARCCH or AACA Office of Culture and Information;
- No work will resume within a radius of 40m from the discovery site until an appropriate directive has been received from ARCCH or AACA Office of Culture and Information;
- Under no circumstances, any artefacts will be removed, destroyed or interfered with by anyone on the site; and contractors and workers shall be informed of the penalties associated with the unlawful removal of cultural, historical, archaeological or paleontological artefacts;
- The AACA's shall assess the significance and importance of the findings according to the various criteria relevant to cultural heritage;
- Decision on how to handle the finding shall be taken by the responsible AACA Authority and ARCCH. This includes conservation, preservation, restoration or salvage;
- Recommendations of the Authority concerning the management of the finding shall be communicated in writing by the Responsible AACA Authority to EEP;
- Restoration measures will be employed to protect discoveries and flagging the area boundaries; and
- An archaeologist will be retained to conduct a data recovery prior to the continuation of construction activities within the 26 m "no work zone".

Annex 8: Occupational Health and Safety Plan

It is clear that the success of a Project, in addition to other factors, depends on the health and safety status of its workers without whom it is hardly possible to achieve the desired goal of successful (efficient and effective) Project completion.

Therefore, the Contractor shall prepare OHS Plan with the objective to lay a road map of technical OHS rules and guidelines to be established and implemented by the contractor so as to provide all personnel with safe operating practices in the process of construction of the transmission line and substation Project.

Annex 12: Operational Health and Safety (OHS) Plan of the ESMF report presents an OHS Plan that provides minimum requirements and guidance for the implementation of Project activities. Sub-Project-specific measures shall be added according to the specific risks and impacts identified. The Contractor is required to compile it's own plan consistent with this plan and submit to the PIU OHS Specialists for review and approval.

Rationale and Objective of the OHS Plan

The main objective of this Plan is to provide a healthy and safe working environment. The OHS Plan will guide execution of project operations in a safe manner by clearly setting out procedures for assessing working conditions for different project activities and identifying safety procedures to mitigate the risks, stating out roles and responsibilities of the various project stakeholders which include: project management, contractors, workers, communities, and others.

This Plan is designed to define and establish commitments made by the Project to comply with the national health and safety requirements and World Bank Environmental Health and Safety Guidelines.

This Plan outlines the roles and responsibilities of employers, workers and affected persons in the implementation of the project activities to ensure that health and safety of workers, and the public is maintained at all times. All workers have a clear responsibility to maintain a positive attitude towards their safety and to prevent injury to themselves and others due to their acts or negligence. This Plan sets out responsibilities and duties of each worker to guarantee that the health and safety of everyone prevails throughout the implementation period of the Project.

Scope and Nature of the Plan

This Plan is applicable to Components 1-4 of the Project, except where the ESMS for sub-component 3b defines anything differently.

Roles and Responsibilities

The PIU will provide consultants, contractors and other workers with the authority to carry out the assigned tasks and holds them accountable for successful and safe completion of those specific tasks. All workers shall be accountable to meet the Project's OHS goals and objectives. Responsibilities of the key personnel and workers are described below:

Entity	Roles and Responsibilities
PIUs	Ensure that the contractors carry out implementation of the OHS Plan. Review and approve OHS mitigation measures for contractors and sub-contractors. Approve the staff for the contractor and sub-contractors. Carry out periodic OHS inspections and receive reporting. To be done by qualified/certified OHS personnel. Approve specific tasks with high safety and health risks. Provide resources for implementing agencies to implement the OHS measures. Adopt and implement workers' GRM Responsible for notifying the World Bank or any accidents or incidents on site, compiling RCA, ensuring costs and/or compensation is paid if applicable.
Principal Contractors	Ensure safe working environments for all workers on the sub-project sites and protect the environment and communities from risks and hazards associated with the works. To that end, the principal contractor will undertake the following duties and responsibilities, among others; ▪ Appoint CERTIFIED/QUALIFIED full time OHS Specialist to oversee development and implementation of OHS measures. ▪ Conduct site assessment. ▪ Compile site-specific OHS plan including site control measures to protect the site, workers on the site, equipment on the site, and the surrounding community from the site and works, including site housekeeping, site rules, standard operating procedures (SOP) for plant and equipment, preparing and use of specific materials or processes, PPE requirements, etc. Applicable to primary work site, and ancillary sites including borrow pit and quarry, transport routes between sites, ▪ Conduct risk assessment for all tasks and propose measures to eliminate risk and provide PPE and trainings according to results of the risk assessment. ▪ Conduct regular training inform and train workers on risks and hazards associated with the works, including briefing on OHS Plan and relevant SOPs, daily tool box talks. ▪ Provide adequate and appropriate PPE; including specialized PPE for specific tasks ▪ Provide safe drinking water and sanitary facilities ▪ Develop and implement an OHS Plan and any supporting plans including, waste management, Traffic Management Plan (which includes pedestrians), Hazardous substances management plan (including transport, handling, storage, disposal and emergency preparedness); ▪ Provide induction and training/safety briefing to all suppliers and visitors to the site, provide appropriate and adequate PPE to persons visiting the site.

Entity	Roles and Responsibilities
	▪ Report all H&S accidents/incidents to Supervising Engineers and Labour Office for independent investigation and initiating compensation process where necessary; ▪ Conduct periodic health assessments for workers as required. ▪ Provide rest areas, water break and sheds for workers for shelter during extreme weather conditions ▪ Conduct training for workers on how to do a Job Hazard Analysis and prestart inspections for vehicle/plant and equipment operators ▪ OHS communications will be done in languages that are easily understood by workers. If need be, translators shall be provided.
Sub- contractors	All subcontractors shall be subjected to and expected to adhere to the requirements of the OHS Plan the same way as the Principal Contractor. The OHS Specialist for the principal contractor shall be responsible for enforcing OHS adherence, conducting inductions and trainings as well as all task assessments for subcontractor's work sites. Subcontractors will: ▪ Ensure its workers are familiar with the OHS requirements and sign Code of Conduct ▪ Provide information, induction, instruction, training and supervision to ensure that each employee is safe from injury and risk to health. ▪ Provide adequate and appropriate protective equipment. ▪ Assist in accident investigations. ▪ Keep and maintain all H&S related records including Job Hazard Analysis and prestart checklists.

Anticipated OHS Risks

OHS related risks may occur specifically in Component 1, 2 and 3. Component 1 and 2, Distribution MV Network and Refurbishment and Modernization and Transmission Networks Strengthening and Modernization, will require significant public works. The specific OHS issues in relation to this component include live power lines, working at heights, working in confined spaces, electric and magnetic fields, heat, exposure to chemicals, fire risks and natural disaster risks.

Under Component 3, Enabling private participation in RE generation, the geothermal drilling and resource establishment bears specific OHS risks, such as Health risks through geothermal condensate has high temperature, low pH, and heavy metal content; reject waters from the separators are often pH neutral and may contain heavy metals; health risks through well blowouts and pipeline failures during well drilling or facility operations that result in the release of toxic drilling additives and fluids, as well as hydrogen sulfide gases from underground formations in the Pipeline ruptures – creating a surface release of geothermal fluids and steam containing heavy metals, acids, mineral deposits, and other pollutants; exposure to geothermal gases, confined spaces, heat, and noise (exposure to heat during construction activities and non-routine cases which include potential blowout accidents); gaseous exposure (like H2S); and health risks through H2S.

OHS risks related to wind and solar power include injuries, falls, fatalities caused by machinery and/or transportation, struck by falling objects, and risks from manual handling of heavy loads including wind towers and rotating blades; health and safety risks for communities and workers through transportation and handling of wind towers and blades and blade failure risks from wind turbines. However, these risks will be mitigated through a separate ESMS specifically for sub-component 3b.

OHS Management Requirements

This section provides guidance on plans and measures that the principal contractors and subcontractors will develop before implementation of the projects so that they are able to provide safe and healthy workplaces by mitigating and safeguarding hazards and risks, as well as by proactively improving OHS performance.

Occupational Health and Safety Management Plan

For all construction projects, the Principal Contractors shall develop a site-specific OHS Plan at least 4 weeks prior to commencement of activities on site, reviewed and cleared by the respective PIU. The OHS Plan shall have sub-plans, which will contribute to the overall implementation of the OHS Plan.

Reporting Obligations

All workers, supervisors, engineers, managerial team, subcontractors are responsible for the verbal or written reporting of accidents, incidents, near miss, hazards and occupational illness to the concerned site OHS Manager. Failure to do this may lead to fine or legal action according to the laws. The H&S Reports shall be submitted to the PIUs and to the responsible authorities on weekly and monthly basis.

Monthly OHS Reports to PIUs

The Principal Contractors shall prepare monthly OHS reports. The monthly reports shall be submitted by close of business of the first week of following month to the PIUs. The weekly reports shall comprise of the following information with respect to the reporting timeframe:

- Originator
- Name of the project
- Activities performed
- Health occurrences
- Safety occurrences
- Resulting accidents, incidents or dangerous situations
- RCA
- Investigation results
- Measures undertaken to address non-compliances including causes of incidents
- Lessons learned
- Informed authorities and resulting obligations/conditions
- Results of workplace inspections
- Training records
- OHS related grievances and resolutions

Work Place Inspection Reporting

The OHS staff of contractors will be requested to undertake workplace inspections. In case that hazards and risks are identified during work, the identified hazard or risk has to be eliminated without delay during the inspection. In case that the problem could not be eliminated, a written report has to be prepared and issued to the OHS Manager highlighting:

- a description of the problem;
- the reason why it could not be solved during the workplace inspection;
- the needed action;
- the responsible person;
- the associated hazards and risks;
- The deadline until the problem must be solved.

The occurrences must be reported in the monthly OHS Report. Any other reporting requirements with respect to OHS, e.g. audit reports, weekly and monthly O&S reports, remain unchanged. The workers/supervisors shall also be trained to conduct and document a Job hazard analysis to be done for each task before starting work. In addition to the site inspections by the OHS staff.

OHS risk	Mitigation Plan or Measures
Traffic Accidents and other traffic related risks	**Traffic Management Plan** Contractors will develop a traffic management plan to ensure smooth flow of traffic and manage the project induced traffic conflicts. This also ensure a safe and standard transportation of workers and material for the project.
Risks related to working next to water, especially in the wet season	**Site Security Plan** Each contractor shall prepare a site-specific security plan to manage the project induced security issues and to ensure a safe and timely completion of the project. It will also help contractors to ensure safe work site and store premises.
	Storm Water Management Plan Contractors will be required to develop and implement Storm Water Management Plan. The Plan will outline measures the contractor will follow to avoid pollution, contamination, erosion and flooding by controlling runoff. Stormwater / runoff water Rain runoff water must be appropriately attenuated on site before discharge to the surround environment and community. Erosion project and energy dissipation must be installed as necessary to prevent soil erosion on and off the site. Oil separation from stormwater must be installed, waste, including sediment, must be collected/retained on site. Tools and Equipment Tools and equipment must be fit for purpose. All lifting appliances and lifting gears are to be properly inspected and certified. Guards and electrical trip switches must work effectively and must not be removed or bypassed. All tools shall be of good quality and maintained in a safe working condition. Homemade tools are not permitted. All power tools must have proper earthing, cables, plugs to avoid any shock. Erecting of Scaffolds shall be inspected and tagged accordingly by competent personnel before use
Health risks through hazardous substances	H**azardous Substances Management Plan** Contractors will be required to submit and implement a Hazardous Substances Management Plan. This plan shall clearly define the mechanisms for managing biological, chemical, and radiological materials and wastes. The Hazardous Substances Management Plan will address methods both to identify materials that need special handling and to prescribe processes to minimize the risk of their unsafe use and/or improper disposal. This plan shall have procedures to govern activities from receipt to disposal of these hazardous agents.
Health risks for workers and communities through waste	**Waste Management Plan** It shall be a requirement for contractors to develop and implement a site specific waste management plan (WMP). The plan shall address management of all solid and liquid refuse that result from project activities. The WMP will provide guidelines on waste reduction, segregation, collection and disposal practices in accordance with international best practices, to avoid deterioration of the natural environment and negative impacts on the health and safety of workers and the communities in the project areas. The Project is committed to apply the waste hierarchy and will seek to be a zero waste discharge facility. This plan is the primary tool to guide employees towards waste management.
Risks through noise for workers and community members	**Noise Management Measures** Each contractor shall ensure to manage the project induced noise at the worksite and the surrounding community. Excessive exposure to

OHS risk	Mitigation Plan or Measures
	noise can increase the onset of Noise Induced Hearing Loss (NIHL). In this regard, the contractor shall ensure to put noise control measures to ensure the safety and health of workers and the surrounding communities. Some of the noise control measures include, but not limited to the following: - Improve the design of machines (e.g. by supplying them with shock absorbers and anti-vibration mounting, installing protective Plexiglas enclosures, etc.). Where possible, use special covers, silencers and generally materials with strong anti-vibration capacity. - When technically feasible, reduce emission of noise by placing a barrier between the noise source and the employee (e.g. a sound-proof cabin). - Increase the distance between the noise source and the worker. - Provide workers with personal protective devices such as suitable earmuffs and plugs. - Use tools and equipment with anti-noise design. - Maintain equipment properly since poorly maintained machinery can increase sound emissions. Reduce the speed of cutting, sawing and spinning (Facts) - Limit the amount of time an employee spends at a noise source. This can be implemented when workers take it in turns to spend time at very noisy areas. Provide quiet areas where workers can spend time in order to gain relief from hazardous noisy environments.
Health risks related to air quality	**Air Quality Management Measures** Contractors shall ensure to put in site specific air quality measures to manage air pollution induced by the project activities to safeguard the safety and health of workers and the public. The measures shall be submitted to PIU for approval prior to commencement of any activities which may have the potential to pollute air. Major sources of air pollution include: - Storage sites for cement, quarry, sand and gravel - Loose soil due to excavations and vehicular movements - In this regard, there is need to locate concrete batch plant away from residential areas. Storage sites for cement, quarry, sand and gravel shall always be covered. This shall include the transportation of such materials. Road and weigh bridges construct may cause significant impacts on surrounding communities due to dust release. The contractor shall frequently suppress dust through compaction and water spray. Where quarrying activities will be conducted under the project dust emissions are expected from production and processing of quarried materials, transporting, loading, unloading and stockpiling quarried material. Among others, the contractors shall implement the measures listed below; - Where possible Install a wetting system at the quarry production site to keep materials damp, - Cover materials by tarpaulin when being hauled by vehicles, - Reduce drop height to a minimum, - Limit vehicles speed, - Provide adequate and appropriate PPE to workers/visitors at the site, - Prepare risk assessment for all activities happening at the quarry site

OHS risk	Mitigation Plan or Measures
Risks of Accidents	**First Aid** A fully equipped first aid box is to be available at all project sites, stores and offices with a ratio of 1 box to 30 people. The first aid box shall be easily accessible and all workers shall be informed of the location. The Site Engineer / Site Supervisor are responsible for maintaining and recording all the usages of the first aid box. The first aid box shall also be easily available at area where activities of high risk of injury are being undertaken. Ensure that the worksite has qualified First Aiders who have undergone first Aid Certification training. All contractors shall provide or ensure that they are provided with such equipment and facilities as are adequate and appropriate in the circumstances for enabling first aid to be rendered to any of their workers / visitors in case of illness, injury or incident at project sites. A leaflet on first aid / posters shall be kept with the first aid box at the stores. The workers are to be briefed regularly about first aid in the 'Tool Box Talks'. Remote sites shall have written emergency procedures in place for dealing with cases of trauma or serious illness up to the point at which patient care can be transferred to an appropriate medical facility. Procedures shall be pictorial and in English as well as in common local languages. The contractors, in their site specific OHS plan/Emergency response plan, shall identify and indicate the closest clinic or hospital to the site in case of emergencies and shall have hospital emergency contacts. Access roads need to be assessed and alternative routes identified in cases on emergency situations especially for remote sites
Risks through handling machinery and equipment	**Machinery Safety** All drivers and operators of mobile plant (mechanically propelled vehicles) shall be in possession of the appropriate license for the class of vehicles. Site Engineer/supervisor to ensure that all drivers and operators of mobile plant (mechanically propelled vehicles) are certified as competent. All mobile equipment (mechanically propelled vehicles) shall be inspected by a competent person and certified fit prior to use on site. Equipment considered to be unsafe shall not be allowed access to the site. Daily Check of Equipment to be carried out before starting of shift and document prestart inspection using a checklist and reporting of faults/anomalies All rotating parts of the plant/equipment shall be guarded properly. In case of any issues with the vehicle/ equipment, the operator must immediately stop the vehicle and report to Site Engineer/ Foreman and get it rectified immediately. The Operator/ driver must ensure that no one is close to the equipment while operating. A trained banksman will give signal to the operator when the equipment is being operated. The banksman must always wear Hi-Visibility jacket for easy visibility – all vehicles/plant shall be fitted with reverse beeping alarms. Prohibit, (through inductions/ Coc/training), resting under parked heavy machinery, plant and vehicles. Provide rest areas and encourage workers to rest in designated areas/sheds only.

Incident and Accident Reporting & Investigation

Any accident resulting into damage or loss of property, injury, disability or loss of human life or have possibility of significant environmental impact shall be reported by project manager of that sub-project giving brief details to the PIUs at earliest possible time and not extending 48 hours from occurrence of the accident. The event summary report of the same shall be submitted to WB within 48 hours of notification, as per the instructions provided in this ESMF.

OHS Plan

This section provides an outline on how principal contractors and subcontractors will manage health and safety risks during project implementation. It contains an introduction, risk management process, task specific permits, job safety analysis, Safe work instructions, Health and Safety Review program, Health and Safety audits, Health and Safety, inspections, Health and Safety corrective actions and Health and Safety trainings.

In order to ensure the effective implementation of an OHS plan, the risk involved in the operation shall be known. In other words, the degree of risk involved in the operation shall be analyzed, controlled and properly managed. The contractor with key personnel along with OHS personnel shall carry out risk assessment of all operations. The basic steps are based on Hierarchy of control (HOC) as follows:

- Classify work activities
- Identify hazards
- Assess the risk from each hazard applying the ESMF risk assessment methodology.
- Try to eliminate the hazard
- Reduce the risk/ exposure by Hierarchy of Control:
- Eliminate
- Reduce / isolate risk
- Engineering and Administrative controls (Operating procedures)
- Provision of task appropriate PPE
- For activities which fall under High/Very high risk “H” following measures will be taken:
    - Consider alternatives that eliminate the risks;
    - Decide if the risk is tolerable otherwise, prepare risk control action plan Identify the qualification/capacity level for persons to undertake the activity
    - Providing task specific training, Tool Box Talk, Safety Induction and on the job training.
    - Monitor and audit the progress of plan and effectiveness
    - Review adequacy of action plan and revise if necessary

Risk Management Process

Job Safety Analysis: The contractor shall undertake a Job Hazard Analysis (JHA). The Analysis is a procedure which shall help to integrate safety and health principles and practices into a particular job operation. In the Analysis, each basic step of the job-related hazards has to be identified and recommendations have to be provided to choose the safest way to do the job.

For conducting the Analysis, five steps have to be considered as follows:

- selecting the job to be analyzed
- breaking down the job into a sequence of steps
- Identifying the core requirements and competency for doing the job for instance Don't use an illiterate person for a task that requires lots of numbers and counting/reading
- identifying potential hazards
- Determining preventive measures to overcome these hazards.

Each contractor shall submit the Analysis procedure for the approval of the Supervising Engineers and PIU prior to commencement of any activity. A contractor's team will be formed comprising of Site Engineer, Site Foremen. Experienced crew staff for the task and the OHS team to prepare the Analysis taking into consideration the above points. The Analysis will be based on past experience and will be site-specific. Once, the Analysis is ready it will be submitted to the respective PIU or supervising engineer for review and approval. The results of the Analysis will be shared with all workers.

Risk Register: The significant risks involved in the installation/ construction and related activities are assessed and registered in the form of qualitative risk assessment. The risk register is a systematic break down of activities, its potential hazards, and the risk involved. Risk rating is identified by multiplying severity by probability of occurrence based on the risk matrix chart and then its control measures. It is always recommended to prioritize those activities considered high risk. The concept of a risk register recognizes that risk elements arising from proposed or actual activities fall into one of following four categories:

a) Risks which are deemed low can proceeded by taking care of all safety measures

b) Risks that are medium will proceed with caution & necessary safety measures

c) Risks that are high need to be managed & checked with site engineer & site OH&S officer. If uncontrolled, a risk event at this level may have a significant impact for the actions and tasks at an installation and construction site as a whole. Mitigating actions need to be very reliable and shall be approved and monitored by the OHS Officer & Site Engineer. Even with mitigating actions in place, the construction site staff potentially exposed to that risk shall be advised of identified or potential risks which have been graded at this level.

d) Risks, which have an extreme high risk and therefore the activity, shall probably not proceed until Site Engineer & OHS Officer take all necessary corrective measures. Identify if there are any controls currently in place to mitigate those risk; If not, develop and document risk mitigation actions. These could include:

    - Planned actions: Reducing the likelihood of a negative risk to occur and/or reduce the seriousness shall it occur (What shall you do now?)
    - Contingency actions: Planned actions to reduce the immediate seriousness of a negative risk when it does occur. (What shall you do when?)
    - Recovery actions: Planned actions taken once a negative risk has occurred to allow you to move on. (What shall you do after?)
    - Risk Transfer: Contractor staffs are covered under firms' accidental insurance. The risk is transferred to subcontractors covering all high risk work. For example bush clearing, excavation etc.

For work to commence the following steps shall be taken:

Stage 1 Highlight Potential Hazards: Worker(s) and the site construction foreman guided by the OHS Specialist shall highlight potential hazards of a task and identify all necessary safety measures. Hazard identification must consider all required electrical and mechanical equipment. Stage 1 has to be done in writing. Work is not permitted to commence until Stage 4.

Stage 2 Application of Permit: The Site Engineer/ Foreman (Issuing authority) applies for permission to start work on a prescribed form and submit the application to the OHS Specialist only when all requirements and conditions described in the permit to work have been fulfilled. The Site Engineer /Foreman has to indicate in the written permit that risk assessment was conducted. The risk assessment must be attached to the permit to work.

Stage 3 Evaluation of Permit: The Supervising Consultant will evaluate and verify that all safety conditions specified in the permit to work have been fulfilled and are adequately described. The Supervising Consultant may also recommend additional measures in the permit to work when necessary. Inspection to the location of work where the permit to work has been applied for is to be done, with the Foreman during this process. Only when all safety requirements and conditions stated in the permit to work are fulfilled, the permitting Supervising Consultant will then endorse the permit to work form and forward to the OHS Specialist.

Stage 4 Approval of Permit: The Supervising Consultant may approve and issue the permit to work only when it is satisfied that:

- Proper evaluation of risk and hazards for the work concerned has been conducted including competence and skills of the persons to carry out the task shall be checked;
- No incompatible work will be carried out in the same time and location of the permit to work, which may pose a risk to the persons at work;
- All reasonably practicable safety measures have been taken and all persons involved in the work have. been informed of the work hazards under the Permit to Work;
- All electrical and mechanical equipment is demonstrable checked and in safe condition. Please note that the permit can be signed by E&S specialists in absence of Project Manager as authorized persons. E&S Specialists must inform the Project Manager before signing the permit. A work permit is valid for a time limit say one working day and for the specified working time. An extension could be provided for additional two hours. In case the tasks could not be finalized within the validity of the permit to work, the permit to work must be renewed before commencement of work on the day the work may continue.

Safe Work Instructions: Contractors shall develop site-specific work instructions. Safe work instructions identifying the OHS issues that may arise from use of the machinery and equipment. The safe work instruction must be based on the OHS Plan. A safe work instruction shall identify:

- the risks and hazards associated with the use of a specific tool or piece of equipment;
- the required control measures to be checked to ensure a safe use of a specific tool or piece of equipment;
- the specific training and/or qualification required;
- the PPE to be worn.

Note that safe work instructions do not replace the requirement for a risk assessment, preparation of a workplace procedure, the need of a permit to work or the need for training. They may be used to supplement the process of creating and providing a safe system of work. In the forms of standard operating procedures or standard work method statements for activities to be undertaken. The safe work instructions shall be submitted for approval from the concerned authorities. The approved work instruction must be communicated to each and every member of the working crew for understanding.

Health & Safety Review Program: All contractors shall commit to review their performance in OHS on a timely basis and as and when required basis. The Project believes the review will play an important role in continual improvement of any OHS management procedure. The Principal Contractor shall implement a Project-specific OHS Review Programme for the project. The review program shall include a systematic evaluation of the implemented management system, compliance with this Project OHS Plan and local legislative requirements.

Health & Safety Audits: Contractors shall review the OHS management system by undertaking OHS site audits on a quarterly basis or randomly. The audits shall be performed by the Construction Manager, OHS Manager, and the Supervising Consultant. The audits shall be conducted at the construction sites, material and equipment storage areas, and workshop areas and the adjacent areas affected by the project activity sites, including ancillary sites. These audits shall be recorded and a copy of the audit report shall be attached to the monthly H&S report. Each contractor will develop its own internal as well as external auditing procedure and Project specific audit plan.

Health & Safety Inspections: Competent Inspection and monitoring is the key to continual improvement when monitoring deviations from the plan and change in the conditions. The inspection will help the contractors to improve their performance by early detection of indicators to major incidents. The PIU shall ensure competent inspection and monitoring on weekly basis of all contractors OHS performance.

Corrective Action: After conducting inspections, the following corrective actions shall be undertaken. The list corrective actions must include the following information:

- Identified risks and non-compliances;
- Needed corrective actions;
- Needed personal and material resources;
- Responsible person;
- Date for latest finalization

Training: OHS trainings aims at equipping workers with knowledge and skills on identifying safety, health and environmental hazards as well as determining appropriate control measures. The trainings will be provided in workers' language. Trainings take different forms as indicated below:

Induction Training:

The recruitment and placement processes ensure that all workers and subcontractors have the necessary physical and mental abilities for the job or can acquire these through training and experience. The contractors will ensure that all new workers, labor supply (from approved vendor) and subcontract personnel (approved) shall be given a H&S induction, carried out by OHS Specialists. No personnel/ sub-contractor will be engaged prior to approval. Prior to commencement of work all tradesman shall be given a trade test by a qualified and competent site foreman and/or site engineer.

OHS induction can be defined as the initial training and awareness imparting session to make the personnel aware of the inherent hazards and risks involved in the process and

area. Prior to commencing work, the contractor will ensure that all personnel undergo an OHS Induction course which stresses the need for the highest standards of health and safety on the project and conveys the requirement to fulfil the requirement of this OHS Plan. No workers will be allowed to work/visit on site without prior induction.

Below is a list of some of the topics to be covered during worker's induction:

- World Bank and national OHS policy statement
- Brief of safety rules and regulation
- Permit to work systems
- Emergency response procedures, emergency telephones numbers assembly points.
- First aider's telephone numbers, egress routes, first aid fire-fighting procedures.
- Reporting procedure.
- Reporting system for unsafe working conditions and practices
- Proper usage of PPE at site.
- Hand tools and its usages.
- Unauthorized jobs or tasks
- House Keeping and waste identification.
- Warning signs and cautions displayed on site.
- Transport, vehicle and equipment movement. Traffic safety
- Drug and alcohol policy.
- Occupational health and hygiene.
- Accident, incident and Near Miss Reporting procedures
- Heat stress, dehydration and remedies (Heat related abnormalities).
- Explanation of project and employee duties and responsibilities.
- Electrical hazards.
- Protection of environment, pollution to Air, Water and Soil
- Waste handling and disposal procedures.
- Basic site safety rules.
- Recent Similar field incidents.

The contractors will ensure that they have the induction training scheduled for the newly joining workers any day irrespective to pre-planned program. Refresher training will be done on a semi-annual basis or as and when situation demands.

Before entering the site, all visitors must undergo OHS induction process. A induction module for visitors will be designed by OHS Specialist for the contractors. The visitors will be provided with an overview of OHS rules particularly OHS risks, risky areas, significance of PPE they need to wear before entering the site and emergency protocols. Visitors induction records will be maintained. .

Toolbox Talks: Tool box talk is a 5-10 minutes communication between working crews and site supervisor/site engineer related to job specific safety issues, roles responsibilities on daily basis and as and when required. Contractors will ensure that the tool box talk document is available with safety department. During the meeting the site engineer will

always ensure all the work force is aware of their duties, Dos and Don'ts and risk involved. The site engineer/ supervisor shall also monitor/ verify the fitness of the personnel for work. Toolbox talks shall consider as well lessons learned from incident and accident investigation, audits, workplace inspections etc. The Site Engineers/ Supervisor shall conduct regular toolbox meeting on different topics by selecting small groups of people (maximum 15).

Training Needs Analysis: Training Needs Analysis (TNA) is the process to discover the training and development needs of people so that they can carry out their job effectively and efficiently, and also to continue to grow and develop their careers. TNA covers a range of approaches. All contractors will carry out a TNA to identify the training needs of the work force as regards OHS.

Training Schedule:

Planned training programs gives the opportunity of continual improvement and re-enforcing the best work practices by reminding the bad practices acquired during the work. All contractors will prepare a training schedule to be in line with TNA to help the personnel gain required level of competency for the time in need.

Personnel Protective Equipment (PPE): PPEs are the last resort of personnel protection. Contractors shall identify PPEs for the working personnel considering the following: For each hazard identified, select PPE that will protect the employee by creating a barrier against workplace hazards. Consider the likelihood of an accident and the seriousness of a potential accident. PPE must be selected to protect against any hazard that is present or likely to be present. It is important for department personnel to become familiar with the potential hazards, the type of protective equipment that is available, and the level of protection that is provided by that equipment. The PPE selected must fit the employee it is intended to protect. Make certain that workers have the correct size of protective equipment. Whenever possible, select adjustable personal protective equipment. Workers including subcontractor workers must be trained in the use of their specifically needed appropriate PPE and adhere to No PPE, No work policy.

Employee input in the selection process of PPE is critical. Personal protective equipment that fits properly and is comfortable will more likely be worn by workers. Damaged or defective protective equipment must be taken out of service immediately to be repaired or replaced and workers must be provided with the proper equipment in the interim. Mandatory PPE requirement at site will be helmets, safety shoes, and hi- visibility vest before entering to site. Few examples listed below the purpose of using such equipment as: Helmet used to prevent - Objects might fall from above and strike them on the head; might bump the heads against fixed objects, such as exposed pipes or beams; or there is a possibility of accidental head contact with electrical hazards. Safety shoes- for example employees who face possible foot or leg injuries from falling or rolling objects or from crushing or penetrating materials, shall wear protective footwear. High visibility vests to be used for good visibility specially to attract drivers/operators while operating equipment and vehicle. Task specific PPE will be used while carrying out specific activities.

OHS Procedures

This section outlines specific activities to be implemented by contractors when implementing sub-projects activities under the Project. The contractors will always adhere to the procedures that follows:

Task/Activity Risk Assessment

Contractors shall undertake a risk assessment for all activities and will be assessed to be of a low, medium, high and very high risk. The OHS Specialist shall conduct the risk assessment with the involvement of the experienced staff, Foreman, and worker(s) to

undertake the activity. The risk assessment shall be carried out before the execution of the activity and the risk assessment shall be documented. The risk assessment shall be approved by the Manager responsible for the installation or construction site. The risk elements shall be identified from actual activities and associating them in terms of likelihood of occurring and seriousness of impact.

Portable Water Supply

The contractor shall be responsible for supply of potable water for drinking and raw water for washing/toilet facilities, and construction purposes.

Workplace Temperature

Exposure to hot or cold working conditions in indoor or outdoor environments can result in temperature stress-related injury or death. Use of PPE to protect against other occupational hazards can accentuate and aggravate heat-related illnesses. Extreme temperatures in permanent work environments shall be avoided through implementation of engineering controls and ventilation. Where this is not possible, such as during short-term outdoor work, temperature-related stress management procedures shall be implemented which include:

- Monitoring weather forecasts for outdoor work to provide advance warning of extreme weather and scheduling work accordingly
- Adjustment of work and rest periods according to temperature stress management procedures provided by ILO, depending on the temperature and workloads
- Provide temporary shelters to protect against the elements during working activities or for use as rest areas
- Use of protective clothing ·
- Providing easy access to adequate hydration such as drinking water or electrolyte drinks;
- Alcohol tests will be done every morning and workers who test positive will be barred from entering the site.

Lone and Isolated Workers

A lone and isolated worker is a worker out of verbal and line of sight communication with a supervisor, other workers, or other persons capable of providing aid and assistance, for continuous periods exceeding 5 minutes. The worker is therefore at increased risk shall an accident or injury occur. Where workers may be required to perform work under lone or isolated circumstances, the contractor/client shall develop and implement SOPs to ensure all PPE and safety measures are in place before the worker starts work. The developed SOPs shall establish, at a minimum, verbal contact with the worker at least once every hour, and ensure the worker has a capability for summoning emergency aid. If the worker is potentially exposed to highly toxic or corrosive chemicals, emergency eye-wash and shower facilities shall be equipped with audible and visible alarms to summon aid whenever the eye-wash or shower is activated by the worker and without intervention by the worker.

Lavatories

During implementation of all activities the contractor shall provide adequate and appropriate lavatory facilities. The facilities shall be maintained in a clean and orderly condition. The provided lavatory facilities shall meet the number of people expected to work in the facility and allowances made for segregated facilities, or for indicating whether the toilet facility is “In Use” or “Vacant”. In cases where both male and females are employed the lavatories will have separate entry for each sex. Toilet facilities shall also be provided with adequate supplies of water and soap.

Annex 9: Community Health, Safety and Security Management Plan

Several activities associated with the construction of the Project may impact upon the health and safety of the local community. Threfore, the Contractor shall prepare Community Health, Safety and Security Management Plan to address the specific risks and impacts that are anticipated to occur as a result of the planned construction. Therefore, the Community Health, Safety and Security Management Plan shall:

- Describe the national and WB' ESS requirements for managing public safety;
- Proactively prevent and avoid risks and impacts to community health and safety, and enhance any positive impacts related to community health and safety;
- Mitigate potential impacts of Project related activities that may affect the health and safety of communities within the Project area and along the transportation route;
- Maintain a healthy workforce and labour pool in the community;
- Continuously identify, evaluate and prioritise the risks and impacts of Project construction's activities on the health and safety of local communities;
- Contribute to the improved health and wellbeing of the local community in the Project area;
- Incorporate measures to manage traffic and road safety risks as required in the ESIAs/ESMPs prepared under ESCP and ESMF content;
- Assess and manage specific risks and impacts to the community arising from Project activities, including, inter alia, the behavior of Project workers, prevention of communicable diseases, risks of labor influx, response to emergencies, and include mitigation measures in the ESMF and ESIAs/ESMPs;
- Present security risk assessment and arrangements, provisions to avoid risks for the workers and communities deriving from inappropriate behaviour or abuse by security staff and commitments to follow good international industry practices (GIIP); and
- Adopt and implement community health and safety measures as part of the C-ESMP and ESIAs/ESMPs.

Scope wise, this community health and safety management plan will be applicable to all work sites and all activities associated with construction of the Project and shall be implemented at the beginning of the construction phase and continue to the end of the Project life.

The Community Health, Safety and Security Management Plan shall contain the following:

a) *Purpose and Scope:* Several activities associated with the construction of the Project may impact upon the health and safety of the local community. This Management Plan shall be compiled to address the specific impacts that are anticipated to occur as a result of the planned construction.

b) *Identified Risk and Impact Origin and Characteristics:* The potentially affected communities by the construction activity shall be identified from the proposed Project area along with the potential health and safety effects and opportunities for improvement through the Project works.

c) *Recommended Management Measures:* The Contractor shall always take risk assessment as prime tools to identify Project related risks to the public so as to protect the community from hazards. The Contractor shall comprehensively set out and recommend management measures in relation to each of the significant risks and potential adverse impacts on the community health and safety, including clear reference to required timing of each measure.

d) *Monitoring:* Implementation of the Community Health, Safety and Security Management Plan will be monitored regularly to ensure its compliance with all relevant national and international standards, including ESS4 of the World Bank and to ensure that the Contractor is fulfilling its commitments specified in its management plan.

e) *Reporting and Notification:*

Internal Reporting: Monthly reports must be generated and lodged with the contractor as part of Contractor's Environmental and Social Monitoring. The reports must summarise the data collected through the monitoring programme, identify any occasions where specific remediation was taken. The reports must also summarise any complaints received from the local communities, setting out the complaint, whether it was substantiated and any actions taken to alleviate the impact.

Community Complaints: Community complaints and concerns must be captured and addressed through regular community consultation and Grievance Redress Mechanism. The procedure has been designed to provide a simple, fair and transparent process for all external parties to provide feedback and to raise grievances.

Community Reporting: A summary report suitable to a non-technical community audience must be developed and disclosed quarterly by EEP. This report shall focus upon graphical representation of information, and in particular outcomes of any community complaints and those actions taken to remedy significant impacts. This shall be undertaken in non-technical languages and in suitable local languages in a culturally appropriate manner.

f) *Training and Capacity Building:* Those responsible for the community management, particularly community health service implementers, and operation of any aspect of the Community Health, Safety and Security Management Plan shall be trained and awareness creation programs shall be done at all levels of the community. Therefore, the Contractor shall prepare specific training plan for the community and construction team.

g) *Roles and Responsibilities:* The plan will identify and list roles and responsibilities for implementation of the plan.

Annex 10: Construction Waste Management Plan

Construction work like substation and transmission line Project will produce considerable amount of waste. Therefore, the Contractor is responsible to avoid or minimize the generation of waste materials as far as practicable and where waste cannot be avoided it will be recovered and reused, treated, or disposed by following nationally or internationally recognized procedures.

Therefore, the Contractor will prepare Construction Waste Management Plan with the objective to:

- Facilitate compliance with applicable requirements (Ethiopian legislation, applicable WB's ESSs, particularly ESS3, and other requirements);
- Establish waste management priorities based on the understanding of the potential Environmental, Social, Health and Safety (ESHS) risks and impacts associated with the Project and considering the consequences of waste generation;
- Identify the different types of waste in accordance with Ethiopian regulations;
- Define waste hierarchy and waste minimization strategy (i.e. prevention, reduction at source, reuse, recovery, recycling, treatment and responsible disposal) from Project activities in such a manner as to minimize potential impacts to human health and the environment; and
- Define responsibility for waste management handling, i.e. collection, segregation, treatment, storage, transport, safe disposal, and documentation.

The Construction Waste Management Plan shall be applicable across Contractor‘s entire direct and indirect activities at Project site. Sub-contractors, acting on site under the Employer's control are required to respect the provisions of this plan.

The Construction Waste Management Plan shall contain the following:

a) *Purpose and Scope*

b) *Impact Origin and Characteristics:* The major waste materials (and their sources) that can be generated during construction of the Project include:

c) *Recommended Management Measures:* The Contractor shall apply the duty of care principles to waste management activities to ensure that waste is managed in accordance with the requirements of the Environmentaland Social Impact Assessment/Environmental and Social Management Plan (ESIA/ESMP) of the works and that waste does not pose a threat to human health or the environment and all disposed waste is taken to authorized areas for the purpose.

d) *Monitoring:* Implementation of the waste management plan will be monitored regularly to ensure its compliance with all relevant national and international standards and to ensure that the Contractor is fulfilling its commitments specified in its waste management plan.

e) *Reporting and Notification:* The Contractor must keep records of all types of waste movements on the jobsite that must be tracked and recorded and reported as part of the monthly environmental, social, health and safety (ESHS) reports to EEP.

f) *Training and Capacity Building:* The Contractor shall ensure that all personnel responsible for the execution of the task and requirements contained within the Construction Waste Management Plan are competent on the bases of education, training and experience. Therefore, the specific training plan will be prepared.

g) *Roles and Responsibilities:* The plan will identify and list roles and responsibilities for implementation of the plan.

Annex 11: Site Rehabilitation and Restoration Plan

When the construction works have been completed, all areas used temporarily by contractors are often left in a deplorable condition. Scrap metal, old tires, other wastes and large masses of concrete, can pose problems for the nearby communities who are left to remove and dispose them, and may be left with contaminated land.

Therefore, following completion of construction activities, all temporary construction sites, etc. shall be rehabilitated/reinstated, leaving them in a clean and tidy condition, and suitable for the purposes for which they were used prior to occupation by the Contractor. However, remedial actions that cannot be effectively carried out as part of the progressive restoration plan during construction shall be carried on completion of the final site restoration works.

Therefore, the Contractor shall prepare Site Rehabilitation and Restoration Plan that shall contain the following:

a) *Purpose and Scope*
b) *Identification of Risk and Impact Origin and Characteristics*
c) *Recommended Management Measures*
d) *Monitoring*
e) *Reporting and Notification*
f) *Training and Capacity Building*
g) *Roles and Responsibilities*

Annex 12: Incident Report Form

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

Annex 12.1: Incident report form

B1: Incident Details			
Date of Incident:	**Time:**	**Date Reported to PIU:**	**Date Reported to WB:**
Reported to PIU by:	**Reported to WB by:**	**Notification Type:** Email/'phone call/media notice/other	
Full Name of Main Contractor:		**Full Name of Subcontractor:**	

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

See Annex for definitions

B3: Description/Narrative of Incident
For example: *I. What is the incident?* *II. What were the conditions or circumstances under which the incident occurred (if known)?* *III. Are the basic facts of the incident clear and uncontested, or are there conflicting versions? What are those versions?* *IV. Is the incident still ongoing or is it contained?* *V. Have any relevant authorities been informed?*

B4: Actions taken to contain the incident			
Short Description of Action	**Responsible Party**	**Expected Date**	**Status**
For incidents involving a contractor: Have the works been suspended under Contract GCC8.9? Yes ☐; No ☐; Name of Contractor:			

B5: What support has been provided to affected people

Annex 12.2: Incident form to be completed after investigation

The following report form will be completed by the PCU following investigations into an incident:

C3a: Fatality/Lost time Injury information

Cause of fatality/injury for worker or member of the public (please check all that apply):

1. Caught in or between objects ☐ 2. Struck by falling objects ☐ 3. Stepping on, striking against, or struck by objects ☐
4. Drowning ☐ 5. Chemical, biochemical, material exposure ☐ 6. Falls, trips, slips ☐ 7. Fire & explosion ☐
8. Electrocution ☐ 9. Homicide ☐ 10. Medical Issue ☐ 11. Suicide ☐ 12. Others ☐
***Vehicle Traffic:* 13. Project Vehicle Work Travel ☐ 14. Non-project Vehicle Work Travel ☐ 15. Project Vehicle Commuting ☐**
16. Non-project Vehicle Commuting ☐ 17.Vehicle Traffic Accident (Members of Public Only) ☐

Name	Age/DOB	Date of Death/Injury	Gender	Nationality	Cause of Fatality/Injury	Worker (Employer)/Public

C3b: Financial Support/Compensation Types (To be fully described in Corrective Action Plan template)

1. Contractor Direct ☐ 2. Contractor Insurance ☐ 3. Workman's Compensation/National Insurance ☐
4. Court Determined Judicial Process ☐ 5. Other ☐ 6. No Compensation Required ☐

Name	Compensation Type	Amount (US$)	Responsible Party

C4: Supplementary Narrative

C1: Investigation Findings

For example:

I. *where and when the incident took place*
II. *who was involved, and how many people/households were affected*
III. *what happened and what conditions and actions influenced the incident*
IV. *what were the expected working procedures and were they followed*
V. *did the organization or arrangement of the work influence the incident*
VI. *were there adequate training/competent persons for the job, and was necessary and suitable equipment available*
VII. *what were the underlying causes; where there any absent risk control measures or any system failures*

C2: Corrective Actions from the investigation to be implemented (To be fully described in Corrective Action Plan)

Action	Responsible Party	Expected Da

Annex 12.3: Incident Report Form for SEA/SH cases

The following incident form will be completed by the PCU in the case of SEA/SH cases, within 24 hours:

B1: Incident Details		
Date of incident intake by the project/GM:	**Date Reported to PIU:**	**Date Reported to WBG:**
Reported to project/GM by: ☐ Survivor ☐ Third party ☐ Other: _____ **Is a record of this incident in GM?** Yes ☐ No ☐	**Reported to PIU by**: ☐ GM operator ☐ Directly, by Survivor ☐ Directly, by third party ☐ Other: _____	**Reported to WBG by**: ☐ PIU ☐ Directly, by Survivor ☐ Directly, by third party ☐ Other: _____

B2: Incident type (please check all that apply) See Appendix 1 for definitions
Sexual exploitation ☐ **Sexual abuse** ☐ **Sexual harassment** ☐

B3: Provide the following details from the GM record	
Age of survivor (if recorded in GM):	Have the national legislation or mandatory reporting requirements been followed? Yes ☐ No ☐
Sex of survivor (if recorded in GM): Male ☐ Female ☐ Other ☐	Was the survivor referred to service provision?[29] Yes ☐ No ☐
Is the survivor employed by the project (as indicated by the survivor or complainant and reported in the GM)? Yes ☐ No ☐	Is the alleged perpetrator employed by the project (as indicated by the survivor or complainant and reported in the GM)? Yes ☐ No ☐

B4: Basis for further action	
a. Has the complainant provided informed consent to lodge a formal complaint? Yes ☐ No ☐	c. Has the survivor provided informed consent to be part of an investigation into misconduct? Yes ☐ No ☐
b. Does the employer have a suitable administrative process and capacity in place to investigate misconduct relating to SEA/SH in a survivor-centered way? Yes ☐ No ☐	d. Has the complaint been filed anonymously or through a third party? Yes ☐ No ☐
If the answer to any of these questions is no, has the GM assessed the risks and benefits of carrying out an investigation into the alleged misconduct, taking into account the survivor's safety and wellbeing? Yes ☐ No ☐	
Will an investigation into misconduct be undertaken in addition to an investigation into adequacy of project systems, processes or procedures? Yes ☐ No ☐	

Annex 12.4: SEA/SH incident report form after investigations

The following form will be completed by the PCU in case of SEA/SH cases – following investigations:

C1: Findings of the investigation		
Have sanctions against a perpetrator been recommended as part of an investigation into misconduct? Yes ☐ No ☐	Has an investigation into adequacy of project systems, processes or procedures been undertaken? Yes ☐ No ☐	
C2: Corrective actions to be implemented (To be fully described in Corrective Action Plan)		
Short Description of Action (SEA/SH examples)	**Responsible Party**	**Timeline for completion/Status**
Referral of Survivor to holistic care services		
Undertake disciplinary investigation in accordance with GM timelines and confirmed process		
Disciplinary actions, including sanctions, to be applied following misconduct investigation by Employer		
Increased training on Codes of Conduct (CoC)		
Audit of implementation of SEA/SH safety mitigation		
Strengthened awareness training on project-related risks, CoC and how to report incidents for project-affected community		
Training for project supervisors on the need to follow guidelines of behaviour in CoC and their supervisory responsibilities		
Plan to improve coverage/quality of service provision		
Any other system strengthening measures or corrections for system failures that are necessary		

C3: For incidents involving a Contractor:
Has the incident been referred to the DAAB? Yes ☐ No ☐

Annex 13: Water Supply and Sewer Lines within Project Impact Zone

Annex 13.1: Water Supply Pipelines along/crossed by the Proposed Underground Transmission Routes

AAWSSA Code[17]	Size of PL (Diameter, mm)	LHS/RHS	Description of Location	Coordinates of UG TL & Pipeline Intersection	Notes
BLL-NADC-Gofa					
110_HDPE_16	110	Intersect	Runs from Mexico square to Diafricque Hotel on RHS of main road	471947 E, 996140 N	May be affected during construction
300_DCI_14	300	Intersect	Runs E-W at northern edge of Mexico square	471939 E, 996053 N	As above
300_DCI_14	300	Intersect	Crosses Mexico sq. at southern part	471938 E, 995974 N	As above
700_DCI_14	700	Intersect	Crosses Mexico sq. at southern part	471937 E, 995962 N	As above
300_DCI_75	300	RHS, Intersect	Running N-S from edge of Mexico sq. to AU gate under RHS carriageway/ on RHS of the proposed UG TL & crosses the TL at in front of EU gate	472042 E, 994857 N	As above
100_JISPVC_75	100	Middle of road, RHS, Intersect	Start at AU gate & runs south at the middle of road, then on RHS. Crossed by the TL at three locations – at 160m & 360m from AU gate and on the road to Bulgaria.	472057 E, 994698 N, 472065 E, 994497 N & 472030 E, 994385 N	As above
110_.....	110	Intersect	Runs on RHS of AU-Bulgara road on RHS edge of pedestrian walkway and crossed by the UG TL at start of the cobblestone road	472110 E, 994302 N	Likely to be affected
110_ISOPVC_75	110	Intersect	Crosses access road before the Oromia Regional Offices	471812 E, 993909 N	As above
63_ISOPE_08	63	Intersect	As above	471767 E, 993878 N	As above
75_ISOPVC_89	75	Intersect	Crosses the Sarbet-Kera road	471980 E, 993505 N	As above
75_GS_75	75	Intersect	Crossed by the TL at the intersection of internal road/ coble stone road at between	472130 E, 993049 N	As above

[17]Designates the size (diameter), material type & year of installation of the line

AAWSSA Code[17]	Size of PL (Diameter, mm)	LHS/RHS	Description of Location	Coordinates of UG TL & Pipeline Intersection	Notes
			existing Towers No. 13 & 14		
75_ISOPE_16	75	Intersect	As above	472131 E, 993035 N	As above
100_JISPVC_75	100	Intersect	Crossed by the TL at nearby Tower No. 15	472142 E, 992630 N	As above
75_ISOPE_09	75	Intersect	Crossed by the TL at main road from Gofa Gebreal to Germany Square	472156 E, 992263 N	As above
75_ISOPE_09	75	Intersect	As above	472157 E, 992236 N	As above
Wereganu-Connection Point-3					
150_DCI_98	150	Intersect	Intersects the TLs at the junction of Gerji road	479853E, 995293 N	May be affected during construction
150_DCI	150	Intersect	Crosses the road/proposed UG TL at in front of Anbesa …. Hotel	480218 E, 995754 N	As above
110_ISOPVC_98	110	Intersect	Crosses the road/proposed UG TL at south of Meta Beer Distribution Centre	480277 E, 995906 N	As above
150_DCI_98	150	Intersect	Crosses the road/proposed UG TL at south of Meta Beer Distribution Centre	480571 E, 996478 N	As above
250_ISOPVC_11	250	Intersect	Crosses the proposed UG route at the main gate to Sahelete Mihret Church	481187 E, 997157 N	As above

Source: Data extracted from AAWSSA Water Supply Network that was verified through site visit

Annex 13.2: Existing Sewer Lines along/crossed by the Proposed Underground Transmission Line

AAWSSA Code	Size (Diameter, mm)	LHS/RHS	Coordinates of UG TL & Pipeline Intersection	Description of Location	Notes
BLL-NADC UG TL					
ISOP-pipes-fi 300mm	300	Intersect	471945 E, 996142 N	Runs along the Mexico square-Diafrique road and crosses the UG TL at nearby the BBL substation & at north of Mexico square; Manhole at nearby both crossing points.	May be affected as crossed by the TL
ISOP-pipes-fi 150mm - 800m	200	LHS	From 471947 E, 995967 N to 472088 E, 994513 N	Runs from nearby Mexico square to nearby NADC substation & runs west direction at just above the NADC. The TL crosses the sewer line just before the substation. There is manhole at 18m east of the crossing point	As above
ISOP-pipes-fi 200mm	200	Intersect	472069 E, 994514 N	Runs E-W direction at just above the NADC substation and crossed by the UG TL; Manhole at 16m east of the crossing point.	As above
NADC – Gofa UG TL					
ISOP-pipes-fi 250mm	250	Intersect	472113 E, 994319 N	Crosses the road to Bulgaria & joins the below sewer line; it is crossed by the UG TL just before about 8m before a manhole where it ends.	May be affected as crossed by the TL
ISOP-pipes-fi 400mm	400	Intersect	471992 E, 994136 N	It starts at just below the AU-Bulgaria road & goes on RHS edge of a coble stone road followed by the UG TL for 210m and turns left and runs on left bank of a stream. It is crossed by the UG TL at 210m below the Bulgaria road.	As above
ASB-pipes-fi 600mm	600	Intersect	472113 E, 993385 N	Crosses the Sarbet-Kera asphalt road and goes on RHS of coble stone road. The TL crosses the sewer line at the main road and runs on LHS of the SL.	As above
ASB-pipes-fi 600mm	600	Intersect	472220 E, 990347 N	Runs along existing access road located on left bank of Akaki river and crossed by the Gofa – Kaliti-1 overhead TL between TRs 23 & 24.	As above

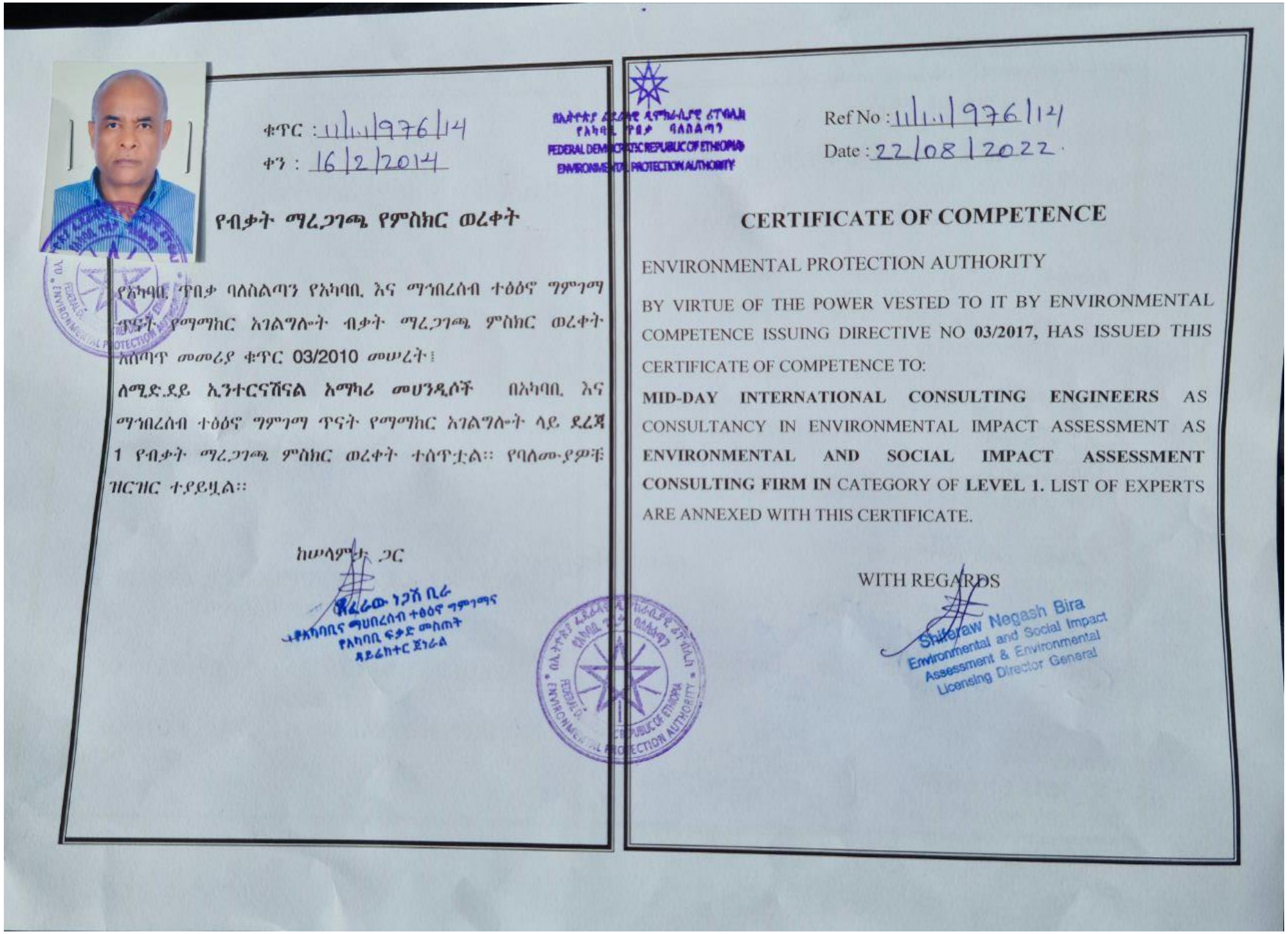
Source: Data extracted from AAWSSA Sewer Line Network and verified through site visit

Annex 14: ESIA Consultant Team

This ESIA study was carried out by a team of senior consultants of a local consultancy firm, Midday International Consulting Engineers (MDI) of Ethiopia. MDI is a local consulting firm licensed by the Federal Environmental Protection Authority to conduct Environmental and Social Impact Assessment (ESIA) studies and a copy of its Competence Certificate is shown in Annex 15. The list of the key consultants is shown below.

Team Member	Position/Profession	Qualification
Dejene Woldemariam	Project Manager	BE, M. Tech
Melessaw Shanko	Senior Sociologist	BA, MA
Alemayehu Desu	Senior Sociologist	BA, MA
Arebo Sambi	Senior Environmentalist	BSc, MSC
Habtamu Denboba	Socio-Economist	BA, MA
Lelisa Temesgen	Gender Specialist Expert	BA
Abel Tesfaye	Data Management Specialist	BA, MA
Abel Mekonnen	Water Resources Engineer/ Land Use Expert	BSc
Getnet Tekeba	Surveyor	

Annex 15: MDI's Certificate of Competence Issued by EPA



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ቀን : 16/2/2014

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Ref No : 11/1.1/976/14
Date : 22/08/2022

CERTIFICATE OF COMPETENCE

ENVIRONMENTAL PROTECTION AUTHORITY

BY VIRTUE OF THE POWER VESTED TO IT BY ENVIRONMENTAL COMPETENCE ISSUING DIRECTIVE NO **03/2017**, HAS ISSUED THIS CERTIFICATE OF COMPETENCE TO:

MID-DAY INTERNATIONAL CONSULTING ENGINEERS AS CONSULTANCY IN ENVIRONMENTAL IMPACT ASSESSMENT AS **ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT CONSULTING FIRM IN** CATEGORY OF **LEVEL 1.** LIST OF EXPERTS ARE ANNEXED WITH THIS CERTIFICATE.

WITH REGARDS

Shiferaw Negash Bira
Environmental and Social Impact Assessment & Environmental Licensing Director General