Environmental and Social Management Framework (ESMF) for Horn of Africa - Groundwater for Resilience Project (P174867 HoA-GW4RP)



Ministry of Water and Energy (MoWE) and Ministry of Irrigation and Lowlands (MoIL)

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ACRONYMS

AGP	Agricultural Growth Program
AIDS	Acquired Immunodeficiency Syndrome
ARAP	Abbreviated Resettlement Action Plan
ASR	Aquifer Storage and Recovery
BCM	Billion Cubic Meter
BDA	Basin Development Authority
BIDNTF	Biodiversity Indicators Development National Task Force
BOD	Biochemical Oxygen Demand
BWYC	Bureau of Women Youth and Children
CBO	Community Based Organization
CCA	Community Conversation Agent
CERC	Contingent Emergency Response Component
CHMP	Cultural Heritage Management Plan
COD	Chemical Oxygen Demand
COVID	Coronavirus Disease
CPF	Country Partnership Framework
CRC	Child Right Committees
CRGE	Climate Resilient Green Economy
CSA	Central Statistical Agency
CSO	Civil Society Organization
CWA	Consolidated WaSH Account
DDEPA	Dire Dawa Environmental Protection Authority
DHS	Demographic and Health Surveys
DRDIP	Development Response to Displacement Impacts Project
EA	Environmental Assessment
EC	Ethiopian Calendar
EDHS	Ethiopia Demographic and Health Surveys
EEPCo	Ethiopian Electric Power Corporation
EFCCA	Environment Forest and Climate Change Authority
EFCCB	Environment Forest and Climate Change Bureau
EFCCC	Environment, Forest and Climate Change Commission
EFWPPDA	Environment, Forest, and Wildlife Protection and Development
	Authority
EHSG	Environmental Health and Safety Guideline
EIA	Environmental Impact Assessment
EIO	Environmental Impact Quotient
EMP	Environmental Management Plan
ENGDA	Ethiopian National Groundwater Database
EPA	Environmental Protection Authority
EPFCCA	Environment Protection Forest and Climate Change Authorities
EPFCCC	Environment Protection Forest and Climate Change Commissions
EPPASC	Ethiopian Parliament Pastoralist Affairs Standing Committee
EPRLUA	Environmental Protection and Rural Land Use Administration
ERM	Emergency Response Manual
ES	Environmental and Social
ESCCD	Environment, Social, and Climate Change Directorate
ESCP	Environmental and Social Commitment Plan
ESD	Environment and Social Directorate
ESF	Environmental and Social Framework

ESHS	Environmental, Social, Health and Safety
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESRS	Environmental and Social Review Summary
ESS	Environmental and Social Standards
ESSF	Environmental and Social Screening Form
E&S	Environmental and Social
EWCA	Ethiopia Wildlife Conservation Authority
FAO	Food and Agriculture Organization
FDRE	Federal Democratic Republic Ethiopia
FEPA	Federal Environment Protection Authority
FGM	Female Genital Mutilation
FI	Financial Intermediary
FM	Financial Management
FPIC	Free Prior and Informed Consent
GBV	Gender Based Violence
GDP	Gross Domestic Product
GERD	Grand Ethiopian Renaissance Dam
GHG	Greenhouse Gases
GNI	Gross National Income
GoE	Government of Ethiopia
GR	Grievance Redress
GRC	Grievance Redress Committee
GRM	Grievance Redress Mechanism
GRS	Grievance Redress Service
GTP	Growth and Transformation Plan
GW	Groundwater
GWPIT	Groundwater Project Implementation Teams
GWPSC	Groundwater Project Steering Committee
HDI	Human Development Index
HIV	Human Immunodeficiency Virus
HoA-GW4R	Horn of Africa – Groundwater for Resilience
HoA-GW4RP	Horn of Africa – Groundwater for Resilience Project
HSE	Health, Safety, and Environment
HTP	Harmful Traditional Practices
HUTLC	Historical Underserved Traditional Local Communities
ICS	Interconnected Power System
IDA	International Development Association
IDC	Irrigation Development Commission
IDPD	Irrigation Development Project Division
IGAD	Intergovernmental Authority on Development
ILO	International Labor Organization
IPF	Investment Project Financing
IPV	Intimate Partner Violence
IWUA	Irrigation Water Users Associations
LMO	Living Modified Organisms
LMP	Labor Management Procedure
LTA	Lost Time Accident
LTI	Lost Time Injury

MAR	Managed Aquifer Recharge
MCE	Metaferia Consulting Engineers
MCM	Million Cubic Meter
MDG	Millennium Development Goals
MoEFCC	Ministry of Environment, Forest, and Climate Change
Moll	Ministry of Irrigation and Lowlands
MoWCYA	Ministry of Women Children and Youth Affairs
MoWE	Ministry of Water and Energy
MoWIE	Ministry of Water Irrigation and Electricity
MSDS	Material Safety Data Sheet
MW	Mega Watts
NRI	Nile Basin Initiative
NBSAP	National Biodiversity Strategy and Action Plan
NCIS	National Child Labor Survey
NDPMC	National Disaster Bick Management Commission
NGO	Non-Governmental Organization
NGWMSC	Notional Groundwater Management Steering Committee
NU ES	National Labor Force Survey
	Occupational Health and Safety
OP	Operational Deliev
OST OST	Operational Folicy
OWND	Occupational Safety and Health One Westi Netional Drogram
OwnP O&M	One wash National Program
DAD-	Desired Affected Demons
PAPS	Project Affected Persons
PCB	Polychiorinated Bipnenyis
PCMU	Project Coordination and Management Unit
PCN	Project Concept Note
PDO	Project Development Objective
PDRE	Peoples Democratic Republic Ethiopia
PESIA	Preliminary/Partial Environmental and Social Impact Assessment
PIM	Project Implementation Manual
PIT	Project Implementation team
PIU	Project Implementation Unit
PMCU	Project Management and Coordination Unit
PMU	Project Management Unit
PPE	Personal Protective Equipment
PPP	Public Private Partnership
PSC	Project Steering Committee
RAP	Resettlement Action Plan
REPA	Regional Environmental Protection Authority
REPFCCA	Regional Environment Protection, Forest, and Climate Change
	Authorities
RF	Resettlement Framework
ROW	Right of Way
RP	Resettlement Plan
RPLRP	Regional Pastoral Livelihoods Resilience Project
RPS	Rural Pipe System
RWS	Rural Water Supply
SEA	Sexual Exploitation and Abuse
SEAH	Sexual Exploitation, Abuse, and Harassment

SEP	Stakeholder Engagement Plan
SGBV	Sexual and Gender Based Violence
SH	Sexual Harassment
SME	Small and Medium Enterprise
SNNP	South Nations, Nationalities, and People
SOP	Standard Operating Procedures
SPIS	Solar Powered Irrigation System
SSI	Small-scale Irrigation
STD	Sexually Transmitted Disease
SUWSSP	Second Urban Water Supply and Sanitation Project
TA	Technical Assistance
TVET	Technical and Vocational Education and Training
UEAP	Universal Electricity Access Program
UN	United Nations
UNDP	United Nations Development Programme
USD	United States Dollar
UWSSP	Urban Water Supply and Sanitation Project
WaSH	Water, Sanitation, and Hygiene
WaSHCOM	Water, Sanitation, and Hygiene Committee
WB	World Bank
WBG	World Bank Group
WDC	Water Development Commission
WGM	Worker Grievance Mechanism
WHO	World Health Organization
WRMD	Water Resources Management Division
WSSD	Water Supply and Sanitation Division
WUA	Water Users Association
WWDSE	Water Works Design and Supervision Enterprise
WWTP	Wastewater Treatment Plant

EXECUTIVE SUMMARY

1. Introduction

Groundwater use and management play an important role in building resilience in the most exposed and vulnerable areas of the Horn of Africa, including the borderlands. In a region where surface water is scarce due to high temperatures and consequent high evapotranspiration rates, groundwater remains often the most reliable source to provide stable supplies of water for domestic, agriculture and livestock use, acting as a natural storage during times of drought, facilitating adaptation to high climate variability. Despite the considerable potential of enhancing access to groundwater sources to address drivers of fragility in the region, including water-related communal disputes in the borderlands, groundwater remains neglected and its exploitation largely untapped. Knowledge on the HoA's aquifers, sustainable extraction rates, and recharge areas is extremely limited. Often available at less than 100 m depth, groundwater in the region is often of good quality and protected against man-made pollution. Due to limited quantitative information on groundwater resources, groundwater storage is commonly omitted from assessments of freshwater availability.

Five countries (Djibouti, Eritrea, Ethiopia, Kenya and Somalia) launched the Horn of Africa Initiative (HoAI) to forge closer economic ties in the sub-region, highlighting the importance of regional cooperation to build resilience. As part of this initiative, the Government of Ethiopia (GoE) is working in collaboration with the World Bank to implement the groundwater resilience project for which the IDA has agreed to provide finance in the order of 210 million USD. As part of the HoA-GW4R project preparations, the development of different ES risk management instruments was recommended. The present ESMF is prepared to provide framework guidance on ES risk management for sub-projects under all project components. It is prepared for use by the project implementing agencies which are mainly the Ministry of Water and Energy (MoWE) and Ministry of Irrigation and Lowlands (MoIL) as well as key stakeholders to be involved in the planning, implementation and management of the proposed Components 1, 2 & 3 sub-projects of the HoA-GW4R project. The ESMF is complemented by the Resettlement Framework (RF) and the Stakeholder Engagement Plan (SEP).

2. Project Description

Project Development Objective (PDO)

The development objective is "to increase the sustainable access and management of groundwater in Ethiopia". The project will strengthen the ability of vulnerable communities, many of them in the fragile borderlands, to better prepare for and respond to climatic shocks and other stressors, increasing their resilience and potentially contributing to the reduction of forced displacement and potential conflicts. The project contributes, with the Intergovernmental Authority for Development (IGAD) and other countries in the HoA (Kenya and Somalia in phase I of this program) to the creation of a regional coordination platform to strategically integrate transboundary groundwater information and to build regional and national capacity on groundwater management. This approach will also help bringing together the major actors within MoWE towards sustainable development and use of groundwater sources. In addition, the project will contribute to build trust and relationships on transboundary groundwater management, as the key resource to increase resilience in the borderlands, helping, in the long term, diffuse tension among HoA countries.

Major Project Features and Locations

The locations of HoA-GW4RP water supply and irrigation development sub-projects are found in different regions of the country. Further, various types of sub-projects are included in the project. The main sub-project types and geographic locations are summarized below:

- Design and implementation of Managed Aquifer Recharge (MAR) at Dire Dawa plains
- Carrying out potential groundwater assessments in 67 woredas, mainly 15 groundwater investigations and studies including of drilling of test boreholes
- Groundwater monitoring in 59 prioritized areas including drilling of monitoring wells and development of groundwater monitoring stations fitted with data loggers
- Developing groundwater based rural water supply infrastructure in 55 prioritized woredas including studies, designs, construction, and rehabilitation of small and medium scale multi-village water supply schemes
- Pressurized irrigation development (~200 ha) in four woredas (namely Dire, Dillo, Yabello and Teltele) in Borena zone of the Oromia region including 7 irrigation development sites (namely Eldema, Mermero, Melka Sadek, Elkune, Elkune 2, Kobo and Hobok)
- Promotes the use of efficient renewable energy, such as wind and solar to lift water
- Promote soil conservation measures
- Enhance service delivery management capacity through strengthening community-level scheme management (WaSHCOMs and WUAs) and building local operation and management capacities
- Strengthening groundwater institutions and information.

The HoA-GW4R project has the following three components:

Component 1: GW Potential Assessment and Infrastructure Development for Inclusive Community-level Use. This component will focus on carrying out groundwater potential assessments, and implementing investments for groundwater use, conjunctive use, and introduction of managed aquifer recharge (MAR). It supports investments to develop critical groundwater infrastructure in selected priority woredas as well as ensuring their sustainability. It will also promote the use of efficient renewable energy, such as solar and wind to lift water, as well as soil conservation measures and aquifer recharge. The component will have three subcomponents.

(i) Subcomponent 1.1 Groundwater Potential Assessment and Aquifer Recharge

This subcomponent will finance: (i) GW potential assessment in prioritized areas, including borderland sites; (ii) design and implementation of Managed Aquifer Recharge in Dire Dawa plain, and (iii) development and management of monitoring wells that will feed into Component 1 in targeted water supply and irrigation sub project sites/ woredas.

(ii) Subcomponent 1.2 Utilization of groundwater for water supply (human and livestock) as well as enhancing service delivery management capacity. The subcomponent is structured into two categories:

- *Subcomponent 1.2a*: Increasing rural and pastoral access to WS services. This subcomponent will focus on groundwater-based rural water supply infrastructure/system development with an emphasis to strengthen resilience at the community level
- *Subcomponent 1.2b*: Enhancing service delivery management capacity. The project will build on existing practices and lessons of ongoing Projects (such as the One WaSH) to ensure the sustainability of rural water supply schemes through community management arrangements
- (iii) Subcomponent 1.3. Utilization of groundwater for small scale irrigation. This component will focus on groundwater based small and medium scale irrigation infrastructure/system development

Component 2: Strengthening groundwater institutions and information. This component is expected to strengthen enabling environment and institutional capacities for groundwater study, development and management as well as strengthening groundwater management information system of the country. Implemented by Water Resource Management Division at MoWE this component will finance the following two sub-components.

- (i) Subcomponent 2.a. Strengthening groundwater institutional capacity for groundwater management. This subcomponent finances technical assistance, capacity building and institutional strengthening, including support to national water resources management entities
- (ii) Subcomponent 2.b. Enhancing groundwater information and monitoring System. This subcomponent will finance interventions that will enhance groundwater information management system

Component 3: Project management, knowledge, and operational support. This component will finance the staff salary and operational costs of the Project Coordination and Management Unit (PCMU) at National Groundwater Management Steering Committee (NGWMSC) and Project Implementation Teams at MoWE (Water Supply and Sanitation Division Project Implementation Team) and MoIL (Irrigation Development Project division Project Implementation Team).

Project Implementation Arrangements

A National Groundwater Management Steering Committee (NGWMSC) will be established and maintained throughout the project duration. The NGWMSC will be the highest governing body for the project and provides overall governance and strategic guidance for the project. The MoWE is the lead agency for implementation of the project. A Project Management and Coordination Unit (PMCU) will be established at the MoWE. Further, Project Implementation Teams (PITs) will be established at both MoWE and MoIL. However, existing Project Management Units (PMUs) at the MoWE and MoIL will be utilized to the extent possible. It is expected that the PMCU will assign ES safeguards specialist manage ES aspects of the project. In addition, it is expected that the PIT to be established at MoWE and MoIL will assign their respective ES safeguards experts for managing implementation of ESMF and other instruments to be developed at sub-projects level. WaSHCOMs and WUAs will be responsible for ES management during operation of the sub-projects.

3. ESMF Development Methodology

The methodology adopted for preparing the ESMF includes conventional methods which includes review of relevant legislations, policies and related documents, qualitative and quantitative data collection and analysis, conducting consultations with project implementers and stakeholders. The main sources of data for these ESMF are secondary data mainly from the ESMF One WASH Consolidated Water Supply, Sanitation and Hygiene Project and Urban Water Supply & Sanitation Project Phase II sub-project ESIA report were adopted and applied to compile the environmental and social baseline of the ESMF. Due to the prevailing global pandemic (COVID-19) which is rocking Ethiopia at the time of ESMF preparation, it was necessary to use COVID-19 appropriate stakeholder consultation methods. For that purpose, telephone calls, zoom/webex meetings and face to face meetings with small group of people were used to carryout consultations with the various stakeholders.

4. Relevant Policy, Legal and Institutional Framework of Environmental and Social Management

The GoE has enacted the necessary legal frameworks for ES management and institutions to support its implementation and enforcement. The primary legislations that support ES management in Ethiopia are the FDRE Constitution, Environmental Policy of Ethiopia, EIA Proclamation No. 299/2002, the Labor Proclamation No. 1156/2019, Proclamation no.1161/2019 on Expropriation of Land for Public Purposes, EIA Procedural Guideline (2003); ESMP Preparation Guideline (2004); National Policy on Ethiopian Women; and other laws, strategies, and guidelines enforcing special support for developing regions and vulnerable groups. These and other relevant policies, legislations, and guidelines have been reviewed.

Moreover, review of the World Bank ESF and relevant Environmental and Social Standards (ESSs), as well as relevant World Bank Group's EHS Guidelines were also carried. Accordingly, it was noted that all except ESS 9 were potentially applicable to the HoA-GW4RP.

5. Potential Environmental and Social Risks and Benefits

The sub-project activities involved in Components 1 and 2 will be site specific and generating impacts that are of High to Moderate significance which can be mitigated. The environmental and social risks associated with the HoA-GW4RP activities are summarized below.

(i) Beneficial Environmental and Social Impacts of Water Supply Sub-projects

Impacts on Women: Often women are the main water users, providers and managers in the household. Women are the guardians of household hygiene. Improvements in water supply infrastructure are likely to shorten women's and girl's time spent carrying heavy containers to collect water thereby freeing up their time for income generating activities and schooling.

Increased Quality Water Supply: Water supply is essential for human health, survival, and for food security. Availability of water supply with the required quality enhances economic development, improves the health of the users, and contributes in ensuring food security.

Improve Community Participation and Social Impacts: Community participation in management and governance of water supply schemes will enhance local organizational capacity,

will strengthen existing institutions, and enhance the overall community decision making capacity.

Employment Opportunities for the Local People: Temporary job opportunities will be available during the construction phase of sub-projects and will include casual laborers, food catering, artisans, etc. Further, operation and maintenance of the water supply sub-projects will provide additional employment opportunities.

(ii) Adverse Environmental and Social Risks of Water Supply Sub-projects

Impact due to Groundwater Aquifer Depletion: Groundwater used for domestic water supply and livestock watering could lead to resource depletion. Groundwater development must be sustainable on a long-term basis. Unmanaged utilization of groundwater could lead to resource depletion since in some cases the rate of groundwater utilization could be much higher than the rate of groundwater replenishment.

Impact due to Groundwater Abstraction on Water Resources of the Area: Surface water and groundwater resources have the same reservoir and the two are interconnected with one another. Abstraction of the groundwater resources will affect the surface water flow regime and vice versa.

Impact due to Animal Water Use and Unhygienic Environment Created: Some of the planned sub-projects provide water for animal watering. Animals using cattle troughs often create unhygienic environment (wet, muddy, murky, and with animal excreta) around the troughs. The unhygienic environment, in turn, pose a health risk to the population attending the domestic animals and to the local community, in general.

Impact due to Community Use of Potable Water and Waste Generation: Development of the groundwater resources is expected to significantly increase access to potable water supply for domestic use by the local communities. The more water is used the more wastewater is generated. The wastewater generated by the various uses of water could pose a community health risk through creation of unhygienic environmental around community dwellings.

Impact due to Water Use Right: In areas where water is scarce (such as the lowlands), it is inevitable that water use rights and associated conflicts occur. Water use rights could arise between domestic water users, animal water users, irrigation water use, and pasture lands.

Impact due to Inefficient Water Use Management: During sub-projects implementation and most importantly during operation of the sub-projects, inefficient water use and management will result in wastage of the resource that would have been available for other uses and beneficiaries.

Impact due to Inefficient Energy Use and Management: Some of the water supply schemes to be developed will entail use of electro-mechanical equipment which require energy from fossil fuels, photovoltaic systems, and from the national electric grid. Further, energy is required for various sub-projects construction, particularly by machines such as drilling rig, compressors, mixers, vibrators, trucks, etc. Unless an efficient energy use and management is practiced, it will result in wastage of energy that could have been used for other purposes and resource exploitation.

Impact of Air Emissions and Decreased Air Quality: The construction activities of the project will emit dust in the environment during the excavation work to install water mains, reservoirs, and while building access roads. Machinery and vehicle traffic will exacerbate dust pollution.

Impacts of Wastewater and Ambient Water Quality: Process wastewater including contaminated wastewater from utility operations, storm water, sanitary sewage, used oils and lubricants from the pumping station and vehicles engaged during project construction, solid waste generated at the borehole sites can pose pollution risk to water resources. Especially, borehole drilling operations apply foaming chemicals to enhance the drilling efficiency and a soil sludge contaminated with the chemicals is released from the operation.

Impact due to Hazardous Materials: . Construction and decommissioning activities may pose the potential for release of hazmats during their storage, transfer, or use in equipment. These materials may also be encountered during decommissioning activities in building components or industrial process equipment.

Impact due to Solid Waste and Effluent Waste:

Solid (non-hazardous) wastes generally include any garbage and construction refuse. Improper handling, transport, storage and disposal of solid wastes will create a risk on the environment and the health of the communities.

Noise and Vibration Impacts: The construction activities of the project will cause noise and vibration in the environment, particularly activities like boreholes drilling will create high pitch noises and vibrations which affects human and animals residing nearby..

Impact of Contaminated Land: Land contamination may be encountered in sites under construction or decommissioning due to known or unknown releases of hazardous materials or due to the presence of abandoned infrastructure formerly used to store or handles these materials. Contaminated land will in turn affects its crop production capacity, increases the risk of water resources contamination, and ultimately affects the environment and biodiversity in the area..

Impact of Soil Erosion and Land Degradation: Earth moving and excavation activities (including access roads construction and materials utilization sites) result in risk of displacement of fertile soil, soil erosion and land degradation. Degraded land losses its capacity to produce crops, sedimentation of water bodies, loss of habitats, and general degradation of the environment.

Impacts on Terrestrial Flora and Fauna: The activities of water supply sub-project will not generally cause a significant impact on fauna and flora of the area. However, activities that could result in vegetation clearing impacts the terrestrial flora and fauna of the area.

Impact on Aquatic Flora and Fauna: Implementation of sub-projects could indirectly affect the aquatic flora and fauna. Unmanaged abstraction and utilization of groundwater may have an impact of surface water resources. Elimination or reduction of water level or baseflow in surface water resources could, in turn, eliminate or restrict the aquatic habitat or ecosystem.

Impact on Settlements and Loss of Properties: The construction of boreholes and other water supply sub-projects may displace peasants from their farmland, i.e., result in economic displacement. The RF provides the framework by which potential resettlement issues will be addressed.

Impacts due to Camp Sites and Other Ancillary Work: During construction period, there are different adverse impacts emanating from construction of ancillary facilities, such as camp site, storage areas, garages, etc. These impacts will be induced soil erosion and sedimentation leading to subsequent deterioration of water quality, dust, and noise pollution, respiratory illnesses related to dust pollution, compaction of soil; traffic accident on local community and workforce, solid waste (household wastes & spoil material), competition for electricity, land use change; disfiguring of landscape; spillage of oils, lubricants and other chemicals.

Community Health and Safety Risks: Community health and safety risks anticipated to arise in the sub-project areas as a result of the interaction with the local community resulting in spread of COVID-19 and HIV/AIDS. Malaria will also be a risk for public health whose transmission may be enhanced due to unintended creation of stagnant waters that breed mosquito in the sub-project areas.

Occupational Health and Safety Impacts: The construction activities of sub-projects will have the potential to expose the construction workers and site visitors to a number of OHS hazards including physical, electrical, fire and explosion hazards.

Gender Based Violence (GBV) Impacts: Sub-projects with a large influx of workers may increase the demand for sex work, increase the risk for trafficking of women for the purposes of sex work, or the risk of forced early marriage in a community where marriage to an employed man is seen as the best livelihood strategy for an adolescent girl. Furthermore, higher wages for workers in a community can lead to an increase in transactional sex. The risk of incidents of sex between laborers and minors, even when it is not transactional, can also increase. Abusive behavior can occur between sub-project-related staff and those living in and around the sub-project site and also within the homes of those affected by the sub-project.

Impact of Labor Influx: The project could involve large number of workers, there is a risk of labor influx, conflict, exclusion of local community members, exclusion of vulnerable groups, and underage employment.

Impact of Child Labor: Children involved in child labor are more likely to experience worse health outcomes later in life. The impact of hazardous work can cause profound and long-lasting health problems that may only become evident in adulthood. The consequences are worsened by poverty and lack of efficient health and social security schemes. There is also the potential impact of child labor on individual's mental health.

Impact due to Exclusion of Women and Community Members: Involving communities effectively in the planning and management of their water services requires an understanding of socio-cultural norms. It is important to involve women in planning and managing the water services in which they have a high stake. However, if the sub-projects implementation is not properly managed, there is a risk of exclusion of women and other community members.

Impact on Cultural Heritages: The impact HoA-GW4RP sub-projects on cultural heritage sites is going to depend on the presence of such cultural, historical, religious or archeological sites in the project implementation areas. Given that sub-projects under HoA-GW4RP will cover a wider geographical area, there exists a potential for certain sub-projects to affect cultural heritage sites valued and recognized by the local communities.

Impact of Traffic: The proposed HoA-GW4RP is likely to cause temporary and long-lasting potential impacts on the traffic volume and traffic flow in the area. During the construction phase, it is anticipated that the traffic flow will be slightly disturbed around the project area.

Impact due to Labor Issues: During implementation and operation of sub-projects, labor issues could arise including rights issues on establishing unions and collective bargaining in the informal sector, forced labor, child labor (indicated above), discrimination in employment, and unacceptable conditions of work such as minimum wages, more working hours, and OHS risks.

ES Impacts of Managed Aquifer Recharge (MAR) Sub-project: Implementation of the MAR sub-projects could result in water quality changes, clogging of infiltration reservoirs, land uptake due to reservoirs, vegetation clearing, and potential risks related to small and micro-dam failures.

Impacts on Indigenous People: As the project will be implemented in emerging regions with pastoralist and agro-pastoralist communities, ESS7 will be relevant for this project and due to land acquisition and relocation impacts, Free Prior and Informed Consent (FPIC) by local communities will be required.

(iii) Beneficial Environmental and Social Impacts of Irrigation Sub-projects

Rural Employment and Income Generation: Construction work of irrigation structures require skilled, semiskilled and unskilled manpower and create temporary job opportunity for several workers. As a result of increased workforce, other job opportunities like supply of different commodities, accommodations, food outlets, restaurants etc. will emerge and it will provide job opportunities for jobless people.

Increased Farm Incomes from Crop Output: An increase in farm incomes as a result of increased and improved agricultural inputs and increased market crops output is anticipated. As a result of increased incomes from agricultural produce, farmers will be able to access inputs which they will use to expand existing enterprises.

Poverty Reduction through Increased Agricultural Production: Developing and expansion of irrigation farmlands would contribute to overcome recurring drought problems and associated failure of rainfed farming systems. It will assure sustainable crop production year around without depending on rainfall. This would contribute for the overall economic development of the country through reducing dependence on rainfall and creating reliable job opportunity for many jobless people.

Efficient Use of Available Water and Land Resource: Irrigated farms would provide better production and efficient use of the land resource for the betterment of the local people as well as for the country. HoA-GW4RP will invest in provision of equipment for water harvesting and water distribution for irrigation purpose. This will minimize water losses and increase water availability to more areas and crops.

(iv) Negative Environmental and Social Impacts of Irrigation Sub-projects

Most of the adverse environmental and social impacts identified for water supply sub-projects are also applicable for irrigation sub-projects. Therefore, adverse impacts included for water supply

sub-projects are not repeated here. The following are additional impacts which are unique or specifically related to the irrigation sub-projects.

Impact on Water Quality: During operation of the small-scale irrigation schemes, there is a potential risk of surface and groundwater pollution due to agricultural intensification and increased use of agro-chemicals. Water quality can be affected by residual agricultural chemicals (chemical fertilizers, pesticides and biocides) used for irrigation. Leaching of chemicals like nitrates and phosphates from agricultural activities and contamination of surface and groundwater by toxic and other undesirable chemicals could occur.

Impact due to Water Logging and Salinization: Irrigation schemes often result is adverse soil modification which mostly depends on the quality of irrigation water, physical and chemical characteristics of the soil, frequency and efficiency of irrigation, adequacy of drainage, and climatic conditions. Among the adverse soil modification problems in irrigation schemes is waterlogging and associated salinization In areas where the soil is impermeable and surplus irrigation water is applied, groundwater rise could occur.

Impact on Ecosystems: Development of groundwater for irrigation could convert currently uncultivated land into permanent cropland. Expansion of irrigation development could encroach into ecologically important and sensitive ecosystems. Such an encroachment could adversely affect the habitats and ecosystems of the area. Application of agro-chemicals to increase soil fertility and to prevent pests and weeds could also negatively affect micro- and macro-organisms that dwell in downstream areas and could destroy the established food chain of the ecosystems.

Impact due to Land Subsidence: Unmanaged groundwater utilization sometimes contributes to land subsidence. Land subsidence problem usually occurs when the water is over extracted from the aquifers. Through time, the hollow or vacuum created in the aquifer may collapse and sink to the bottom and form land subsidence.

Impact due to Degradation of Vegetation Cover and Groundwater Recharge: Loss of vegetation cover from the catchment for irrigation development could cause adverse impact on the rate of infiltration and percolation of water into the soil. Loss of vegetation would also increase surface runoff and reduce contact time of water in the soil.

Loss of Biodiversity due to Inappropriate Pesticides Application; During pesticides application, some residues are released into the air and can settle on the ground, will be broken down by sunlight and water in the atmosphere or dissipate into the surrounding air. The pesticides in the air become a health risk Where high input-dependent crop/pest practices are adopted, pesticide misuse is known to be common and can result in ES impacts.

Environmental and Social Management Plan (ESMP)

Recommended mitigation measures for the water supply and irrigation sub-projects adverse ES impacts are included in separate ESMPs The ESMPs also outline the responsible bodies for implementing the proposed mitigation measures together with expected period of implementation.

Environmental and Social Monitoring Plan

The ESMF provides the Environmental and Social Monitoring Plans (ESMPs) for water supply and irrigation sub-projects with recommended mitigation and enhancement measures together with proposed monitoring indicators and responsible bodies for carrying the monitoring.

6. ESMF Processes and Implementation

Sub-project Categorization and the ESS requirements: The HoA-GW4R project is environmentally categorized as "Substantial Risk" and socially "High Risk" project with an overall "High" risk rating in the ESRS. The Environmental "Substantial Risk" categorization is mainly linked to the activities of Component 1 and the construction of the water supply and irrigation scheme in 67 woredas in eight regions of the country. The specific interventions like capacity building under Component 2 are not expected to lead to extensive risks as compared to Components 1 and 2 hence are generally expected to be "Substantial risk" or lower risk subprojects.

Procedures of the ESMF Implementation: The following steps summarizes procedures for ESMF implementation:

Step 1: Sub-project identification: Identification of sub-projects will be carried through a consultative process by the lead implementing agencies MoWE (WSSD) and MoIL (IDPD) with the local communities and authorities in the beneficiary woredas. WSSD and IDPD with regional water bureaus will facilitate smooth communications between the project affected communities and themselves during subproject identification and implementation.

Step 2: Screening/scoping: The ESMF requires that all HoA-GW4RP sub-projects shall be scoped/screened for social and environmental impacts.

The PMCU and PITs environment and social staff will initiate the scoping/screening process by completing the form contained in Annex I. The aim of the screening/scoping form is to assist in identifying potential environmental and social impacts based on field investigations in the area of the sub-project site.

The completed scoping/screening report will be submitted first to the PMCU and PITs for internal checking and approval. It will then be submitted to the relevant federal, regional, zonal or local environmental protection commissions/authorities/bureaus/offices with an official application letter for review and approval The federal, regional, zonal, or local environmental protection offices will review the Scoping/Screening Report and will accept the document - with conditions relating to implementation; accept the documents with required and/or recommended amendments; or and reject the document with comments as to what is required to submit an acceptable Screening Report.

Following the approval of the sub-project environmental screening/ scoping report by the relevant offices, the sub-project will be fed into one of the following processes based on its approved Categorization of Schedule I, Schedule II and Schedule III.

Step 3: Schedule I & II Sub-projects (Full and Preliminary/Partial ESIA Preparation): If the outcome of the E&S screening/scoping finally results in categorizing the sub-project as Schedule I or II activities, it is required that it shall be subject to a Full and Preliminary/Partial

ESIAs, respectively, which should be carried out with the help of registered and licensed environment and social consultants. For sub-projects involving land acquisition, ESS-5 requires the development of resettlement plans (RP) proportionate to the scale and magnitude of the land acquisition impacts, regardless of the number of affected parties. The ESIA and RP will be sent to the World Bank Country Office for review and clearance/no-objection. Finally, the ESIAs and RP will be submitted by the PMCU of MoWE (WSSD &WMRD) as well as the PITs to the relevant federal, regional. Zonal, and local environmental protection offices with an official application for review and approval. Similarly, Preliminary/Partial ESIA will undergo the same review and clearance procedures. If the outcome of the E&S screening/scoping results in categorizing the sub-project as Schedule III activities, no further actions to carry Environmental Assessment will be needed. However, for Schedule III categorized sub-projects, an ESMP shall be prepared and ESHS conditions shall be included in sub-projects procurement and contract documents.

Step 4: Review and Decision: The relevant federal, regional, zonal, and local environmental commissions/authorities/bureaus/offices will review the Full ESIA, PESIA and RP submitted by the MoWE PMCU as well as PITs.

The outcome of the review of the Full ESIA, PESIA and RP by the federal, regional, zonal, and local environmental commissions/authorities/bureaus/offices will result in either one of the following options that accept the documents - with conditions relating to implementation; accept the documents with required and/or recommended amendments and reject the documents with comments as to what is required to submit an acceptable Full ESIA, Preliminary/Partial ESIA and ESMP.

Step 5: Implementation and Supervision: When approval has been given to the Full ESIA, PESIA and RP, implementation of mitigation measures and systemic follow-up is needed for the sub-projects. In order to enforce the implementation of recommended mitigation measures, there is a need to include environmental, health and safety and social clauses in the contract agreements to be signed with the construction contractors.

Internal monitoring to ensure the compliance of HoA-GW4RP Components 1 and 2 subproject implementation activities against the mitigation measures set out in its ESMP and RP, will be carried out by the environment and social risk management staff of the MoWE PMCU as well as the PITs who are responsible for environmental and social management and the supervisory engineer at the construction sites.

The implementation of the recommended mitigating measures will also be monitored by the federal, regional, zonal, and local environmental commissions / authorities / bureaus / offices

During sub-projects operation period, environmental and social requirements will be implemented by the WaSHCOMs and water users association with a close support by the local administrations (Woreda, zonal, and where applicable regional administration offices).

Step 6: E&S Risk Management and Monitoring Reports: During the course of ESMF implementation, the MoWE PMCU and the PITs will prepare and submit regular quarterly, biannual and annual E&S monitoring and performance reports for all sub-projects carried under components 1, 2, and 3.

The environmental and social risk management monitoring reports should be submitted internally to MoWE PMCU and to the NGWMSC respectively and externally to the concerned federal, regional, zonal, and local environmental protection authorities, and the World Bank for review.

Step 7: Annual Reviews: ESMF implementation will also be supported by conducting annual E&S performance audit that will be carried out by a third party (i.e. registered and licensed independent consultancy firm). The third-party annual E&S performance audits will be conducted on HoA-GW4RP to evaluate the overall implementation of the ESMF.

7. Grievance Redress Mechanism

A grievance redress mechanism will be established in order to resolve concerns effectively and timely. The mechanism will be notified for the affected people and thus grievances will be actively managed and tracked to ensure that appropriate resolutions and actions are taken. The grievance procedure does not replace existing legal processes. Whenever misunderstandings and disputes arise between the principal parties (e.g. local government bodies and affected parties) involved in the resettlement and compensation process, the preferred means of settling disputes is through arbitration (Proclamation No.1161/2019).

The grievance procedure will be simple and administered as far as possible at the local levels to facilitate access, flexibility and ensure transparency. All the grievances will be managed through the Grievance Resolution Committees. Complaints will be received in writing or orally and will be filled in a Grievance Registration Form by the committee.

The steps for grievance redress are as follows:

First Step: Registration of the grievances with the Grievance Resolution Committee at Kebele level

Second Step: The Woreda GR committee receives grievance forwarded by the Kebele GRM committee concerning the aggrieved PAP(s) to negotiate and forward possible resolution.

Third Step: In instances where the project, in this case HoA-GW4RP is unable to resolve the matter, the same will be referred to the Courts for settlement.

Fourth Step: Expropriation of land will be used as a last resort when either all the above procedures have failed or caused extensive delays to the sub-project are foreseen with the deposition of the compensation amount in the closed account opened on his/her behalf. The decisions of the action to be taken will be communicated to all involved parties mainly in grievance resolution form.

8. Training and Capacity Building

Effective implementation of ESMF will require technical capacity within the PMCU and PITs, beneficiary communities, local authorities, and other institutions responsible for monitoring HoA-GW4RP Components 1, 2 & 3 activities. The existing capacities and practical experiences of the main project implementing and partner institutions in the area of environmental management are found to be generally encouraging.

There is already an ongoing capacity building program offered by the World Bank to strengthen the ES Directorates of both ministries that implement the project. As both ministries are familiar with implementation of ESMF procedures and ESF requirements in general, it is evident that training to further strengthen their capacities is required.

There will be a need to carry out environmental awareness workshops for officials of project implementing and stakeholder institutions such as members of project steering committee and technical committee on environmental management principles and ESMF procedures.

9. ESMF Implementation Budget

The estimated budget for implementation of the ESMF during the five-years project period is USD 857,000. The budget coves for ES staffing, ESMF training, implementation and monitoring of GBV action plan, for carrying due diligence and annual external environmental and social performance audits, procurement of consultants to provide ESIA/RP preparation services, etc. This budget will be funded from HoA-GW4R project. Costs related to the required mitigation measures for Components 1, 2, & 3 sub-projects are not set out in the budgets presented here. These will be assessed and internalized by beneficiary institutions as part of the overall sub-project costs.

INTRODUCTION

BACKGROUND

Ethiopia is endowed with abundant water resource (both ground and surface). However, the spatial and temporal distribution of this resource is exceptionally variable and unpredictable, both in time (within and between years) and space, which is manifested in endemic, devastating droughts, and floods. Displacement and resource-based conflicts are among the major risks in Ethiopia caused by extreme climates (Eli no and la Nina) recurring for decades as extreme changes in rainfall patterns in these areas. As per the early warning and response directorate in 2017, more than half of the country's rural districts (450 woredas) are identified as priority drought woredas of which 192 are identified as hotspot woredas who urgently need immediate interventions to avoid catastrophic impacts. Resource constraints due to hydrological variability and climate change are further exacerbated by growing population demands and increasing competition for water resources between multiple productive sectors (agriculture, industry, hydropower, etc.).

Ethiopia's water resource management policy, strategy, regulations, and proclamations are well articulated and have adequate provisions for proper management of water resource. However, assessment of efficacy of the provisions revealed that regulations on water resources management, pollution control, and land use rights related to water, watershed development, and environmental quality are not effective or enacted because of weak/ lack of enforcement capacity (NBI, 2006).

Therefore, the proposed project will strengthen the ability of vulnerable communities to better prepare for and respond to the impact of shocks and stressors, to adapt to change and to potentially transform leading to reduction of forced displacement and potential conflicts. The Project contributes to the creation of a coordination platform to strategically integrate the groundwater information and use aspects by bringing together the major actors within Ethiopia towards sustainable development and use of groundwater sources. In addition, the project will contribute to build trust and relationships, and to diffuse tension among HoA countries by supporting collaboration and trust building through regional platforms.

The project development objective of the proposed Project is to increase the sustainable use and management of groundwater by beneficiary groups in Ethiopia and new beneficiaries provided with access to improved water supply.

The main objective of the ESMF is to establish an environmental and social management process that meets national environmental requirements and World Bank ESF principles applicable for addressing environmental and social risks of Components 1 and 2 subprojects of the HoA-GW4R Project. The ESMF sets out the principles, rules, guidelines and procedures to assess the environmental and social risks and impacts of components 1 and 2 subprojects. Its purpose is to provide general guidance to program implementers found in the participating institutions (i.e., MoWE & MoIL) on the implementation of environmental and social standard requirements and associated procedures that should be accomplished prior to the commencement of the subprojects on the ground. The ESMF contains proposed mitigation measures to reduce, mitigate and/or offset adverse risks and impacts. The ESMF also consists of the country's policy, legal and institutional framework including its national, regional, and sectoral implementing institutions and associated implementation capacity relevant to the environmental and social risks and impacts of the project. The ESMF is complemented by resettlement framework (RF) and Stakeholder Engagement Plan (SEP).

PROJECT DESCRIPTION

Overview of the Project

The proposed project is aligned with Ethiopia's Country Partnership Framework (CPF) in particular on Building Resilience and Inclusiveness. The proposed Project is also aligned with the GTP II and the 10-year strategy of the sector which aims to enhance the knowledge and use of the country's groundwater potential for production and consumption. The project is expected to have an important impact on the country's resilience through increased groundwater access for consumption and production, through improved groundwater information systems providing validated data and analyses to decision makers, and through increased drought preparedness.

The proposed project will strengthen the ability of vulnerable communities to better prepare for and respond to the impact of shocks and stressors, to adapt to change and to potentially transform leading to reduction of forced displacement and potential conflicts. The Project contributes to the creation of a coordination platform to strategically integrate the groundwater information and use aspects by bringing together the major actors within Ethiopia towards sustainable development and use of groundwater sources. In addition, the project will contribute to build trust and relationships, and to diffuse tension among HoA-GW4RP countries by supporting collaboration and trust building through regional platforms. The project supports implementation of Managed Aquifer Recharge (MAR) to minimize flood risks during the rainy seasons and shortages of water during dry periods. In addition, MAR provides promising adaptation measures to ensure a reduction in the climate and hydrological vulnerability of groundwater resources.

Major Project Features and Geographic Locations

The locations of HoA-GW4RP water supply and irrigation development sub-projects are found in different regions of the country. Further, various types of sub-projects are included in the project. The main sub-project types and geographic locations are summarized below:

- Design and implementation of Managed Aquifer Recharge (MAR) at Dire Dawa plains
- Carrying out potential groundwater assessments in 67 woredas, mainly 15 groundwater investigations and studies including of drilling of test boreholes
- Groundwater monitoring in 59 prioritized areas including drilling of monitoring wells and development of groundwater monitoring stations fitted with data loggers
- Developing groundwater based rural water supply infrastructure in 55 prioritized woredas including studies, designs, construction, and rehabilitation of small and medium scale multi-village water supply schemes
- Pressurized irrigation development (~200 ha) in four woredas (namely Dire, Dillo, Yabello and Teltele) in Borena zone of the Oromia region including 7 irrigation development sites (namely Eldema, Mermero, Melka Sadek, Elkune, Elkune 2, Kobo and Hobok)
- Promotes the use of efficient renewable energy, such as wind and solar to lift water
- Promote soil conservation measures

- Enhance service delivery management capacity through strengthening community-level scheme management (WaSHCOMs and WUAs) and building local operation and management capacities
- Strengthening groundwater institutions and information.

Detailed descriptions of the above sub-projects are provided in the subsequent sections.

Project Development Objective (PDO)

The development objective is "to increase the sustainable access and management of groundwater in Ethiopia". The project will strengthen the ability of vulnerable communities, many of them in the fragile borderlands, to better prepare for and respond to climatic shocks and other stressors, increasing their resilience and potentially contributing to the reduction of forced displacement and potential conflicts. The project contributes, with the Intergovernmental Authority for Development (IGAD) and other countries in the HoA (Kenya and Somalia in phase I of this program) to the creation of a regional coordination platform to strategically integrate transboundary groundwater information and to build regional and national capacity on groundwater management. This approach will also help bringing together the major actors within MoWE towards sustainable development and use of groundwater sources. In addition, the project will contribute to build trust and relationships on transboundary groundwater management, as the key resource to increase resilience in the borderlands, helping, in the long term, diffuse tension among HoA countries.

The Project development objective is envisioned to be achieved through implementation of three interlinked components: i) Groundwater Potential Assessment and Infrastructure Development for Inclusive Community-level use; ii) strengthening groundwater institutions and information, and; iii) project management, knowledge, and operational support. Project components are further divided into different subcomponents and categories as described in the below sections.

Project Components

Component 1: Groundwater Potential Assessment and Infrastructure Development for Inclusive Community-level Use (US\$ 191 million)

This component will focus on carrying out groundwater potential assessments, and implementing investments for groundwater use, conjunctive use, and introduction of managed aquifer recharge (MAR)¹. It supports investments to develop critical groundwater infrastructure in selected priority woredas as well as ensuring their sustainability. It will also promote the use of efficient renewable energy, such as solar and wind to lift water, as well as soil conservation measures and aquifer recharge. The component will have three subcomponents (i) Groundwater Potential Assessment, ii) Utilization of groundwater for water supply (human and livestock) as well as enhancing service delivery management capacity and iii) Utilization of groundwater for irrigation.

Selection criteria for prioritizing woredas to be supported under the Project. The federal MoWE and MoIL project preparation teams in consultation with regional administrations have identified

¹ MAR is one of the groundwater storage enhancement technologies through a purposeful addition of excess water from precipitation, treated wastewater or any other source to the groundwater system or aquifer using a variety of water retention structures.

priority woredas to be financed under the Project. During the prioritization process consideration is made to: i) ensure adequate representation of regions in the country; ii) maintain alignment with the regional project though prioritization of woredas in borderland areas, and; iii) ensure prioritization of least served woredas based on a set of defined selection criteria. The selection criteria include the following:

- **Priority drought prone woredas**: chronically drought-prone arid and semi-arid areas are prioritized based on the drought prevalence ranking assessment of the National Disaster Risk Management Commission (NDRMC)
- **Conflict**: the project will not select investments in conflict areas.
- Water scarcity: "Priority-1" water stress areas identified in recent assessment are selected
- Absence of financing from other stakeholders
- **Readiness for implementation**: availability of developed groundwater sources and engineering design is given priority

Based on the resource allocated to the project components, and detailed cost estimates of planned sub-projects, the project will support 59 prioritized woredas (55 for water supply and 4 for irrigation). Additionally, 67 woredas are targeted to be part of the groundwater assessment interventions. The figure below shows the preliminary identification of woredas with investments under the project.

Focus on Borderland Areas: The prioritization of woredas gave focus to borderland areas, and also considers critical challenges in other vulnerable areas. The prioritization of border areas will strengthen resilience of communities in border areas potentially contributing to the reduction of forced displacement and potential conflicts. As shown in the map, 30 woredas bordering Somalia, Sudan, South Sudan, Kenya, Eretria, and Djibouti are selected under the project for groundwater investigation/monitoring, water supply and irrigation interventions. Any intervention tapping into deeper or transboundary aquifers will need to be backed up by a corresponding aquifer sustainability assessment. This is expected to ensure that the proposed investments will not compromise the sustainability of the resource or have negative externalities. Aquifer sustainability assessment will be conducted prior to development as a prerequisite for proposed infrastructure investments (water supply and irrigation) in the border areas.

Ethiopia HoA GW for resilience Project Sub project location map



Figure 0-1 Ethiopia HoA-GW4RP Sub-projects Location Map

Sub-component 1.1 Groundwater Potential Assessments and Aquifer recharge (US\$ 67.5 million)

This subcomponent will finance: (i) groundwater potential assessment in prioritized areas, including borderland sites; (ii) design and implementation of MAR in the Dire Dawa plain, and (iii) development and management of monitoring wells that will feed into component 2 in targeted water supply and irrigation subproject sites/ woredas under components 1.2 and 1.3. Groundwater sources in the priority areas will be regularly monitored and the information will be used for sustainable management and efficient utilization of the groundwater sources.

Design and implementation of Managed Aquifer Recharge (MAR) (US \$3.9 million). The project will conduct detailed design and implementation of MAR at Dire Dawa Plains, an area that suffers from flooding during the rainy seasons and shortages of water during dry periods - largely caused by i) overflow from the main streams and small gullies; ii) the flat terrain, and; iii) lack of permeability in the topsoil. The Dire Dawa MAR project is a pilot to assess the suitability of Aquifer Storage and Recovery (ASR) through MAR to enhance the groundwater resources of the country, using excess rainwater available only for short periods during the rainy season of the year. The conceptual design of six cascaded small and micro dams on two streams of Dire Dawa town showed that the streams have a total inflow of about 8.38 MCM/year and a total of 1.8 MCM could be stored in the reservoirs and/or recharge the groundwater basin. Construction of these cascaded micro and small dams on the escarpment part of the administration will ensure some part of runoff recharges the groundwater basin where the Dire Dawa town well fields are located. This will also provide flood protection by decreasing the risk of floods in Dire Dawa town by about 20percent. The project will finance a pilot consisting of diverting flood water from the Dire Dawa plain to the

permeable part of the formation at the project sites. Major project activities include: (i) supporting feasibility study preparation and the development of numerical groundwater models (assess potential aquifer, selecting suitable location for recharge, assess methods and design system for draining the flood water into recharge wells and develop a preliminary groundwater model, and; (ii) installing the recharge system (small and micro dams) and developing water points for productive uses such as water supply for domestic and pastoralist consumption.

Through the implementation of MAR, the project is expected to expand the volume of groundwater available to project beneficiaries and hence improve resilience to climate shocks, including droughts/floods and extreme temperatures. In addition, the MAR is a promising adaptation measure to reduce the climate and hydrological vulnerability of groundwater resources, given the buffer capability of the resource and its ability to help communities bridge dry periods. Moreover, MAR can also lead to other benefits such as maintaining a healthy environmental flow and reduce the risk of water source over-extraction and degradation. The flood risk reduction measures are expected to benefit an estimated 36,100 people living in and around Dire Dawa.

• **GW potential assessment in prioritized areas (US \$54.46 million).** The project will support MoWE to carryout potential GW investigations/assessments in selected priority areas that will ultimately contribute to expanding national groundwater information coverage, which is currently estimated at only 17percent. Under the project 15 groundwater investigations/studies covering an area of 116,172 km², including drilling of test boreholes in 67 prioritized woredas, have been identified. The intervention is expected to increase national groundwater resources in the country in a sustainable manner, therefore diversifying water sources and increasing the buffer capacity during drought periods as a key climate change adaptation measure. The prioritization of the study areas considered the following criteria: i) potential for development and positive environmental impacts aligned with the demand from MoWE and MoIL; ii) sustainability of results, and iii) inclusiveness of the potential beneficiaries and severity of the water supply shortage, as well as availability of groundwater and suitable land for irrigation.

Dire Dawa Managed Aquifer Recharge Sub-project

- Estimated cost: about US \$3.89 million based on initial estimate from MoWE
- Expected benefit: could store water in the reservoirs and/or recharge the groundwater basin and reduce flood impacts
- Main activities:
 - feasibility study and development of numerical groundwater model (assess potential aquifer, selecting suitable location for recharge, assess methods and design system for draining the flood in to recharge wells and develop preliminary groundwater model)
 - installing recharge system construction of 6 8 cascaded micro and small dams.

The height of the small dams is less than 15 meters and the number of small dams is 8 and the total water storage expected from all dams is 1.8 million M^3 with an average of 225,000 m³ per dam.

Figure 0-2 Basic Features of the Managed Aquifer Recharge Subproject in Ethiopia

Groundwater monitoring in prioritized woredas (US \$9.14 million): This activity constitutes the basis to understand aquifer dynamics, and therefore protect groundwater sources, improve water quality, and promote sustainable water use, ultimately increasing resilience to droughts of the beneficiaries of targeted woredas. Accordingly, the project will support drilling of monitoring wells and development of groundwater monitoring stations fitted with data loggers in 59 prioritized areas under components 1.2 and 1.3. The project will support relevant institutions to ensure regular monitoring of the information, which will be used for sustainable management and efficient utilization of groundwater sources, particularly during droughts. The prioritization of the study areas considered the following criteria: i) woredas in the borderlands; (ii) potential for development and positive environmental impacts aligned with the demand from MoWE and MoIL; iii) sustainability of results, and; iv) inclusiveness of the potential beneficiaries and severity of the water supply shortage as well as availability of groundwater and suitable land for irrigation.

Sub-component 1.2 Utilization of Groundwater for Water Supply (human and livestock) and Enhancing Service Delivery Management Capacity (US\$ 118.5 million)

The subcomponent is structured into two activities:

Sub-component 1.2a: increasing rural and pastoral access to water supply services (US\$ 112.5 million). This subcomponent will focus on groundwater-based rural water supply infrastructure/system development with an emphasis on strengthening resilience at the community level against droughts and extreme temperatures. By tapping into more stable groundwater resources, it will be possible for vulnerable communities to diversify water sources and ensure water availability during longer dry periods. It will also reduce the water collection burden of women and girls. Within the selected, drought prone woredas, the project targets rural communities based on a set of prioritization criteria including: i) priority - drought prone woredas, ii) water scarcity "priority-1" areas; iii) absence of financing from other stakeholders, and; iv) readiness for implementation. Project locations will be mainly focused in borderland

areas to maintain alignment with the regional project, and will be in national aquifers to reduce the potential impact on transboundary aquifers. Fifty-five Woredas will be provided with access to community managed, groundwater based, improved water supply services. This subcomponent will finance: i) groundwater source development; ii) feasibility studies and engineering designs, and iii) construction/ rehabilitation of small and medium scale multi village water supply schemes for community and livestock demand, including water distribution to public water taps.

The selected subproject locations are largely arid and semi-arid areas with limited potential for groundwater at shallow depth. The project may need to develop deeper groundwater sources to secure sustainable and resilient water supply use. Design and construction of water supply schemes will build in resilience to increasingly severe weather-related events or hydrological shocks. The project will consider appropriate solar powered water lifting technologies in the design of the water supply system - as an alternative energy source to reduce operating costs and provide a low carbon alternative to fossil fuels.

In alignment with activities under components 2 and 1.1, the WRMD at MoWE will confirm sustainability of groundwater sources prior to development. Groundwater sustainability assessments made by the Water Supply and Sanitation Division at MoWE (WSSD-MoWE) will be: i) reviewed and verified by the Water Resources Management Division of MoWE (WRMD-MoWE) to confirm there is sufficient confidence that the supported development projects will not endanger the sustainability of the groundwater resource, and ii) shared with WRMD-MOWE to expand the groundwater mapping coverage of potential and current uses of groundwater. The water quality and quantity monitoring aspect will be integrated with the groundwater monitoring wells that will be developed under component 1.1 for water supply intervention areas.

Sub-component 1.2b: Enhancing service delivery management capacity (US\$ 6 million). The project will build on existing practices and lessons from ongoing projects (such as the One WaSH), and apply lessons learned on operational and managerial challenges by existing rural water systems, to ensure the sustainability of rural water supply schemes through strengthened community management arrangements. It will adopt GoE's existing experience of community-led water supply management arrangement though Water Supply, Sanitation and Hygiene Committees (WaSHCOMs), building on existing guidelines and manuals. Activities under this sub-component will enhance sustainable and adaptive management practices to cope with climate shocks or other stressors such as increase in demand by strengthening community capacity for O&M; increasing awareness on key challenges that affect the system's continuity and performance, including those related to climate change and variability; and improving local skill sets to help ensure the water supply systems are maintained optimally and function well into the future (also considering climate trends and projections). This will significantly reduce the risk of system failure during climate related shocks. The project will support to priority woredas and will focus on the following key aspects:

• Strengthening community level scheme management arrangements: Under this subcomponent MoWE will provide Technical Assistance (TA) support in the development of training materials and conduct a series of trainings in planning, works execution and the operation and maintenance (O&M) of water supply facilities for woreda water offices and WaSHCOMs. The project will: i) support the establishment of WASHCOMs at water point and Rural Piped Schemes level and train their members; (ii) enable WASHCOMs to design and implement an effective fee collection system for scheme O&M through setting standard tariff structures that will cover operation costs; iii) ensure the establishment of WASHCOM bank accounts, and strengthening of

bookkeeping practices; (iv) build technical capacity of WASHCOMs to respond to changes in the environment (supply-demand), and rapid response in conducting repairs and maintenance tasks through provision of technical trainings and facilitation of easy access to technical service providers, and awareness of aquifer dynamics including effects of climate change; (v) facilitate legalization of the WASHCOMS based on MoWE's existing manuals and guidelines, and(vi) ensure that women constitute a target share of leadership positions in WASHCOMS.

- Facilitating community engagement: The project will give due attention to adequate community engagement during planning, design, implementation, and post-construction stages to ensure beneficiary community ownership, control, and management of their water supply facilities. In this regard, WaSHCOMs will be established at an early stage to ensure early engagement in decision making processes. Additionally, the project will finance activities to enhance the participation of local communities in groundwater management, including gender and other social inclusion and stakeholder capacity building. The project will also finance activities in groundwater management. Community structures in groundwater management. Community capacity will also be strengthened in relation to climate change and variability, in order to enhance sustainable use.
- **Building local level (woreda level) capacity for O&M**: avoiding post-construction functionality challenges will require the timely supply of spare part materials. Although the primary responsibility for O&M lies with the WASHCOMs, Woreda Water Offices are expected to provide O&M technical backstopping. In this regard, the project will support woredas to i) establish fast-moving spare part shops, and; ii) establish woreda level mobile O&M crews to enhance O&M capacity. The project will train and leverage women- and youth-led small- and medium-sized enterprises (SMEs) within each woreda to strategically address O&M challenges (including those related to climate change), and enhance O&M training curricula under vocational skills programs to increase the capacity of the local private sector (technicians, artisans, construction firms).
- Establish and strengthen water quality monitoring: Water quality is one of the major • constraints compromising expected health and nutrition impacts from improved WASH services. Water quality is also a key factor for enhance preparedness and response to climate shocks such as drought and floods, and to enhance climate-informed decision making. This subcomponent will support the establishment, strengthening, and maintenance of the water quality monitoring systems in project woredas. The subcomponent will also benefit from the groundwater monitoring stations that will be developed under subcomponent 1.1. To this end the program will finance: (i) TA to determine the magnitude and source of contamination from source to consumption point for better targeting and refining interventions along the supply and consumption chain; (ii) establishment and strengthening the water quality monitoring system including the commitment from the woredas to hire water quality experts; iii) procurement of mobile water quality test kits, provision of training, and support for regular data collection (at least quarterly), and; (iv) development and adherence to source protection standards (fencing, drainage, cleanliness, separation of livestock water points, etc.).

Sub-component 1.3: Utilization of groundwater for small scale irrigation (US\$ 5 million). This component will focus on groundwater-based small scale irrigation infrastructure/system development to improve agricultural livelihoods and to foster livelihoods diversification by tapping into a more stable resource during times of droughts, as an important adaptation strategy in arid and semi-arid lands such as the project borderlands. This subcomponent will finance: i) groundwater source development; ii) feasibility studies and engineering designs, construction/ rehabilitation of small-scale groundwater-based irrigation infrastructures, including climateresilience considerations, and; iii) introduction of the concept of farmer-led irrigation (FLID), where farmers are the decision makers, to improve agricultural water use. The subcomponent will be informed by the findings of subcomponent 1.1. Boreholes drilled for testing purposes, that are ready for production, will be optimally utilized.



Figure 0-3 Location of Irrigation Development Project in Borena Zone

According to definition in Ethiopia, Small Scale Irrigation (SSI) are those schemes covering areas less than 200 ha. A typical small scale irrigation scheme (SSI) subproject will have the following features:

- Estimated beneficiaries/ha: about 6, based on the Borena study
- Estimated cost including Borehole drilling/ha (about US \$9,000) per ha based on recent feasibility study of the Borena irrigation
- Main activities
- Supply and installation of Sprinklers laterals earth work and associated works,
- Supply and installation of Main, Submain and BHs delivery pipes and fittings earth work and associated works,
- Construction of Boreholes and Guards housings earth work and associated works,
- Supply and installation of electromechanical equipment including electrification accessories, and
- Construction of drain Earth work drain structure work and associated works.
- All of the schemes are going to be fitted with pressurized system that will utilize renewable energy (from the national grid) for water lifting and distribution.

The total number of BH is 7 (which are already drilled) with a total yield of 797.

Figure 0-4 National Definition of SSI Schemes and Typical Features of Proposed SSI Sub-projects

The project will finance pressurized irrigation development (total area of about 200 hectares) in the Borena zone of the Oromia region. The subprojects, located in borderlands, will establish different types of multipurpose water infrastructure for ensuring sustainable water supply for irrigation development. They will propose measures and technologies to address irrigation-based, Climate Smart Agriculture development and the integration of optimum crop-livestock and forage production. These measures are key to enhance local preparedness and adaptation to droughts. The proposed project is in four drought-prone and food-insecure woredas in the Borena zone: Dire, Dillo, Yabello and Teltele. Seven irrigation development sites (Eldema, Mermero, Melka Sadek, Elkune, Elkune 2, Kobo and Hobok) covering a total net irrigable area of approximately 200 hectares are prioritized for immediate implementation under the project.

The Project will consider solar powered irrigation system (SPIS) as an alternative energy source to reduce operating costs and provide a clean energy alternative to fossil fuels, enabling the development of low-carbon irrigated agriculture. The project will also support activities related to: i) establishing/strengthening Irrigation Water Users Associations (IWUAs) which are essential in ensuring the sustainability of developed schemes, and; ii) ensure adequate O&M arrangements and tariff structures are implemented. IWUAs will be established for each of the irrigation development sites.

Provision of the irrigation system in the proposed project area can be one of the most successful measures to help adapt to changing climate by providing a regular supply of water for agriculture. This will help the farmers switch from rainfed agriculture to irrigated agriculture,
helping them adapt to changing rainfall patterns and drought events in the lowlands. The establishment of irrigation infrastructure will have minimized carbon emissions, and will help mitigate climate change through the following three mechanisms: i) all of the schemes will be fitted with pressurized systems that will utilize renewable energy (from the national grid) for water lifting and distribution. The pressurized (fully piped) system will ensure irrigation efficiency exceeding 85percent (compared to an average of 45-60percent for canal systems). Going forward the schemes will be solar powered; ii) access to irrigation will significantly boost productivity, thereby reducing emission intensity per ha, and; iii) there will be natural resource management interventions upstream (afforestation, soil & water conservation measures etc.) to reduce siltation and aid carbon sequestration.

Component 2: Strengthening groundwater Institutions and Information (US\$ 8 million)

This component is expected to strengthen the enabling environment and institutional capacities for groundwater study, development and management as well as strengthening groundwater management information system of the country. Implemented by Water Resource Management Division at MoWE this component will finance the following two sub-components.

Sub-component 2a: strengthening institutional capacity for groundwater management (US\$ 3 million): This subcomponent finances technical assistance, capacity building and institutional strengthening, including support to national water resources management entities. It aims to improve the MoWE WRM division's groundwater governance and management capacity through: (i) development of a groundwater strategy in line with the national policy; (ii) establishment of a groundwater management and regulation framework, and (iii) building institutional capacity through the design and implementation of training programs for groundwater resources exploration, management, and planning. In developing the strategy and legal frameworks special attention will be given to sustainable access and management of the resource, climate resilience, and to ensure that women can attain equal representation in leadership/decision-making positions. The capacity building program to be developed by PMCU will align with IGADs regional capacity building program. In this regard, a training program will be designed and implemented in collaboration with the Ethiopian Institute of Water Resources. In addition, the project will support national professionals at MoWE (WSS and WRM divisions) and MoIL to participate in regional trainings and experience sharing platforms organized by IGAD and other member states. The MoWE WRM Division will carry out needs assessments to identify capacity building gaps - this will be an input into regional trainings that will be organized by IGAD.

Project activities under this sub-component will contribute to enhance the sustainable use of groundwater to avoid overexploitation through a clear strategy and regulations. At the same time, institutional capacity building will address key topics for sustainable infrastructure development and sustainable groundwater exploitation, low-carbon groundwater management, and continuity at the service delivery level in vulnerable contexts to climate change (including groundwater risks and threats, assessment of natural groundwater recharge/discharge dynamics and artificial recharge potential to better understand the role of groundwater as a buffer against drought, groundwater pollution and degradation, among others).

Sub-component 2b: enhancing groundwater information and monitoring systems (US\$ 5 million): This subcomponent will finance interventions that will enhance groundwater information management systems, which are critical to ensure the sustainable management of the

resource. Activities include the: (i) development of supportive tools for groundwater information access, monitoring and use, and the (ii) consolidation, production, and dissemination of groundwater data and information. While building national groundwater information capacity the project will also collaborate with IGAD and member states on groundwater information sharing based on defined/ agreed protocols to be developed during implementation. The Groundwater Information and Monitoring System is expected to provide critical information regarding groundwater management and monitoring, improve the quality and scale of data of Ethiopia's groundwater resources, provide information needed to avoid potential overexploitation and misuse of the resource, enhance decision-making and enable climate-informed policies and strategies, including information to enhance the country's preparedness and adaptation to climate shocks.

The project will also support the MoWE WRM Division in the preparation of a region aligned national groundwater risk mitigation assessment, with focus on climate resilience, and support transboundary collaboration and dialogue on groundwater resource management through regional platforms/forums. The national groundwater risk mitigation assessment will make a vital contribution to the both the preparation of the national risk mitigation Strategy and the regional water risk assessment to be caried out by IGAD. These activities are expected to enhance Ethiopia's collaboration with IGAD and member countries on groundwater management. The consultative approach of developing the groundwater risk mitigation strategy, with IGAD and Member states, is also expected to contribute to transboundary groundwater policy, collaboration, and risk management capacity. IGAD will play a key role in facilitating meetings among riparian states to advance the dialogue and transboundary cooperation towards common understanding and management of the resource. The outcome of the National Groundwater Risk Mitigation Strategy will inform feasibility studies as well as the design of water supply and medium scale irrigation interventions identified under component 1.2 and 1.3.

Component 3: Project Management, Knowledge, and Operational Support (US\$ 11 million)

This component will finance consultants and operational costs of the Project Coordination and Management Unit (PCMU) at MoWE and the Project Management Teams at MoWE (water supply project implementation team and WRM project implementation team) and MoIL (irrigation development project implementation team). This component will finance the procurement of goods, services, training, and operating costs including: (i) implementation support in the form of technical experts, and equipment, including assistance in capacity building; (ii) project management and coordination costs between implementing agencies; (iii) specialists on procurement and contract management, financial management, and environmental and social management to support the corresponding staff at the Ministry, and; (vi) knowledge management.

Component 4: Contingent Emergency Response Component (US\$ 0 million)

This component is a mechanism for financing eligible expenditures in the event of an eligible crisis or emergency, such as a major natural disaster. The CERC has no initial allocation of funds. In the event of an eligible crisis or emergency, the Government of Ethiopia may request the World Bank to reallocate funds from other HoA Groundwater for Resilience components to the CERC, as well as funds from other Bank projects, to cover emergency response and recovery costs. An Emergency Response Manual (ERM) is developed in the Operations Manual, including fiduciary, safeguards, monitoring and reporting, and any other necessary coordination and

implementation arrangements as a condition for disbursement. All expenditures under the Program-specific CERC will be in accordance with World Bank OP 10 (Investment Project Financing - IPF) and will be reviewed by the Bank for eligibility prior to disbursement. Disbursements will be made based on an approved list of goods, works, and services needed for crisis mitigation, response, recovery, and reconstruction.

Project Beneficiaries

The project targets hotspot areas requiring the most urgent interventions and benefit the most vulnerable groups. Sub-project locations will be selected based on criteria including nutrition and health problems, crop and livestock losses, lack of access to basic services, prevalence of drought and flood and diseases outbreaks, positive environmental and development impacts, and absence of financing from other sources. The project will benefit an estimated 1.48 million people living in the selected drought prone and water stressed areas.

Project Implementation Arrangement

National Groundwater Management Steering Committee (NGWMSC)

A National Groundwater Management Steering Committee (NGWMSC) will be established and maintained throughout the project duration. The NGWMSC will be the highest governing body for the project and provides overall governance and strategic guidance for the project. The NGWMSC will be chaired by the state minister for Water Resource Management Division, Ministry of Water and Energy (MoWE) and is composed of State Minister for Water Supply Division of the MoWE, Ministry of Finance, Ministry of Irrigation and Lowland and the World Bank. Members of the steering committee could expand as required and may include Minister of Agriculture, Agriculture Transformation Agency, and National Metrological Agency etc. Specifically, NGWMSC will be responsible to review and approve annual work plan and budget of the Project and review progress reports on a quarterly basis.

Ministry of Water and Energy (MoWE)

Following the recent establishment of new government in Ethiopia in October 2021, the then MoWIE was reorganized into two separate ministries, Ministry of Water and Energy (MoWE) and Ministry of Irrigation and Lowlands (MoIL). Mandate for water resource management has remained under MoWE. Nonetheless, MoIL does not have adequate institutional capacity to coordinate and provide guidance to institutions and stakeholders involved in groundwater planning and management. As a result, the present HoA-GW4RP-Ethiopia is going to be based in the MoWE and will be implemented in collaboration with other sector stakeholder institutions. The MoWE will be responsible for overall coordination, monitoring, evaluation and facilitation of capacity building of the HoA-GW4RP-Ethiopia. Moreover, implementation of subcomponent 1.2 (infrastructure development for water supply) and 1.1 (study and development of potential national aquifers) will be managed by a Project Implementation Teams (GWPIT) to be established at the Water Supply and Sanitation Division and Groundwater Resource Management Directorates of the MoWE. While the project will finance establishment of these PITs, potential use of existing PMUs and their staffs at WSSD-MoWE and IDPD-MoIL will be explored.

Ministry of Irrigation and Lowlands (MoIL)

The Ministry of Irrigation and Lowlands (MoIL) will be responsible for planning and implementation of sub-component 1.3: Infrastructure Development for irrigation. A Project Implementation Team will be established at the Irrigation Development Projects Division at Ministry of Irrigation and Lowlands for the implementation of Subcomponent 1.3 (Infrastructure Development for Irrigation). There will be a strong need for integrating the information, infrastructure and use aspect of groundwater among actors (WSSD, WRM Division under MoWE and Irrigation Development Project Division under MoIL) to ensure higher return from groundwater development and use.

Project Management and Coordination Unit (PMCU)

A Project Management and Coordination Unit (PMCU) will be established at the Ministry of Water and Energy under the Water Resource Management Division. The PMCU will carry out the overall coordination, planning, monitoring, and supervision of the Project. Accordingly, PMCU will be responsible for i) consolidation of the annual Project action plan and budget for all components, ii) consolidation of quarterly physical progress and Interim financial reports, iii) channeling of resource to Project management unit at WSSD-MoWE and IDPD-MoIL based on approved annual work plan and budget, and iv) coordinating implementing agencies and serve as a secretariat to the National Groundwater Resource Management Steering Committee. The PMCU will deploy critical staffs including Coordinator, FM Specialist, Procurement Specialist, Environmental & Social Safeguard Specialist, M&E Specialist, and Water Resource Management Specialists. The PMCU will also be responsible for planning, implementation, and regular reporting of activities under the project.

Project Implementation Teams (PITs)

Implementation of sub-component 1.2 (infrastructure development for Water Supply) will be managed by a Project Implementation Team (PIT) to be established at the MoWE water supply and sanitation division. As much as possible priority will be given for utilizing capacity of existing PMUs such as OWNP-CWA PMU. Similarly, a Project Implementation Team will be established in Irrigation Development Projects Division at the Ministry of Irrigation and Lowlands for implementation of Subcomponent 1.3 (Infrastructure Development for Irrigation). Each PIT will be responsible for the planning and implementation of their respective subcomponents. Instead of establishing and financing new project management units, it is potentially better to use existing PMUs and their staffs at WSSD-MoWE and IDPD-MoIL.

Water Users Associations (WUAs) and Water, Sanitation, and Hygiene Committees (WaSHCOMs)

The operation of the sub-projects will be mainly by Water Users Associations (WUAs) and Water, Sanitation and Hygiene Committees (WaSHCOM) depending on the type of sub-projects. The irrigation sub-projects will be operated and maintained by Irrigation WUAs while the water supply sub-projects will be managed by WaSHCOMs. The IWUAs and WaSHCOMs will be closely supported by local administration; Woreda, Zonal, and where applicable regional administration.



Figure 0-5 Proposed Institutional Arrangement for Project Implementation

THE ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK (ESMF)

PURPOSE AND SCOPE OF THE ESMF

Since the potential adverse environmental and potentially impacts of the HoA-GW4RP could not be identified prior to appraisal, this ESMF has been prepared consistent with World Bank Environmental and Social Standards (ESSs). It outlines an environmental and social screening process which will enable qualified project personnel to screen sub-projects for potential negative environmental and social impacts. As a safeguard instrument, the ESMF is a tool that ensures environmental and social sustainability of various subprojects under the framework of HoA-GW4RP. The ESMF also provides guidance towards identification and mitigation of potential environmental and social impacts of the proposed HoA-GW4RP. To this end, this ESMF has been prepared in compliance with the Bank's ESS and relevant Ethiopian policies and laws on environmental and social assessment. Potential adverse environmental and social impacts will be addressed in the context of this ESMF, while potential social impacts related to land acquisition such as loss of livelihoods or loss of access to economic assets will be addressed in the Resettlement Policy Framework (RF). The RF has been prepared as a separate document. The document outlines the policies and procedures to be applied in the event of land acquisition under the proposed project. The World Bank ESS requires that all Bank-financed operations are screened for potential adverse environmental and social impacts, and that the required environmental and social assessments be carried out based on the screening results.

ESMF RATIONALE

The Environmental and Social Management Framework is being prepared to ensure that investments under the proposed HoA-GW4RP are implemented in accordance with World Bank's Environmental and Social Standards and GoE's National Environmental legislations which require that investments should be implemented in an environmentally and socially sustainable manner. The National ESIA proclamation No. 299/2002 under its Article 3.1 states that a project that requires environmental impact assessment shall not commence implementation without authorization from the competent Federal or Regional authorities. According to the World Bank Environmental and Social Standards for Investment Project Financing (IPF), Projects supported by the Bank through IPF are required to meet the nine Environmental and Social Standards outlined in the new ESF. The Bank also supports the use of the Borrower's (in this case MoWE and MoIL) ES Framework in the assessment, development and implementation of projects supported through IPF.

The ESMF is an instrument that examines the risks and impacts when a project such as HOA-GW4RP consists of a series of subprojects, and general risks and impacts of subproject details have been identified. The HoA-GW4RP will implement water supply interventions in 59 priority Woreda including in rural, pastoral and urban areas, ground water-based irrigation infrastructure development in the Borena Zone as well as drilling of ground water test wells in 67 Woreda. However, the specific locations where the subproject activities will be implemented have not been yet identified. The project activities will be implemented under different environmental and social conditions. As part of the project preparation, the Client (MoWE and MoIL) have prepared

this ESMF which will serve as a basis for management of any potential environmental and social risks originating from the subproject activities.

This ESMF has been prepared for use by the project implementing agencies which are mainly Ministry of Water and Energy (MoWE) and Ministry of Irrigation and Lowlands (MoIL) as well as key stakeholders to be involved in the planning, implementation and management of the proposed subprojects of the HoA-GW4R project. As such, the ESMF would be useful to the following stakeholders:

- Project financier (World Bank/IDA)
- Ministry of Water and Energy (MoWE)
- Ministry of Irrigation and Lowlands (MoIL)
- Stakeholders and beneficiary local communities
- Federal and regional environment protection authority offices
- Service providers, contractors and consultants.

OBJECTIVES OF THE ESMF

The overall objective and purpose of the HoA-GW4RP ESMF can be summarized as follows:

- Review Ethiopia's environmental policies, legislation, regulatory and administrative frameworks in conjunction with the World Bank's ESS. Where there are gaps between these standards, make recommendations as to how to bridge these gaps in the context of the proposed project as appropriate;
- Review of the biophysical and socio-economic characteristics of the environment in the postural, rural and urban areas to be covered by the project, and highlight the major constraints that need to be taken into account in the course of project implementation;
- Develop a stakeholder consultation process that ensures that all key stakeholders, including potentially affected persons, are aware of the objectives and potential environmental and social impacts of the proposed project, and that their views are incorporated into the project's design as appropriate as possible.
- Assess the current ability at the federal, regional, rural and/or city levels to implement the recommendations of the ESMF, and make appropriate recommendations (through stakeholders' consultations);
- Identify the general potential environmental and social impacts of planned sector investments and rehabilitation activities in the pastoral, rural and urban areas such as: water supply and irrigation development project recommend mitigation measures as appropriate,
- Provide procedures and guideline to develop specific ES instruments for sub-projects, ES clauses in procurement and contract documents, guidelines for supervision and monitoring of sub-projects implementation of ES requirements during implementation and operation periods, and appropriate considerations of ES risks in any project studies and consultations.

ESMF DEVELOPMENT METHODOLOGY AND CONSULTATION

The methodology adopted for preparing the ESMF includes conventional methods which are briefly discussed below.

A. Review of Relevant Legislations, Policies and Other Documents

Relevant literature consisting of the following was reviewed for ESMF preparation:

- Review of the existing national and regional policies and legal documents, regulations and guidelines on environmental management;
- Existing ESMFs for similar World Bank projects (such as the One WASH Consolidated Water Supply, Sanitation and Hygiene Project and Urban Water Supply & Sanitation Project Phase II);
- Project Appraisal Document of HoA-GW4RP
- Project Concept Notes (PCN) prepared by MoWE and MoIL,
- Environmental and Social Review Summary report (ESRS) as well as Environmental and Social Commitment Plan (ESCP)
- WBG EHS guidelines
- WB environmental and social Standards for IPF projects as outlined in the Environmental and Social Framework. The new ESF of the World Bank (2018) was reviewed and applied for preparation of the current ESMF.

B. Data Collection and Analysis

Secondary data, mainly from the One WaSH and Urban Water Supply & Sanitation Project Phase II ESMF and ESIA report of subproject were adopted and applied to compile the environmental and social baseline of the ESMF. The stated ESMF and ESIA report presented a detailed assessment of the water sector in the project influence areas.

C. Consultation with Project Implementers and Stakeholders

Owing to the prevailing global pandemic (COVID-19) which is also rocking Ethiopia at the time of ESMF preparation, it has become necessary to utilize stakeholder consultation methods that are COVID-19 appropriate. For that purpose, telephone calls, zoom/webex meetings and face to face meetings with small group of people were applied to carry out consultations with the various stakeholders.

In the run up to arrange and conduct the stakeholder and community consultations, two COVID appropriate virtual meetings and a visit to the relevant directorates in the MoWE were held. The first virtual meeting was held on 29 October 2021, and was mainly focused on planning and organizing the various activities including the stakeholders and community consultations required to prepare the ESMF with the project partners. Project focal persons in MoWE, including members of the Environment and Public Participation Directorate, World Bank task team members and the E & S consultants—participated in this meeting that was attended by about ten participants. Following the first virtual meeting, a visit to the Ground Water and Environment & Community Participation Directorates in MoWE was made by the consultants on 11 November 2021. Further discussions were held with the staff members of the MoWE and in particular with the E & S experts in the Groundwater Directorate to finalize arrangements for the stakeholder and community consultations. At the end of these discussions, it was agreed that a virtual stakeholder meeting will be organized in collaboration with the staff of the Groundwater Directorate which will be attended by all stakeholders at head office, federal and regional levels.

It was also agreed that taking the contemporary fragile security and COVID-19 situations in the country into consideration, the community consultations will be conducted in three selected woredas with the help of the relevant regional and woreda level Water Resource Development offices. Accordingly, a webex meeting invite link was circulated to more than 30 stakeholders. The virtual stakeholder consultation meeting was attended by relevant MoWE head office staff, federal and regional stakeholders and was held on 18 November 2021.

POLICY, LEGISLATIVE, ADMINISTRATIVE AND INSTITUTIONAL FRAMEWORKS

POLICIES AND STRATEGIES OF NATIONAL ENVIRONMENTAL AND SOCIAL MANAGEMENT SYSTEM

The FDRE Constitution

The constitution of the Federal Democratic Republic of Ethiopia was issued in August 1995 with several provisions, which provides basic and comprehensive principles and guidelines for environmental protection and management in the country. The concept of sustainable development and environmental rights are presented in Articles 40, 41, 42, 43, 44 and 92 of the Constitution.

Article 40 - Land and Natural Resource

In relation to land and natural resources, the Constitution under Article 40 proclaims that land and natural resources are commonly owned by the people of Ethiopia and shall not be subject to sale or other means of exchange. It stipulates the rights of Ethiopian farmers and pastoralists to obtain land for cultivation and for free grazing without payment and the protection against eviction from their possession.

Article 41 - Economic, Social and Cultural Rights

Article 41 of the Constitution states that every Ethiopian has the right to access publicly funded social services. Sub-article 5 of the same article stipulates, the state, within available means, should allocate resource to provide rehabilitation and assistance to physically and mentally disabled, the aged and to children who are left without parents or guardians.

Article 42 - Rights of Labor

Article 42(2) stipulates that 'workers have the right to a healthy and safe work environment', obliging an employer (be it government or private) to take all necessary measures to ensure that workplace is safe, healthy and free of any danger to the wellbeing of workers.

Article 43 - The Right to Development

The Peoples of Ethiopia as a whole, and each Nation, Nationality and People in Ethiopia in particular have the right to improved living standards and to sustainable development. Nationals have the right to participate in national development and, in particular, to be consulted with respect to policies and projects affecting their community.

Article 44 - Environmental Rights

All persons have the right to a clean and healthy environment. All persons who have been displaced or whose livelihoods have been adversely affected as a result of State programs have the right to commensurate monetary or alternative means of compensation, including relocation with adequate State assistance.

Article 92 - Environmental Objectives

Government shall endeavor to ensure that all Ethiopians live in a clean and healthy environment. The design and implementation of programs and projects of development shall not damage or destroy the environment.

People have the right to full consultation and to the expression of views in the planning and implementations of environmental policies and projects that affect them directly. Government and citizens shall have the duty to protect the environment.

Regional States Constitutions

Regional states have their own constitution upholding the federal constitution in its entirety and constituting their regional particulars. All the regional state constitutions have addressed land and natural resources management and environmental protection. The regional states constitutions state that:

- The regional governments are entrusted to administer land and natural resources in the name of the people and deploy for the common benefit of the same;
- The regional governments and all citizens of the regions are responsible for the conservation of natural resources and the environment;
- Concerned communities shall be given opportunity to express their opinions in the formulation and implementation of policies in relation to the environment.

Environmental Policy of Ethiopia

The first comprehensive statement of the Environmental Policy of Ethiopia was approved by the Council of Ministers in April 1997 that was based on the policy and strategic findings and recommendations of the Conservation Strategy of Ethiopia. The policy is aimed at guiding sustainable social and economic development of the country through the conservation and sustainable utilization of the natural, man-made and cultural resources and the environment at large. The overall policy goal is to improve and enhance the health and quality of life of all Ethiopians and to promote sustainable social and economic development development through the sound management and use of natural, human-made and cultural resources and the environment as a whole so as to meet the needs of the present generation without compromising the ability of future generations to meet their own needs. The Environmental Policy provides a number of guiding principles that require adherence to the general principles of sustainable development. In particular, the need to ensure that Environmental Impact Assessment:

- Considers impacts on human and natural environments
- Provides for early consideration of environmental impacts in project and program design
- Recognizes public consultation processes as essential to effective management
- Includes mitigation and contingency plans
- Provides for auditing and monitoring
- Is a legally binding requirement.

The Government of Ethiopia has recently initiated to update the Environmental Policy of Ethiopia. The technical committee under the Federal Environment Protection Authority was

formalized to be in charge of updating the National Environmental Policy to fulfil the gaps identified in addressing climate change and other environmental issues.

Climate Resilient Green Economy

The Climate Resilient Green Economy (CRGE 2011) is Ethiopia's overarching framework and a national strategy towards a green economy. The CRGE strategy is believed to provide an opportunity to promote sustainable development in Ethiopia. Currently, it builds on an investment plan of over 60 initiatives that are, or can be, turned into financed projects. For this to happen, there is a strong need to reform the economy. The CRGE is envisioned to be the main driver for this transformation. The CRGE has three complementary objectives: i) fostering economic development and growth, ii) ensuring abatement and avoidance of future GHG emissions; and iii) improving resilience to climate change. To achieve these objectives, CRGE sets out to tap into international climate finance, seize opportunities for innovation and new technologies, and create competitive advantages via sustainable resource use and improving productivity.

National Water Resource Management Policy

Ethiopian Water Resources Management Policy (WRMP) was issued in 1999 to enhance efficient, equitable, and optimum utilization of water resource for socio-economic development on sustainable basis. The policy among others recognizes water as a scarce and vital resource that needs to be managed on a strategic planning base to ensure social equity, economic efficiency, systems reliability, and sustainability and the integration of water resources development in the overall national economic development framework. The policy recognizes and adopts hydrologic boundaries or basins as the fundamental planning unit for water resources management.

The policy also provides guidance on cross cutting issues such as water allocation and apportionment, water resources protection and conservation, water resources management information systems, water cost and pricing (economics of water), water financing, groundwater resources, disasters, emergencies and public safety, transboundary water, gender, and water quality management. The sector is currently revising its 1999 Water Resources Policy and updating the sector's 10-year strategy as a follow up of the current GTP II.

The main legal provisions for translating the WRM policy include the Water Resources Management Proclamation (2000) and Water Resources Management Regulation (2005), Basin Councils and Authorities Proclamation (2007), and respective Regulation (2008), Environmental Impact Assessment Proclamation (2002) and Environmental Pollution Control Proclamation (2002).

Integrated Water Resource Management Strategy

The Integrated Water Resource Management Strategy of the sector calls for sector integration to ensure harmonized implementation of groundwater initiatives. In the context of groundwater management, different institutions within MoWE are mandated to develop and manage these resources, although there is a weak linkage with the BDA who is mandated to be the groundwater information center. For instance, under the One WaSH National Program over 17,000 groundwater sources have been developed but basic borehole data (yield, depth, geological formation, functionality, etc.) for these groundwater sources have not been systematically collected, documented, and shared with the central database. This is also negatively impacting

groundwater source studies as the information is not feeding to site identification. This is largely demonstrated by the reduction of borehole success rate from time to time, which in some regions reached less than 70%. Hence there is a strong need for integrating the information, infrastructure and use aspect of groundwater among the Water Resource Management Division at Ministry of Water and Energy (WRMD-MoWE), Water Supply and Sanitation Division at Ministry of Water and Energy (WSSD-MoWE) and Irrigation Development Project Division at Ministry of Irrigation and Lowlands (IDPD-MoIL) to ensure higher return from Groundwater development and use.

FDRE National Occupational Safety and Health Policy and Strategy

The National Policy and strategy on Occupational Safety and Health (OSH) was endorsed by the FDRE Council of Ministers in July 2014. The OSH policy and strategy was prepared to implement the rights of Labor as stipulated in article 42(2) of the Constitution and also implement the requirements of International Conventions on Occupational Health and Safety (No.155) to which Ethiopia is a signatory. The overall objective of the national OSH Policy and strategy is to avoid, prevent or minimize occupational and health hazards by providing effective OSH services in all working places and thereby contribute to the socioeconomic development of the Country.

The guiding principles of the National OSH policy and strategy are stated as the following:

- a. Occupational Safety and Health Services are basic rights of workers
- b. Occupational Safety and Health Services are necessary in all working places
- c. Occupational accidents and health hazards can be prevented
- d. Tripartite and bipartite cooperation and coordination are key instruments for the national OSH policy and strategy implementation.

The specific objectives of the National OSH policy and strategy include:

- a. To ensure availability and accessibility of OSH services in all economic activities including in the informal work sectors
- b. To prevent occupational safety and health hazards by establishing a tripartite and bipartite consultation and coordination mechanisms
- c. To establish OSH systems that pays attention to those workers who seek special assistance (e.g., women, youth, persons with disabilities, HIV patients, etc.).
- d. To prevent the environment, public and workers health by preventing the release of pollutants from the work places.

The strategy of the national OSH policy includes;

- a. Establishment of an effective and accessible work conditions inspection mechanism that is focused on prevention.
- b. Formulating and implementing national regulations and standards on OSH and updating and improving it periodically.
- c. Integrating and implementing OSH protection principles in all national development plans.
- d. Establishing control and inspection mechanism that ensure prevention of occupational and health hazards to workers and impacts on the environment from occurring due to import. Use or disposal of machineries, raw materials or chemicals in work places.

- e. Establishing a mechanism to ensure OSH services are provided in the private sector
- f. Establishing a mechanism to ensure provision of advices and technical support on OSH are provided by organizations.

The national OSH policy and strategy is applicable to all types of work places and economic activities in Ethiopia.

The National Policy on Ethiopian Women (1993)

It underlines the need to establish equitable and gender sensitive public policies that empower woman, especially in education and property rights, and engaging them in decision making. Improving healthy working conditions, ensuring access to basic services, protecting woman from harmful traditional practices are among the emphasized key issues.

Gender Mainstreaming Strategy and Guideline (2010)

This strategy was adopted at policy, program and project level by government and development partners to ensure the outcomes of development to be shared equally between men and women; both men and women enjoy equal opportunities, status and recognition.

The ratification of the Family Law and amendments made to the criminal code significantly support to fight abuses committed against woman and children. Proclamation No, 1156/2019 gives special attention to woman and young workers. The proclamation provides protection for woman in general and pregnant woman in particular from hard work and long hours. The law clearly states that women should not be discriminated against as regards to employment and payment on bases of her sex. Gender norms in Ethiopia vary widely depending on geographic location, ethnicity, and religion, especially related to property ownership, inheritance, and the division of assets after divorce. However, the new Family Code has changed all that. Passed in 2000, it gives equal rights to women in marriage and it requires all assets be divided equally among both partners in the case of a divorce. By now, all the states in Ethiopia have approved this new Code. Ethiopia is one of many developing countries implementing gender policy reforms, especially regarding women's equal access to assets and resources.

APPLICABLE PROCLAMATIONS, REGULATIONS AND PROCEDURAL GUIDELINES FORMING THE NATIONAL ENVIRONMENTAL MANAGEMENT SYSTEM

Environmental Impact Assessment Proclamation (Proclamation No. 299/2002)

The ESIA Proclamation is used to predict and manage the environmental effects of a proposed development activity as a result of its design, sitting, construction, operation, or an ongoing one as a result of its modification or termination, entails and thus helps to bring about intended development.

The proclamation is an effective means of harmonizing and integrating environmental, economic, cultural and social considerations into the planning and decision-making processes thereby promoting sustainable development. Moreover, it serves as a basic instrument in bringing about

administrative transparency and accountability, to involve the public and the communities in particular, in the planning and execution of development programs that may affect them and their environment. The objective of undertaking the assessment study is to ensure the impacts of a development project and the incorporation of mitigating measures for the adverse significant impacts. The ESIA law and associated guidelines clearly defines:

- Why there is a need to prepare ESIAs
- What procedure is to be followed in order to implement ESIA
- The depth of environmental impact studies
- Which projects require full ESIA studies
- Which projects need partial or no ESIA studies
- To whom the report must be submitted

There are ongoing efforts carried by the former EFCCC (now Federal Environment Protection Authority) to review the ESIA Proclamation in order to update and improve it.

a. Environmental Impact Assessment Procedural Guidelines Series (Series 1 and 2)

In order to facilitate the implementation of Environmental Impact Assessment Proclamation (Proclamation 299/2002), the then MoEFCC (now EPA) had formulated four procedural guidelines, namely, Review Guideline Series 1: Guidelines for Review Approach; Review Guideline Series 2: Guidelines for Contents and Scopes of Report; Review Guideline Series 3: Checklist of Environmental Characteristics and Review Guideline Series 4: Review Criteria. These widely applied draft environmental impact assessment guidelines were under review to enhance the documents in light of the experiences gained so far and to publish it for official use after endorsement by the authority. The review process is still ongoing and yet to be completed. Review Guideline Series 1 and 2 are elaborated to a certain extent here and any further updates made to the documents will apply after official publication of the revised guidelines.

b. Procedural Guideline Series 1 - Guidelines for Review Approach

This guideline pointed out roles and responsibilities of the former MoEFCC (now called EPA) and Regional Environmental Agencies, the proponent, consulting firm, interested and affected parties, and the licensing agency. In the guideline, the ESIA processes and requirements, and comprehensive description of the EA process has been stated. It also outlined projects which may have adverse and significant environmental impacts, and may, therefore, require full ESIA (Schedule 1), projects whose type, scale or other relevant characteristics have the potential to cause some significant environmental impacts but not likely to warrant an environmental impact study (Schedule 2) and projects which would have no impact and does not require environmental impact assessment (Schedule 3).

c. Procedural Guideline Series 2 - Guidelines for Contents and Scopes of Report

This guideline among others indicates structure and content of the Environmental Impact Study Report and describes the contents including the administrative, legal and policy requirements, assessment and mitigation measures. The guideline indicates the following main types of mitigating measures, which need due considerations:

• Preventing, reducing or minimizing impacts before they occur;

- Eliminating an actual impact over time by incorporating appropriate maintenance measures during the life of the project;
- Rectifying an impact by repairing, rehabilitating or restoring the affected environment;
- Compensating for an impact by replacing or providing substitute resources or environments as well as contingency plans in case of emergencies;
- Maximizing beneficial impacts through specific additional actions

d. Directive No.2/2014 (2006 EC)

Directive on issuing "professional competence certificate to consultants and firms providing service in Environmental Impact Assessment, Environmental Audit and Climate Change fields" The Directive was issued by the MoEFCC (now called EPA) and has been in force since then. It has become an important milestone in the development of the ESIA system in Ethiopia. The directive stipulates that ESIA and Environment Audits should be conducted by professional consultants and firms that are registered and certified for their competence by the Federal Environment, Forest, and Climate Change Commission. ESIAs and Environment Audits prepared by unregistered and certified firms will not be eligible for review and approval. The regional environmental protection commissions/offices have also started applying the stated directive of MoEFCC. Directive no. 2/2014 is also among the guidelines put under review by the MoEFCC and is being updated.

e. Environmental Guideline and Management Plan

Guideline for Environmental Management Plan (draft), May 2004: Outlines measures for preparation of an Environmental and Social Management Plans (ESMP) for proposed developments in Ethiopia and institutional arrangements for implementation of ESMPs.

ESIA Procedural Guideline (draft), November 2003: This guideline outlines the screening, review and approval process for development projects in Ethiopia and defines the criteria for undertaking an ESIA.

ESIA Guideline, July 2000: The ESIA Guideline Document provides essential information covering the following elements:

- Environmental Assessment and Management in Ethiopia
- Environmental Impact Assessment Process
- Standards and Guidelines
- Issues for sector environmental impact assessment in Ethiopia covering agriculture, industry, transport, mining, dams and reservoirs, tanneries, textiles, hydropower generation, irrigation projects and resettlement
- The guideline contains annexes that:
 - o Identify activities requiring a full ESIA, partial measure or no action
 - \circ Contain sample forms for application
 - \circ $\,$ Provide standards and guidelines for water and air $\,$

10	Table 0-1 Relevant ES and Other Guidelines and Standards			
GUIDELINE/ STANDARD	DESCRIPTION			
ESIA Procedural	The ESIA guideline of 2000 mentioned above was revised in 2003			

Table 0-1 Relevant ES and Other Guidelines and Standards

Guideline/ standard	DESCRIPTION
Guideline, November 2003	and issued as draft ESIA procedural guideline. The later outlines the screening; review and approval process for development projects in Ethiopia and defines the criteria for undertaking an ESIA. Annex-III identifies the schedule of activities for which a full ESIA, Preliminary ESIA or no action is required. The schedule of activities listed in Annex-III is widely applied by the Federal and Regional competent authorities to classify sub-projects into one of the three Categories.
Directive No.2/2014 (2006 EC): Directive on issuing "professional competence certificate to consultants and firms providing service in Environmental Impact Assessment, Environmental Audit and Climate Change fields"	The Directive has been issued by the EFCCC and brought into force in the last four years. It has become an important milestone in the development of the ESIA system in Ethiopia. The directive stipulates that ESIA and Environment Audits should be conducted by professional consultants and firms that are registered and certified for their competence by the Ministry of Environment. ESIAs and Environment Audits prepared by unregistered and certified firms will not be eligible for review and approval. The regional environmental protection commissions/offices have also started applying the stated directive of EFCCC and others preparing their own version of the Directive (e.g. Amhara region)
Draft Guideline for Environmental Management Plan (draft), May 2004	The guideline provides guidance on the necessary elements for preparation of an Environmental Management Plan (ESMP) for proposed development projects in Ethiopia and the institutional arrangements for implementation of ESMPs.
The Labor Proclamation 1156/2019/	The Labor proclamation requires an employer to take the necessary measures to adequately safeguard the health and safety of the workers. It also consists of provisions that address working conditions of women and young workers (14-18 years age). The Federal Labor law is the basic legislation directly applied by all the regional states without further making regional version of it.

Environmental Pollution Control Proclamation (Proclamation No. 300/2002)

This proclamation is aimed at eliminating or, when not possible, to mitigate pollution as an undesirable consequence of social and economic development activities. It has also an objective of protecting the environment and safeguarding of human health, as well as maintaining of the biota and the aesthetic value of the environment. The Proclamation, among others has considered control of pollution; management of hazardous waste, chemical and radioactive substances; management of municipal wastes; the importance and need to respect environmental standards; and punitive and incentive measures.

Solid Waste Proclamation (Proclamation 513/2007)

Solid Waste Management proclamation aims to promote community participation to prevent adverse impacts and enhance benefits resulting from solid waste management. It provides for preparation of solid waste management action plans by urban local governments.

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

This is one of the recently introduced environmental legislation that specifically deal with hazardous wastes, the proclamation in its preamble elucidated hazardous waste as one of the most crucial environmental problems in Ethiopia. It stated the importance of prevention and control of these type wastes and emphasized the need for creation of a system to control the generation, storage treatment, recycling and reuse as well as transportation and disposal of hazardous wastes to prevent harm to human and animal health as well as the environmental.

The proclamation defined "hazard" as the inherent characteristics of a substance, agent, or situation having the potential to cause adverse effects or damage to human or animal health, the environment, biodiversity and property and has determined the categories and characteristics of hazardous waste in Annex I and Annex II respectively. The objectives of this proclamation are stated as:

- Create a system for the environmentally sound management and disposal of hazardous Waste
- Prevent the damage to the human or animal health, the environment, biodiversity and property due to the mismanagement of hazardous waste.

Further its scope of application is also stated as:

- Waste that belongs to any category contained in Annex One of this Proclamation, and waste possesses any of the characteristic contained in Annex Two; as well as on those wastes that might be categorized as hazardous waste by the directive to be issued by the Ministry;
- Person who generates, reuses, recycles, stores, transports, or disposes hazardous waste at large in nation.

The proclamation within its 24 articles has dealt with all character and management of hazardous wastes.

Water Resources Management Proclamation (197/2000)

The purpose of the Proclamation is to ensure that the water resources of the country are protected and utilized for the highest social and economic benefits of the people of Ethiopia, to follow up and supervise that they are duly conserved, ensure that harmful effects of water are prevented, and that the management of water resources is carried out properly.

Proclamation on Forest Development, Conservation and Utilization, Proclamation No. 1065/2018

The Proclamation was issued in January, 2018 for the sustainable development, conservation and utilization of forests in order to address effects of climate change, preventing soil erosion, desertification and loss of biodiversity, sustain agricultural productivity, ensure food security and

enhance other benefits from forest developments. It applies to private, community, association and state-owned forests. For each sort of ownership, the proclamation, stipulates the rights and obligations in forest developments.

It also provides incentives in forest development by the private and community ownerships. A provision with specific implication to the HoA-GW4RP involves the following. During construction of water supply and irrigation development, the government through relevant bodies will make sure to:

- Protect the forest from invasive species, pests and diseases; and apply curative measures in case of occurrence of same;
- Protect the forest resources from natural and man-made disasters;
- Conserve and administer any protected forest; and
- Rehabilitate and protect development plans on forest lands.

Expropriation of landholding for Public Purposes, Payment of Compensation and Resettlement of Displaced People (Proclamation No 1161/2019)

The previous proclamation no. 455/2005 has been repealed and replaced by a new Proclamation no. 1161/2019. The new proclamation has introduced extensive improvements to the principles and provisions governing the process of expropriation of landholdings for public purposes and payment of compensation. The new legislation bases itself on the following four principles:

Principle 1: Expropriation of land for public purposes shall be made only on the basis of approved land use plan, urban structural plan; or development master plan.

Principle 2: Compensation and Resettlement Assistance Compensation for the expropriated land shall sustainably restore and improve the livelihood of displaced people.

Principle 3: The amount of compensation to be paid at Federal, or Regional or Addis Ababa or Dire Dawa level for similar properties and economic losses in the same areas shall be similar.

Principle 4: Where land is expropriated for public purpose, the procedure shall be transparent, participatory, fair and accountable.

The new proclamation has made improvements to the amount and kind of compensation entitlements to displaced people. Landholders whose land is expropriated for public purposes are entitled for property compensation, displacement compensation, displacement assistance, economic loss compensation and social ties discontinuance and moral damage compensations as deemed appropriate. The determination of the amount of property compensation for the property on the land is improved from "replacement cost" to "replacing the property anew". Similarly, the determination of compensation for permanent improvement to land is clarified to be based on "current value of capital and labor expended on the land". Determination of displacement compensation for expropriated Land holding where equivalent substitute land is not available is improved from the previous "ten times" to "fifteen times" the highest annual income generated during the last three years preceding the expropriation of land.

The new legislation has also introduced new provisions on resettlement (i.e., livelihood restoration) and compensation for economic loss aspects. Article 16(1) of the proclamation states

that "Regional states shall establish fund for compensation payment and rehabilitation" Moreover the next sub-article 16(2) puts a responsibility to regional states to develop a resettlement package that enable displaced people to sustainably resettle. Sub-article 16(3) places the duty to resettle the people displaced on Urban or Woreda administrations based on the resettlement package and allocated budget.

Council of Ministers Regulation No. 472/2020

The new regulation No. 472/2020 repealed 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 should be used in calculating compensation for various properties. It also contains lump sum compensation to be paid for severed social relationship 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.

Proclamations 1156/2019 - The Labor Law

The Proclamation repealed and substituted the former Labor Proclamation No.377/2003. But much of the provisions of the previous labor law were retained with some improvements and additions. One of the important improvements made is on protecting child labor by increasing the minimum age for young workers to be 15 years old (versus the previous 14 years) and have introduced a new sub-article (14h) prohibiting Sexual Harassment or Sexual Assault at workplace to prevent GBV.

Proclamation 1156/2019 covers health and safety at work, harmonious industrial relation and minimum workplace standard and addresses workplace vulnerability. Article 92-93 of the proclamation defines obligation of employers and employees in work-place including assignment of safety officers and committee. The Labor Proclamation mandates employers to protect occupational safety, health and create better working environment for their workers. Article 92 states that "An employer shall take the necessary measure to safeguard adequately the health and safety of the workers..." The law requires employers to i) take appropriate steps to ensure that workers are properly instructed and notified concerning the hazards of their respective occupations and the precautions necessary to avoid accident and injury to health; ii) ensure that directives are given and also assign safety officer; establish an occupational, safety and health committee of which the committee's establishment, shall be determined by a directive issued by the Minister; iii) provide workers with protective equipment, clothing and other materials and instruct them of its use; etc.

In addition to enacting its labor codes, Ethiopia is also a signatory to the international UN conventions and has ratified the major international human rights instruments. Ethiopia has also ratified the following ILO conventions:

- Forced Labor Convention No.29 /1930;
- Freedom of Association and Protection of the Right to Organize Convention, No.87/1948;
- Employment Service Convention, No.88/1948;
- Right to Organize and Collective Bargaining Convention, No.98/1949;

- Abolition of Forced Labor Convention, No.105/1957;
- Minimum Age Convention No. 138 /1973;
- Occupational Safety and Health Convention, No.156/1981;
- Termination of employment Convention, No.158/1982;
- The Rights of the Child Convention (1989); and
- The Worst Forms of Child Labor Convention No.182/1999.

The 2005 Occupational Health and Safety Directive: developed as a follow-up to the labor Proclamation provides guidance on the establishment of occupational health and safety committees in public and private organizations.

Laws against GBV/SEA/SH

Proclamation No.414/2004 Criminal Code criminalizes most forms of violence against women and girls including physical violence within marriage or cohabitation (Article 564), Female Genital Mutilation/Circumcision (Articles 565-6), trafficking women (Article 597), rape (Articles 620-28), prostitution/exploitation of another for financial gain (Article 634), and early marriage (Article 648). The Criminal Code outlaws abortion, except in cases of rape or incest, risk to the life of the mother or fetus, severe or incurable disease or birth defect, a mother who is mentally or physically incapable of raising a child, or "grave and imminent danger" that can only be addressed by terminating the pregnancy.

Title of the Policy Document	Policy Description	Policy Gaps
National Policy on Women (1993)	Set up structures in government at all levels to implement gender-sensitive policies Created the Ministry of Women's Affairs (MoWA) in 1995	These organizations have insufficient resources and decision-making power and are often marginalized within the larger government.
1995 Ethiopian Federal Constitution (FDRE Constitution)	Allows for disputes to be resolved through religious or customary law	Sharia law and traditional regional laws are not usually as strict on GBV as national law.
	Women and men are equal and guaranteed equal protections without discrimination due to sex	Vague and non-enforceable
	Articles 16: "Everyone has the right to protection against bodily harm." Article 35: "The State shall enforce the right of women to eliminate the influences of harmful customs. Laws, customs and practices that oppress and cause bodily or mental harm are prohibited."	These declarations are bold and egalitarian, but their effectiveness relies on the motivation of the country's leadership, the legal system, law enforcement, and the general populace to follow the Constitution.
2005 Revised Criminal Code	Improves the way the criminal code addresses violence, expanding vague sections, adding new offenses, redefining the penalties, and adding aggravating circumstances. Includes prohibitions and penalties against specific forms of GBV	Includes penalties and punishments for those who are accomplices of many of the forms of GBV as well as those who are directly responsible
2009 Charities and Societies Proclamation (CSO Law)	Limits if and how NGOs and development organizations can be involved in certain "sensitive" areas, including human rights and gender issues (specifically FGM). Requires that NGOs respect the policies of	On-the-ground organizations are unable to legally mix their agendas with issues of human rights, which excludes many avenues of tackling GBV. NGOs, like the Ethiopian

Table 0-2 Summary of General Laws and Policies Related to GBV

	the government and must not deem an issue	Women's Lawyers Association, are now
	in Ethiopia, i.e., any form of GBV, a "rights	constrained in their ability to aid women
	issue".	in seeking justice for GBV and other
		injustices.
		Non-NGOs that are similarly concerned
		with justice and aid for vulnerable
		women, like the Center for Human
		Rights at Addis Ababa University, have
		to fill the gap left by the legal
		constraints on NGOs. Many are
		underfunded, however.
Strategic Plan for an	Both emphasize that to effectively combat	Plans to scale up the GBV response
Integrated and Multi-	GBV, cooperation between the justice,	system, including coordination
Sectoral Response to	health, education and social welfare sectors	mechanisms, referral pathways, and
VAWC and child justice	is needed.	one-stop centers.
in Ethiopia (2010)		-
Operational Plan for an		
Integrated and Multi-		
Sectoral Response to		
Violence against Women		
and Children and Child		
Justice in Ethiopia		
(2010)		

Proclamations on Persons with Disability and Vulnerable Groups

Proclamation No. 568/2008 Rights to employment for Persons with Disabilities: makes null and void any law, practice, custom, attitude and other discriminatory situations that limit equal opportunities for persons with disabilities. It also requires employers to provide appropriate environment for work, training and take affirmative measures particularly when employing women with disabilities.

APPLICABLE INTERNATIONAL CONVENTIONS ENDORSED BY ETHIOPIA

Ethiopia has ratified several international/multilateral environmental conventions and many of the principles and provisions in those conventions have been well addressed in the national environmental policies and regulations. Accordingly, Article 9(4) of the constitution of the Federal Democratic Republic of Ethiopia provides that once an international agreement is ratified through the accepted or established procedure, it automatically becomes an integral part of the law of the land. Therefore, the following international conventions and protocols are relevant to the proposed Component 1 (ancillary facilities), 2 & 3 project operation.

UN Framework Convention on Climate Change: It provides a framework for international cooperation to combat climate change by limiting average global temperature increases and the resulting climate change and coping with its impacts. The objective of this convention is to stabilize greenhouse gas concentrations in the atmosphere at a level that will prevent dangerous interference with the climate system. Ethiopia ratified this convention through proclamation No. 97/1994 on May 2/1994. This convention considers the fact that climate change has transboundary impacts.

The United Nations Conventions to Combat Desertification: The objective of the convention is to combat desertification and mitigate the effects of droughts in countries experiencing serious

drought and desertification, particularly in Africa. Ethiopia has ratified the convention through its proclamation No. 80/1997.

Convention on Biological Diversity: The convention on biological diversity has three goals. These are:

- Conservation of biodiversity;
- Sustainable use of the components of biodiversity; and
- Fair and equitable sharing of the benefits arising from the use of genetic resources.

Cartagena Protocol on Bio-Safety to the Convention on Biological Diversity: It aims to ensure the safe handling; transport and use of living modified organisms (LMOs) are resulting from modern biotechnology that may have adverse effects on biological diversity, taking also into account risks to human health.

Convention for the Protection of the World Cultural and Natural Heritage Paris, 23 November 1972 Kyoto Protocol to the United Nations Framework Convention on Climate Change: Legally binds developed country Parties to emission reduction targets.

INSTITUTIONAL ROLES AND RESPONSIBILITIES FOR ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT AND MANAGEMENT

The discussions hereunder summarize the roles and responsibilities of institutions involved in environment and social management in Ethiopia. Identification of institutional roles and responsibilities takes into account potential environmental and social implications of supported activities of the HoA-GW4RP Components 1 & 2 project.

Proclamation to Provide for the Establishment of Environmental Protection Organs (Proclamation No. 295/2002)

The first objective of this proclamation is to assign responsibilities to separate organizations for environmental development and management activities on the one hand, and environmental protection, regulations and monitoring on the other, which is instrumental for the sustainable use of environmental resources. The second objective is to establish a system that fosters coordinated but differentiated responsibilities among environmental protection agencies at federal and regional levels.

The Federal Environment Protection Authority (FEPA)

Following the establishment of the new government in October 4/2021, the former Environment, Forest and Climate Change Commission (EFCCC) was changed from a Commission headed by a commissioner to its former status of Federal Environment Protection Authority Despite that the FEPA is bestowed with the powers and duties of the former EFCCC and it is made to be directly accountable to the Planning and Development Commission. The powers and duties include:

• Coordinate activities to ensure that the environmental objectives provided under the Constitution and the basic principles set out in the Environmental Policy of the Country are realized;

- Establish a system for evaluating and decision making, in accordance with the Environmental Impact Assessment Proclamation, the impacts of implementation of investment programs and projects on environment prior to approvals of their implementation by the concerned sectoral licensing organ or the concerned regional organ;
- Coordinate actions on soliciting the resources required for building a climate resilient green economy in all sectors and at all regional levels; as well as provide capacity building support and advisory services;
- Establish an environmental information system that promotes efficiency in environmental data collection, management and use;
- Enforcing and ensuring compliance to the ESIA proclamation which currently is being implemented through delegated authority provided to sector ministries;
- Reviewing ESIAs and monitoring the implementation of ESIA recommendations which is also in part being implemented through delegated authority provided to sector ministries;
- Regulating environmental compliance and developing legal instruments that ensure the protection of the environment;
- Ensuring that environmental concerns are mainstreamed into sector activities; and
- Coordinating, advising, assessing, monitoring and reporting on environment-related aspects and activities

Sector Environment Units: The other environmental organs stipulated in the Environmental Protection Organs Establishment Proclamation (295/2002) are 'Sector Environmental Units' which have been established in some of the line Ministries. These Sector Environment Units have the responsibility of coordinating and implementing activities in line with environmental protection laws and requirements (Article 14, Proclamation 295/2002). Article 13 of the ESIA Proclamation 299/2002 requires that public instruments undertake ESIA.

To this end, water Sector Environmental Units (i.e., Environment, Social and Climate Change Directorate of MoWE) plays an important role in ensuring that ESIA is carried out in projects initiated by their respective sector institution. However, due to the fact that the strengthened capacity of the Federal Environment, Forest and climate Change commission has been suspended and takeaway the delegation given the sector environmental unit and to this date all the environmental and social issue will be review and approve by Federal Environment, Forest and climate Change commission, if it is the federal project.

Regional Environment Protection, Forest, and Climate Change Authorities (**REPFCCA**)

At the regional level, there are environmental bureaus to implement environment management systems within their respective jurisdictions. Proclamation 295/2002 requires regional states to establish or designate their own regional environmental agencies. The regional environmental agencies are responsible for coordination, formulation, implementation, review and revision of regional conservation strategies as well as environmental protection, regulation and monitoring. Relating to ESIA specifically, Proclamation 299/2002 gives regional environmental agencies the responsibility to evaluate ESIA reports of projects that are licensed, executed or supervised by regional states and that are not likely to generate inter-regional impacts. Regional environmental agencies are also responsible for monitoring, auditing and regulating implementation of such projects.

In the context of the present proposed HoA-GW4RP Components 1 & 2 project with collaboration of regional environmental protection bureaus of the eight regions and the Dire Dawa City Administration are going to play a major role during the implementation of the ESMF and its associated guidelines. For that reason, it will be more important to focus on the capacities, performances and challenges of these regional institutions which will be directly involved in the daily review and approval of the environmental and social risk management instruments for sub-projects.

The institutional standing of the regional environmental agencies in the eight regions slightly differs from one another. Whereas in Oromia, Amhara, Tigray, SNNPRS and Somali regions, it is established as separate institutions in the form of Environment, Forest and Climate Change Authorities, in Afar and Sidamo regional state it is joined with range land use administration and utilization agency as EPRLUA.

It was observed that all the eight regions under consideration and the Dire Dawa city administration have established their own Environment Protection Authority (REPA) since long time (see table below). The REPA's in all the eight regional states have expanded their structures down to the Zone and Woreda level. Though the woreda environment protection offices are immediately accountable to the Woreda administrator, they also report to the regional REPA.

Regarding the division of responsibilities between the regional REPA offices and those having zonal and woreda level offices for carrying the review and approval of E&S Screening reports, the mandate to review and approve schedule III (Category C) screening reports and to conduct implementations monitoring of approved EMPs is given to the Woreda environment protection offices. The review and approval of EIAs and EMPs prepared for all Schedules I & II projects are still handled by the Zonal level and REPA head offices.

Role in the Implementation of the Proposed HoA-GW4RP Components 1 & 2 Project: The REPAs will be responsible to discharge their regulatory services to the proposed HoA-GW4RP Components 1 & 2 Project through the review, approval and implementation monitoring of E&S screening reports and ensuing ESIAs as appropriate. The table below shows the existing competent environment authorities at regional level and the status of regional environmental regulations that define the applicable environmental and social management systems in the region.

Broadly speaking, activities of the eight regional REPAs and Dire Dawa Environment Protection Authority in enforcing the ESMF in their respective jurisdictions are increasingly growing over the years. The implementation of multiple World Bank financed programs such as UWSSP, PSNPJ, DRDIP, RPLRP, AGP, One WASH programs, etc., in the eight regions have already created practical experiences in the review and approval of E&S screening reports and environmental performance monitoring of ESIAs. The awareness and application of ESMF requirements from the past and present World Bank financed programs in the head offices of REPAs has comparatively increased. To some extent, the REPAs also conduct environmental monitoring of sub-projects based on the approved ESMPs. The regional EPAs shift to the WB ESF is expected to improve as more projects under the ESF are implemented.

Table 0-3 Existing Institutions & Critical Legislations for Environmental & Social Management in the
Regions

	Regions				
Region	Responsible Regional	ESIA Regulations	Other Environmental Key Management Legislations/guidelines	Remarks	

	Environment Bureau / Agency	Enacted at Regional Level	Pollution Control	Solid Waste Management	Regional Guideline for ESIA	
Amhara	Amhara EFWDPA	Yes	Yes	Yes	Yes	It has zonal and woreda level Environment Offices
Tigray	Tigray EPRLUA	Yes	Yes	Yes	Yes	It has zonal and woreda level Environment Offices
SNNPR	SSNPRS EPA	Yes	Yes	Yes	Yes	It has zonal and woreda level Environment Offices
Oromia	Oromia EFCCA	Yes	Yes	No	No	It has zonal and woreda level Environment Offices
Somali	Somali EFCCB	Yes	Yes	Yes	Yes	It has zonal level Environment Offices
Afar	Afar EPRLUA	Yes	Yes	No	No	Apply Federal ESIA procedural guideline
Dire Dawa	DDEPA	No	No	No	No	It has a city level Environment Protection Authority

Zonal and Woreda Level Environment, Forest, Land Utilization, and Climate Change Offices

It is identified that institutional structures exist for environmental management in the eight regions at zonal and woreda levels. The Dire Dawa City Administration also has its own Environmental Protection Authority. All regions of EFCCA have parallel offices at zone and woreda levels.

It should be noted that all the regional, zonal and woreda level environment offices are located in the capital cities of the respective zone and woreda cities/towns. However, there are some cities and towns in Oromia region which have their own city level environmental protection offices. For example, eighteen selected Cities with potential growing economic activities are made to have their own Environment Protection Forest and Climate Change (EPFCC) Offices with a Zonal office status.

The roles and responsibilities of the woreda level environmental organs in eight regions are almost identical. Their main areas of responsibility fall in carrying environmental performance monitoring and follow up of development projects for which ESMPs and screening reports are approved and the review and approval of Schedule III (category C) environmental and social screening reports.

Ministry of Labor and Social Affairs/Regional Labor and Social Affairs Bureaus

The Ministry of Labor and Social Affairs (MoLSA) is responsible to ensure industrial peace, maintain employee's health and safety at workplace, improve working condition and environment, promote efficient and equitable employment services; and maintain developmental social welfare of citizens. Implementing Occupational Safety & Health, Public Safety and Social welfare protection activities, prevention of child labor is also among the mandates, roles and responsibilities of their Ministry. Overall, the ministry shall have the following powers and duties to:

• With a view to ensuring the maintenance of industrial peace (a) Encourage and support workers and employers to exercise their rights to organize and collective bargaining; (b)

Encourage the practice of participating in bilateral forums between workers and employers and tri-partite forums including the government; and (c) Establish efficient labor dispute settlement mechanisms;

- Issue and follow up the implementation of occupational health and safety standards
- Create conducive conditions for the provision of efficient and equitable employment services; determine conditions for the issuance of work permit to foreigners, issue such permits and incorporation with the relevance bodies, supervise compliance there with; regulate the provision of foreigners employment service to Ethiopians;
- Undertake studies on manpower employed in the formal and informal sectors, unemployed manpower and occupational classifications in the country collect, compile and employers' unions established at national level;
- Register workers' and employers' unions established at national level;
- Register workers' unions and collective agreement relating to federal public enterprise situated in cities accountable to the federal government, and carry out labor inspection services in such enterprise; provide conciliation services to amicably settle labor disputes arising between employers and employees;
- In corporation with the concerned stakeholders, undertake and facilitate the implementation of studies on ensuring and improving social well-being of citizens in particular on; (a) The creation of enabling condition for persons with disabilities to benefit from equal opportunities and full participation; (b) The provision of care to the elderly and the encouragement of their participation and (c) The prevention of social problems and provision of rehabilitation services to the affected.

Regional governments have established bureau/agency responsible to implement the national vision and set mission of the Ministry. Woreda and town administrations have offices whose responsibility is investigation and supervision of establishment (manufacturing plants) to ensure that all stakeholders are adhering to Proclamation 377/2003. Ensuring rights and interest of persons with disabilities and the elderly is included in policies and laws of federal and regional governments and are mainly the duty of the Ministry. By the same token even though the implementation of the National Social Protection strategy is a consorted effort of all government organs, the responsibility mainly falls on the Ministry.

In addition to the Ministry of Labor and Social Affairs, the Ministry of Construction is responsible to ensure public and workers safety at construction sites. Regional governments have adopted different approach to establish a body responsible for the construction sector, as a department within the bureau of urban development, housing and construction (Amhara region) or an independent bureau of construction (Oromia region).

Ministry of Women, Children and Youth Affairs (MoWCYA)/Regional Women, Children and Youth Bureaus

MoWCYA has the responsibility to ensure that women and children are benefiting from development activities and are protected from harm. Its main area of responsibilities focus on awareness creation and compilation and dissemination of data and information on woman and children; ensuring opportunities are created for woman to participate in political, economic and social affairs; ensure woman and children are not discriminated against and devise strategies for the proper application of affirmative actions; encourage and support women to organize and ensure their agenda (including children) are mainstreamed in to national and regional policies, legislations and programs. Regional governments have also established Woman, Children and Youth Affairs Bureau responsible to implement national visions and objectives at region level. All urban administrations have offices responsible to promote women, children and youth agenda.

Woman, child and youth affair offices also provide legal support to children and women victim of physical and sexual abuse by offering free legal counsel. The offices work in close collaboration with Labor and Social Affairs, Justice Department, the Police and the court to ensure perpetrators get appropriate punishment. Efforts to rehabilitation victims are however hindered due to capacity limitations.

WORLD BANK ENVIRONMENTAL AND SOCIAL STANDARDS

According to the World Bank Environmental and Social standards, projects supported by the Bank through Investment Project Financing are required to meet the Environmental and Social Standards (ESSs). The ESSs are designed to help the implementing agency and implementing partners (i.e., MoWE and MoIL) to manage the risks and impacts of a project, and improve their environmental and social performance, through a risk and outcomes-based approach. The lead implanting agencies (i.e., MoWE and MoIL) are required to manage environmental and social risks and impacts of the project throughout the project life cycle in a systematic manner, proportionate to the nature and scale of the project and the potential risks and impacts.

MoWE and MoIL, together with the Bank, has prepared an Environmental and Social Commitment Plan (ESCP) outlining detailed commitments to support compliance with the ESSs of the Environmental and Social Framework (ESF) of the Bank. The ESCP described the different management tools that MoWE and MoIL need to develop and implement the agreed measures and actions. These management tools include environmental and social management framework (ESMF), Resettlement Framework (RF), Stakeholder Engagement Plan (SEP), and Labor Management Procedure (LMP). In the context of the present HoA-GW4R project, ESMF has been proposed as a management tool for the project as the specific sites for implementation of subproject activities has not been identified at this stage. However, during implementation stage, site specific risk management instruments (ESMP, ESIA) will be prepared to mitigate risks associated with the subproject activities.

This HoA-GW4R project ESMF will serve as an instrument to satisfy the Bank's ESS1 on Assessment and Management of Environmental and Social Risks and Impacts. In the present context of the HoA-GW4R project, the Environmental Assessment takes into account the natural environment (air, water, and land); human health and safety; as well as social aspects (involuntary resettlement and physical cultural resources) in an integrated way.

Standard	Objectives of the Standard	Explanation	Applicable
ESS1: Assessment and Management of Environmental and Social Risks and Impacts	The objective of ESS1 sets out that Bank-financed projects are the Borrower's responsibilities for assessing, managing and monitoring environmental and social risks and impacts associated with each stage of a project supported by the Bank through Investment Project Financing, in order to achieve environmental and social outcomes consistent with the Environmental and Social Standards (ESSs)	The HoA-GW4RP will finance a variety of subprojects involving development of infrastructures and construction such as irrigation scheme, water supply shallow well fitted with hand pump or submersible electric pump, shallow or deep well based multivillage water supply systems with transmission, , deep well fitted with submersible electric pump storage, distribution and delivery structures, rehabilitation of existing groundwater-based systems, cattle troughs and animal water stations, and other groundwater based rural small irrigation systems. As implementation of these subprojects involve carrying construction activities in the different subproject sites, it will pose potential environmental and social risks during implementation and triggers ESS 1. ESS1 is therefore relevant for activities under HoA-GW4RP activities. The ESMF is designed to help identify these potential impacts and direct the PMU team to practical ways of avoiding or mitigating them. Note: For projects involving multiple small subprojects, that are identified, prepared and implemented during the course of the project, MoWE, WSSD and GWRMD) and MoIL PMU will carry out appropriate environmental and social assessment of subprojects, in accordance with the ESSs (b) Substantial Risk, Moderate Risk and Low Risk subprojects, in accordance with national law and any requirements of the ESSs that the Bank deems relevant to such subprojects. Note also that the overall Environmental risk rating is also "Substantial".	Yes
ESS2: Labor and Working Conditions	projective of ESS2 to ensure that Bank- Inflanced projects to recognizes the importance of employment creation and income generation in the pursuit of poverty reduction and inclusive economic growth. Borrowers can promote sound worker-management relationships and enhance the development benefits	(direct workers such as consultants, technical experts and other workers), and workers hired by contractors under the project. These involve MoWE (WSSD and GWRMD) and MoIL (IDPD) staff engaged in project implementation, as well as staff working in HoA-GW4RP subprojects implementations. The potential risks identified include occupational health and safety (OHS) risks as well as workplace accidents/injuries, lack	Yes

Table 0-4 World Bank – Applicable Environmental and Social Standards

Ministry of Water and Energy (MoWE) Ministry of Irrigation and Lowlands (MoIL)

Standard	Objectives of the Standard	Explanation	Applicable
	of a project by treating workers in the project fairly	of use of personal protective equipment (PPE), and dust; community health and safety	
	and providing safe and healthy working conditions.	issues (e.g., exposure to hazardous materials); communicable disease (e.g., COVID-19)	
		which may arise from the interaction of project workers with local communities,	
		between project workers; GBV in relation to contacts between project workers, and	
		members of the project affected local communities and members of local communities.	
		Although there might be a risk of discrimination, i.e., a potential inappropriate	
		treatment or harassment of project workers; potential exclusion/preferences with	
		respect to recruitment, training and development, termination of employment, and	
		working conditions, discrimination is unacceptable as per the Ethiopian Labor Law and	
		WB's ESS2. While most of the workers involved in MoWE (WSSD and GWRMD) and	
		MolL (IDPD) are public workers governed by the government civil service regulation,	
		other workers hired by the project (PITs, consultants, etc.) and project contractor need	
		to be contracted in line with the requirements of ESS2 in relation to labor and working	
		conditions, non-discrimination and equal opportunities and occupational health and	
		safety and workers grievance redress mechanisms. Thus, ESS2 remains relevant and is	
	ESS2 manufact that according activity and	The UsA CWARD will fingure a project	
	urbanization often generate pollution to air water	round water based water supply infrastructures and construction of irrigation scheme	
	and land and consume finite resources that may	ground water-based water supply initiasti defines and construction of infigation scheme.	
	threaten people accessitem services and the	shellow or deep well based multi village water supply systems with transmission deep	
ESS3: Resource	environment at the local regional and global levels	well fitted with submersible electric pump storage distribution and delivery structures	
Efficiency and	The current and projected atmospheric concentration	rehabilitation of existing groundwater-based systems, cattle troughs and animal water	
Pollution Prevention	of greenhouse gases (GHG) threatens the welfare of	stations and other groundwater based rural small irrigation systems	Yes
and Management	current and future generations. At the same time.	stations, and other ground water based runar sinan migation systems.	
une mungement	more efficient and effective resource use, pollution	The construction activities will also use extensive natural resources including water.	
	prevention and GHG emission avoidance, and	energy and construction materials during project implementation which will cause	
	mitigation technologies and practices have become	degradation of natural resource. As a result, ESS 3 will be triggered by the subproject	
	more accessible and achievable.	activities and remains relevant to HoA-GW4R project.	
		The HoA-GW4R Project will involve construction works and installation of equipment	
	The ESSA recognized that project estivities	which may result in the presence of workers with the potential to impact community	
	The ESS4 recognizes that project activities,	health. Construction activities will result in excavations consisting of trenches and	
	equipment, and initiastructure can increase	temporary ponds. Open trenches and ponds can cause risks to community safety by	
ESS4: Community	addition communities that are already subjected to	serving as malaria breeding site. Increased traffic movements due to subproject	Vas
Health and Safety	impacts from climate change may also experience an	construction and equipment installation activities may also cause community safety	168
	acceleration or intensification of impacts due to	hazards. Improperly managed solid and liquid waste stream generated by subproject	
	project activities	supported activities, contamination of water bodies, and unacceptable water quality	
		may also pose public health risks in the long term. Thus, ESS4 is triggered by the HoA-	
		GW4R project.	

Standard	Objectives of the Standard	Explanation	Applicable
ESS5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	The ESS5 recognizes that project-related land acquisition and restrictions on land use can have adverse impacts on communities and persons. Project-related land acquisition1 or restrictions on land use2 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),3 or both. The term "involuntary resettlement" refers to these impacts. Resettlement is considered involuntary when affected persons or communities do not have the right to refuse land acquisition or restrictions on land use that result in displacement.	The HoA- GW4RP will finance a variety of subprojects involving development of infrastructures and construction of irrigation scheme such as water supply shallow well fitted with hand pump or submersible electric pump, shallow or deep well based multivillage water supply systems with transmission, , deep well fitted with submersible electric pump storage, distribution and delivery structures, rehabilitation of existing groundwater-based systems, cattle troughs and animal water stations, and other groundwater based rural small irrigation systems. The process for acquisition of land for subproject sites and right of way clearance for linear infrastructure development may cause involuntary resettlement and restriction on land use. As a result, a separate Resettlement framework document is prepared to provide guidance and procedures for involuntary resettlement and restriction of land use risk management for the HoA-GW4RP. Thus ESS 5 will be triggered by the subproject activities and will be applicable to HoA-GW4R project.	Yes
ESS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	The ESS6 recognizes that protecting and conserving biodiversity and sustainably managing living natural resources are fundamental to sustainable development. Biodiversity is defined as the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species, and of ecosystems. Biodiversity often underpins ecosystem services valued by humans. Impacts on biodiversity can therefore often adversely affect the delivery of ecosystem services.	Ground water based water supply infrastructures and construction of irrigation scheme such as water supply shallow well fitted with hand pump or submersible electric pump, shallow or deep well based multi-village water supply systems with transmission, , deep well fitted with submersible electric pump storage, distribution and delivery structures, rehabilitation of existing groundwater-based systems, cattle troughs and animal water stations, and other groundwater based rural small irrigation systems. could affect sustainable use of natural resource. Potential impacts to habitat and biodiversity could be more significant during the construction activities and it will also use extensive natural resources including water, energy and construction materials during project implementation which will cause degradation of natural resource. As a result, ESS6 will be triggered by the subproject activities and remains relevant to HoA- GW4R project.	Yes
ESS7: Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	The ESS7 applies to communities or groups of Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities who, during the lifetime of members of the community or group, have lost collective attachment to distinct habitats or ancestral territories in the project area, because of forced severance, conflict, government resettlement programs, dispossession of their land, natural disasters, or incorporation of such territories into an urban area	The HoA-GW4R projects will be implemented in emerging underserved regions and in areas where large part of the population follows pastoralist and agro pastoralist livelihood systems. The Bank will apply ESS7 for this project in the same spirit as previously agreed with the GoE. Given the currently explored woredas for the intervention, ESS7 is likely to be applied to several villages (Kebeles), requiring a respective assessment and support plan to ensure culturally appropriate stakeholder engagement and benefit sharing. Hence, ESS7 is triggered for this project.	Yes

Standard	Objectives of the Standard	Explanation	Applicable
ESS8: Cultural Heritage	The ESS8 recognizes that cultural heritage provides continuity in tangible and intangible forms between the past, present and future. People identify with 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. ESS8 sets out measures designed to protect cultural heritage throughout the project life cycle	Some of the Ethiopian cities and rural areas has historical, religious, and cultural properties that are of significance at National and/or international levels in them. There are also additional heritages sites such as buildings and religious sites registered at national, regional or Woreda level throughout the Country. Although large scale infrastructure development is not anticipated, the small-scale infrastructure development activities such as groundwater-based water supply and irrigation schemes may have impact on cultural heritage. If there is a possibility that HoA-GW4RP subprojects may result in damage to cultural property, the ESMF specifies procedures for avoiding such damage. Chance find procedures will be incorporated into civil works supervision plan, and buffer zones will be created to avoid damage to cultural resources. Thus ESS 8 remains relevant for the HoA-GW4RP.	Yes
ESS9: Financial Intermediaries	The ESS9 recognizes that strong domestic capital and financial markets and access to finance are important for economic development, growth and poverty reduction. The Bank is committed to supporting sustainable financial sector development and enhancing the role of domestic capital and financial markets.	Financial Intermediaries (FIs) are not involved in this project.	No
ESS10 Stakeholder Engagement and Information Disclosure	The 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 project will require inputs from different stakeholder groups, including those who will be directly affected as well as those who have other interests in the project interventions. The project should ensure that the voices of vulnerable people (female-headed households, elderly, youth, and people with disabilities) and underserved communities are heard through inclusive consultation and participation to ensure that they can equally participate and benefit from the project. The project will require inputs from different stakeholder groups, including those who will be directly affected as well as those who have other interests in the project interventions. Stakeholder engagement will be facilitated through appropriate means such as virtual arrangements and phone calls among others taking proper measures as precaution to COVID-19. A Stakeholder Engagement Plan (SEP) is developed. The SEP outlines the characteristics and interests of the relevant stakeholder groups and timing and methods of engagement throughout the life of the project. The project will ensure that the needs and voices of vulnerable people (female-headed households, elderly, youth, and people with disabilities) and underserved communities are heard through inclusive consultation and participation to ensure that they can equally participate and benefit from the project.	Yes

Standard	Objectives of the Standard	Explanation	Applicable
		potential adverse impacts but also to ensure strong participation of women in the	
		development. A project level, functioning Grievance Redress Mechanism, including	
		sensitivity to any risk or incident of gender-based violence, will be established and will	
		allow early identification of issues and correction of project implementation as	
		necessary. Thus ESS 10 remains relevant for the HoA-GW4R project.	

ESF Environmental and Social Standard (ESS)	Status of Application to the Project	Available National Policy and Legislation to Fulfill the Performance Standard	Gaps	Measures to Bridge the Gap
ESS1: Assessment and Management of Environmental and Social Risks and Impacts	ESS1 is applicable to the HoA-GW4RP Components 1 and 2	The Federal EIA Proclamation No. 299/2002 and related regional EIA regulations mandatorily requires a project proponent to undertake EIA. The Federal EIA procedural guideline (2003) classifies projects into Schedule I, II and III to facilitate the undertaking of EIA proportionate to the risks and impacts of each project. The EIA proclamation and regulations seek all direct, indirect and cumulative impacts likely to occur during project life cycle are considered in the assessment. The stated legislation and regulation also require stakeholder and community consultations to be carried as part of the EIA process. The preparation of ESMP based on mitigation hierarchy and monitoring plan is also required by the EIA proclamation and associated guidelines.	 Requirement of the EIA proclamation and regional regulations do not cover "associated facilities" as defined by the ESF. Requirements of the EIA proclamation and regional regulations do not explicitly seek for consideration of risks and impacts associated with primary suppliers as defined by the ESF during EA. Apart from the presence of effluent standards for specified industrial sectors, the EIA proclamation is not complemented by a guideline similar to EHS and do not require its use 	 EA requirements for "primary suppliers" shall be addressed as part of the present ESMF process when and if it occurs The application and use of EHS guidelines as appropriate to subproject EA is required by the present ESMF. The ESS 1 requirements for E & S risk management of "Associated facilities" should apply as appropriate to bridge the gap.
ESS2: Labour and Working Conditions	ESS2 is applicable to the HoA-GW4RP Component 1	The former Labor Proclamation No.377/2003 is repealed and substituted by the new Proclamation 1156/2019. The new legislation remains to be the labor legislation applied invariably all over the Country without customization to regional contexts. The labor law is applied to govern all aspects of employment relations based on a contract of employment that	All the rules of the labor law are applicable to employment relations based on a contract of employment that exists between a worker and an employer. The	- The ESMF should adopt the provisions of both the labor law and ESS 2 for undertaking complete Labor Management

Table 0-5 Comparison of World Bank ESF (ESS 1-10) with Ethiopian Legal and Policy Frameworks

Ministry of Water and Energy (MoWE) Ministry of Irrigation and Lowlands (MoIL)

		 exists between a worker and an employer. The legislation covers formation of contract of employment defining the rules and conditions of employment, nondiscrimination, equal opportunity for women workers, the right to form trade unions (workers organizations), working conditions of young labor setting the minimum age for child labour to be 15 and working conditions, and arbitration/conciliation mechanism to handle grievances and disputes of workers in relation to employment. The labour law also covers occupational safety, health and work environment aspects. The labor law largely fulfills the requirements of ESS 2. Proclamation No. 568/2008 Rights to employment for Persons with Disabilities makes null and void any law, practice, custom, attitude and other discriminatory situations that limit equal opportunities for persons with disabilities. 	labor law is not applicable to community workers as it is not based on employment relations between worker and employer. As most workers of subprojects are likely to be contracted through formal employment process, there are major gaps between ESS 2 and the labor law.	Practices.
ESS3 Resource Efficiency and Pollution Prevention	ESS3 is applicable to the HoA-GW4RP)	The requirements of ESS-3 are largely fulfilled by the following national legislations and International Conventions which Ethiopia is a Party, which are widely referred during ESIA studies. These include: -The Pollution Control Proclamation no. 300/2002 which set the binding provisions for prevention and control of pollution addresses management of hazardous waste; chemicals and radioactive materials, management of non-hazardous municipal waste, and set the provisions for issuing environmental standards including for air, water and various effluents. The proclamation is complemented by effluent standards for certain industrial sectors. - Ethiopia has ratified and is party to the following three International Conventions that help in managing/avoiding the use of restricted and banned pesticides, chemicals trade and trans-boundary movement of Hazardous wastes. These are: - The Stockholm Convention on POPs - The Rotterdam Convention on PIC procedures - The Basel Convention on trans-boundary movement of Hazardous Wastes. Besides the Proclamation for the Registration and Control of Pesticides (Proclamation No. 674/2010) provides for the procedures of approval and registration of pesticides to be imported or manufactured in Ethiopia.	Detailed guidelines to support the avoidance, minimization or reduction of environmental and health impacts of pesticides during application are not sufficiently available. Detailed guidelines to support efficient use of resources like water and energy are not sufficiently available.	The application of relevant sections of the General EHS and sector specific EHS guideline is advisable when appropriate. The application of measures and actions developed to assess and manage subproject specific risks and impacts as outlined in the ESMF and subsequent subproject ESMPs.
ESS4: Community Health, Safety and Security	ESS4 is applicable to the HoA-GW4RP	Building Proclamation No. 624/2009 and Public Health Proclamation No.200/2000 contain certain provisions that partly address the issues of community safety in the areas of building designs and community exposure	There are gaps in fully addressing the community Health, Safety and Security	The application of relevant sections of the General EHS and sector specific
		to health risks. Other regulations such as prevention of industrial pollution require industrial facilities to prepare emergency response systems. In general, some aspects of the ESS 4 are either fully or partially addressed across the existing sector legislations and regulations.	aspects as defined in the ESF.	EHS guideline is advisable when appropriate. Measures and actions developed to assess and manage subproject specific community health and safety risks and impacts as outlined in the ESMF and subsequent subproject ESMPs and C-ESMPs.
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ESS5: Land acquisition and Involuntary Resettlement	ESS5 is applicable to the HoA-GW4RP	The new Proclamation no 1161/2019 for expropriation of land for public purposes has provisions that address resettlement and compensation of involuntary resettlements caused by land acquisition for public purposes. The new proclamation provides for various types of compensation for resettlers such as property, displacement and economic loss compensations. Resettlers are also entitled for replacement land substitution and compensation for disruption of social ties. Entitlement for compensation is based on legal land holding. Valuation of compensation will be based on current costs and values to replace the properties anew. The proclamation also consists of a provision for establishing resettlement fund, resettlement package to restore livelihood of resettlers and complaint hearing and appeal provision to address complaints in relation to resettlement and compensation.	The entitlements for compensation of resettlers is based on legal land holding and do not include informal settlers without any legal landholding.	The application of ESS 5 to bridge the gap and cover the informal resettlers during resettlement is recommended. -reliance on the more elaborate provisions of proclamation 1161/2019 and regulation 135/2007 is advisable to bridge the gap of non-clarity.
ESS6: Biodiversity Conservation and Sustainable Management of Living Natural resources.	ESS6 is applicable to the HoA-GW4RP	The Federal EIA Proclamation no.299/2002 has defined the terms "Environment" and "Impact" broadly to include all forms of habitats, biodiversity, heritage and ecosystems. "Environment" means the totality of all materials whether in their natural state or modified or changed by human; their external spaces and the interactions which affect their quality or quantity and the welfare of human or other living beings, including but not restricted to, land atmosphere, whether and climate, water, living things, sound, odor, taste, social factors and aesthetics. "Impact" means any change to the environment or to its component that may affect human health or safety, flora, fauna, soil, air, water, climate, natural or cultural heritage, other physical structure, or in general, subsequently alter environmental, social, economic or cultural conditions. The impact of a project shall be assessed on the basis of the size, location, nature, cumulative effect, duration, reversibility or irreversibility or other related effects of the project. The EIA report is required to contain information on the characteristics and duration	ESS6 categorizes habitats in three main group, namely <i>Natural</i> , <i>Modified</i> , and <i>Critical</i> habitats, and provides conditions where projects will not be implemented in these habitats. In the national policies, strategies, and legislations, ecosystems are defined considering altitudes, specific flora, and fauna presence. Environmental assessment for projects implemented in these ecosystems are broadly addressed through the general	The application of EES6 to bridge the gap and categorize habitats and requirements for projects to be implemented in these habitats. Measures and actions developed to assess and manage subproject specific biodiversity risks and impacts as outlined in the ESMF and subsequent subproject ESMPs.

		of all the estimated direct or indirect, positive or negative impacts, as well as measures proposed to eliminate, minimize, or mitigate negative impacts. Thus, the requirements of ESS 6 are broadly addressed through the EIA process. There are also more specific sectoral laws and regulations which complement the EIA proclamation in conserving habitats and biodiversity such as: -Forest Development, Conservation and Utilization Proclamation No.542/2007 -Development Conservation and Utilization of Wildlife Proclamation No. 541/2007 -Wildlife Development, Conservation & Utilization Council of Ministers Regulations No.163/2008. -National Biodiversity Strategy and Action Plan (NBSAP).	EIA process rather than specific ecosystem requirements.	
ESS7: Indigenous People	ESS7 is applicable to the HoA-GW4RP.	As these sub-components will be implemented mainly in lowland areas where pastoralist and semi-pastoral communities reside, the potential risks of the project may disproportionately impact these groups who are historically underserved or mostly vulnerable due to their distinct livelihood strategies, ways of living and other socio-economic dynamics. The Bank will apply ESS7 for this project in the same spirit as previously agreed with the GoE.	The gaps in the definition of Indigenous people between the national system and ESS 7 is already bridged through discussions and agreement with the GoE.	None.
ESS8: Cultural Heritage	ESS8 is applicable to the HoA-GW4RP	As described above in ESS 6 the term "Impact" is defined broadly by the EIA proclamation. The definition reflects the kind of adverse impacts a project proponent is required to assess which includes any change to the environment or to its component that may affect flora, fauna, natural or cultural heritage , or in general, subsequently alter environmental, social, economic or cultural conditions . Thus, the Federal proclamation on EIA has provisions by which it considers the issues of cultural resources. Article 41 of Proclamation No. 209/2000 on research and conservation of cultural heritage also contains the measures that should be taken during chance finding of heritages.	Though natural and cultural heritages are required to be included during EIA process, the preparation of a Cultural Heritage Management Plan (CHMP) as indicated in the ESF is not required by the national EIA law.	The application of ESS 8 requirement for CHMP is advisable when appropriate.
ESS10: Stakeholder Engagement and Information Disclosure	ESS10 is applicable to the HoA-GW4RP	Article 15 of the EIA Proclamation requires public participation/consultation during EIA study process and public disclosure of EIA reports. Current practice also shows public consultations are carried during EIA studies and minutes of consultation produced. Incorporation of the views and concerns of stakeholders into the EIA report usually carried.	The stakeholder and public consultations requirement are focused on initial EIA study phase and do not continue through the project lifecycle as required by ESS-10. Thus, preparation of Stakeholder Engagement Plan not required	The application of ESS 10 requirement for SEP is advisable to continue engagement of stakeholders during project implementation and beyond when appropriate.

	by the EIA proclamation. Establishing GRM to address	
	public concerns is also not	
	required by the EIA	
	proclamation.	

Relevant EHS Guidelines (World Bank Group) for HoA-GW4RP Sub-projects

The Environment Health and Safety general and industry sector guidelines provide information on a variety of issues which need to be adopted to mitigate adverse environmental and safety issues that may likely arise during the implementation of Components 1, 2 & 3 subprojects. The most relevant of these guidelines to the subprojects include the following:

- EHS General Guidelines
- EHS Annual Crop Production
- EHS Perennial Crop Production
- EHS Guideline for Water and Sanitation
- EHS Guideline for Construction Materials Extraction

EHS General Guidelines

The EHS general guideline section 1 to 4 provides guidance on prevention and control of environmental, occupational health and safety, community health and safety, as well as on construction and decommissioning impacts that may occur during components 1 and 2. As many of these subprojects consist of construction activities which will involve manual labor work activities, section 2.0 and 4.0 of the EHS general guidance provides some appropriate strategies and recommendations useful to minimize occupational health and safety hazards. It describes the sources of hazards and recommended strategies for the prevention of risks associated with over-exertion, slips and falls, work in heights, struck by objects, and working in confined spaces and excavations in construction and decommissioning sites. These recommendations of the EHS guidance are highly applicable for the components 1 and 2 subprojects and would need to be considered during course of subproject implementation.

EHS Water Quality and Availability

Groundwater and surface water represent essential sources of drinking and irrigation water in developing countries, particularly in rural areas where piped water supply may be limited or unavailable and where available resources are collected by the consumer with little or no treatment. Project activities involving wastewater discharges, water extraction, diversion or impoundment should prevent adverse impacts to the quality and availability of groundwater and surface water resources.

Drinking water sources, whether public or private, should at all times be protected so that they meet or exceed applicable national acceptability standards or in their absence the current edition of WHO Guidelines for Drinking-Water Quality. Air emissions, wastewater effluents, oil and hazardous materials, and wastes should be managed according to the guidance provided in the respective sections of the General EHS Guidelines with the objective of protecting soil and water resources.

Where the project includes the delivery of water to the community or to users of facility infrastructure (such as hotel hosts and hospital patients), where water may be used for drinking, cooking, washing, and bathing, water quality should comply with national acceptability standards or in their absence the current edition of with WHO Drinking Water Guidelines. Water quality

for more sensitive well-being-related demands such as water used in health care facilities or food production may require more stringent, industry-specific guidelines or standards, as applicable. Any dependency factors associated with the delivery of water to the local community should be planned for and managed to ensure the sustainability of the water supply by involving the community in its management to minimize the dependency in the long-term.

The potential effect of groundwater or surface water abstraction for project activities should be properly assessed through a combination of field testing and modeling techniques, accounting for seasonal variability and projected changes in demand in the project area.

Project activities should not compromise the availability of water for personal hygiene needs and should take account of potential future increases in demand. The overall target should be the availability of 100 liters per person per day although lower levels may be used to meet basic health requirements. Water volume requirements for well-being-related demands such as water use in health care facilities may need to be higher.

EHS Annual Crop Production

The EHS Guidelines contain the performance levels and measures that are generally considered to be achievable in crop production areas by existing technology at reasonable costs. Application of the EHS Guidelines to existing farming systems may involve the establishment of site-specific targets, with an appropriate timetable for achieving them. The applicability of the EHS Guidelines should be tailored to the hazards and risks established for each project on the basis of the results of an environmental assessment in which site-specific variables such as host country context, assimilative capacity of the environment, and other project factors are taken into account. The applicability of specific technical recommendations should be based on the professional opinion of qualified and experienced persons.

Cultivation of annual crops is characterized by a wide range of crops, soil types, and climatic conditions. Modification of the environment varies from minimal to intensive. Land use, production levels, and associated costs reflect these and other parameters. The land areas used for production may vary from a few to thousands of hectares.

Modern machinery gives farmers the opportunity to farm greater areas. The tractor, a central tool in crop production, provides power to implement crop production and handling operations. Tractors are most often used to pull equipment through the field and to provide power to rotate equipment components— called power takeoff (PTO). A modern farm tractor is usually equipped with a diesel engine with an output ranging from less than 40 to more than 400 PTO horsepower.

The lifetime of an annual crop is one growing season that falls within one year. More than one crop may be produced on the area during one year. Annual crops are often grown in rotation across years, alternating with other crops and fallow periods. Rotational practices are determined by nutrient management and economic considerations. In some cases, monoculture, or production of the same annual crop year after year, takes place. Typically, post-harvest operations lead straight to the next field preparation phase. The production cycle is illustrated in Figure A-1, and each step is described below as it applies to grain production.

EHS Perennial Crop Production

The production of perennial crops consists of planting useful crops and modifying the environment to provide them with optimum conditions for growth. The life cycle of a plantation is normally longer than one growing season. For example: olive trees may be productive for several hundred years; modern oil palm, coconut, and rubber plantations are productive for 20 to 30 years; but sugar cane crops are only grown for one or two seasons. Perennial crops belong to many different plant classifications and families. Products from palms include palm oil and coconuts; products from tree crops include citrus fruits, rubber, and cacao; products from bushes include coffee and tea; products from herbs include bananas; and sugar cane is derived from a member of the grass family. Tropical forestry plantations include species such as Eucalyptus and Pinus. Temperate and boreal plantations are varied and many include spruce, pine, and fir. The optimal growing conditions (including nutrient and water needs) and threats (including diseases and insects) differ for each crop. This is also the case for the utilization of the crop, which varies from human consumption to industrial uses.

Modification of the environment ranges from minimal to intensive depending on the particular crop, growing conditions (soil, climate, diseases, weeds, and insects), and management techniques. The land area used for plantation crops and the scale of the production output are a factor of the above considerations, in addition to the use of fertilizer, water, and pesticides. It is the management of these latter factors that is of particular concern for environmental protection, as well as for occupational and community health and safety. However, achieving sustainable intensification and increased productivity per unit of land may be the most important factor in both reducing the expansion of plantation crops into natural areas and ensuring the adequate provision of foodstuffs for communities.

EHS Guideline for Construction Materials Extraction

The EHS guideline for construction materials extraction was consulted during the development of the present ESMF for it consists of recommended mitigation actions applicable to the HoA-GW4R project. Relevant recommended actions from the EHS guideline for construction materials extraction are applied in the proper sections of the present ESMF.

ENVIRONMENTAL AND SOCIAL BASELINE

OVERVIEW OF BIOPHYSICAL BASELINE

Ethiopia is a large land-locked country occupying an area of over 1.1 million km². It is located between 3° and 15°N latitude and 33° and 48 ° E longitudes. Ethiopia is bounded by Sudan from the west, Eritrea and Djibouti from the northeast, Somalia from the east and southeast, and Kenya from the south. The country is constituted of eleven regional states and two city administrations. It is a country of great geographical and climatic diversity, which has given rise to many and varied ecological systems.



Figure 0-1 Map of Ethiopia (Source: Wikipedia, List of Zones of Ethiopia, December, 2020)

Climate

Ethiopia has a diversified climate ranging from semi-arid desert type in the lowlands to humid and warm (temperate) type in the southwest (Beyene 2010). Hurni (1982), Osman (2001), and Seleshi and Demaree (1995) also described high inter and intra-annual rainfall variability in Ethiopia. The mean annual rainfall of Ethiopia ranges from 141 mm in the arid area of eastern and northeastern borders of the country to 2,275 mm in the southwestern highlands (Berhanu et al. 2013). The complex topographical and geographical features of the country have a strong impact on these spatial variations of climate and different rainfall regimes in Ethiopia (National Meteorology Service Agency 1996; Zeleke et al. 2013).

Ethiopia has a tropical climate that is strongly a function of altitude. The mean annual temperature varies from more than 300C in the lowlands to less than 100C in the highlands. The annual rainfall is over 2,700 mm in the southwestern highlands; and less than 200 mm towards

the north; less than 100 mm in the northeast; and less than 200 mm in the southeast. Based on rainfall distribution, Ethiopia has three major seasons: 'Kiremt' (June – September, the main rainy season for most parts); 'Bega' (October – February, the dry season for most parts); and 'Belg' (March – May, the short rainy season for some parts). While this is the broad climatic pattern, large spatial and temporal variability are the salient features of Ethiopia's climate.

No.	Eco-climatic Zone	Environmental Sensitivity
1	High Dega Wurch Very high elevation areas (>3200 m) principally in Wollo, Gonder and Gojam in Amhara; dominated by grassland landscapes; rainfall is 1000-1600 mm	Potential for rapid rainfall runoff and the vulnerability to overgrazing and other human uses.
2	Dega High elevation areas (2000-3200 m) such as in Tigray, Wollo, Gonder and Gojam in Amhara, and Harrerege, Arsi and Bale in Oromiya; typically, mixed coniferous shrubs and trees; rainfall is 1000-2000 mm.	Relatively high rainfall and potential high soil erosion rates.
3	Kolla Low elevation semi-arid areas (500-1500m) of western Tigray, southern Oromiya and northern Somali; dry savanna landscapes; rainfall is in the range of 200-800 mm.	The semi-arid, dry savanna Kolla landscapes are vulnerable to deforestation and overgrazing, variable rainfall, and wildfire potential; soils are generally nutrient poor and moderate-high erodibility.
4	Bereha Low elevation arid areas in Afar, Somali, Benshangul, Gumuz and Gambella and the western parts of Tigray and eastern Oromiya (Harrerege and Bale); arid and dry savanna landscapes; rainfall is generally less than 200 mm.	Generally, have low soil quality, high erosion potential and vulnerability to pastoral livelihoods.

Morphology, Relief, and Ecology

Ethiopia, with a total area of approximately 1.13 million km2, is a country that is characterized by a topography that consists of a complex blend of massive highlands, rugged terrain, and low plains. The Great Rift Valley of the eastern Africa divides the country into two plateaus and stretches from northeast to southwest with 40–60 km wide flat-lying plain in the east, south, and west borders of the country that has an elevation around 600 m above mean sea level (amsl). It creates three major relief regions in the country: the Western Highlands, the Eastern Highlands, and the low-lying Rift Valley and Western Lowlands. The elevation also ranges between two extremes from 125 m below mean sea level at the Danakil Depression to 4,620 m amsl at Ras Dejen (Dashen) peak.

The physiographic diversity of the country is impressive. It consists of rugged mountains, flattopped plateaus, deep gorges and river valleys and vast lowland areas. About 45% of the country is highland with an altitude of 1500 m or above, and 55% is lowlands with an altitude of less than 1500 m. The Great Rift Valley cuts across the country in a northeast-southwest direction and divides the highlands and plateaus and associated river drainage systems into western and eastern parts. The diversity of the terrain is fundamental to regional variations in climate, natural vegetation, soil composition, and settlement patterns. Much of the Ethiopia's landmass is part of the East African Rift Plateau. As a result of the contrasting physiographic and climatic features of the country, Ethiopia has diverse ecosystems. There are 10 major ecosystems, and 18 major and 49 minor agro-ecological zones, which are inhabited by a great diversity of animal, plant and microbial genetic resources (FDRE, 2015, in EFCCC, 2019). Evidence suggests that there are 1,408 known species of fauna and 6,603 species of flora, of which 15.1 percent are considered endemic (FDRE, 2015. in EFCCC, 2019). This makes Ethiopia to be one of the biodiversity hotspots of the world.

NATURAL RESOURCES

Water Resources and Drainage

Surface Water Resources

Ethiopia is endowed with a substantial amount of water resources. The country is divided into 12 basins; 8 of which are river basins; 1 lake basin; and remaining 3 are dry basins, with no or insignificant outflow of the drainage system. Almost all of the basins radiate from the central plateau of the country that separate into two due to the Rift Valley. Basins drained by rivers originating from the mountains west of the Rift Valley flow toward the west into the Nile River basin system, and those originating from the Eastern Highlands flow toward the east into the Republic of Somalia. Rivers draining in the Rift Valley originate from the adjoining highlands and flow north and south of the uplift in the center of the Ethiopian Rift Valley.

Since almost all river basins originate from the highlands and high rainfall areas, they have huge amount of surface water running in the river basin systems and Ethiopia is considered to be the water tower of the Horn of Africa. This potential is not fully utilized and translated into development because of many factors including limited financial resources, technical challenges, and lack of good governance in the water sector. Among the major river basins which form four major drainage systems:

- The Nile basin (including Abbay or Blue Nile, Baro-Akobo, Setit-Tekeze/Atbara and Mereb river basins) covers 33 percent of the country and drains the northern and central parts westwards;
- The Rift Valley basin (including Awash, Denakil, Omo-Gibe River basins and Central Lakes) covers 28 percent of the country;
- The Shebelle-Juba basin (including Wabi-Shebelle and Genale-Dawa river basins) covers 33 percent of the country and drains the southeastern mountains towards Somalia and the Indian Ocean;
- The North-East Coast (including the Ogaden and Gulf of Aden basins) covers 6 percent of the country.

These four major drainage systems drain the entire rural and urban parts of the Country through its primary, secondary and tertiary level tributaries. Cities like Addis Ababa, Adama, Bishoftu and Mekelle are found far upstream of the Awash and Tekeze River basins, respectively, and are drained by small tributaries such as the Akaki Rivers in the case of Addis Ababa. Other cities such as Dessie, Kombolcha and Woldiya are also situated upstream of the Awash basin and are drained by its major tributary rivers (i.e., Borkena and Mile Rivers). On the other hand, cities like Bahir Dar, Gondar, Assosa and Gambella are found within the Blue Nile and Baro Akobo River Basins, not far from their main tributaries. Other cities/towns like Batu (Ziway), Hawassa and Arbaminch are situated within the Rift valley lakes basins close to the lakes. Bahir Dar City is situated adjacent to Lake Tana and it is crossed by the river mouth of the main Blue Nile River which starts from Lake Tana itself. Similarly, Gambella city is crossed by Baro River which is one of the main rivers of the Baro-Akobo basin. The Bishoftu, Hawassa, Ziway and Abaya lakes, which are among the important lakes in the rift valley basin, are situated adjacent to Bishoftu, Hawassa, Batu and Arbaminch city/town, respectively.

The country has opportunities and potentials for irrigation in the River Basins. Tadesse (2002) argued that food shortage can be minimized if farmers have access to irrigation water. Awulachew et al. (2007) also indicated that, the prevalent rain fed agriculture production system together with the progressive degradation of the natural resources base and climate variability has aggravated the incidence of poverty and food insecurity. Currently, the Ministry of Water and Energy identified more than 500 irrigation sites with a total of 3.8 million ha irrigable land. The details of this irrigation potential in the Ethiopian major river basins are presented in the table below. From this irrigation potential, the GTP planned to develop 15.4% of the potential at the end of 2015. This will boost the irrigable land of the country to 785,582.6 ha. Accordingly, over the past 2 years and 6 months of the GTP, the performance of the ministry indicates that study and design have been finalized for 473,225 ha, and 148,836 ha of land have been constructed out MoWE 2013). Generally, up until the first 6 months of the 2012–2013 fiscal year, 276.078.6 ha of land have been at different levels of studies and designs through medium- and large scaleirrigation schemes. On the other hand, several irrigation development projects are under construction, to mention a few: Kesem-Tendaho, Koga, Rib, Gidabo, Megech-Sereba, Kobo-Girana, Rava-Azebo, and Adea-Betcho. This has increased the overall irrigation coverage growth from 2.4 to 7.34 % (MoWE 2013).

Name Basin	Small Scale	Medium Scale	Large Scale	Total
Abbay (Awulachew et al. (2007))	45,856	130,395	815,581	991,832
Awash (MoWE and FAO (2012))		198,632	139,627	338,259
Baro-Akobo (Awulachew et al. (2007))			1,019,523	1,019,523
Denakil (Awulachew et al. (2007))	2,309	45,656	110,811	158,776
Genale-Dawa (Awulachew et al. (2007))	1,805	28,415	1,044,500	1,074,720
Omo-Ghibe (Awulachew et al. (2007))		10,028	57,900	67,928
Rift Valley (Awulachew et al. (2007))		4,000	45,700	49,700
Wabishebele (Awulachew et al. (2007))	10,755.00	55,950	171,200	3,700,738

Table 0-2 Irrigation Potentials (ha) Compiled from Respective Master Plan Studies



Figure 0-2 Map Showing Major Water Bodies, National Parks & World Heritage Sites of Ethiopia

Groundwater Resources

The groundwater resources potential of Ethiopia is estimated to be about 185 billion cubic meters. Groundwater has been used as the main source of water supply since the 1970s for the main cities, towns and dispersed rural communities across the country, where provision of reticulated surface-water schemes is often expensive because of initial project construction costs and poor water quality. The exponential growth of the urban population and agriculture-led industrial development has resulted in greater attention to groundwater as the potentially cost-effective water supply source. As part of the growing focus on the use of groundwater, the Ethiopian government is currently implementing irrigation projects. One plan involves nine irrigation projects covering an estimated area of 8,000 ha, being developed at a pilot scale, with 9,000 test wells, 28,000 monitoring wells and 14,657 spring improvements. If this unprecedented Ethiopian groundwater-centered development plan is implemented successfully at such a scale, it is highly likely that its success will persuade other Sub-Saharan developing nations to put in place the necessary policies, regulations and investment for infrastructure and capacity development for exploring, exploiting and managing their groundwater resources.

The occurrence of groundwater is mainly influenced by the geophysical and climatic conditions of the area. The difficulty in obtaining productive aquifers is a peculiar feature of Ethiopia, which is characterized by the wide heterogeneity of geology, topography, and environmental conditions (Alemayheu 2006). Actually, the geology of the country provides usable groundwater and provides good transmission of rainfall to recharge aquifers, which produce springs and feed perennial rivers. In many parts of the country, groundwater is an important source of domestic and industrial water use especially in rural areas and towns. However, the occurrence of groundwater is not uniform because it depends on various environmental and geological factors

(Alemayehu 2006). Geologically, the country can be characterized with generalized classifications, such as 18% of the Precambrian basement, 25% of the Paleozoic and Mesozoic sedimentary rocks, 40% of the Tertiary sedimentary and volcanic rocks, and 17% of the Quaternary sediments and volcanic rocks (MoWR 2009).

With the understanding of the nature of the distribution of these rocks and the recharge classification of the country, Alemayehu (2006) estimated the total groundwater reserve of the country as 185 BCM, which is distributed in an area of 924,140 km2 made of Sedimentary, Volcanic, and Quaternary rocks and sediments, including the highlands and the Rift Valley. In this estimation, the mean groundwater recharge for the entire country is assumed as 200 mm. This should be confirmed with a detailed hydrogeological investigation to use as a reliable potential. Hydrogeological investigations refer to the study of lithological, stratigraphical and structural aspects of a territory using basic geologic methods and will be finalized in the understanding of factors that regulate effective infiltration, groundwater reserve, circulation and outflow of the groundwater (Alemayehu 2006). The Ethiopia Geological Survey so far covers only 20.4% of the Ethiopian landmass that has been mapped at 1:250,000 scales, about 36.8 % of the country are mapped at one million scale and the whole country at two million scale (MoWE 2013).

The Ethiopian National Groundwater Database (ENGDA) has been implemented since 2003 jointly by the then Ministry of Water Resources, Addis Ababa University, and Geological Survey of Ethiopia. It has a close collaboration with the regional water resources development bureaus, Water Work Enterprises, NGOs, and contractors. ENGDA has large attributes and collections of about 5,000 boreholes in the country. The availability of this groundwater database is playing an important role in understanding the hydrologic cycle and discharge–recharge relation, for assessing and managing water resources within the hydrogeologic environment. At present, detailed groundwater assessments are ongoing in several areas and these indicate that the previously estimated groundwater usage potential of 2.6 BCM was underestimated. And it needs to be revised. Best guesses in this respect range between 12 and 30 BCM, or even more if all aquifers in the lowlands are assessed (MoWR and GW-MATE 2011). Studies for irrigated agriculture in Kobo, Raya, and Adaa Bechoo suggest that regional aquifers are deep and water movement crosses surface basin boundaries. It is estimated that the groundwater reserve of the Kobo Girana Valley alone is in the order of 2.5 BCM, that of Raya is 7.2 BCM, and Adda Bechoo is 0.96 BCM (AGWATER 2012).

Water resources are the central elements for the development of Ethiopia. One can easily understand that "water-centered development" is the key for growth and transformation of the country. The growth and transforming plan (GTP) also consider and targets to enhance the uses of country's water resources (MoFED 2010). It gives priority for the expansion of small-, medium-, and large-scale irrigation to the extent possible, hydropower developments to satisfy the energy demand of the upcoming industries and then the water supply and sanitation system for the satisfaction of the inhabitants. Technologies that will enable us to use the water resources will also be used extensively. The GTP recognized to expand watershed management and to carry out effective water- and moisture-retaining works that will help to cope up the challenges of climate change.

Planning should support with information about resource availability. Thus, to enhance the use of country water resources, we have to understand the potential with spatial and temporal variations of the resource. For the past two to three decades, the government of Ethiopia is exerting efforts to cover all the major river basins with the integrated master plan studies. All the master plan

studies were devoted to assess the availability of resources and potentials of the river basins for different developments (MoWR 1996, 1997, 1998a, b; PDRE 1989).

Some of the master plan studies need to be updated to reflect the current situation on the ground. With this regard, other resources that include the water sector development program (MoWR 2002, 2010), feasibility studies and detailed designs of different development projects (WWDSE 2005; Halcrow and MCE 2007), and other basin-level studies (MoWE and FAO 2011, 2012) are reviewed to estimate and analyze the different water resources development potentials of the country.

Groundwater Quality

Groundwater quality is highly variable across Ethiopia, from fresh waters in many of the springs flowing from basement aquifers, to more saline waters in volcanic aquifers in parts of the Rift Valley and sedimentary aquifers of the plains. Although reliability of data is a concern, Ethiopia is rich in groundwater resources. According to MacDonald et al. (2012) for Ethiopia the best estimate on groundwater storage is 12,700 billion cubic meters (bcm) which is approximately 5% of Africa's potential. A conservative estimate by Kebede (2012) deduced based on the explored/mapped part of aquifers in Ethiopia is 1,000 bcm, which is much lower than MacDonald's. Of the 1,000 bcm storage in Ethiopia, 65 percent is fresh groundwater available for irrigation and other uses. Locally, the groundwater quality may show spatial variations and requires more detailed mapping and sampling for project development and site selection of wells. A specific feature of the groundwater quality in Ethiopia is the presence of fluoride, mainly in the Rift Valley.

National Parks and Wildlife Sanctuaries

Ethiopia harbors six of the world's major terrestrial biomes (alpine, coniferous forests, deciduous forest, tropical rain forest, savanna, and desert) and nine distinct ecosystem types (BIDNTF, 2010). Across all these nine different ecosystem types, there are 52 conservation areas with official protection status. These include 20 National parks, 3 wildlife sanctuaries, 2 wildlife reserves, 17 controlled hunting areas, 7 open hunting areas and 3 community conservation areas (EWCA, 2012). The difference between the different conservation statuses includes a wildlife sanctuary does not allow people to live inside it but a wildlife reserve allows people to live together and conserve wildlife (Vreugdenhil et al., 2012). National parks are areas of land protected to conserve native plants and animals and their habitats, places of natural attractiveness, historic heritage and indigenous cultures (NSW, 2015). The list of National parks administered by the Federal and respective regional governments is shown in table below.

There are eight officially recognized natural ecosystems in Ethiopia: Afro alpine and sub – afro alpine, dry evergreen montane forest and grass land complex, moist evergreen montane forest, Acacia – commiphora woodlands, Combretum – Terminalia woodland, low land semi-evergreen forest, desert and semi-desert scrubland and aquatic ecosystems. The vegetation covers can be classified as (typically):

- Desert and semi-desert scrubland in the northeast and southeast of the country
- Acacia-Commiphora woodland and bushland proper in the northeast, east, southeast and south of the country
- Acacia wooded grassland of the rift valley
- Wooded grassland of the western Gambella region

- Combretum-terminalia woodland and wooded grassland in the northwest, west, and southwest of the country
- Dry evergreen Afromontane Forest and grassland complex in the central plateau
- Moist evergreen Afromontane Forest in the southwest plateau

The major ecosystems of Ethiopia exhibit different levels of threats to biodiversity due to human and animal population pressure. These specific threats require to be dealt differently and prioritization of ecosystems for intervention.

No.	National Park	Region	Established	Area	Administered by
1	Awash National Park	Oromia, Afar	1958	756 km ² (292 sq mi)	Federal Government
2	Omo National Park	SNNP	1980	4068 km ² (1571 sq.mi)	Federal Government
3	Simien Mountains National Park	Amhara	1959	412 km ² (159 sq mi)	Federal Government
4	Alatish National Park	Amhara	2006	2,666 km ² (1,029 sq mi)	Federal Government
5	Bahir Dar Blue Nile River Millennium Park	Amhara	2008	4,728 km ² (1,825 sq mi)	Regional Government
6	Borena Saynt National Park	Amhara	2001	4,325 km ² (1,670 sq mi)	Regional Government
7	Bale Mountains National Park	Oromia	1962	2,200 km ² (850 sq mi)	Federal Government
8	Abijata Lakes National Park	Oromia	1963	887 km ² (342 sq mi)	Federal Government
9	Nech Sar National Park	SNNP	1966	514 km ² (198 sq mi)	Federal Government
10	Mago National Park	SNNP	1974	1,942 km ² (750 sq mi)	Regional Government
11	Chebera Churchura National Park	SNNP	1997	1,190 km ² (460 sq mi)	Regional Government
12	Maze National Park	SNNP	1997	202 km ² (78 sq mi)	Regional Government
13	Yangudi-Rassa National Park	Afar	1969	4,731 km ² (1,827 sq mi)	Federal Government
14	Gambela National Park	Gambela	1966	5,061 km ² (1,954 sq mi)	Federal Government
15	Geraille National Park	Somali	1998	3,558 km ² (1,374 sq mi)	Regional Government
16	Dati Wolel National Park	Oromia	1998	431 km ² (166 sq mi)	Regional Government
17	Yabello National Park	Oromia	1978	2,500 km ² (970 sq mi)	Regional Government
18	Gibe Sheleko National Park	SNNP	2001	248 km ² (96 sq mi)	Regional Government
19	Loka Abaya National Park	SNNP	2001	500 km ² (190 sq mi)	Regional Government
20	Kafeto Shiraro National Park	Tigray	1999	5,000 km ² (1,900 sq mi)	Federal Government

Table 0-3 List of National Parks in Ethiopia

ENERGY

Having access to modern energy sources is essential for economic development and livelihood improvement. Access to modern energy supports both income generation activities and the national development agenda through improving education, reducing indoor air pollution, and ensuring environment sustainability. The primary source of energy in Ethiopia is biomass, which accounts for 91% of energy consumed. Petroleum supplies about 7% of total primary energy and electricity accounts for only 2% of total energy use. Biomass consumption accounts for over 98% of total supply in the residential sector.

Power generation for the electric grid in Ethiopia currently depends almost entirely on hydropower. Ethiopia is having large Interconnected Power System (ICS). This ICS consist of 13 hydro, 6 diesel standby, 1 geothermal and 3 wind farms. Presently, Ethiopia has a total installed power generation capacity of around 4244 MW. About 90% (3814 MW) is generated by hydroelectric power plants. Additionally, 324 MW (7.65%), 7.3 MW (0.17%) and 99.17 MW (2.34%) are produced by the wind, geothermal and diesel power plants, respectively. It was intended that the government of Ethiopia was developing large-scale hydroelectric projects with the aim of increasing the supply of renewable energy sources from the present generation capacity of 4244MW to 10,000MW by the end of 2014 &15 EC. The Grand Ethiopian Renaissance Dam (GERD) is under construction and expected to be completed soon. The GERD hydropower plant would add 6000MW to meet the government targets of over 10,000MW capacity.

The per capita electricity consumption was 23 kWh in 2000 and increased to about 41 kWh by 2008 and 70 kWh by 2014. There are stark differences in the rate of electricity access in urban and rural areas. Urban populations have major access to electricity; while the large populations residing in rural areas have less access to electricity. In urban areas 87% of the population has access to electricity, while in rural areas electricity access remains extremely low at about 5%. Eighty-three percent of the population resides in rural areas, largely relying on traditional biomass energy sources for cooking and heating.

The Universal Electricity Access Program (UEAP) has been developed to provide electricity access for most of the rural areas. An integrated plan has been developed by the Ethiopian electric power corporation (EEPCo) for achieving these goals. The government of Ethiopia is aiming to increase electricity access from 26% (2014) to 60% by 2040.

CLIMATE CHANGE

Ethiopia is vulnerable to climate variability and global climate change. Climate change has occurred across much of Ethiopia, particularly since the 1970s, at a rate that is variable but broadly consistent with wider African and global trends. Mean annual temperature has increased by 1.3°C between 1960 and 2006, an average rate of 0.28°C per decade. Climate models suggest that Ethiopia will see further warming in all seasons between 0.7°C and 2.3°C by the 2020s and of between 1.4°C and 2.9°C by the 2050s and that the timing, intensity, and volume of rainfall will change over much of the country. The frequency and intensity of droughts has increased in recent years, severely affecting the livelihoods of millions of people. At the same time, increases in floods have placed additional stress on social institutions and intensified the vulnerability of households. Climate related shocks affect productivity, together with high levels of poverty and low levels of technology, leave people with limited choices or resources to adapt. These changes also hamper economic progress and exacerbate existing social and economic problems. The Ethiopian government is committed to building a Climate Resilient Green Economy (CRGE) that

aims to ensure economic development whilst pursuing a low emissions pathway and building resilience to climate change.

OVERVIEW OF SOCIAL BASELINE

People and Population Dynamics

Ethiopia is a large country covering a geographic area of more than 1 million km^2 . It is a diverse and multi-cultural nation and a home for over 90 ethnic groups and 10 regional states. An estimated 80% of Ethiopians live in rural areas and 20% live in cities. Rain fed agriculture is the main source of livelihood. Agro-pastoral and mobile pastoral livelihood is practiced in East and Southern part of the country. Urban livelihood is dominated by informal employment and self-sustaining activities.

Ethiopia is the second most populous country in Sub Saharan Africa and the 12th most populated country in the world². The population of Ethiopia is 110 million based on projections of the last population census conducted in 2007. Growing at a rate of 2.5%, Ethiopia's population is projected to reach 150 million by 2035. The population density (2018) is 109.2 persons per square kms with significant variations between the more densely populated north and central highlands and the sparsely populated lowlands in Eastern part of the country.

Demography

Ethiopia has a high percentage of young population. The DHS survey (2016) shows that 46% of the population is under 15 years of age and 51% of the population is between 15-64 years old. The population under 30 years of age account for 73%. The gender disaggregation is 50% with slightly higher women (51%) in urban areas. The average household size in Ethiopia is 4.6 persons. Urban households are slightly smaller than rural households (3.5 persons versus 4.9 persons). Women are heads of households for 1 in 4 households.

Social-Economic Environment

Basic Socio-economic Environment of Sample Regions

SNNP Region

Population & Ethnic Group: According to the 2007 national census, the total population of Southern National, Nationalities, and People's Regional State (SNNPRS) is 15,042,531 of whom 1,545,710 are urban dwellers while 13,496,821 live in rural areas. Based on the 2017 population projection, the estimated population of the SNNPRS is 19,170,007. From the estimated population, 15.6 % or 3,178,000 people live in rural areas while 83.4 % or 15,992,000 people are rural residences. There are about 45 ethnic groups in the Region. Sidamigna, Gruagigna, Wolayitagna, Hadiyigna, Keffigna, and Kembatigna are widely spoken language in the region. Other languages such as Gamoigna, Malo, Goffa and Gedeo are also used for communication purposes.

² Worldometer: <u>https://www.worldometers.info/demographics/ethiopia-demographics/#pop</u> viewed on December 5, 2020.

Livelihood: The population of SNNPR is concentrated mostly in eastern, northern and central part of the Region while the western and southern part of the State is sparsely populated. SNNP Regional State has abundant land and Water resource that can be harnessed to improve the livelihood of the region community in general and the pastoral and agro pastoral community in the lowlands of the region in particular. But these resources could not be easily accessed and sustainably exploited especially at the southern lowlands where the pastoralist and agro-pastoralist live to lack of adequate in road infrastructure. Coffee is the most important cash crop. Other major crops of the region include maize, teff, enset, potato, and wheat.

Heritage and Popular Attraction Sites: There are cultural heritage sites in the region like the Tiya monuments and the Omo valley archaeological site.

Oromia Region

Population & Ethnic Group: According to the 2007 national census, the total population of Oromia Region is 27,158,471 of whom 3,370,040 are urban dwellers while 23,788,431 live in rural areas. Based on the 2017 population projection, the estimated population of the region is 35,467,001. Ethnic group residing in the region is also varied, the majority being Oromo, followed by Amhara, and several other ethnic groups.

Livelihood and Natural Resources: Agriculture is the basis of livelihood for the majority of the population. The region is also endowed with livestock resources, although quality and productivity are very low. Traditional range land management practices have deteriorated, and development in the water sector for various purposes has led to the degradation of some wet season grazing areas. Grazing land has been taken away from pastoralists for irrigation and for resettlement. Bush encroachment to the grazing lands is also a serious problem to the farmers in the region threatening their livelihood. Mineral deposits such as gold, platinum, nickel, iron-ore, soda ash, diatomite, limestone, feldspar, silica sand, dolomite, kaolin, granite and other construction materials and precious minerals such as gold and platinum is found in Adola and Laga Dambi (Borena zone) Nejo and Birbir river Valley (Wollega) and Yubdo (Wellega).

Heritage and Popular Attraction Sites: The hot springs in Walliso and Sodere are popular attraction sites for tourists In Oromia Region. The Sof-Omar caves in central Bale, with their galleries of polished white cone and chamber of columns are the incredible natural phenomena of great interest and beauty. The palace of Aba Jifar in Jimma City is another cultural heritage & historical attraction in the region.

Amhara Region

Population & Ethnic Groups: According to the 2007 national census, the total population of Amhara Region is 17,214,056 of whom 2,112,220 are urban dwellers while 15,101,836 live in rural areas. Based on the 2017 population projection, the estimated population of the Amhara Region is 21,134,988. From the estimated population, 3,682,000 (17.4%) people live in urban areas while 17,453,000 (82.6%) people are rural residents. Ethnic group residing in the region is also varied, the majority being Amhara and other ethnic groups including Oromo, Agew, Tigre,Kimant &Argoba etc.

Livelihood and Social Services: About 85% of the people are engaged in agriculture. The region is one of the major Teff producing areas in the country, in addition barely, wheat, oil seeds, sorghum, maize, wheat, oats, beans and peas are major crops produced in large quantities. Cash

crops such as cotton, sesame, sunflower, and sugarcane grow in the vast and virgin tract of the region's lowlands. The water resources from Lake Tana and all the rivers found in the region provide immense potential for irrigation development. Regarding health structure, there are 4262 functional health facilities in the region; of these, 3345 are health post, 848 health centers and 69 hospitals.

Heritage and Popular Attraction Sites: The Amhara Region is rich in cultural and historical heritages. Very old Monasteries, rock-hewn churches, palaces and castles are found in the region. The 12th century Rock-Hewn churches of Lalibela and the Gondar Castle in the region are registered as International Cultural Heritage sites. There are several monasteries in Lake Tana Islands. The Blue Nile Falls is found just few kilo meters downstream of the Regional Capital, Bahir Dar, which is a tourist attraction site. The traditional mural paintings and hand craft, the preserved corpse of the royalty found in the ancient monasteries in Lake Tana, as well as the Semien mountains national park, which shelters the endemic Walia ibex are spectacular tourist attractions

Beninshangul-Gumuz Region

Population & Ethnic Group: According to the 2007 national census, the total population of Benishangul-Gumuz Region is 670,847 of whom 97,965 are urban dwellers while 572,882 live in rural areas. According to 2017 projection, the estimated population of the Benishangul-Gumuz is 1,066,001. The ethnic groups include Berta, Amhara, Gumuz, Oromo), Shinasha and Agaw-Awi. Main languages are the Berta, Amharic, Gumuz, Oromo, Shinasha and Awngi.

Livelihood: The economic activities in the region are predominantly agricultural with livestock being of limited importance. Although there is high potential for agricultural development, traditional farming practices and inadequate involvement of women in all aspects of development compounded with other factors have considerably affected the performance of the region's agricultural production and productivity. Subsequently, abundant rural households have been subjected to food deficit and challenges in feeding their family. Besides agriculture, other means of livelihood are trade and traditional gold-washing in some rivers. Even though there were inspiring developments there is still inadequate infrastructure and logistical constraints in terms of transportation and communication. In general, chronic food insecurity has remained a critical development challenge for the region for many decades.

The region is endowed with fertile land suitable for high value crops, livestock, apiculture, fishery, minerals like gold and marble, and economically important trees like bamboo and incense. Livestock production is important means of livelihood in the region next to crop production. It is important sources of food, cash income, and assets to buffer against shocks.

Somali Region

Population & Ethnic Group: According to the 2007 national census, the total population of Somali Region is 4,439,147 of whom 621,210 are urban dwellers while 3,817,937 live in rural areas. According to 2017 projection, the estimated population of the Somali Region is 5,748,998. Somali and Issa are the majority ethnic group, while Oromo, Amhara and Gurage are also found in the region.

Livelihood: Most of the people of the region mainly earn their livelihood by rearing livestock. Some people in the region also practice crop production as well. The major crops cultivated in

the region are sorghum and maize. Commercial activity is another occupation that is significantly exercised in the region. The state of Somali is known for its livestock resources from which most of the Somali people earn their livelihood. The region is estimated to have about 15.2 million domestic animals.

Afar Region

Population & Ethnic Group: According to the 2007 national census, the total population of Afar Region is 1,411,092 of whom 188,973 are urban dwellers while 1,222,119 live in rural areas. As per the estimations made by the CSA, for the year 2017 the total population of the region was estimated to be 1,812,002. The major ethnic groups of the regional state include Afar, Amhara, Tigray and others.

Heritage and Popular Attraction Sites: Afar region is rich in cultural assets. The archaeological findings from the Region have revealed that it is one of the cradles of mankind. The hominid relic of the world renown, "Lucy", was found in Hadar area of the Region. Hadar, which is 4.4 million years old humanoid is found in this region.

There are also other tourist attraction areas in the region including Ertele & the Dallol depression are some of the tourist attraction sites in the Afar region. Yangu Dirasa and the Awash National Parks also hosts number of wildlife species for tourism and biodiversity conservation.

Livelihood: Afar pastoral community is leading a communal life (using natural resources communally) moving from place to place in search of water and grazing. The life of the people of the region depends on its animal wealth and the natural resources like grazing and water. However, the animal production and husbandry practice in the region is not properly managed in line with the availability of grazing and water distribution. Agriculture such as production of maize, beans, sorghum, papaya, banana, and orange is also practiced. Cotton production is also typical to the region. Commercial activities such as production of salt are another area of occupation.

Urbanization

Ethiopia is among countries with the lowest level of urbanization and rapidly urbanizing countries in the world. Share of urban population is slightly higher than 20%, well below the Sub-Saharan Africa's average of 37 percent. Ethiopia is rapidly urbanizing, and the rate of urbanization is 5.4% a year (World Bank 2015)³. According to official figures from the Ethiopian Central Statistics Agency (2016), the urban population is projected to nearly triple from 15.2 million in 2012 to 42.3 million in 2037, growing at 3.8 percent a year. Studies show that 30 percent of the country's population will reside in urban areas by 2028.

The capital, Addis Ababa has, according to the CSA 2012 population projection, a total population of 3,384,569, representing over 30% of the urban population in Ethiopia. Based on projected growth of urban population, the current population of Addis Ababa is close to 4 million. All other major cities have a population of less than one million. Ethiopian cities employ 15 percent of the labor force and contribute 38 percent to gross domestic product (GDP).

³ World Bank and Cities Alliance (2015): Ethiopia Urbanization Review: Urban Institutions for Middle Income Countries

Pastoralism

Pastoralists in Ethiopia are mainly found in four lowland regions, Afar, Somali, Oromiya, and the Southern Nations, Nationalities and People's (SNNP) regional states. Pastoral groups are also found in Gambella and Benishangul areas. The main livelihoods systems include pastoralism, farming and ex-pastoralism – those who have dropped out of pastoralism and now survive on petty income-earning activities⁴. Pastoralist communities in Ethiopia occupy the largest percentage of the country's total land area along the borders of Somalia, Kenya and Sudan. In deed this extends to the border of Djibouti as well. Pastoral communities of Ethiopia occupy 61 percent of the total land mass with more than 29 nationalities and ethnic groups, which comprise Arid and Semi-Arid climatic conditions. The pastoralists are traditionally nomadic ethnic groups that are highly mobile, move from one area to another in search of pasture and water for their livestock, well adapted to harsh terrain and extreme climates. Ethiopian pastoralists are freely move from one region to another and not restricted to one area or even country, sometimes they move out of neighboring countries⁵.

Pastoralists are found distributed over 122 districts of the country. More than half of the country's landmass belongs to pastoralists. Besides the mainly known pastoral regions, others like the Gambella and Benishangul-Gumuz regional states have pastoral communities although these regions at the western end of the country have predominantly a shifting cultivation agricultural system. Over 97% of the pastoral population lives in Somali, Oromia, Afar and Southern Region States⁶. The Ethiopian constitution incorporated the issues of pastoralists by forming separated department for pastoralist issues under the ministry of federal affairs which coordinates and facilitates development in pastoral areas and set up Ethiopian Parliament Pastoralist Affairs Standing Committee (EPPASC) which oversees pastoral development activities in the country. Livestock and Pastoral Development offices have been established in regions where pastoralism is an important production and livelihood system⁷.

Social Capital

Social capital is a set of networks, resources, information, affiliations and associations that people depend upon and draw up on when in need; and it can be developed through social relationship and associated linkages between individuals and groups of similar interest. Social capital enhances people's trust and competence to work with one another, with concomitant expansion of their access to wider institutions. Plenty of literatures indicate that pastoral and agro-pastoral communities in Ethiopia have various social networks and institutions which assist in solving different economic, social and political problems of the community

Land Tenure and Land Use

⁴ Behnke, R., S. Devereux, R. White, M. Wekesa and A. Teshome (2007). The Productive Safety Net Programme in Pastoral Areas: Pilot Design. Addis Ababa.

⁵ Abdulselam Abdulahi (2019). Pastoralism and Development Policy in Ethiopia: A Review Study. Article in Budapest International Research and Critics Institute (BIRCI-Journal) Humanities and Social Sciences · November 2019DOI: 10.33258/birci.v2i4.562

⁶ United Nation Development Program (2010). Pastoralism in Ethiopia: its total economic values and development challenge. A knowledge management study implemented by SoS Sahel Ethiopia.

⁷ Abdulselam Abdulahi (2019). Pastoralism and Development Policy in Ethiopia: A Review Study. Article in Budapest International Research and Critics Institute (BIRCI-Journal) Humanities and Social Sciences · November 2019DOI: 10.33258/birci.v2i4.562.

Ethiopia's new land tenure policy continues to be seen as a fundamental concern. Researchers are increasingly arguing about this controversial issue to persuade the government to change land policy. Two scholars evaluated the current tenure system by considering the existence of a high level of insecurity regarding land. Land insecurity, in particular, is an obstacle to farmers' interests in the conservation of soil and other natural resources. They concluded that land tenure security should ensure access to land for vulnerable groups, including pastoralists and women⁸.

The backbone of Ethiopia's land economy is smallholder agriculture. With few exceptions, the rights of smallholders' access to land have been largely preserved. However, the conditions and criteria for women and pastoralists' access to land are poor and not properly understood. As a result, access to land by gender, occupational, religious, and ethnic minorities is at risk and must be carefully controlled. Despite the fact that it seems that after the reforms, these efforts to strengthen the rights of women in the land were complementary to the changes that give equal ownership to men and women, some discrimination has subsequently increased since the land reform⁹.

Another neglected, but relevant, aspect is land access on behalf of pastoralists and women. The way that pastoralists wander from place to place and occupy areas for a limited period of time makes it difficult for them to assert their territorial rights¹⁰. The victims of international law are pastoralists and, therefore, their specific claims need to be recognized. In most societies, such as non-indigenous individuals or minorities, pastoralists face double discrimination. Despite the gradual evolution and recent progress in the international land tenure rights of nomads, they are still seen as nomadic societies in their homelands at the national level¹¹.

In Ethiopia, land-use change is active and it provides a complete understanding of the interaction and relationship of anthropogenic activities with the surroundings¹². Changes in land-use practices are strongly linked with direct and indirect human actions that put long-term pressure on the environment thereby aggravating land-use transformation¹³. Changes from farming land to residential use and degradation of land by overgrazing and deforestation are examples of the land-use transformation. According to Deribew and Dalacho¹⁴, for example, over the course of 60 years (1957-2017), the direction and extent of land-use land cover have become more dynamic in the central highland of Ethiopia. He highlighted that there has been a 37.8% reduction in the forest cover while the agricultural land use has shown a 36.7% increase in areal coverage, which means that the average net change for forest was negative with varying rates of deforestation. In general, change in land-use management practices such as cultivation of steep slopes, overgrazing, and no or limited fallow periods, and slope position affects the quality of soils, natural resources management practices and livelihood options of the communities.

⁸ Dejene, Tsehaye Asmelash, and Mekonen Teferi. 1994. Land Tenure and Land Policy Issue in Ethiopia. Paper presented at the Fourth Annual Conference on the Ethiopian Economy, October 3–4; pp. 74–97.

⁹ Kumar, Neha, and Agnes R. Quisumbing. 2015. Policy Reform toward Gender Equality in Ethiopia: Little by Little the Egg Begins to Walk. World Development 67: 406–23. [CrossRef]

¹⁰ Abate, Tsedeke, Bekele Shiferaw, Abebe Menkir, Dagne Wegary, Yilma Kebede, Kindie Tesfaye, Menale Kassie, Gezahegn Bogale, Berhanu Tadesse, and Tolera Keno. 2015. Factors that transformed maize productivity in Ethiopia. Food Security 7: 965–81. [CrossRef]

¹¹ Makki, Fouad. 2018. The Political Ecology of Land Grabs in Ethiopia. In From Biocultural Homogenization to Biocultural Conservation. Ecology and Ethics. Edited by R. Rozzi. Cham: Springer, vol. 3. [CrossRef]

¹² Prakasam C. Land use and land cover change detection through remote sensing approach: a case study of Kodaikanal taluk, Tamil Nadu. Int J Geo Geosci. 2010;1:150-158.

 ¹³ Deribew KT, Dalacho DW. Land use and forest cover dynamics in the Northeastern Addis Ababa, central highlands of E
¹⁴ Ibid

Vulnerability and Social Exclusion

The types of vulnerability prevalent in Ethiopia include agricultural vulnerability, natural calamities, economic shocks, health and nutrition risks and demographic vulnerability/population explosion. Environmental degradation and the dependence on rain fed agriculture contribute to chronic food insecurity. People over age sixty make up around five per cent (3.6 million in the 2007 census) of Ethiopians (1.5 million people over age 70 were counted). Most have no reliable income sources; currently only 500,000 older people have regular public sector pension.

Epidemics including of HIV and AIDS and malaria have adversely affected lives and livelihoods. In Ethiopia, the 2016 EDHS measures 0.9 percent of national prevalence rate for 15+ age range as positive which is lower than the prevalence rate in much of Africa countries. Orphan comprises almost 12% (660,000) of Ethiopia's total child population, and half of the children below the age of five are stunted in 2018¹⁵.

According to the 2013 National Labor Force Survey (NLFS), there were 2,428,877 Person with Disabilities (PWDs) accounting for an overall disability prevalence rate of 3.02 percent in Ethiopia, with negligible difference between men (3.17%) and women (2.87%). PWDs in Ethiopia face number of economic, social and attitude related problems. They have limited opportunity for education, health, training, employment, and accessibility. Their potential to lead normal lives is constrained by an absence of friendly physical environments, stigma and discriminative views.

Unemployment and underemployment are a major concern for Ethiopian society. During the Last decade, urban unemployment in Ethiopia stood at about 19%. That is the rate of unemployment is higher in urban areas. Unemployment is higher amongst women both in urban and rural areas. More than a quarter of the youth (aged 15-29) in Ethiopia are unemployed. Similarly, about a quarter of women are unemployed. Young women face an even higher unemployment rate of 34%¹⁶. Compounded by a sizable number of new entrants joining the labor market every year, unemployment represents a barrier in terms of fulfilling rights of individual youth as well as for fulfilling the vision of national development. According to the 2015 National Child Labor Survey (NCLS) report prepared by the Ethiopian Central Statistical Agency (CSA) and the International Labor Organization (ILO), child labor is particularly prevalent in Ethiopia with 42.7% of children aged 5–17 years engaged in child labor.

Given the presence of vulnerability and social exclusion of some segment of population due to their economic, social, disability, inequality status within the community; it is essential to come up a socially inclusive integrated water resources management system. In order to maintain better responsive and socially inclusive water resources management; the following activities are recommended at strategic and operational level:

At the strategic level:

- Provide clarity at the organizational level on what is understood by social inclusion in E-HoA-GW4RP, who the "excluded" are, and what the project's priority groups are.
- Include "social inclusion" as an explicit crosscutting theme in the organization's strategic plan.

¹⁵ WHO, "Under-nutrition in Under-Five Children," WHO, Geneva, Switzerland, 2018.

¹⁶ CSA. (2018). 'Urban Employment Unemployment Survey 2018', Central Statistics Agency, Addis Ababa.

- Establish targets for social inclusion relating to the (potentially) excluded groups and people to be reached.
- Establish partnerships with organizations (MoWSA, EPA) outside the water sector and that are stronger in working on gender, youth and underserved groups.
- Become better at communicating messaging about inclusiveness and why it is so important. While it becomes a mantra that development agencies always emphasize, sometimes it is hard to find ways to get the message across without it becoming just a tick-box exercise. We need to revise our messages.

At the operational level:

- Adopt more formalized criteria for all projects to consider in identifying who are most in need and why.
- Include a social inclusion specialist in the team who encourages adaptation of inclusiveness across programs, to apply a gender and/or inclusive lens to all projects.
- Develop tools focused on WRM since currently only generic tools exist.
- Ensure the fundraising department structurally includes social inclusion in all the organization's project proposals.
- Ensure sufficient funding for program design and implementation, to enable working together with more diverse interest groups. And to ensure that these groups also communicate well among each other.

Outcasting

As like that of the other areas of the country, there are outcasted groups in pastoral and agropastoral areas. some minority social groups among the Borena people called '*Waataas*'. They are hunters and gatherers and also depend on handicrafts. Similarly, in SNNPR among the *Tsemay* people, members of the *Gitema* clan who are blacksmiths are labeled as *Puga* and are excluded from social services. Also in the *Bena* ethnic groups, there are outcasts. These are clans that perform the pottery and metal works. The pottery workers are labeled as *Baji* or *Dam Meshaha and the blacksmiths were labeled as Gito or Dokompha*. The outcasts do not eat, drink, greet, and marry with the other clan members.

Common Resource Management

The most vital resources in low land areas particularly in pastoral / agro-pastoral communities are grazing land and water resources. In most of the low land areas land holding is communal. In Afar and Somali, pastoral community members' ownership, access and use of land are determined by membership to a clan in most cases, as most settlement/communities include members of the same clan. On the other hand, in SNNNP of pastoral areas, the communities express their affiliation to the boundary they occupy simply by stating-- "this is our land," "this is the land of Dassench, Bena or Tsemay" and so on. Therefore, all households in a given ethnic group and/or sub-ethnic group (clan) equally have access to and control over land and all kinds of resources on it. Pasture land is a typical example whereby communal land tenure is exercised. The same is true on using other natural resources like forest and water.

But in the highland areas and same areas of agro pastoral communities, farm lands are perceived as private property while grazing land is owned communally. For instance in Afar, agropastoralists in the Argoba special woreda practice subsistence agriculture and supplementary livestock rearing in fragmented, individually owned plots. Implementation of land certification has even begun in the woreda. According to the discussant, the certificates issued by government details the size of the land, land use type and cover, level of fertility and boarders, as well as obligations and right of the holder. Land certificates give full user right for the holders. Therefore, in this case the land required for the purposes of the project is a legal right to be compensated. In doing so, the land certificate helps the projects in creating a positive environment by reducing conflicts that may arise due to project activities.

In Oromia, resource management, alienation and access is ruled and controlled by Gada system. Communal land and resource ownership are the guiding principles of resource management and the Gada acknowledges that land and other range resources are the property of a clan or a group of clans. This is instituted in the Gada system at different social hierarchies. The Boranas have strict rules and regulation on tenure rights, resource utilization and administration. Within the Borana clans and members of the community, resource management and ownership is exercised at madda and reeraa levels. Grazing land and water points have their own utilization and management procedures. Grazing land is managed by the abbaa dheedaa, a person who administers over 15 ollaas and monitors the utilization of large grazing areas. An elected abbaa herreega is responsible for planning watering schedule and managing the wells. He is also responsible for designing, scheduling water use for each ollaa and household, and, by so doing, controlling overutilization and ensuring the protection of water quality. Each ollaa or group of households is responsible for cleaning the wells as well as watering of their animals according to the schedule set by the abbaa herreega.

Social Support Networks

In one way another, community members of the country have various informal arrangements and social protection mechanisms, such as livestock transfer mechanisms with neighboring people, resource pooling within their vicinity and sharing information. These customary social security mechanisms have helped households to cope with various forms of hazards and risks.

In Madda Walabu, the system of social security/ assistance is called Hirpha, while among the Guji and Borena Oromos it has different names and forms. This system of mutual help has three forms in the Borana and Guji Oromos. These are Buusaa, Gonnofaa and Dabbaree. These institutions or networks involve sharing of milk, livestock and other resources for households that lost their belongings through different shocks. Some of these are voluntary while others are compulsory and failure to do so may led for social sanctions. In addition to the broader community based social security system, the Boran and Arsi pastoralists have an extensive support system for specific members of their community such as orphans, the disabled, and women with many unproductive children (haadha hiyyeessaa), etc.

In Somali, communities tend to live in extended families, sharing resources for basic subsistence. Support for needy individuals is either obligatory (religious duty Zakat or clan obligation) or voluntary (helping others out of benevolence). These traditional relationships within the community that entirely depends on kinship ties, marriage relationships and other social obligations are the most important social risk sharing mechanisms. The Dagu is also another form of social network where community members share different information among the Afar people.However, recurrent drought, other natural and anthropogenic hazards, and the resultant disasters are steadily eroding the traditional social capital that has persisted for a long period of time.

Gender Issues

The constitution of FDRE acknowledges the equal right of men and women. The Article 35, Rights of Women, sub article 1 stated, 'Women have the right to equality with men in the enjoyment and protection of rights provided for by this Constitution.' The same article sub article 6 has references on the participation of women in policy, programs design and implementation. "Women have the right to participate in the formulation of national development policies, the execution of projects, and to full consultation in the preparation of projects, particularly, those affecting the interests of women.'

But, on the ground the discrimination and inequality of women has continued in mainly in the pastoral community in terms of property ownership, access, use and decision-making over productive and reproductive assets, and participation in decision-making. Otherwise, their involvement in community matters is very minimal. Let alone decide on community matters, it was not easy to discuss issues related to contraceptives and mechanisms for preventing the transmission of HIV in Somali even in situations where the participants were only women.

Unless HoA-GWRP come up with specific mechanisms that promote the involvement of women, it would be difficult through the traditional institutions to ensure women will benefit from the projects. Involving women in WaSHCO and WUA is one of the mechanisms.

In most cases, the participation of women had been low in different economic activities that generate income. They have not be given the opportunity, but rather are directed to be dependent on their male counter parts. As a result their low social skills, weak education opportunity and awareness, they have developed low self-esteem and tend to disengage themselves from decision-making activities. To make women beneficiary of income generating activities, the proposed project needs to provide technical assistance and culturally appropriate capacity building for women.

In spite of these challenges, through the gender empowerment programs, women's participation in various development committees, kebele and woreda councils, and development activities has shown progress. Continuous training and awareness creation has improved women's participation in community activities and various committees. Women account at least for 20 percent of the water management committees in the kebeles.

Employment

There is high level of unemployment in Ethiopia. A quarter of urban working age population is unemployed, and 2million people join the work force annually. Agriculture is the main source of employment for 70% of working population in Ethiopia. Women experience higher rates of unemployment than men. The overall labor participation of women is 45% in the year 2015-2016 compared to 55% for men. EDHS 2016)

In 2016, employment among women age 15-49 increased from 29% in 2005 to 38% in 2011 but decreased to 33% in 2016. The percentage of men who are currently employed has shown a slight increase since 2005, from 85% to 88%. In rural areas, 55% of employed women and 83% of employed men are engaged in agricultural work while urban women are most likely to be employed in sales and services (56%) and in the professional/technical/managerial sector (13%). In contrast, urban men are most likely to be employed in skilled manual labor (25%) and sales and services (22%) (World Bank Gender Diagnostic Report Ethiopia 2019).

Economic Situation

Ethiopia is a land locked country with second largest population in Sub-Saharan Africa. The country ranks 147th on the UNDP Human Development Index (HDI) with a HDI of 0.047 in 2019. The per capita GNI was estimated at USD 850 for the same year. The country's GDP was USD 96 Billion in 2019.

Ethiopia's average annual growth rate of slightly over 10 percent in the past decade has far exceeded the regional average of 5 percent. Services grew at 12 percent, industry at 21 percent, and agriculture at 7 percent. The recent rapid economic growth disproportionately favoring services and industry than agriculture signals the advent of a demographic transition. The main driver of growth has been public investment particularly in power production, roads, railways, and industrial parks to education, health, and water provision (World Bank).

Economic growth over the past decades has resulted in significant reduction of poverty. Between 2011-2016 the national poverty rate (1.9 USD/day) dropped from 30% to 24%. The reduction was higher for urban residents than rural residents and resulted in slight increase of inequality (0.33). In urban areas poverty decreased from 26 percent in 2011 to 15 percent in 2016. In rural areas poverty decreased in 4 percentage points, from 30% to 26% in the same period (World Bank).

Education

Education is instrumental to attaining development goals through application of science, technology and innovations. The latter are major instruments to bring about transformation such as increasing the productive capacity and efficiency of the economy by rapidly improving quality, productivity, and competitiveness of agriculture and manufacturing industries.

There is low level of literacy in Ethiopia. Half of women (48%) and 28% of men age 15-49 in Ethiopia have not gone through any formal education (EDHS2016). Three percent of women and 5% of men have completed primary school, while 1% of women and men have a secondary education. Six percent of women and 9% of men have more than a secondary education. Education in urban areas is better than in rural areas; 57% of rural women have no formal education, as compared with 16% of urban women.

The gender gaps in education have been narrowed significantly due to improvement in the education sector. Between 2000-2016 the share of women who had never attended school dropped from 77 percent to 49 percent. Similarly, the gender parity index, or the ratio of female to male primary school attendance, increased from 73 percent to 99 percent. The effects of increased attendance on literacy are beginning to show for younger cohorts, with the current gender literacy gap for individuals ages 15–24 standing at only 3 percent (EDHS 2016).

Access to education has increased over the last decades. Between 2011 and 2015, primary enrollment increased by 2.5 million students, to nearly 19 million students by 2016, yet net rates of primary attendance (65 percent) and completion (below 50 percent) are low.

Regional variations on school enrollment are significant. The school enrolment national average (2016) for ages 7-18 is 59%. The highest percentage of school attendance is in Addis Ababa while the lowest is in Afar region (54%). Girl's school attendance in the same age group is 86% in Addis Ababa and 51% in Afar and Somali regions.

Access to quality education and equity are particularly severe in several emerging regions, home to Ethiopia's pastoralist communities. While 80 percent of enrolled students in Addis Ababa survive to Grade 5, the proportion in Gambella and Afar regions, for example, were 49 percent and 29 percent respectively, as of 2016/17.

There is a rapid expansion in the development of the higher education infrastructure (institutions and facilities), qualified human resources, the enrolment rate and the graduation rate in the higher education of the country over the last 15 years. There are 200 plus universities, colleges of teachers' education (CTE) and research institutions, and roughly 1,500 Technical and Vocational Education and Training institutions (TVETs).

Health

Health service provision in Ethiopia includes a wide range of providers in both the public and private sectors, such as public facilities managed by federal, regional state, zonal and woreda administration and private for-profit providers, Non-Governmental Organizations (NGOs), community-based and faith-based organizations and traditional care givers (WHO 2002). Currently there are 290 hospitals, 3962 health centers, and 16,547 health posts under the regional and federal government which provides health care services. Ethiopian health care delivery system has three-tier, to deliver essential health services and ensure referral linkages. The first tier is primary health care unit in woreda health service includes general hospitals. Tertiary facilities form the highest level of healthcare in the country and include Specialist Hospitals, Teaching Hospitals and Federal Referral Hospitals.

Government investment in basic health services has brought results in declining mortality and increasing life expectancy. Over the last two decades, under five mortality rates declined from 166 deaths per 1000 live births in 2000 to 48 deaths per 1000 live births in 2016. Infant mortality also declined from 97 deaths per 1,000 live births in 2000 to 48 deaths per 1,000 live births in 2016, which is about a 50% reduction in the last 16 years. Neonatal mortality declined from 49 deaths per 1,000 live births in 2000 to 29 deaths per 1,000 births in 2016, a reduction of 41% over the past 16 years (EDHS 2016).

Between 2000 and 2016, Contraceptive Prevalence Rate increased from 8 percent to 36 percent; Total Fertility Rate declined from 5.5 to 4.6 children per woman; and births attended by skilled attendants increased from 6 percent to 28 percent. However, Ethiopia remains one of the poorest countries in the world with lagging indicators in maternal and child health, especially neonatal mortality (EDHS 2016).

Similarly, despite progress toward the MDG on undernourishment (stunting rates fell from 58 percent to 38 percent between 2000 and 2016), the prevalence of stunting remains alarmingly high. Stunting (2017) affects 36.8% of children under 5 years of age which is higher than the average for the Africa region (29.1%) and wasting affects 7.2% of children under 5 years of age are still affected, which is higher than the average for the Africa region (6.4%). There are significant spatial disparities within and between regions as well as between rural and urban areas (EDHS 2016).

Ethiopia has 370,886 confirmed cases of COVID 19 and 6,714 confirmed deaths (November 26,2021). COVID has wide ranging consequences in all sectors of the economy. The country's

economic growth has slowed down, exports and investments have dropped and earnings from Tourism industry have dropped. Unemployment and loss of income particularly in urban areas has increased the number of people in the safety net programs. Covid-19 has reversed gains in education and health and other sectors too.

Security Situation (Civil War)

According to the UN Human Development Report (2020), Ethiopia has one of the lowest development levels in the world; with an index of only 0.485, ranking 173rd in the planet. The civil war is likely to drain Ethiopia's economic development financial allocations as the country attempts to recover from COVID-19. According to African Development Bank estimates, Ethiopia's economy is expected to shrink by 2 percent in real terms in 2021. Its growth prospects for 2022 are uncertain, depending on the extent and duration of the civil war and on the pace of its post-pandemic recovery. The civil war represents a serious threat to Ethiopia's national unity, territorial integrity and social cohesion. Meanwhile, the regional conflict over Nile waters is upsetting centuries of peaceful coexistence and shared history between the three riparian states -Egypt, Ethiopia and Sudan. If things get out of hand in either conflict, there could be unspeakable repercussions in the region and beyond. Ethiopia is already a major source of human trafficking and illegal migration, but if it stays in this state of multiple conflicts, there may be millions more refugees and illegal migrants seeking shelter in neighboring countries and farther afield. In general, the current political landscape in Ethiopia is highly polarized and unstable, and the security is fragile¹⁷. From the social perspective, the problem of inter-ethnicity continues to affect the citizens of the country, religious institutes are in danger, population displacements are traceable to political instability and the people have become refugees in their own country. Thus, to restore the peace and security situation of Ethiopia, it requires vehement and rapid solutions to end the ongoing insecurity and dangerous inter-ethnic conflict¹⁸.

Social Security Assessment

The socio-political and governance condition of Ethiopia has been characterized with high level of volatility and reputational risk of social-economic insecurity. So, the consequent high rate of incidents of violence, inter and intra-ethnic conflict, seasonal flood, drought, natural disaster, farm and grazing land related conflict, scarcity of water supply affects the national and regional peace and security. The HoA-Ground Water for Resilience Project is implemented across one city administration (Dire Dawa) and nine regional states (Amhara, Afar, Benishangul Gumuz, Gambella, Oromia, Sidama, Somali, SNNP and Tigray). Due to the inter-ethnic conflict in the northern and other parts of the country, and climate induced social problems leads to high rate of incidents which means the risk to the World Bank financed projects is currently rated high throughout the country, and with Tigray, Amhara and Afar regional states being rated as more severe. Furthermore, COVID-19, epidemics, migratory pests (desert locust) and are widely considered as "threat multiplier" which, can amplify existing vulnerabilities, inequalities, grievances, societal divides, conflict drivers, fragility, instability, and threats to social cohesion and peaceful resolution processed. Ultimately, they become part of the social risk contexts, and thus in conflict-affected situations (i.e., like the current situation of Ethiopia), they become absorbed into the logic of conflict-not necessarily making the conflict better or worse, but

¹⁷ Institute for Peace and Security Studies (IPSS)-Addis Ababa University (2020). Peace and Security Report: Ethiopia Conflict Insight (see page 15)

¹⁸ African Security Review (2020): The Recent political Situation in Ethiopia and Rapprochement with Eritrea. By-Addis, Amsalu and Asongu, Simplice and Zuping, Zhu and Addis, Hailu Kendie and Shifaw, Eshetu. (page 19-21)

shaping the challenges, incentives, opportunities and calculations of development actors like the WBG. In general, the findings suggest that a rethink is needed on the importance of human security, with the risk, thus far, primarily affecting individuals rather than actors.

One of the outcomes of social insecurity is the high prevalence of Sexual and Gender Based Violence (SGBV). The most frequently reported form of violence related to conflict, natural disaster, water fetching, COVID-19 and other crisis is rapidly increasing SGBV in different parts of the country, so much so that SGBV has been called the "shadow pandemic". In addition to increased SGBV, there is also strong evidence of general worsening of safety of women and girls, including an increased threat from human trafficking and child sexual abuse and exploitation. The evidence suggests the widespread, collective failure to protect potential victims or to take SGBV into account in to initial roll-out of WB financed interventions despite years of evidence from other crises, making the "shadow pandemic" an entirely predictable crisis.

The presence of high level of social insecurity leads to exacerbating fissures in social cohesion in conflict settings and instability is widely considered a risk factor with heightened stigmatization, and tensions over access to resources and power, and as the strains on economic development and scarce water supply continue. There are also warnings that various social crisis is negatively affecting state-citizen relations, where they are already fragile and where conflict on ethnic factors and natural resources competition can provide the opportunity for corruption, incompetence and exclusive or repressive behaviors by elites and government officials. In line with the WBG's dynamic approach that is making a paradigm shift from post-social insecurity or conflict reconstruction to addressing challenges across the spectrum of fragility; and security, justice and development contexts are interrelated in the intervention sites.

Social Risk Assessment

The social risk rating is considered to be Substantial. Activities under Component 1; which focus on groundwater infrastructure, both for people and to support livelihoods, could lead to a range of social risks and impacts in Ethiopia. There is the potential to exclude disadvantaged and vulnerable groups from decision making and project benefits (particularly women, minority groups and nomadic pastoralists). In addition, the project will require land to develop water infrastructure in locations where land is undergoing registration as community land and has been subject to land grabbing and has a range of claims. Lack of access to an adequate network of water structures that supply water for both livestock and domestic purposes has often been a cause of conflict between pastoralists and settled communities which will need to be managed through consultation between communities and include women who also have critical domestic needs. There are many contextual risks of operating in conflict-affected areas with complex social contexts where effective and inclusive community consultations and meaningful stakeholder engagement are challenging. Furthermore, developing effective grievance redress mechanisms will be complex due to rural locations, traditional decision-making structures and existing social tensions. The extent of any labor influx will be determined during preparation. However, the presence of even relatively small numbers of external workers can result in social tensions, increased risk of transmission of diseases and the risk of sexual exploitation and abuse (SEA), sexual harassment (SH), and other forms of gender-based violence (GBV). The project will be subject to a range of labor risks, including OHS risks, safety and security risks and the potential use of child labor. Local contracting arrangements may also mean that project workers do not have contracts or are subject to unfair conditions (lack of breaks, irregular pay, etc.). Female workers may be discriminated against in terms of employment but are also at higher risk of SEAH, and other forms of GBV. Covid-19 may continue to play a role in influencing project

implementation, notably around stakeholder engagement and face-to-face gatherings. Virtual options for meetings will be limited due to poor connectivity and a lack of familiarity with such forums.

Gender Based Violence (GVB)

Research shows that gender-based violence (GBV) is widespread in Ethiopia. Wife beating is commonly accepted and adolescent girls are subject to harmful practices, such as female genital cutting, marriage by abduction, and early and forced marriage¹⁹. Little information is available on married adolescents, but with child marriage rates estimated at up to 41 percent²⁰. this large population faces especially difficult challenges in accessing health services—lack of information and poor perceptions about sexual and reproductive health, feeling of shame, fear of being seen by others. restrictive cultural norms, lack of privacy and confidentiality, and unavailability of services²¹. Girls and women face different forms of GBV across their lifecycle, and the health system is often best placed to respond to GBV given the frequency of girls' and women's interaction with it.

Other studies like EDHs have also identified the overall magnitude of GBV in Ethiopia. According to the 2016 EDHS, around 23% of women between the ages of 15-49 have ever experienced physical violence and 10% have ever experienced sexual violence²². Furthermore, 15% of women in this same age group have experienced physical violence in the last 12 months²³. Researchers also identified specific patterns and characteristics in regard to prevalence of violence in Ethiopia. For example, young women (those between the ages of 15-19), women who have never married, and women without children were all less likely to have ever experienced violence since age 15 than most other women²⁴. Additionally, the EDHS did not find significant variation in the magnitude of physical violence in rural and urban settings. Rural women (24%) were only slightly more likely to have experienced violence since age 15 than urban women $(21\%)^{25}$. Similarly, rural women faced a larger magnitude of physical violence in the past 12 months, with 16% of rural women reporting an experience of violence versus 11% of urban women²⁶. However, the magnitude of physical violence throughout the country varies greatly between regions, from 6% in Somali to 28% in Oromia²⁷. Lastly, both employment and education were important indicators of the experience of violence, since employed women were more likely to have experienced physical violence (25%) compared to those who were not employed (22%), which can be due to challenging household power dynamics where the wife might be better educated than the husband²⁸. Similarly, experiences of physical violence since age 15 among women were found to decline sharply with increasing levels of education, from 28% for those who were uneducated to 13% for those who had attained more than a secondary

²² Ethiopia Demographic and Health Survey. Central Statistical Agency. 2016.

27 Ibid

¹⁹ Federal Democratic Republic of Ethiopia Ministry of Women, Children and Youth Affairs. 2013. National Strategy and Action Plan on Harmful Traditional Practices against Women and Children in Ethiopia. Accessed October 3, 2018: http://www.africanchildinfo.net/clr/policy%20per%20country/2015%20Update/Ethiopia/ethiopia_http_2013_en.pdf. ²⁰ The United Nations Children's Fund (UNICEF) 2016

²¹ Central Statistical Agency and Inner City Fund (ICF) 2016; Brhane and Kidane-Mariam 2016; USAID 2016

https://dhsprogram.com/pubs/pdf/FR328/FR328.pdf.

²³ Ibid

²⁴ Ethiopia Demographic and Health Survey. Central Statistical Agency. 2016.

https://dhsprogram.com/pubs/pdf/FR328/FR328.pdf.

²⁵ Ibid

²⁶ Ibid

²⁸ Ibid

education²⁹. Uneducated women were also found to be four times more likely to have experienced violence during pregnancy than those with more than a secondary education³⁰.

²⁹ Ibid 30 Ibid

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POTENTIAL ENVIRONMENTAL AND SOCIAL BENEFITS, RISKS, IMPACTS AND MITIGATION MEASURES OF WATER SUPPLY SUB-PROJECTS

GENERAL

This chapter describes the general potential environmental and social benefits and risks of the HoA-GW4RP water supply sub-project activities (including groundwater assessment, test drilling, monitoring, and conservation activities). The sub-project activities involved in Components 1 and 2 will be site specific and generating impacts that are of high, substantial, and moderate significance which can be mitigated. The main water supply sub-projects are summarized below.

- Design and implementation of Managed Aquifer Recharge (MAR) at Dire Dawa plains
- Carrying out potential groundwater assessments in 67 woredas, mainly 15 groundwater investigations and studies including of drilling of test boreholes
- Groundwater monitoring in 59 prioritized areas including drilling of monitoring wells and development of groundwater monitoring stations fitted with data loggers
- Developing groundwater based rural water supply infrastructure in 55 prioritized woredas including studies, designs, construction, and rehabilitation of small and medium scale multi-village water supply schemes
- Promotes the use of efficient renewable energy, such as wind and solar to lift water
- Promote soil conservation measures
- Enhance service delivery management capacity through strengthening community-level scheme management (WaSHCOMs) and building local operation and management capacities
- Strengthening groundwater institutions and information.

The environmental and social risks associated with the HoA-GW4RP water supply activities are described as follows.

BENEFICIAL ENVIRONMENTAL AND SOCIAL IMPACTS OF WATER SUPPLY SUB-PROJECTS

The implementation of HoA-GW4RP will have impacts on the natural and socio-economic environment in which it is set and the impacts might be of positive or negative nature. Each positive and negative impact will vary in extent to which it can be enhanced or mitigated. For the purpose of this assessment, impacts and /or benefits that will mostly occur during the construction and operation phases will be considered. The environmental analysis will therefore attempt to screen out the insignificant impacts and bring the critical elements into the attention of decision makers. Project will have several social and economic beneficial impacts that cascade from the national level down to the community levels. These beneficial impacts of the HoA-GW4R project at regional and local levels are described below.

Impact on Women

Women have very different roles than men in water supply and sanitation activities. These differences are particularly evident in the rural areas. Often women are the main users, providers and managers in the household. Women are the guardians of household hygiene. Hence women tend to benefit most when the access, quality and quantity of water improve. Improvements in water supply and sanitation infrastructure are likely to shorten women's and girl's time spent carrying heavy containers to collect water, thereby freeing up their time for income generating activities and schooling. Given their long-established active role in water supply and sanitation, women generally know about current water sources, their quality and reliability, any restrictions to their uses and how to improve hygienic behaviors. It is therefore essential to fully involve women in demand driven water supply and sanitation programs, where communities decide what types of systems they want. Improvements in water supply and sanitation infrastructures will help increase women's human capital, reduce their time constraints, allow for new income generating activities and improve community health. This will in turn increase the productivity of the society there by increasing incomes. In light of this, involving women during the construction and operation of water supply projects is very critical.

Improve Community Participation and Social Impacts

Community participation has to be scaled up and need to involve two levels, namely participation in management and governance. In this case, management is mainly deals with the day-to-day supervision and decisions at the operational level, while the sole purpose of governance is devising working rules and regulations commonly practiced across the entire water supply project itself. This will necessitate the drafting of appropriate management and governance structures that best suit the intended purpose. Government and other partners need to be committed to the development of such institutions as it is a long-term process that calls for in depth work with beneficiaries. Otherwise, participation in management without involving governance is not effective as has been practiced and will not ensure the sustainability of the water supply projects.

Furthermore, the effects of RWS lead to an increase in local organizational capacity: the new village-level institutions that will be created in many villages to operate and maintain the water schemes will make those communities more self-reliant. It will strengthen already-existing institutions and help bring about improvements. to their local government or water authority providing new or improve services. Beyond the new organizations, their installations, and the change interaction patterns they cause, the true extent of local involvement can be seen in the membership of the new organizations, attendance at water committee meetings, and participation in the design and maintenance of the projects.

Increased Quality Water Supply

Water supply is essential for human health and survival, for food security and the empowerment of women as well as the education of girls, for reduction in productivity losses due to morbidity and malnutrition, for the management and protection of natural resources. Although the crucial importance has been widely recognized, the right to safe water remains a promise unfulfilled for the world's poorest citizens. The lack of access to safe drinking water impedes economic development, spoils progress towards gender equality and puts people's health in danger.

The project will ease the current water deficit in the project area and the environs, promoting economic growth. The communities will get access to quality clean water for drinking and

domestic use. This will minimize cases of waterborne diseases resulting to healthy communities; reduce drudgery associated with water collection and result in gender balance.

Employment Opportunities for Local People

Temporary job opportunities shall be available during the construction phase of the project and will include casual laborers, food catering, artisans, etc. This shall be an important positive impact to the community because unemployment has been cited as one of the most pressing problems in rural and urban areas in Ethiopia today. During operation phase, there will be employment of permanent workers in the operation and maintenance, security service and billing. Moreover, this project also creates market for construction materials. The Project will require construction materials, some of which will be sourced locally and some internationally. These include cement, sand, coarse aggregates, pump sets, steel pipes, valves, and chemicals. These will provide a ready market for suppliers in and outside the project area.

ADVERSE ENVIRONMENTAL AND SOCIAL RISKS OF WATER SUPPLY SUB-PROJECTS

The adverse environmental risks of HoA-GW4RP Components 1 and 2 projects are likely to arise from the construction and operation of the subprojects. Components 1 and 2 subproject involves developing irrigation and water supply infrastructure like hand dug wells, spring development, boreholes for water supply, access and link roads, as well as construction of complementary infrastructure in the area. These and other subproject activities are anticipated to have potential environmental and social risks and impacts that will arise during construction and operational phases. The potential environmental and social risks/impacts anticipated arising in the construction and operation phases are described below.

Risks and Impacts of Test, Monitoring, and Productive Boreholes Drilling

The majority of the HoA-GW4RP sub-projects will involve drilling of test, monitoring, and/or productive boreholes. There are a number of environmental and social risks associated with borehole drilling including:

- Land uptake and clearing at borehole locations
- Contamination of soil, surface water and ground water from drilling chemicals (foam and bentonite).
- Land degradation and compaction of soil due to movement of heavy trucks and machineries.
- Dust and exhaust emissions resulting in air pollution
- High pitch noise and vibrations generation from drilling rigs, compressors, and generators.
- Release and spillage of hazardous chemicals such as oil, fuel, and drilling chemicals.
- Solid wastes generated from drilling sites will affect the environment
- Occupational health and safety risks due to operation of heavy machines such as drilling rigs, compressors, and generators.
- Community health and safety risks due to potential traffic accidents if drilling sites are not fenced or exclusion zones are not created and during movement of heavy trucks ad machinery. Other community health and safety risks include exposure to noise and

vibration, exposure to drilling chemicals released in soil, groundwater, and surface water resources.

The above risks and impacts are discussed and mitigation measures are also proposed in the subsequent parts of this section

Impact due to Groundwater Aquifer Depletion

Groundwater used for domestic water supply and livestock watering could lead to resource depletion. Even though most of the planned water supply sub-projects are small rural water schemes, some of the schemes could extract considerable amount of groundwater and in areas where the groundwater resource is scarce (such as the lowlands where recharge is limited), its impact could be significant and thus should be accounted. Groundwater development must be sustainable on a long-term basis. Unmanaged utilization of groundwater could lead to resource depletion since in some cases the rate of groundwater utilization could be much higher than the rate of groundwater replenishment. The rate of groundwater abstraction should be equal to or less than the rate of recharge. If the rate of groundwater abstraction is higher than the rate of recharge, it will result in groundwater level drop or reduction in safe yield. If extraction continues for long period, groundwater levels will continue to decline to the level where one cannot extract water easily, which will render some water schemes non-functional or it will steadily increase pumping costs.

To avoid or reduce impact due to groundwater depletion, the following mitigation measures can be considered:

- Conduct well pump testing to characterize the capacity of recharge and discharge (to determine the safe yield and recovery rate)
- Determine sustainable amount of groundwater to be extracted without causing appreciable reduction in groundwater level
- Assess/model groundwater recharge and discharge rates for the specific catchment or subbasin
- Monitor the groundwater characteristics such as static water level, dynamic water level, drawdown, and safe yield periodically, particularly during dry periods (some of the existing or proposed boreholes in a specific well field or catchment can be used as monitoring wells)
- Modify or control the groundwater abstraction rate depending on the outcome of groundwater monitoring
- If possible, consider artificial recharge of groundwater using stored runoff water or other practical means.

Impact due to Groundwater Abstraction on Water Resources of the Area

Surface water and groundwater resources have the same reservoir and the two are interconnected with one another. Abstraction of the groundwater resources will affect the surface water flow regime and vice versa. Groundwater-surface water interaction, recharge and discharge, potential modification of surface water flow regime shall be considered as a potential risk. In Ethiopian case, most groundwater wells are located close to lower points in a catchment, i.e., close to surface water resources. Such points are surface water locations and interaction between
groundwater and surface water is unavoidable. Further, utilization of springs (which are classified under groundwater resources) could affect the availability of water in rivers and streams downstream. Also, the need for environmental flow shall also be considered. Environmental flows support aquatic and other habitats.

In general, impact on surface water resources such as elimination of streams or reduction of base flows of rivers could occur due to groundwater abstraction unless appropriate precautions are taken. Experience in some part of the country indicates that spring or stream flows could be reduced or eliminated due to over abstraction of groundwater.

To reduce the impact of groundwater abstraction on the water resources of a specific area, the following measures can be considered:

- Assess groundwater flow direction in relation to existing springs and streams in adjacent or downstream areas
- Register the existing flow rate of springs, streams, and rivers as well as their use prior to commencement of any development scheme based on groundwater
- Assess/model groundwater level changes and resulting impacts to surface water flows and its socio-economic impacts on the population depending on those surface water resources
- Monitor the groundwater characteristics such as static water level, dynamic water level, drawdown, and safe yield periodically, particularly during dry periods (some of the existing or proposed boreholes in a specific well field or catchment can be used as monitoring wells)
- Modify groundwater extraction rate depending on impact on current and future surface water flows
- Avoid construction of water supply wells in sensitive ecosystems
- Allow environmental flows in surface waters.

Impact due to Animal Water Use and Unhygienic Environment Created

Some of the planned sub-projects are provision of water for animal watering. This is usually done through construction of cattle or animal troughs as part of the rural water supply schemes. Livelihood of population residing in lowland areas mostly depend on livestock rearing and thus in such areas animal troughs form major components of a water supply scheme, often multiple troughs are constructed for a community. Animals (cattle, shoats, camel, etc ...) using the troughs usually create unhygienic environment (wet, muddy, murky, and with animal excreta) around the troughs. The unhygienic environment, in turn, pose a health risk to the population attending the domestic animals and to the local community, in general.

To avoid or reduce impact due to animal use of groundwater and associated unhygienic environment created, the following mitigation measures can be considered:

- Consider soak-away pits in the design and construction of animal trough; especially where the soil around the trough is free-draining
- Where the soil around troughs is impermeable, consider extending the drainage channel of the troughs to natural drainage channels or provide sand mounds to serve as soak-away pits
- Provide concrete, stone pitching, or other material aprons/pavements around the animal troughs so that the area can be kept dry

• Periodically clean and maintain a dry environment around animal troughs.

Impact due to Community Use of Potable Water and Waste Generation

Development of groundwater resources is expected to significantly increase access to potable water supply for domestic use by the local communities, satisfying the per capital domestic water demand of the communities. In addition to water availability, the developed schemes will considerably reduce water fetching time. This will encourage using water for various purposes including drinking, washing, and other hygienic exercises. The more water is used the more wastewater is generated. The wastewater generated by the various uses of water could pose a community health risk through creation of unhygienic environmental around community dwellings.

The following measures are proposed to avoid and reduce the impact of increased use of water by the community and associated waste generated:

- The community water supply schemes shall be furnished with drainage channels and soak-away pits to safely convey and discharge splashed water during water fetching
- Drain and keep dry areas around water supply schemes to maintain hygienic environment
- Along with provision of potable water supply, consider providing basic sanitation to the local communities
- Enhance the community's awareness on proper storage, handling, and disposal of wastewater
- Adapt efficient water use methods including reusing of water where practical and safe.

Impact due to Water Use Right

In areas where water is scarce (such as the lowlands), it is inevitable that water use rights and associated conflicts occur. Water use rights could arise between domestic water users, animal water users, irrigation water use, and pasture lands. All these modes require water, directly or indirectly. Conflict can also be between other groundwater source users or surface water users.

Water use conflict can be mitigated through the following measures:

- Improve water use efficiency and reduce water wastage so that more water is available for use by the various modes or groups
- Avoid or reduce over-extraction surface and groundwater by the various modes or groups so that water will be available for all to fairly use
- Consider pricing water use to pay for effective management of the resource (the pricing, however, should protect access to water for the poor and disadvantaged communities)
- Engage all water users, communities, and other stakeholders in the management of the water resources including development, operation, and maintenance.

Impact due to Inefficient Water Use and Management

During sub-projects implementation and most importantly during operation of the sub-projects, inefficient water use and management will result in wastage of the resource that would have been available for other uses and beneficiaries. Water could be wasted while fetching, through pipe systems, valves, and other appurtenant equipment. Water wastage is expected to be more in multi-village water supply systems with transmission, storage, distribution, and delivery points.

The following mitigation measures can be considered for efficient use of water:

- Estimate water balance at sub-project level during operation period to identify water management issue
- Implement effective water management system.
- Implement water conservation measures.
- Install water meters to monitor and control consumption, particularly for multi-village water supply systems.
- Ensure the proper sealing of all pipelines, valves and storage structures to avoid water loss.
- Avoid using the local communities' water sources and, as much as possible, try to develop own source during the construction period.

Impact due to Inefficient Energy Use and Management

Some of the water supply schemes to be developed will entail use of electro-mechanical equipment which require energy from fossil fuels, photovoltaic systems, and from the national electric grid. Further, energy is required for various sub-projects construction, particularly by machines such as drilling rig, compressors, mixers, vibrators, trucks, etc. Unless an efficient energy use and management is practiced, it will result in wastage of energy that could have been used for other purposes and resource exploitation.

The following mitigation measures can be considered for efficient energy use and management:

- Implement effective energy management system.
- Operate energy intensive machines and plants at the lowest level possible.
- Ensure efficient operation of machines and systems so that energy loss from leaks and other failures can be avoided
- Install energy meters to monitor and control energy consumption by electro-mechanical equipment.
- Periodically check and evaluate the efficiency of energy systems and where necessary replace problem components so that energy loss due to ageing of components can be avoided.
- Encourage use of electrical energy from the national grid since it is mostly produced from hydropower plants, which are environmentally friendly.
- Reduce the overall carbon footprint of the construction work and operation of systems.

Impact of Air Emissions and Decreased Air Quality

The construction activities of the project will emit dust and other air pollutants in the environment. Dust emission will more during excavation work to install water mains, reservoirs, and while building access roads. Machinery and vehicle traffic will exacerbate dust pollution.

Air pollution affects many ascpects of the environment and the local communities. It is harmful to people's health. It affects the environment through reducing visibility, blocking sunlight, causing acid rain, harming forests, wildlife and agriculture. Also, vehicle exhaust emission results in greenhouse gases emission. Greenhouse gases pollute the air and result in climate change which affects the entire planet.

Emissions of air pollutants can occur from a wide variety of activities during construction, operation, and decommissioning phases of sub-projects. These activities can be categorized based on the spatial characteristic of the source including point sources, fugitive sources, and mobile sources and, further, by process, such as combustion, materials production and storage, or other construction processes.

Where possible, activities and sub-projects should avoid, minimize, and control adverse impacts on human health, safety, and the environment from emissions to air. Where this is not possible, the generation and release of emissions of any type should be managed through a combination of:

- Energy use efficiency
- Applying dust emission methods such as watering the workarea
- Applying proper housekeeping
- Selection of fuels or other materials which may result in reduced pollutants emissions
- Application of emissions control techniques.

Impacts of Wastewater and Water Quality

Wastewater may be generated during sub-projects implementation and operation including wastewater from water supply scheme operations, storm water, sanitary sewage, used oils and lubricants from the pump stations and from vehicles engaged during project construction. Wastewater can pose pollution risk to water resources thereby harming the environment and water users. Especially, borehole drilling operations apply drilling foams and bentonites to enhance the drilling efficiency and drilling discharge or sludge contaminated with chemicals are released from the drilling operation. Disposal of drilling water and sludge into the rivers and/or on the soil will pollute surface and groundwater resources, and it will also increase sedimentation. As a result, the quality of surface and groundwater will be compromised. To minimize such impacts introducing a mechanism for proper handling of chemicals, drilling discharges, bentonite sludge and other contaminant spillages is essential.

The WB EHS Guidelines provide information on techniques for wastewater management and reuse that can be applied to a wide range of activities. Sub-projects with the potential to generate wastewater, sanitary (domestic) sewage, or storm water should incorporate the necessary precautions to avoid, minimize, and control adverse impacts to human health, safety, or the environment. In the context of their overall ESHS management system, sub-projects should:

- Understand the quality, quantity, frequency and sources of wastewater or liquid effluents from its activities and from its operations. This includes knowledge about the locations, routes and integrity of internal drainage systems and discharge points.
- Plan and implement segregation of wastewater/liquid effluents principally from utilities, sanitary, and stormwater, in order to limit the volume of water requiring specialized treatment.
- Identify opportunities to prevent or reduce wastewater generation and pollution through measures such as recycle/reuse, input substitution, or process modification (e.g. change of technology or operating conditions/modes).
- Assess compliance of their wastewater with the applicable: (i) discharge standard (if the wastewater is discharged to a surface water or sewer), and (ii) water quality standard for a specific reuse (e.g. if the wastewater is reused for irrigation).

- Water use efficiency shall be improved to reduce the amount of wastewater generation.
- If needed, consider application of wastewater treatment techniques to further reduce the load of contaminants prior to discharge, taking into consideration potential impacts of cross-media transfer of contaminants during treatment (e.g., from water to air or land).

Impact due to Hazardous Materials

Hazardous materials can be classified according to the hazard theu pose such as explosives, compressed gases, toxic gases, flammable gases, flammable liquids, flammable solids, oxidizing substances, toxic materials, radioactive materials, and corrosive substances.

Construction and decommissioning activities may pose a potential for release of petroleum-based products, such as lubricants, hydraulic fluids, or fuels during their storage, transfer, or use in equipment. These materials may also be encountered during decommissioning activities from electro-mechanical equipment, storages, and water supply treatment facilities. Techniques for prevention, minimization, and control of these impacts include:

- Providing adequate secondary containment for fuel storage tanks and for temporary storage of other fluids such as lubricating oils and hydraulic fluids
- Using impervious surfaces for refueling areas and other fluid transfer areas
- Training workers on the correct transfer and handling of fuels and chemicals and the response to spills.
- Providing portable spill containment and cleanup equipment on site and training in the equipment deployment
- Assessing the contents of hazardous materials and petroleum-based products (e.g. PCB containing electro-mechanical equipment) and process equipment and removing and treating them prior to initiation of decommissioning activities
- Assessing the presence of hazardous substances in or on building materials (e.g., polychlorinated biphenyls, asbestos containing flooring or insulation) and decontaminating or properly managing contaminated building materials

Impact due to Solid Wastes

Solid (non-hazardous) wastes generally include any garbage, domestic waste, construction refuse, and construction spoils. Examples of such waste include domestic trash and garbage, inert construction / demolition materials, refuse, such as metal scrap and empty containers (except those previously used to contain hazardous materials which should, in principle, be managed as a hazardous waste), and residual waste from water supply schemes operations.

Non-hazardous solid waste generated at construction and decommissioning sites includes excess fill materials from grading and excavation activities, scrap wood and metals, and small concrete spills. Solid wastes shall be properly collected, segregated, stored, transported, and disposed at designated and approved sites.

Noise and Vibration Impacts

Construction activities of sub-project will cause noise and vibration in the environment. The main sources of noise and vibration are operation of drilling rigs and compressors, machines used for foundation and trench excavation, machines used for access road construction, vehicles and trucks used for various construction activities, and power tools and equipment used during

construction. Also, operation of electro-mechanical equipment such as surface pumps and generators will generate noise and vibrations. From these sources, operation of drilling rigs and compressors generate high pitch noise and vibration which affects construction workers, local communities, domestic animals, and wildlife in the vicinity of the operation.

The preferred method for controlling noise from stationary sources is to implement noise control measures at the source. Methods for prevention and control of sources of noise emissions depend on the source and proximity of receptors. Noise reduction options that should be considered include:

- Selecting equipment with lower sound and vibration levels
- Installing silencers where applicable
- Installing suitable mufflers on engine exhausts and compressor components
- Installing acoustic enclosures for equipment casing radiating noise
- Improving the acoustic performance of constructed buildings, apply sound insulation (such as for generator houses)
- Where applicable, installing acoustic barriers without gaps and with a continuous minimum surface density of 10 kg/m^2 in order to minimize the transmission of sound through the barrier. Barriers should be located as close to the source or to the receptor location to be effective

Impact of Contaminated Land

Land is considered contaminated when it contains hazardous materials above background or naturally occurring levels. Contaminated lands may involve surficial soils or subsurface soils that, through leaching and transport, may affect groundwater, surface water, and adjacent sites. Where subsurface contaminant sources include volatile substances, soil vapor may also become a transport and exposure medium, and create potential for contaminant infiltration to indoor air spaces of buildings/dwellings.

Land contamination may be encountered in sites under construction, operation or decommissioning due to known or unknown historical releases of hazardous materials or due to the presence of abandoned infrastructure formerly used to store or handles these materials, including storage tanks. Actions necessary to manage the risk from contaminated land will depend on factors such as the level and location of contamination, the type and risks of the contaminated media, and the intended land use. However, a basic management strategy should include:

- Managing contaminated media with the objective of protecting the safety and health of occupants of the site, the surrounding community, and the environment post construction or post decommissioning
- Understanding the historical use of the land with regard to the potential presence of hazardous materials prior to initiation of construction or decommissioning activities
- Preparing plans and procedures to respond to the discovery of contaminated media to minimize or reduce the risk to health, safety, and the environment
- Preparation of a management plan to manage obsolete, abandoned, hazardous materials or oil consistent with the approach to hazardous waste management.

Impact of Soil Erosion and Land Degradation

Soil erosion may be caused by exposure of soil surfaces to runoff and wind during site clearing, earth moving, and excavation activities. Mobilization and transport of soil particles may, in turn, result in sedimentation of surface drainage networks, which may result in impacts to the quality of natural water systems and ultimately the biological systems that use these waters.

Construction of access road will require vegetation clearing, excavation, and filling with selected materials. Material production sites can expose the soil structure to erosion unless necessary precautions are taken.

Moreover, an appreciable part of the excavation of trenches for installing the rural pipe system lines could be done on cropland (cultivated lands) of individual farmers. The excavation work could result in the displacement of the fertile top soil and this will affect the crop growing capacity (yield) of the plot. As a result, in addition to the immediate interruption of the farming activities during the construction period, farmers could be affected by loss of top soil from the excavated part of their farming land which will make it unproductive for quite some time. It should be noted that the soil of the cultivated lands in the area are fertile and farmers commonly grow crops during the regular summer seasons.

Farming fields could be rendered unavailable for periods if excavated soil and big boulders are not quickly cleared from them. Thus, parts of certain farming fields could become unusable unless the excavated materials on them are promptly cleared. This issue has been one of the impacts that were raised with great emphasis by the participants of the public consultation meetings. Mitigation measures include avoiding land clearing as much as possible, frequently removing construction spoil, revegetation of exposed areas, providing runoff protection measures, and rehabilitating excavation and construction materials production sites once their use is completed.

Impacts on Terrestrial Flora and Fauna

The activities of water supply sub-projects will not generally cause a significant impact on fauna and flora of the area. Therefore, the construction and installation activities of the project are anticipated not to cause the cutting of important trees or bushes that have habitat and economic value. However, owing to the prevalent land degradation in the project areas, most uncultivable lands, hills and valleys would be designated as area closures to enhance the re-vegetation and conservation efforts. Because of this, some activities of the project are going to have a limited impact on the vegetation and conservation efforts of the area. The project could construct access roads to borehole sites and the access roads will impact vegetation and wildlife by clearing the area.

Impacts on Aquatic Flora and Fauna

Implementation of sub-projects could indirectly affect the aquatic flora and fauna. Unmanaged abstraction and utilization of groundwater may have an impact of surface water resources of a specific sub-project area. Elimination or reduction of water level or baseflow in surface water resources (such as streams, rivers, wetlands, lakes, etc..) could, in turn, eliminate or restrict the aquatic habitat or ecosystem resulting on impacts on the aquatic flora and fauna. Further, water quality deterioration of surface water resources as a result of sub-project activities could affect the aquatic species.

The following measures can be considered to reduce the impact on aquatic flora and fauna:

- Maintain environmental flows in surface water resources at all times
- Monitor the flow or level of surface water resources and based on the finding provide appropriate correction measures including reduction on extraction rate of groundwater
- Conduct regular monitoring of aquatic species diversity
- Conduct water quality monitoring of surface water resources
- Delineate important aquatic habitats and ecosystems so that appropriate attention and protection can be provided.

Impact on Settlements and Loss of Properties

The construction of borehole and other water supply sub-projects may displace peasants from their farmland, i.e., result in economic displacement. With regard to expropriation of land and resettlement, all local governments have processes for calculating compensation required for expropriation of land and resettlement, most of which are based on recent national legislations. However, these are generally only applied to regional and federal level projects where funds are available. In areas where land availability is not too much of an issue, rural inhabitants are provided with money as compensation. The RF provides the framework by which potential resettlement issues will be addressed. Any persons adversely affected by HoA-GW4RP will be supported by enabling them to get jobs and other assistance similar to the support provided through the Government for SMEs.

Impacts due to Camp Site and Other Ancillary Work

During construction period, there are different adverse impacts emanating from construction of ancillary facilities, such as camp site, storage areas, garages, etc. These impacts will be induced soil erosion and sedimentation leading to subsequent deterioration of water quality, dust, and noise pollution, respiratory illnesses related to dust pollution, compaction of soil; traffic accident on local community and workforce, solid waste (household wastes & spoil material), competition for electricity, land use change; disfiguring of landscape; spillage of oils, lubricants and other chemicals. Thus, there could be adverse impacts stemming from inappropriate management of waste disposal, air pollution, competition for water and electricity around these camp sites.

Impact on Occupational Health and Safety

Sub-projects will employ labor forces for their various construction activities. Communicable diseases like tuberculosis, malaria, diarrhea, etc., are therefore likely to be transmitted, especially during peak demand for manpower. Further, different types of accidents at sub-project sites can cause injuries and fatalities including through handling of construction equipment, spills and leakage of hazardous materials, stepping on or using sharp objects, fires, and accidents by vehicles and heavy machineries, etc.. The OHS risks and impacts are likely to increase due to large manpower and traffic involved in construction activities. The occupational health safety risks include:

- Risk of hitting by moving parts during operation of heavy machineries (such as drilling rigs, compressors, and generators) and during installing materials and equipment (well casings, pumps, generators, storage tanks, pipes, fittings, etc)
- Traffic safety during movement of machines and vehicles

- Work at height during construction of elevated tanks or tank seats
- Collapse of excavations during construction of pits for reservoir foundation, deep trenches (if any), valve chambers, soak pits, etc ...
- Risk of falling in due to open pits and pipe trenches (this is also a community health and safety issue)
- Risk from electrocution during installing electric pumps, generators, and during welding/cutting operations (such as during steel well casing installation)
- Hazardous chemical related risks (such as drilling foam, bentonite, oil, fuel, etc ...)
- Solid waste related risks
- Manual handling risks during most of the construction work
- Housekeeping (often resulting in slips, trips, and falls).

The occupational health and safety risk can be mitigated through the following measures:

- The construction area shall be surveyed before work begins to ensure that adequate ingress and egress is provided for personnel and equipment.
- Good housekeeping to remove potential slip, trip, and fall hazards.
- As much as possible avoid work at height. If not, use proper access equipment, such as scaffold/work platform, for all work at height required.
- Access equipment (where necessary) shall be checked before work commences to ensure stability.
- Sides of excavation must be supported/battered where there is a risk to collapse.
- Inspect supported excavations before work commences each day.
- Personnel must stay within the protection of the excavation at all times.
- Substantial barriers to be erected around excavations.
- Suitable signs and barriers to be provided to warn of the work being undertaken.
- Ladders, stairs or ramps to be provided for safe access/egress, where necessary.
- Work shall be coordinated so as to reduce risks to workers from falling objects.
- Site traffic must avoid the area where work is in progress as far as practicable.
- First-aid kit shall be available on site.
- Fire extinguishers shall be available on site.
- The placing of a second person (fire watch) on stand-by in case of emergency should be considered.
- Work shall be undertaken away from flammable materials (at least 15 m).
- Where other operations are being undertaken adjacent to welding, the combined effect must be considered and suitable systems work put in place.
- Materials shall be properly staked (low stake rise, anchored and barricaded off).
- Practice safe manual handling techniques (plan, get help if needed, place your feet firmly, bend your knees not your back, firm grip, lift with legs, etc).
- Where possible, manual handling to be reduced by use of mechanical devices.
- Material safety data sheet (MSDS) shall be provided for all products so that workers are informed on precautionary measures.
- Hand washing facilities shall be made available.
- Provision and use of PPE (high visibility vests, hard hats, safety boots, hand gloves, face masks, ear plugs, welding visors, overalls, safety harness, safety glasses, etc.)

Impact on Public Health

Some impacts on public health are of short duration and reversible, but can be of a high magnitude if not well managed. Management measures including proper sanitation, waste disposal facilities, awareness campaigns for the prevention of HI/AIDS, sexually transmitted diseases and other communicable diseases, sensitization for health insurance will be needed at sub-project sites. COVID-19 is also a public health hazard, particularly during implementation of sub-projects involving large workforce.

Problem of Malaria Intensification

Formation of soil heaps from the excavation of trenches, open pits at materials production sites, and reservoir foundations may form stagnant water ponds and these ponds can be source of health risks to the local people by serving as favorable mosquito breeding sites and consequently intensifying malaria. This problem can be minimized by draining out the stagnant water and appropriately filling back the excavated trenches and pits.

Gender Based Violence (GBV) Impacts

Projects with a large influx of workers may increase the demand for sex work and even increase the risk for trafficking of women for the purposes of sex work or the risk of forced early marriage in a community where marriage to an employed man is seen as the best livelihood strategy for an adolescent girl. Furthermore, higher wages for workers in a community can lead to an increase in transactional sex. The risk of incidents of sex between laborers and minors, even when it is not transactional, can also increase. Projects create changes in the communities in which they operate and can cause shifts in power dynamics between community members and within households. Male jealousy, a key driver of GBV, can be triggered by labor influx on a project when workers are believed to be interacting with community women. Hence, abusive behavior can occur not only between project-related staff and those living in and around the project site, but also within the homes of those affected by the project.

When land redistribution occurs for example due to resettlement for civil works women may be extremely vulnerable to GBV. This is particularly true in countries where the legal systems preclude women from holding land titles. Women and girls' job opportunities are limited due to a lack of appropriate transportation options. When creating job opportunities for women within projects, teams should be aware that traveling to and from work in some settings can force women and girls to use unsafe, poorly lit commuter routes, or unsafe public transport. Increased risk of violence is experienced when women are confronted with traveling long distances to access work opportunities or forced to travel at night.

Manifestations of GBV include, but are not limited to:

- Physical violence (such as slapping, kicking, hitting, or the use of weapons);
- Emotional abuse (such as systematic humiliation, controlling behavior, degrading treatment, insults, and threats);
- Sexual violence, which includes any form of non-consensual sexual contact, including rape;
- Early/forced marriage, which is the marriage of an individual against her or his will often occurring before the age of 18, also referred to as child marriage;

- Economic abuse and the denial of resources, services, and opportunities (such as restricting access to financial, health, educational, or other resources with the purpose of controlling or subjugating a person);
- Trafficking and abduction for exploitation; and,
- Intimate Partner Violence (IPV) perpetrated by a former or current partner, includes a range of acts of violence

Impact of Labor Influx

As a medium infrastructure project that involves a large number of workers, labor influx related risks and impacts such as conflicts over resources, community tensions, Gender-Based Violence (GBV) or Sexual Exploitation and Abuse and Sexual Harassment (SEA/SH), spread of communicable diseases like COVID-19, HIV/AIDS and other STDs, will need to be addressed. The GBV/SEA risks for the project are rated as Substantial as risks of labor influx during construction will be managed with the implementation of a Gender Based Violence Action Plan including requirements for signing of code of conducts, training and awareness, review of GBV reporting and referral mechanisms in the project area, provision of opportunities, and confidential avenues for grievance redress mechanisms.

The influx of mobile workers can also increase local costs (e.g., housing, food), making it more difficult for low-income residents to afford both food and shelter required for good health. In some cases, labor influx results in higher rates of violence, injury, alcohol and drug consumption, and sexually transmitted diseases in the local population. Influx-related environmental effects that affect subsistence agriculture or harvesting may change nutritional choices, which, in turn, can have physical health consequences. Overcrowded or camp-based living conditions can significantly alter existing levels of communicable diseases including respiratory problems, diarrheal and vector-borne diseases, and tuberculosis, which also increase the risks of disease being introduced and spreading through host communities. This, in turn, strains public resources and affects overall service capacity for local residents' health needs.

There are also possible risks of underage employment, conflict, exclusion of vulnerable groups during community consultations, etc. Consequently, the social risk mitigation measures will focus on: (i) prepare a resettlement policy frameworks and respective action plans (RF/RP), Labor Management Procedures (LMP), GBV/SEA Action Plan (ii) prepare a Stakeholder Engagement Plan; (iii) mitigating social tensions through community involvement and engagement as well as establishment of an effective and functional GRM for the community members and project workers; and (iv) addressing gender dimensions of the operation including STDs and HIV/AIDS.

Impact of Child Labor

Children involved in child labor are more likely to experience worse health outcomes later in life. The impact of hazardous work can cause profound and long-lasting health problems that may only become evident in adulthood. This makes them difficult to measure or even prove. Cancer, infertility and chronic back pain are just some of the possible long-term negative health outcomes. The consequences are worsened by poverty and the lack of efficient health and social security schemes.

There is also the potential impact of child labor on individual's mental health. However, like other aspects of health and child labor, the magnitude of the issue is hard to measure and is

therefore less known. First and foremost, child labor should be stamped out, especially in its worst forms.

Children are exposed to accidental and other injuries at work. They should thus be protected to prevent social, economic and physical harm, which persist to affect them during their lifetime. Such injuries include:

- General child injuries and abuses like cuts, burns and lacerations, fractures, tiredness and dizziness, excessive fears and nightmares.
- Sexual abuse, particularly sexual exploitation of girls by adults, rape, prostitution, early and unwanted pregnancy, abortion, Sexually Transmitted Diseases (STDs) and HIV/AIDS, drugs and alcoholism.
- Physical abuse that involves corporal punishment, emotional maltreatment such as blaming, belittling, verbal attacks, rejection, humiliation and bad remarks.
- Emotional neglect such as deprivation of family love and affection, resulting in loneliness, and hopelessness.
- Physical neglect like lack of adequate provision of food, clothing, shelter and medical treatment.
- Lack of schooling results in missing educational qualifications and higher skills thus perpetuating their life in poverty.
- Competition of children with adult workers leads to depressing wages and salaries.

Impact of Community, Health and Safety

Construction activities expose communities to health and safety risks especially those that are close to construction sites including borehole drilling, foundation and trench excavation sites.. The main community health ad safety risks include:

- Traffic safety
- Environmental risks towards communities including dust, noise, etc.
- Risks on community due to falling into open pits, trenches, uncovered hand dug wells, etc.
- Environmental impacts of the constructed infrastructure, including diverted water flows, etc.
- Labor influx and GBV/SEA, but also ecosystem services
- Local tensions, conflict analysis including on resource access and use
- Security and risks related to eventual security personnel.

In addition, lack of sufficient quantities of clean water also critically impairs the ability of most rural populations to engage in appropriate personal, food and environmental hygienic practices which would greatly assist in stemming the tide of infectious diseases. The inaccessibility of protected and improved water supplies to the rural population clearly indicates that the health and well-being of the population, in general, and that of women and children, in particular, is at risk from a multitude of water-borne or water-related diseases. Although it is difficult to quantify morbidity and mortality related to unsafe and inadequate water supply because of lack of an effective monitoring and surveillance system and country-wide baseline survey, limited information on disease prevalence reported indicates that water-borne or water-related diseases are among the major causes of sickness and death. Women and children particularly girls as the main water carriers are in frequent contact with contaminated water. They are, therefore, the segment of the population most vulnerable to water-related diseases. Among the major water related diseases is diarrhea, which alone is accountable for 46% of under -five-child mortality. Therefore, the strongly held opinion of public health experts is that the provision of safe water is a prime importance to public health.

The sub-projects ES instruments shall outline risk management approaches for these risks, which will be used to develop site-specific ESMPs as needed; included but not limited to a traffic safety management, community health and safety plan, and GBV/SEA/SH action plan and a security management plan.

Impact of Groundwater Quality on Human Health

Groundwater will normally look clear and clean because the ground naturally filters out particulate matter. However, natural and human-induced chemicals can be found in groundwater. As groundwater flows through the soil, metals such as iron and manganese are dissolved and may later be found in high concentrations in the water. Hydro-chemical characteristics are widely used to indicate the source of the main components of ions, types of groundwater, water–rock interactions, and groundwater reservoir environments. Knowledge of hydro-chemical characteristics is useful for evaluating groundwater quality because it provides an understanding of groundwater suitability for various purposes. Investigations have shown that exposure to potentially toxic chemicals, such as heavy metals, fluorides, and nitrate in groundwater can pose major risks to human health.

Moreover, industrial discharges, urban activities, agriculture, groundwater pumping, and disposal of wastes can affect groundwater quality. Contaminants can be human-induced, as from leaking fuel tanks or toxic chemical spills. Pesticides and fertilizers applied to grasses and crops can accumulate and migrate to the water table. Leakage from septic tanks and/or waste-disposal sites also can introduce bacteria to the water, and pesticides and fertilizers that seep into farmed soil can eventually end up in water drawn from boreholes. A borehole might be placed in land that was once used for garbage or chemical disposal site if not carefully located.

Impact of Exclusion of Women and Other Community Groups/Members

Involving communities effectively in the planning and management of their water services requires an understanding of socio-cultural norms – the attitudes and relationships that inform community interest in and usage of services. Gender is key issue given the time-consuming and physically demanding burden that insufficient, distant, and poor-quality water supply places on women and girls – those typically responsible for collecting water and managing household water, sanitation, and hygiene. This makes it especially important to involve women in planning and managing the water services in which they have such a high stake. The participation of women throughout the project cycle is emphasized in Ethiopia's sector policies, but the case studies suggest their continued exclusion. Focus group discussions with female users of water schemes indicated that WASHCOs rarely include women members (Community consultation in Teltele Borona Woreda- Oromia and Humbo Woreda-SNNP).

In Ethiopia, the capacity of rural communities to both cope with and adapt to a changing external environment depends on factors such as local natural resources, access to livelihood assets, kinship networks, access to information, skills, and local institutions, amongst others³¹. At a

³¹ Ludi, E., Jones, L., and Levine, S. (2011) Preparing for the Future? Understanding the Influence of Development Interventions on Adaptive Capacity at Local Level in Ethiopia, Africa Climate Change Resilience Alliance/ODI, London.

national level, Ethiopia's ability to adapt to climate change is limited by limited financial reserves; a lack of technical expertise and information; low access to education, training, health facilities, financial resources, and services; and limited availability of infrastructure and markets among others.

Although most rural Ethiopian communities suffer from low levels of adaptive capacity³² there are notable differences both within and between them. For example, relatively rich households with a diverse asset base, a well-developed social network, and significant political power tend to be better able to respond and adapt than poorer and more marginalized households³³. Disparities in levels of adaptive capacity exist not only in relation to assets, but to entitlements, social exclusion, and institutions³⁴. For example, marginalization and inequality can be significant barriers to adaptation for women, children, and various excluded groups across Ethiopia.

Risk of Not Having an Inclusion Plan

In developing sets of water supply approaches in a given area, careful consideration should be given to their suitability for different purposes, equitable inclusion of all segment of population including historically underserved local communities, and the prospects for sustainability of community sources. The latter could be at risk if increasing numbers of households in a community 'opt out' by adopting self-supply and cease to invest in O&M of the community-level scheme. However, in practice, many households are observed to simultaneously use and value both family wells (for bulk water on their doorstep) and community sources (for perceived better water quality).

The legal framework for inclusion plan in water resources management comprises not only statutory legislation but also self-regulatory instruments and customary norms. Customary laws³⁵ and traditions often play an important role, as some communities manage water according to traditional norms³⁶. Consideration of all types of norms containing rights and obligations is crucial: legal pluralism often occurs where traditional and customary water management rules are mixed with statutory regulations and national and global laws and declarations: "which both complements and complicates effective, legitimate and equitable policy and law formulation and implementation especially if the norms are not aligned."³⁷

Risk of Excluding Disadvantaged and Vulnerable Groups

The principle of inclusiveness will guide the stakeholder engagements, particularly with respect to vulnerable individuals and groups. In cases where vulnerable status may lead to people's reluctance or physical incapacity to participate in large-scale community meetings, the project will hold separate small group discussions with them at an easily accessible venue. This way, the

³² Ibid

³³ Amsalu, A. and Adem, A. (2009) 'Assessment of climate change-induced hazards, impacts and responses in the southern lowlands of Ethiopia', FSS Research Report No.4, Forum for Social Studies (FSS), Addis Ababa.

³⁴ Kaur, N., Getnet, M., Shimelis, B., Tesfaye, Z., Syoum, G., and Atnafu, E. (2010) 'Adapting to climate change in the water sector. Assessing the effectiveness of planned adaptation interventions in reducing local level vulnerability', RiPPLE Working Paper 18, RiPPLE, Addis Ababa.

³⁵ Customary law is a common rule or common practice that is, as the word 'customary' suggests, a traditional and accepted form of conduct in society (e.g. the laws, practices and norms of indigenous peoples and local communities).

³⁶ Social Equity and Integrated Water Resources Management, No. 15 (2011) https://www.gwp.org/en/learn/ KNOWLEDGE_RESOURCES/Global_Resources/background-papers/ page 4

³⁷ See text of Joyeeta Gupta, Professor of Law and Policy in Water Resources and Environment, at IHE Delft - available at: https://www.un-ihe.org/water-law

project will reach out to groups who, under normal circumstances, may be insufficiently represented at general community gatherings. Some strategies to be adopted to reach out to these groups include:

- Identify leaders of vulnerable and marginalized groups to reach-out to these groups
- Through the existing industry associations, maintain a database of marginalized groups, e.g., Federation of Disabled Persons.
- Leverage existing water supply and groundwater management and use projects which include vulnerable populations who overlap with this project to use their systems to identify and engage them
- Engage community leaders, CSOs and NGOs working with vulnerable groups
- Organize face-to-face focus group discussions with these populations

Sexual Exploitation, Abuse and Sexual Harassment Risks and Impacts

The World Bank Group recognizes that World Bank-financed Projects can increase the risk of GBV in both public and private spaces by a range of perpetrators in several ways. Based on the protocol laid out in the WB SEA/SH Good Practice Note, a preliminary GBV risk assessment was conducted on the E-HoA-GW4R project and it shows the likelihood of GBV risks increasing as a result of both contextual and project related factors. The assessment rates the level of risks at "moderate". The Risk Assessment highlighted the following as the major risk factors:

- Though it is illegal, there is a high risk of prevalence of child marriage (defined as mirage before the exact age of 18 reported by women)
- Poverty in the project area is in bottom quartile of country; the periphery areas are likely to be in remote locations where historically underserved and pastoralist people live
- The project can bring influx of labor and employment income differentials in local communities. Projects with labor influx of workers may increase the demand for sex work, including the risk for trafficking of women for the purposes of sex work; or the risk of forced early marriage. Furthermore, higher wages for workers in a community can lead to an increase in transactional sex. The risk of incidents of sex between laborers and minors, even when it is not transactional, can also increase. Risk of SEA/SH by project personnel e.g. regional, zonal, woreda and community level officials who may ask for sexual favors from women, girls, men and boys.
- Absence of legal protection and provision to marital rape;
- Laws on domestic violence legislation does not extend to unmarried intimate partners and protection orders for domestic violence do not exist
- Justification of wife beating 63% (wife beating justified for at least one reason) considerably higher than regional average of 45.7
- Much infrastructure construction, upgrading or rehabilitation through ground water supply and irrigation scheme construction, is small by definition, but there will be a large number of them under the project
- Largely, most project areas are likely in remote rural areas where historically underserved and pastoralists live so that projects can be in hard-to-supervise areas. (for instance, very remote or geographically diffuse projects)
- Project construction near school, school routes or health centers or roads that are frequently used by local women and girls for daily activities increasing exposure to project workers and in turn, risks of SEA/SH(the project will connect school and health facilities with electric light).

- The capacity/ability of project implementers like contractors, PPP models operated by private sector or cooperatives to monitor GBV and SEA/SH risks across the full span of the project.
- Consultations with key stakeholders on GBV risks and processes, including women's groups and service providers, may not take place as part of the project preparation; community engagement and integration of local concerns and considerations.
- It is likely that female laborers will work alongside male laborers without adequate supervision of work sites; without separate latrine and other sanitation facilities for males and females; and without specific mechanisms for females to share concerns about their working environments, including concerns about sexual harassment.

In addition, although there is a National GBV Working Group, it focuses on humanitarian issues; and because the project is not applied in a humanitarian environment, frameworks for coordinating GBV prevention and response may be limited and insufficient for local government, NGO, and CBO. Although there is a gender action plan, there is no protocol defined for referrals to GBV services, which may impact the availability and access to response services. Multi-sectoral government partners (health service providers, Women and Children Affairs, Police and legal service providers) will be supported to develop referral pathways.³⁸Impact on Cultural Heritages

The impact of HoA-GW4RP sub-projects on cultural heritage sites is going to depend on the presence of such cultural, historical, religious or archeological sites in the sub-projects implementation areas. Given that the supported HoA-GW4RP activities will be carried out in most regional states and 67 woredas, the potential location of sub-project sites under HoA-GW4RP will cover a wider geographical area and hence there still exist a potential for certain sub-projects to affect cultural heritage sites valued and recognized by the local communities.

The sub-project works would involve earthworks, temporary and permanent land uptake in areas with significant level of known physical cultural heritages, and thus there is a possibility of encountering previously unknown heritages (archaeological remains such as stone tools made by Early Man). Construction activities could physically destroy artifacts or change conditions so that artifacts are affected through changed hydrological conditions, improved access and therefore risk of vandalism and theft. Construction of temporary access roads and construction materials production sites could pose the same risk of affecting unknown cultural heritages.

The screening/scoping exercise to be carried for each sub-project should strive to identify if any specific impacts on cultural heritages will arise in the process of sub-project implementation. In the event that cultural heritages are identified, the ES instrument should propose necessary site-specific mitigation measures to prevent and avoid adverse impacts on the cultural heritages. In the course of construction, archeological, cultural or historic sites identified are treated by the chance find procedures developed for the project (see Annex VIII).

Impact on Traffic

³⁸ The implementing entity should focus on establishing referral pathway and training/orienting service providers/key stakeholders at least on the guiding principles.

The proposed HoA-Groundwater for resilience project is likely to cause temporary impacts on traffic volume and traffic flow in the area. This is mainly associated with movement of drilling rigs, heavy trucks, compressors, water trucks, and other machineries that will be used for well drilling and construction of other components of the water supply schemes. As a result, during the construction phase, it is anticipated that the traffic flow will be slightly disturbed on main and rural roads available around a specific sub-project area. Traffic signs and safety guides should be arranged in advance and be in place to avoid unnecessary traffic interruptions and associated risks.

Impact due to Labor Issues

This assessment identifies potential impacts on workers from the working conditions they will experience. Impacts would occur in the construction and the operation phase. The main human rights issues prevalent in the country include some labor-related issues, such as:

- Rights in relation to establishing unions and collective bargaining in the informal sector;
- Forced labor, including children subjected to domestic servitude and other forms of forced labor including rural/agricultural labor;
- Child labor where children often receive low or no wages with as many as 38% of children aged 5-17 engaged in some form of child labor;
- Discrimination in employment and occupation with respect to gender and disability; and
- Acceptable conditions of work, including minimum wages, working hours, and occupational health and safety

Poor occupational health and safety, as a result of poor working conditions, can cause injuries and even fatalities if not managed, as well affect relationships with the workforce. During construction, activities may include intensive manual labor, the operation of heavy equipment and trucks, working at heights, working in confined spaces, construction traffic, use of electrical devices, handling of hazardous materials, and other hazardous activities. Due to the nature of the activities being undertaken during construction, worker health and safety is a key risk, with the potential for accidents that may result in injuries and fatalities as well as work stoppages.

Activities during operation and regular maintenance could include hazardous activities such as the operation of heavy equipment and trucks, working on electrical devices including, working at heights, maintenance of machinery, and handling of hazardous materials. During these activities, workers may be at risk for accidents and injury. Potential poor labor and working conditions would be short term and constant during construction. The impact would be restricted to subproject sites, impacting workers. The impact is possible, given the generally poor status of labor and working conditions in the country and given that hazardous activities are involved in the construction of the sub-projects. The impact magnitude is considered to be small, as the workforce is anticipated to be small. The sensitivity of receptors (workers) is considered to be high, given low levels of education, lack of formal wage-earning opportunities, and high levels of poverty, which could make potential workers prone to accepting poor labor and working conditions. As a result, the impact significance is assessed to be Moderate.

Impacts on Indigenous People (as described in ESS-7)

The application of an Indigenous People's policy (as ESS-7) was controversial in Ethiopia, until an GoE-WB agreement has been reached that it would be applied in four regions (Afar, Benishangul-Gumuz, Gambella, and Somali) as well as pastoralist areas in other regions (Oromia and SNNP); in line with the Ethiopian constitution which notes that "Government shall provide special assistance to Nations, Nationalities, and Peoples least advantaged in economic and social development." The Bank continues to apply ESS7 in the same spirit. Given the currently explored route for the intervention, ESS7 is likely to be applied to several villages (Kebeles), requiring a respective assessment and support plan to ensure culturally appropriate stakeholder engagement and benefit sharing. It should be noted that local communities are in general skeptical towards federal development interventions based on experience from earlier projects (railway, sugar plantations, etc.). In addition, it is expected that FPIC would be required, based on two out of three circumstances noted in ESS7 (land impacts and physical relocation from land and natural resources subject to traditional ownership). Good faith negotiations will be conducted with local communities, based on transparent disclosure of risks and benefits of the project as well as capacity support for local communities and integration of international expertise prior to documenting the targeted FPIC outcome.

Experience from other infrastructure projects highlights the need for strong and earlier engagement with local government as well as local communities to avoid delays in project progress; and careful alignment of land acquisition timelines with design and construction timelines. As the project will be implemented in emerging regions with pastoralist and agropastoralist communities that have been assessed earlier by the World Bank together with the Government of Ethiopia as falling under ESS7, ESS7 will be relevant for this project and due to land acquisition and relocation impacts, Free Prior and Informed Consent (FPIC) by local communities will be required.

ENVIRONMENTAL AND SOCIAL IMPACTS OF MANAGED AQUIFER Recharge Sub-project

Sub-component 1.1 of the HoA-GW4R project is aimed at designing and implementing Managed Aquifer Recharge (MAR) at the Dire Dawa plains. The conceptual design of the Dire Dawa MAR includes:

- Six cascaded small and micro-dams on two streams of Dire Dawa town with total inflows of about 8.38 MCM/year and 1.8 MCM.
- Diverting flood water from the plains to permeable formations in the Dire Dawa plains.
- Developing water points for productive uses such as water supply for domestic and pastoralist consumption.

The above MAR activities are expected to result in environmental and social risks and impacts, some of which are indicated below:

- Water quality issues may result due to untreated flood water/runoff to be used to recharge the target aquifer.
- Chemical differences between the water injected into and the water in the receiving aquifer could result in chemical reactions (such as transporting contaminants through flood and dissolving surrounding geological formations in the injected water) resulting water quality changes.
- Clogging of injection wells or infiltration reservoirs/ponds can reduce the amount of recharged water.
- Construction of small and micro-dams could lead to land uptake.

- Vegetation clearing could be required for reservoirs which are used to impound flood water/runoff.
- Although it is not expected to be significant, there is a risk of failure of the constructed small and micro-dams and associated risk on downstream communities and infrastructure (one of the objectives of aquifer recharge is to store excess water in underground aquifers so that large dams are not needed).
- Recovery of the injected water will require energy (for pumps).

The following mitigation measures can be considered for the ES risks and impacts identified:

- Assess the quality of flood water/runoff to be used for aquifer recharge and identify potential contaminant sources within the catchment.
- Depending on the water quality assessment above, avoid the use of low-quality floodwater for recharge.
- Assess groundwater quality after aquifer recharge and consider appropriate technology to treat the water is quality is poor, particularly if there are health based hazardous chemicals are present.
- Determine the optimal combination of flooding and drying periods that yield maximum long-term accumulated infiltration rates.
- Conduct soil conservation and catchment management to reduce sediment load of flood water which could lead to clogging of infiltration reservoirs and wells.
- Small or micro-dam and associated reservoir locations should avoid, as much as possible, farmlands and lands with vegetation cover. This can also be considered as one of te criteria in locating the small or micro-dam axis/location.
- Assess the safety of the small or micro-dams and determine potential risk downstream in the event of failure.
- Use renewable energy sources (such as photovoltaic systems) to lift water from boreholes.

ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLANS FOR WATER SUPPLY SUB-PROJECTS

Environmental and Social Management Plan for Water Supply Sub-projects

(<u>Note</u> – This ESMP is indicative and shall be further developed and updated prior to sub-projects implementation. Further, Contractor's-Environmental and Social Management Plan (C-ESMP) shall be prepared prior to sub-projects implementation.)

No	Potential Environmental Impacts	Possible Mitigation / Enhancement Measures	Implementation Period	Responsible Institution	Budget Estimate
Posit	ive Environmental and So	cial Impacts			
1	Employment opportunities to the local people	 Temporary job opportunities shall be available during the construction phase of the project and shall include casual laborers, food catering, artisans, etc. As much as possible, workforce during project implementation and operation shall be from the local community. As much as possible, encourage the local labor force to work on skilled labor categories in addition to the unskilled job opportunities. 	During implementation and operation periods	PMCU at MoWE, PIT at MoWE, Contractors, Woreda water offices, WaSHCOMs, Local community representatives	Part of sub-project implementation and operation budget
2	Increased quality of water supply	 Maintain quality of water from water supply schemes through periodic monitoring/testing. Water treatment shall be continuously done (where necessary) to ensure the quality of water used for domestic water supply, particularly for human drinking. The water schemes shall be disinfected periodically for bacteriological water treatment. 	During operation period	Woreda Water offices, WaSHCOMs	Part of sub-project operation budget
3	Improve community participation and social impacts	 Community participation has to be scaled up and it needs to involve participation in management and governance of the water supply schemes. The community shall be allowed to participate in sub-projects planning, design, implementation, and operation. WaSHCOMs shall be established before project implementation so that the committee could participate starting from the early stage of the sub-projects. The WaSHCOMs shall be representative of the local community 	During implementation and operation periods	PMCU at MoWE, PIT at MoWE, Contractors, Woreda water offices, WaSHCOMs, Local community representatives	Part of sub-project implementation and operation budget

Table 0-1 Environmental and Social Management Plan (ESMP) for Water Supply Sub-projects

	Potential		Implementation	Responsible	
No	Environmental	Possible Mitigation / Enhancement Measures	Period	Institution	Budget Estimate
	Impacts		I CHOU	Institution	
		including women and other vulnerable groups.			
4	Reduce time spent by women in collecting water	 Women shall participate in sub-projects planning, design, implementation, and operation. If no technical constraints, the water supply schemes shall be located in central locations with respect to the local communities so that travel can be minimized for most of the beneficiaries. The water supply schemes location and orientation shall allow easy access of the scheme by women, accounting cultural and other requirements. Women shall be part of the WaSHCOMs to be established to manage the water supply schemes. Awareness creation campaigns shall be conducted to enhance the capacity and knowledge of women in rural water supply scheme management. 	During implementation and operation periods	Woreda Water offices, Local community representatives, WaSHCOMs	Part of sub-project implementation and operation budget
Adver	se Environmental and Social Ir	npacts			
1	Impact due to groundwater aquifer depletion	 Conduct well pump testing to characterize the capacity of recharge and discharge (to determine the safe yield and recovery rate) Determine sustainable amount of groundwater to be extracted without causing appreciable reduction in groundwater level Assess/model groundwater recharge and discharge rates for the specific catchment or sub-basin Monitor the groundwater characteristics such as static water level, dynamic water level, drawdown, and safe yield periodically, particularly during dry periods (some of the existing or proposed boreholes in a specific well field or catchment can be used as monitoring wells) Modify or control the groundwater abstraction rate depending on the outcome of groundwater monitoring If possible, consider artificial recharge of groundwater using stored runoff water or other practical means. 	During implementation and operation periods	PMCU at MoWE, PIT at MoWE, Contractors, Regional water bureau, Woreda water offices, Woreda environmental unit, WaSHCOMs,	Part of sub-project implementation and operation budget
2	Impact due to groundwater abstraction on water resources of the area	 Assess groundwater flow direction in relation to existing springs and streams in adjacent or downstream areas Register the existing flow rate of springs, streams, and rivers as well as their use prior to commencement of any development scheme based on groundwater 	During implementation and operation periods	PMCU at MoWE, PIT at MoWE, Contractors, Regional water bureau, Woreda	Part of sub-project implementation and operation budget

	Potential		Implementation	Responsible	
No	Environmental	Possible Mitigation / Enhancement Measures	Period	Institution	Budget Estimate
	Impacts		I CHIOU	monution	
		 Assess/model groundwater level changes and resulting impacts to surface water flows and its socio-economic impacts on the population depending on those surface water resources Monitor the groundwater characteristics such as static water level, dynamic water level, drawdown, and safe yield periodically, particularly during dry periods (some of the existing or proposed boreholes in a specific well field or catchment can be used as monitoring wells) Modify groundwater extraction rate depending on impact on current and future surface water flows Avoid construction of water supply wells in sensitive ecosystems Allow environmental flows in surface waters. 		water offices, Woreda environmental unit, WaSHCOMs,	
3	Impact due to animal water use and unhygienic environment created	 Consider soak-away pits in the design and construction of animal trough; especially where the soil around the trough is free-draining Where the soil around troughs is impermeable, consider extending the drainage channel of the troughs to natural drainage channels or provide sand mounds to serve as soak-away pits Provide concrete, stone pitching, or other material aprons/pavements around the animal troughs so that the area can be kept dry Periodically clean and maintain a dry environment around animal troughs. 	During implementation and operation periods	PMCU at MoWE, PIT at MoWE, Contractors, Woreda water offices, Woreda environmental unit, WaSHCOMs,	Part of sub-project implementation and operation budget
4	Impact due to community use of potable water and waste generation	 The community water supply schemes shall be furnished with drainage channels and soak-away pits to safely convey and discharge splashed water during water fetching Drain and keep dry areas around water supply schemes to maintain hygienic environment Along with provision of potable water supply, consider providing basic sanitation to the local communities Enhance the community's awareness on proper storage, handling, and disposal of wastewater Adapt efficient water use methods including reusing of water where practical and safe. 	During implementation and operation periods	PMCU at MoWE, PIT at MoWE, Contractors, Woreda water offices, Woreda environmental unit, WaSHCOMs,	Part of the sub-project implementation and operation budget
5	Impact due to water use right	• Improve water use efficiency and reduce water wastage so that more water is available for use by the various modes or groups	During operation period	Woreda administration,	Part of sub-project operation budget

	Potential		Implementation	Responsible	
No	Environmental	Possible Mitigation / Enhancement Measures	Period	Institution	Budget Estimate
	Impacts		1 01100	monution	
		 Avoid or reduce over-extraction surface and groundwater by the various modes or groups so that water will be available for all to fairly use Consider pricing water use to pay for effective management of the resource (the pricing, however, should protect access to water for the poor and disadvantaged communities) Engage all water users, communities, and other stakeholders in the management of the water resources including development, operation, and maintenance. 		Woreda water offices, WaSHCOMs, Local community representatives	
6	Impact due to inefficient water use and management	 Estimate water balance at sub-project level during operation period to identify water management issue Implement effective water management system. Implement water conservation measures. Install water meters to monitor and control consumption, particularly for multi-village water supply systems. Ensure the proper sealing of all pipelines, valves and storage structures to avoid water loss. Avoid using the local communities' water sources and, as much as possible, try to develop own source during the construction period. 	During implementation and operation periods	PMCU at MoWE, PIT at MoWE, Contractors, Woreda water offices, Woreda environmental unit, WaSHCOMs,	Part of sub-projects implementation and operation budget
7	Impact due to inefficient energy use and management	 Implement effective energy management system. Operate energy intensive machines and plants at the lowest level possible. Ensure efficient operation of machines and systems so that energy loss from leaks and other failures can be avoided Install energy meters to monitor and control energy consumption by electro-mechanical equipment. Periodically check and evaluate the efficiency of energy systems and where necessary replace problem components so that energy loss due to ageing of components can be avoided. Encourage use of electrical energy from the national grid since it is mostly produced from hydropower plants, which are environmentally friendly. Reduce the overall carbon footprint of the construction work and operation of systems. 	During implementation and operation periods	PMCU at MoWE, PIT at MoWE, Contractors, Woreda water offices, Woreda environmental unit, WaSHCOMs,	Part of sub-project implementation and operation budget
8	Air emissions and decreased	• Vehicles and machinery must be kept in good condition to prevent	During	PMCU at MoWE,	Part of sub-project

Ministry of Water and Energy (MoWE) Ministry of Irrigation and Lowlands (MoIL)

	Potential		Implementation	Responsible	
No	Environmental	Possible Mitigation / Enhancement Measures	Period	Institution	Budget Estimate
	Impacts		I CHOU	montation	
	air quality	 excessive smoke from exhausts and reduce dust by watering the access road surface. Prevent generation of air pollutants during the construction period by procuring such materials from the market and checking whether suppliers satisfy ES requirements shall be considered. Proposed investments should require that construction contractors operate only well-maintained engines, vehicles, trucks and equipment. A routine maintenance program for all equipment, vehicles, trucks and power generating engines should be in place. The project should ensure the use of good quality fuel and lubricants only. Practice wetting of sites especially during dry season to reduce dust emission. Contractors to provide protection gears to the construction workers. 	implementation and operation periods	PIT at MoWE, Contractors, Woreda water offices, Woreda environmental unit, WaSHCOMs,	implementation and project operation budget
9	Impacts of wastewater and water quality	 Select well site where water drains away from the well. As much as possible, do not construct well in a depression or on low-lying, poorly drained site. Construct drainage ditches to divert run-off water around well site. Construct concrete pad/apron around the base of the wellhead Build soak-away pit to allow wastewater percolation and partial treatment. Coordinate activities with ongoing rural water supply and sanitation project (if any) Conduct awareness creation campaign on wastewater management and maintaining water quality. 	During implementation and operation periods	PMCU at MoWE, PIT at MoWE, Contractors, Woreda water offices, Woreda environmental unit, WaSHCOMs,	Part of sub-project implementation and operation budget
10	Impact due to hazardous materials	 Training of operators on release prevention, including drills specific to hazardous materials as part of emergency preparedness response training. Implementation of inspection programs to maintain the mechanical integrity and operability of pressure vessels, tanks, piping systems, relief and vent valve systems, containment infrastructure, emergency shutdown systems, controls and pumps, and associated process equipment. 	During implementation and operation periods	PMCU at MoWE, PIT at MoWE, Contractors, Woreda water offices, Woreda environmental unit, WaSHCOMs,	Part of sub-project implementation and operation budget

No	Potential Environmental Impacts	Possible Mitigation / Enhancement Measures	Implementation Period	Responsible Institution	Budget Estimate
		 Preparation of written Standard Operating Procedures (SOPs) for filling underground storage tanks (USTs), above-ground storage tanks (ASTs) or other containers or equipment as well as for transfer operations by personnel trained in the safe transfer and filling of the hazardous material, and in spill prevention and response · Prepare SOPs for the management of secondary containment structures, specifically the removal of any accumulated fluid, such as rainfall, to ensure that the structures are not accidentally or willfully compromised. Identification of locations of hazardous materials and associated activities on an emergency plan site map · Documentation of availability of specific personal protective equipment and training needed to respond to an emergency. Documentation of availability of spill response equipment sufficient to handle at least initial stages of a spill and a list of external resources for equipment and personnel, if necessary, to supplement internal resources. 			
11	Impact due to solid waste and effluent waste	 Adequate waste receptacles and facilities should be provided at project sites/camp sites Training and awareness shall be given on safe waste disposal in construction camps for all workers Reduce, reuse and recycle wastes whenever possible Final disposal should be at dumpsites approved by the local government authorities. 	During implementation and operation periods	PMCU at MoWE PIT at MoWE, Contractors, Woreda water offices, Woreda environmental unit, WaSHCOMs,	Part of sub-project implementation and operation budget
12	Noise and vibration impacts	 Construction traffic speed control measures should be enforced on unpaved roads. No use of noisy machinery within 50m of residential areas and near institutions. As much as possible, manual labour can be used at such locations. Engines of vehicles/trucks and earth-moving equipment should be switched off when not in use. Good maintenance and proper operation of construction machinery to minimize noise generation. 	During implementation and operation periods	PMCU at MoWE, PIT at MoWE, Contractors, Woreda water offices, Woreda environmental unit, WaSHCOMs,	Part of sub-project implementation and operation budget

No	Potential Environmental	Possible Mitigation / Enhancement Measures	Implementation	Responsible	Budget Estimate
110	Impacts	Tossible mitigation / Emancement measures	Period	Institution	Duuget Listinute
		 Good maintenance and proper operation of equipment such as surface pumps and generators (if any) during sub-projects operation. Proposed sub-projects should require contractors to use equipment and vehicles that are in good working order, well maintained, and that have some noise suppression equipment (e.g. mufflers, noise baffles) intact and in working order. Such provision could be part of the contractual obligations with the contractors. Contractors will be required to implement best driving practices when approaching and leaving the site (speed limit of ≤30 km/hr) to minimize noise generation created through activities such as unnecessary acceleration and breaking squeal. Engines of vehicles/trucks and earth-moving equipment should be switched off when not in use. Setting up temporary noise barriers where possible. Provide necessary PPE such as ear plugs and mufflers during operation such as well drilling. 			
13	Impact of contaminated land	 Preventing or controlling the release of hazardous materials, hazardous wastes, or oil to the environment including on soil/land. When contamination of land is suspected or confirmed during any project phase, the cause of the uncontrolled release should be identified and corrected to avoid further releases and associated adverse impacts. Managing contaminated media with the objective of protecting the safety and health of occupants of the site, the surrounding community, and the environment post construction or post decommissioning Understanding the historical use of the land with regard to the potential presence of hazardous materials or oil prior to initiation of construction or decommissioning activities Preparing plans and procedures to respond to the discovery of contaminated media to minimize or reduce the risk to health, safety, and the environment Contaminated lands should be managed to avoid the risk to human health and ecological receptors. The preferred strategy for land 	During implementation and operation periods	PMCU at MoWE, PIT at MoWE, Contractors, Woreda water offices, Woreda environmental unit, WaSHCOMs,	Part of sub-project implementation and operation budget

	Potential		Implementation	Responsible	
No	Environmental	Possible Mitigation / Enhancement Measures	Period	Institution	Budget Estimate
	Impacts		I CHOU	mstitution	
14		 decontamination is to reduce the level of contamination at the site while preventing the human exposure to contamination. Preparation of a management plan to manage obsolete, abandoned, hazardous materials or oil consistent with the approach to hazardous waste management. 	D		
14	Impact of soil erosion and land degradation	 As much as possible, reduce unnecessary soil disturbance during the various construction activities. As much as possible, retain the vegetation cover of the sub-project area to reduce exposed land and ultimately soil erosion. Re-vegetate exposed areas as a result of construction activities. Rehabilitate soil/land compacted due to the construction activities. Stockpile and reuse top soil from excavation work. Provide runoff protection or interception structures such as bunds, terraces, and berms in areas that are susceptible to erosion. Practice good soil and land management practices to improve the soil organic matter and vegetation growth capacity. Practice good agricultural methods in the catchment to reduce soil erosion and land degradation. Manage both the source and destination of wastewater and storm water. Dispose of surplus soil and construction wastes at designated and approved disposal sites. 	During implementation and operation periods	PMCU at MoWE, PIT at MoWE, Contractors, Woreda water offices, Woreda environmental unit, WaSHCOMs,	Part of sub-project implementation and operation budget
15	Impacts on terrestrial flora and fauna (loss of biodiversity due to removal of vegetation)	 As much as possible, retain the vegetation cover of the sub-project area to reduce exposed land and ultimately soil erosion. Re-vegetate exposed areas as a result of construction activities. Avoid construction in sites of importance or sensitive habitats and ecosystems. Conduct regular monitoring of the terrestrial flora and fauna species and changes due to project implementation and operation. 	During implementation and operation periods	PMCU at MoWE, PIT at MoWE, Contractors, Woreda agricultural offices, Woreda environmental unit, WaSHCOMs,	Part of sub-project implementation and operation budget
16	Impact on aquatic flora and fauna	 Maintain environmental flows in surface water resources at all times Monitor the flow or level of surface water resources and based on the finding provide appropriate correction measures including 	During implementation and operation periods	PMCU at MoWE, PIT at MoWE, Contractors, Woreda	Part of sub-project implementation and operation budget

	Potential		Implementation	Desponsible	
No	Environmental	Possible Mitigation / Enhancement Measures	Poriod	Institution	Budget Estimate
	Impacts		I CHOU	mstitution	
		 reduction on extraction rate of groundwater Conduct regular monitoring of aquatic species diversity Conduct water quality monitoring of surface water resources Delineate important aquatic habitats and ecosystems so that appropriate attention and protection can be provided. 		agricultural offices, Woreda environmental unit, WaSHCOMs,	
17	Impact on settlements and loss of properties or loss of land and assets on land (crops, trees and structures) due to construction works, hence resulting in people's displacement and assets loss	 As much as possible, avoid unnecessary land uptake and damage on properties. Preparation of a resettlement action plan (RAP) according to the RF to fully compensate for lost/damaged property and resettles the displaced persons. Compensation of land acquired permanently for project purposes will be handled under client responsibility based on the provisions of the RF. 	During implementation period	PMCU at MoWE, PIT at MoWE, Contractors, Woreda administration	Part of sub-project implementation budget
18	Occupational health and safety impacts	 The construction area shall be surveyed before work begins to ensure that adequate ingress and egress is provided for personnel and equipment. Good housekeeping to remove potential slip, trip, and fall hazards. As much as possible avoid work at height. If not, use proper access equipment, such as scaffold/work platform, for all work at height required. Access equipment (where necessary) shall be checked before work commences to ensure stability. Sides of excavation must be supported/battered where there is a risk to collapse. Inspect supported excavations before work commences each day. Personnel must stay within the protection of the excavation at all times. Substantial barriers to be erected around excavations. Suitable signs and barriers to be provided to warn of the work being undertaken. Ladders, stairs or ramps to be provided for safe access/egress, where necessary. Work shall be coordinated so as to reduce risks to workers from falling objects. Site traffic must avoid the area where work is in progress as far as 	During implementation and operation periods	PMCU at MoWE, PIT at MoWE, Contractors, Woreda environmental unit, WaSHCOMs,	Part of sub-project implementation and operation budget

	Potential		Implementation	Responsible	
No	Environmental	Possible Mitigation / Enhancement Measures	Poriod	Institution	Budget Estimate
	Impacts		I CI IOU	mstitution	
		practicable.			
		• First-aid kit shall be available on site.			
		• Fire extinguishers shall be available on site.			
		• The placing of a second person (fire watch) on stand-by in case of emergency should be considered.			
		• Work shall be undertaken away from flammable materials (at least 15 m).			
		• Where other operations are being undertaken adjacent to welding, the combined effect must be considered and suitable systems work put in place.			
		• Materials shall be properly staked (low stake rise, anchored and barricaded off).			
		• Practice safe manual handling techniques (plan, get help if needed, place your feet firmly, bend your knees – not your back, firm grip, lift with legs, etc).			
		• Where possible, manual handling to be reduced by use of mechanical devices.			
		• Material safety data sheet (MSDS) shall be provided for all products so that workers are informed on precautionary measures.			
		• Hand washing facilities shall be made available.			
		• Provision and use of PPE (high visibility vests, hard hats, safety boots, hand gloves, face masks, ear plugs, welding visors, overalls, safety harness, safety glasses, etc.)			
		• Implement a training program for operators who work with			
		chlorine and ammonia regarding safe handling practices and emergency response procedures.			
		• Provide appropriate personal protective equipment (including, for example, self-contained breathing apparatus) and training on its proper use and maintenance during sub-project operation.			
		• Prepare escape plans from areas where there might be a chlorine or ammonia emission.			
		• Install safety showers and eye wash stations near the chlorine and			
		ammonia equipment and other areas where hazardous chemicals			
10		are stored or used.	D		Dest of a large last
19	Community nealth and safety	Recommended measures related to traffic safety:	During	PMCU at MOWE,	Part of sub-project

	Potential		Implementation	Responsible	
No	Environmental	Possible Mitigation / Enhancement Measures	Period	Institution	Budget Estimate
	Impacts		I CHOU	mstitution	
	impacts	 Reduce construction vehicles and trucks speed to acceptable level so that accidents could be avoided (particularly in settlement areas and in areas where there is pedestrian traffic) Provide barriers or exclusion zones around sites where machines and tracks are operated as part of the construction process Provide flagmen to direct vehicular and pedestrian traffic Training the construction crew on safe driving to protect the community in the construction area Follow all traffic rules when sub-project vehicles and trucks are using main roads and highways. Provide safety signs awarding the community members falling into open pits and trenches: Provide temporary edge protection around pits and trenches Do not leave open pits and trenches, particularly in settlement areas and where there is pedestrian traffic Complete construction of dug wells, valve chambers, soak-away pits, and installation of pipes as quick as possible so that the open pits and trenches could be covered. Provide safety signs awarding the community the damager ahead. Recommended measures for health risk due to water-borne diseases: Drain and keep dry inundated areas due to the various construction activities Provide drainage channels and soak-away pits for the water supply schemes so that splashed water during fetching will not inundate the area Taking the necessary environmental and social measures, use pesticides to eliminate disease vectors. 	implementation and operation periods	PIT at MoWE, Contractors, Woreda health office, Woreda environmental unit, WaSHCOMs,	implementation and operation budget

	Potential		Implementation	Responsible	
No	Environmental	Possible Mitigation / Enhancement Measures	Period	Institution	Budget Estimate
	Impacts		I CHOU	msutution	
		required) in accordance with national requirements and			
		internationally accepted standards to meet national water quality			
		standards or, in their absence, WHO Guidelines for Drinking			
		Water Quality.			
		• Evaluate the vulnerability of the treatment system and implement			
		appropriate security measures, such as background checking of			
		employees and perimeter fencing.			
		• Improve the reliability of electrical power feeds to water treatment			
		facilities (if any) to ensure continuous operation.			
		Recommended measures to prevent or minimize potential			
		community health risks associated with the water distribution			
		system include:			
		• Construct, operate, and manage the water distribution system in			
		accordance with applicable national requirements and			
		internationally accepted standards;			
		• Construct and maintain the distribution system so that it acts as a			
		barrier and prevents external contamination from entering the			
		water system by, for example:			
		• Maintain adequate water pressure and flow throughout the			
		system, for example by:			
		 Implementing a leak detection and repair program 			
		• Reducing residence time in pipes			
		• Monitoring hydraulic parameters, such as inflows, outflows,			
		and water levels in all storage tanks, discharge flows and			
		pressures for pumps, flows and/or pressure for regulating			
		walves, and pressure at critical points, and using system			
		a Drawant introduction of contamination from the distribution			
		system itself for example by minimizing microhial growth and			
		biofilm development (e.g. by ensuring adequate residual			
		disinfection levels)			
		\circ Collect samples from several locations throughout the			
		distribution system including the farthest point and test for			
		both free and combined chlorine residual to ensure that			
		adequate chlorine residual is maintained			

	Potential		Implementation	Posponsiblo	
No	Environmental	Possible Mitigation / Enhancement Measures	Period	Institution	Budget Estimate
	Impacts		I CHOU	monution	
		 Choosing residual disinfectant (e.g. chlorine or chloramines) to balance control of pathogens and formation of potentially hazardous disinfection byproducts Using construction materials that do not contribute to release undesirable metals and other substance or interact with residual disinfectants. 			
20	Impact of groundwater quality on human health	 All water supply schemes developed shall be texted for physical, chemical, and biological parameters before handover and use by the community. If the water quality test result show exceedance of health-based parameters (such as Nitrate, Fluoride, Arsenic, Coliform, etc), the scheme shall be abandoned unless there is an economical and practical water treatment option. Provide water treatment facilities where it is technically and economically feasible. Disinfect all water supply schemes periodically. Seek the community's acceptance of water for drinking purpose (palatability) in the case of non-health based (or secondary) parameters exceedance. Periodically monitor the water quality of the scheme during subproject operation. 	During implementation and operation periods	PMCU at MoWE, PIT at MoWE, Contractors, Woreda water offices, Woreda health office, Woreda environmental unit, WaSHCOMs,	Part of the sub-project implementation and operation budget
21	Impact of public health	 Provide education for local communities regarding the spread of HIV/AIDs and STDs in public places, schools, and through community clubs and groups Work closely with local health service giving institutions to control the spread of STD and HIV/AIDS Provide care and support for HIV/ AIDS affected groups Free distribution of condoms both male and female type Produce leaflets and posters about HIV/AIDS. 	During implementation and operation periods	PMCU at MoWE, PIT at MoWE, Contractors, Woreda water offices, Woreda health office, Woreda environmental unit, WaSHCOMs,	Part of sub-project implementation and operation budget
22	Impact of Malaria Intensification	 Draining out the stagnant water and appropriately filling back excavated trenches and pits. Apply vector control measures, interventions for preventing malaria transmission by Anopheles mosquito, including indoor 	During implementation and operation periods	PMCU at MoWE, PIT at MoWE, Contractors, Woreda water	Part of sub-project implementation and operation budget

	Potential		Implementation	Responsible	
No	Environmental	Possible Mitigation / Enhancement Measures	Period	Institution	Budget Estimate
	Impacts	spraying with insecticide, use of chemical and environmental management to remove breeding sites.		offices, Woreda health office, Woreda environmental unit, WaSHCOMs,	
23	Impacts due to construction camps and other ancillary facilities	 Locate construction camps away from environmentally, socially, and culturally sensitive sites. Locate construction camps away from local communities' settlement areas, villages, and towns. Get the local authorities' concurrence in locating construction camps. Provide amenities in the camp. Provide potable and reliable water supply for the camp. Provide reliable and sufficient energy supply to the camp. Provide sufficient ingress and egress from/to the camp with internal roads and storm drainage structures. Provide reliable health care facility in the camp. Provide around the clock security personnel to prevent unauthorized entrance to the camp. 	During implementation period	PMCU at MoWE, PIT at MoWE, Contractors, Woreda administration, Woreda water offices, Woreda environmental unit,	Part of sub-project implementation budget
24	Child labor risk	 Child labor shall be restricted and all employees shall satisfy the requirements set in the labor law. Contractors shall be bound in contracts to commit against the use of child and forced labor. Device and implement Contractor's Code of Conduct which include commitment against child labor. Workers need to be employed and managed following national regulations, and should be monitored during implementation period. 	During implementation and operation periods	PMCU at MoWE, PIT at MoWE, Contractors, Woreda labor unit	Part of sub-project implementation and operation budget
25	Risk of labor influx	 Conduct labor influx risk screening prior to sub-projects implementation (as part of ES instruments). Ensure that sub-project planning considers workforce estimates, skills required, workforce recruitment policy and management, and availability of workforce housing and other utilities. 	During implementation and operation periods	PMCU at MoWE, PIT at MoWE, Contractors, Woreda labor unit	Part of sub-project implementation budget

	Potential		Implementation	Responsible	
No	Environmental	Possible Mitigation / Enhancement Measures	Period	Institution	Budget Estimate
	Impacts		101100		
		 As much as possible, recruit sub-projects workforce from the local labor (particularly unskilled labor). Monitor change in labor influx throughout the life cycle of a sub-project, effectiveness of mitigation measures, Conduct training for all sub-project participants on the likelihood, 			
26	Gender Based Violence (GBV) impacts	 significance and management of labor influx. Prepare and implement a Gender Action plan (contractors and implementing agencies). Prepare and enforce GBV action plan (Contractors and implementing agencies). Educate all workers and nearby communities on preventing and responding to GBV. Establish partnerships with relevant government agencies and NGOs Follow survivor centered approach Ensure that women are given adequate employment opportunities during recruitment and job postings Provide gender disaggregated bathing, cloth changing, sanitation facilities for men and women Impose zero tolerance on gender-based violence and discrimination 	During implementation and operation periods	PMCU at MoWE, PIT at MoWE, Contractors, Woreda labor unit	Part of sub-project implementation and operation budget
27	Labor risks	 Sub-project contractors shall be required to have a written contract with their workers materially consistent with objective of ESS2 and in compliance of this LMP, in particular about child and forced labor. Sub-project contractors shall be required to develop and implement written labor management procedures, including procedures to establish and maintain a safe working environment as per requirements of ESS2. Ensure fair and transparent hiring and staff management procedures and culturally appropriate communication with communities regarding employment opportunities. Work closely with project woreda, kebele administration & local community representative on recruitment of the workforce Consult the project Labor Management Procedure (LMP) 	During implementation and operation periods	PMCU at MoWE, PIT at MoWE, Contractors, Woreda labor unit	Part of sub-project implementation and operation budget

	Potential		Implementation	Responsible			
No	Environmental Impacts	Possible Mitigation / Enhancement Measures	Period	Institution	Budget Estimate		
	Impacts	 Maintain the rights of labor in relation to establishing unions and collective bargaining. Exclude forced labor, including child labor during sub-project implementation and operation Remove discrimination in employment and occupation with respect to gender and disability. Set minimum wages, working hours, and occupational health and safety. When practical, consider a labor contract with a lump-sum payment for a certain type of service or scope of work. 					
28	Impact on cultural heritages	 The screening/scoping exercise to be carried out for each subproject should strive to identify if any specific impacts on cultural heritages will arise in the process of subproject implementation. The ES instruments should propose the necessary site-specific mitigation measures to prevent and avoid adverse impacts on cultural heritages. 	During implementation period	PMCU at MoWE, PIT at MoWE, Contractors, Woreda culture and tourism unit	Part of sub-project implementation budget		
29	Impacts on indigenous people	• Good faith negotiations should be conducted with local communities, based on transparent disclosure of risks and benefits of the project as well as capacity support for local communities and integration of international expertise prior to documenting the targeted FPIC outcome.	During implementation period	PMCU at MoWE, PIT at MoWE, Woreda administration	Part of sub-project implementation budget		
30	Impact of exclusion of women and other community groups	• Involve women and other community groups/members in the planning and management of water schemes/services with an understanding of the socio-cultural norms.	During implementation and operation periods	PMCU at MoWE, PIT at MoWE, Contractors, Woreda administration, Woreda women affairs office	Part of sub-project implementation and operation budget		
Adver	Adverse Environmental and Social Impacts of Managed Aquifer Recharge (MAR)						
1	Impacts of MAR at the Dire Dawa plains • Water quality issues may	 Assess the quality of flood water/runoff to be used for aquifer recharge and identify potential contaminant sources within the catchment. Depending on the water quality assessment above, avoid the use 	During implementation and operation periods	PMCU at MoWE, PIT at MoWE, Contractors, Woreda	Part of sub-project implementation and operation budget		
No	Potential Environmental Impacts	Possible Mitigation / Enhancement Measures	Implementation Period	Responsible Institution	Budget Estimate		
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	recharge is to store excess water in underground aquifers so that large dams are not needed).						
	• Recovery of the injected water will require energy (for pumps).						

Environmental and Social Monitoring Plan for Water Supply Sub-projects

(<u>Note</u> – This monitoring plan is indicative and shall be further developed and updated prior to sub-projects implementation.)

Project Activities / Components	Impacts	Mitigation Measures	Monitoring Indicator	Frequency of Monitoring per Sub-project	Responsibility for Monitoring	Budget
Operation of sub- projects (groundwater wells)	Impact due to groundwater aquifer depletion	 Conduct well pump testing to characterize the capacity of recharge and discharge (to determine the safe yield and recovery rate) Determine sustainable amount of groundwater to be extracted without causing appreciable reduction in groundwater level Assess/model groundwater recharge and discharge rates for the specific catchment or sub-basin Monitor the groundwater characteristics such as static water level, dynamic water level, drawdown, and safe yield periodically, particularly during dry periods (some of the existing or proposed boreholes in a specific well field or catchment can be used as monitoring wells) Modify or control the groundwater abstraction rate depending on the outcome of groundwater monitoring If possible, consider artificial recharge of groundwater using stored runoff water or other practical means. 	 Borehole water levels Borehole yield 	Biannually	Woreda water office, Woreda environmental office, Regional water bureau,	Part of sub- project operation budget
Operation of sub- projects (groundwater wells)	Impact due to groundwater abstraction on water resources of the area	 Assess groundwater flow direction in relation to existing springs and streams in adjacent or downstream areas Register the existing flow rate of springs, streams, and rivers as well as their use prior to 	 Borehole water levels Borehole yield Surface water levels Surface water baseflow 	Biannually	Woreda water office, Woreda environmental office Regional water	Part of sub- project operation budget

Table 0-2 Environmental and Social Monitor	oring Plan for Water Supply Sub-projects

Project Activities / Components	Impacts	Mitigation Measures	Monitoring Indicator	Frequency of Monitoring per Sub-project	Responsibility for Monitoring	Budget
		 commencement of any development scheme based on groundwater Assess/model groundwater level changes and resulting impacts to surface water flows and its socio-economic impacts on the population depending on those surface water resources Monitor the groundwater characteristics such as static water level, dynamic water level, drawdown, and safe yield periodically, particularly during dry periods (some of the existing or proposed boreholes in a specific well field or catchment can be used as monitoring wells) Modify groundwater extraction rate depending on impact on current and future surface water flows Avoid construction of water supply wells in sensitive ecosystems Allow environmental flows in surface waters. 			bureau	
Operation of sub- projects (water supply schemes)	Impact due to animal water use and unhygienic environment created	 Consider soak-away pits in the design and construction of animal trough; especially where the soil around the trough is free-draining Where the soil around troughs is impermeable, consider extending the drainage channel of the troughs to natural drainage channels or provide sand mounds to serve as soak-away pits Provide concrete, stone pitching, or other material aprons/pavements around the animal troughs so that the area can be kept dry Periodically clean and maintain a dry environment around animal troughs. 	 Proper water scheme designs prepared Clean and hygienic water supply schemes 	When designs are prepared, Quarterly	PMCU at MoWE, PIT at MoWE, Construction supervisor, Woreda water office, Woreda health office, Woreda environmental office, WaSHCOMs	Part of sub- project implementation and operation budget
Operation of sub- projects (water supply schemes)	Impact due to community use of potable water and	• The community water supply schemes shall be furnished with drainage channels and soak- away pits to safely convey and discharge	Proper water scheme designs preparedSanitary facilities	When designs are prepared, Quarterly	PMCU at MoWE, PIT at MoWE, Woreda water	Part of sub- project implementation

Ministry of Water and Energy (MoWE)

Project Activities / Components	Impacts	Mitigation Measures	Monitoring Indicator	Frequency of Monitoring per Sub-project	Responsibility for Monitoring	Budget
	waste generation	 splashed water during water fetching Drain and keep dry areas around water supply schemes to maintain hygienic environment Along with provision of potable water supply, consider providing basic sanitation to the local communities Enhance the community's awareness on proper storage, handling, and disposal of wastewater Adapt efficient water use methods including reusing of water where practical and safe. 	 provided Clean and hygienic water supply schemes 		office, Woreda health office, Woreda environmental office, WaSHCOMs	and operation budget
Operation of sub- projects (water supply schemes)	Impact due to water use right	 Improve water use efficiency and reduce water wastage so that more water is available for use by the various modes or groups Avoid or reduce over-extraction surface and groundwater by the various modes or groups so that water will be available for all to fairly use Consider pricing water use to pay for effective management of the resource (the pricing, however, should protect access to water for the poor and disadvantaged communities) Engage all water users, communities, and other stakeholders in the management of the water resources including development, operation, and maintenance. 	 Absence of water use conflicts Water conflicts resolved 	As required, quarterly	Woreda administration, Woreda water office, Woreda environmental office	Part of sub- projects operation budget
Most construction activities and operation of sub- projects (water supply schemes)	Impact due to inefficient water use and management	 Estimate water balance at sub-project level during operation period to identify water management issue Implement effective water management system. Implement water conservation measures. Install water meters to monitor and control consumption, particularly for multi-village water supply systems. Ensure the proper sealing of all pipelines, 	 Water volume consumed vs. produced Unaccounted for water (percentage) in the system 	Quarterly	PMCU at MoWE, PIT at MoWE, construction supervisor, Woreda water office, Woreda environmental office, WaSHCOMs	Part of sub- project implementation and operation budget

Project Activities / Components	Impacts	Mitigation Measures	Monitoring Indicator	Frequency of Monitoring per Sub-project	Responsibility for Monitoring	Budget
		 valves and storage structures to avoid water loss. Avoid using the local communities' water sources and, as much as possible, try to develop own source during the construction period. 				
Most construction activities and operation of sub- projects (water supply schemes)	Impact due to inefficient energy use and management	 Implement effective energy management system. Operate energy intensive machines and plants at the lowest level possible. Ensure efficient operation of machines and systems so that energy loss from leaks and other failures can be avoided Install energy meters to monitor and control energy consumption by electro-mechanical equipment. Periodically check and evaluate the efficiency of energy systems and where necessary replace problem components so that energy loss due to ageing of components can be avoided. Encourage use of electrical energy from the national grid since it is mostly produced from hydropower plants, which are environmentally friendly. Reduce the overall carbon footprint of the construction work and operation of systems. 	 Energy consumed vs. produced Energy loss in the system Amount of fossil fuel used to generate power 	Quarterly	PMCU at MoWE, PIT at MoWE, Construction supervisor, Woreda water office, Woreda environmental office, WaSHCOMs	Part of sub- project implementation and operation budget
Site clearing, excavation, backfilling, concrete work, application of paints, access road construction and use,	Air emissions and decreased air quality	 Vehicles and machinery must be kept in good condition to prevent excessive smoke from exhausts and reduce dust by watering the access road surface. Prevent generation of air pollutants during the construction period by procuring such materials from the market and checking whether suppliers satisfy ES requirements shall be considered. 	 Number of sound reducing machinery and equipment purchased Availability of equipment and machinery maintenance plan Frequency of watering 	Quarterly	PMCU at MoWE, PIT at MoWE, Construction supervisor, Woreda water office, Woreda health office, Woreda environmental	Part of sub- project implementation and operation budget

Ministry of Water and Energy (MoWE) Ministry of Irrigation and Lowlands (MoIL)

Project Activities / Components	Impacts	Mitigation Measures	Monitoring Indicator	Frequency of Monitoring per Sub-project	Responsibility for Monitoring	Budget
Construction and operation activities that involve operation of vehicles, machines, compressors, drilling rigs, pumps, other electro- mechanical equipment		 Proposed investments should require that construction contractors operate only well-maintained engines, vehicles, trucks and equipment. A routine maintenance program for all equipment, vehicles, trucks and power generating engines should be in place. The project should ensure the use of good quality fuel and lubricants only. Practice wetting of sites especially during dry season to reduce dust emission. Contractors to provide protection gears to the construction workers. 	of surfaces to reduce dust related impacts • Inclusion in contract air pollution mitigation measures • PPE purchased and used.		office, WaSHCOMs	
Most construction activities, operation of construction camps, and operation of the sub-projects (water supply schemes)	Impacts of wastewater and water quality	 Select well site where water drains away from the well. As much as possible, do not construct well in a depression or on low-lying, poorly drained site. Construct drainage ditches to divert run-off water around well site. Construct concrete pad/apron around the base of the wellhead Build soak-away pit to allow wastewater percolation and partial treatment. Coordinate activities with ongoing rural water supply and sanitation project (if any) Conduct awareness creation campaign on wastewater management and maintaining water quality. 	 Water quality tests (surface water and groundwater) Wastewater quality tests 	Quarterly	PMCU at MoWE, PIT at MoWE, Construction supervisor, Woreda water office, Woreda health office, Woreda environmental office, WaSHCOMs	Part of sub- project implementation and operation budget
Construction and operation activities that involve the use of hazardous materials such as	Impact due to hazardous materials	 Training of operators on release prevention, including drills specific to hazardous materials as part of emergency preparedness response training. Implementation of inspection programs to 	 Hazardous materials management procedure prepared Absence of hazardous materials spill 	Quarterly	PMCU at MoWE, PIT at MoWE, Construction supervisor, Woreda water	Part of sub- project implementation and operation budget

Project Activities / Components	Impacts	Mitigation Measures	Monitoring Indicator	Frequency of Monitoring per Sub-project	Responsibility for Monitoring	Budget
operation of vehicles, machines, electro-mechanical equipment, etc. Use of paints and other solvents Borehole drilling and use of foam and bentonite Operation of water treatment facilities Use of pesticides and biocides		 maintain the mechanical integrity and operability of pressure vessels, tanks, piping systems, relief and vent valve systems, containment infrastructure, emergency shutdown systems, controls and pumps, and associated process equipment. Preparation of written Standard Operating Procedures (SOPs) for filling underground storage tanks (USTs), above-ground storage tanks (ASTs) or other containers or equipment as well as for transfer operations by personnel trained in the safe transfer and filling of the hazardous material, and in spill prevention and response · Prepare SOPs for the management of secondary containment structures, specifically the removal of any accumulated fluid, such as rainfall, to ensure that the structures are not accidentally or willfully compromised. Identification of locations of hazardous materials and associated activities on an emergency plan site map · Documentation of availability of specific personal protective equipment and training needed to respond to an emergency. Documentation of availability of spill response equipment sufficient to handle at least initial stages of a spill and a list of external resources for equipment and personnel, if necessary, to supplement internal resources 	 No. of hazardous materials spill Acceptable standard of chemicals purchased and used No. of awareness training held No. of communities and chemical handlers training given 		office, Woreda health office, Woreda environmental office, WaSHCOMs	
Most construction activities including site clearing, excavation,	Impact due to solid waste and effluent waste	 Adequate waste receptacles and facilities should be provided at project sites/camp sites Training and awareness shall be given on safe waste disposal in construction camps for all 	• No. of Litter bins and receptacles purchased and used at the project site.	Quarterly	PMCU at MoWE, PIT at MoWE, Construction supervisor,	Part of sub- project implementation and operation

Project Activities / Components	Impacts	Mitigation Measures	Monitoring Indicator	Frequency of Monitoring per Sub-project	Responsibility for Monitoring	Budget
demolishing, etc. Operation of camps and ither ancillary facilities Operation of the sub-projects (water supply schemes)		 workers Reduce, reuse and recycle wastes whenever possible Final disposal should be at dumpsites approved by the local government authorities. 	 Volume of effluent produced and properly disposed No of awareness training held. Amounts of final waste disposed at designated site. 		Woreda water office, Woreda health office, Woreda environmental office, WaSHCOMs	budget
Construction and operation activities that involve vehicles, machines, compressors, drilling rigs, pumps, other electro- mechanical equipment Drilling of boreholes is a major sound emitter	Noise and vibration impacts	 Construction traffic speed control measures should be enforced on unpaved roads. No use of noisy machinery within 50m of residential areas and near institutions. As much as possible, manual labor can be used at such locations. Engines of vehicles/trucks and earth-moving equipment should be switched off when not in use. Good maintenance and proper operation of construction machinery to minimize noise generation. Good maintenance and proper operation of equipment such as surface pumps and generators (if any) during sub-projects operation. Proposed sub-projects should require contractors to use equipment and vehicles that are in good working order, well maintained, and that have some noise suppression equipment (e.g. mufflers, noise baffles) intact and in working order. Such provision could be part of the contractual obligations with the contractors. Contractors will be required to implement best 	 Number of sound-reducing machinery and equipment purchased Availability of equipment and machinery maintenance plan Inclusion in contract issues of noise pollution. PPE purchased and used. 	Quarterly	PMCU at MoWE, PIT at MoWE, Construction supervisor, Woreda water office, Woreda health office, Woreda environmental office, WaSHCOMs	Part of sub- project implementation and operation budget

Project Activities / Components	Impacts	Mitigation Measures	Monitoring Indicator	Frequency of Monitoring per Sub-project	Responsibility for Monitoring	Budget
		 driving practices when approaching and leaving the site (speed limit of ≤30 km/hr) to minimize noise generation created through activities such as unnecessary acceleration and breaking squeal. Engines of vehicles/trucks and earth-moving equipment should be switched off when not in use. Setting up temporary noise barriers where possible. Provide necessary PPE such as ear plugs and mufflers during operation such as well drilling. 				
Most construction activities involving use of fossil fuel for vehicles, machines, electro-mechanical equipment Drilling activity and associated use of chemicals (foam, bentonite) Operation of camps and other ancillary facilities Handling, transport, use, storage, and disposal of other hazardous materials Operation of sub-	Impact of contaminated land	 Preventing or controlling the release of hazardous materials, hazardous wastes, or oil to the environment including on soil/land. When contamination of land is suspected or confirmed during any project phase, the cause of the uncontrolled release should be identified and corrected to avoid further releases and associated adverse impacts. Managing contaminated media with the objective of protecting the safety and health of occupants of the site, the surrounding community, and the environment post construction or post decommissioning Understanding the historical use of the land with regard to the potential presence of hazardous materials or oil prior to initiation of construction or decommissioning activities Preparing plans and procedures to respond to the discovery of contaminated media to minimize or reduce the risk to health, safety, and the environment Contaminated lands should be managed to 	 Contaminant(s): Presence of hazardous materials, waste, or oil in any environmental media at potentially hazardous concentrations Receptor(s): Actual or likely contact of humans, wildlife, plants, and other living organisms with the contaminants of concern Exposure pathway(s): A combination of the route of migration of the contaminant from its point of release (e.g., leaching into potable groundwater) and exposure routes 	Quarterly	PMCU at MoWE, PIT at MoWE, Construction supervisor, Woreda water office, Woreda health office, Woreda environmental office, WaSHCOMs	Part of sub- project implementation and operation budget

Ministry of Water and Energy (MoWE) Ministry of Irrigation and Lowlands (MoIL)

Project Activities / Components	Impacts	Mitigation Measures	Monitoring Indicator	Frequency of Monitoring per Sub-project	Responsibility for Monitoring	Budget
project (water supply schemes) such as use of disinfectant chemicals, treatment waste disposal, wastewater disposal, etc.		 avoid the risk to human health and ecological receptors. The preferred strategy for land decontamination is to reduce the level of contamination at the site while preventing the human exposure to contamination. Preparation of a management plan to manage obsolete, abandoned, hazardous materials or oil consistent with the approach to hazardous waste management. 	(e.g., ingestion, transdermal absorption), which would allow receptor(s) to come into actual contact with contaminants			
Construction activities such as site/land clearing, excavation, spoil disposal, etc. Movement of heavy machinery on access road and other parts of the sub-project area	Impact of soil erosion and land degradation	 As much as possible, reduce unnecessary soil disturbance during the various construction activities. As much as possible, retain the vegetation cover of the sub-project area to reduce exposed land and ultimately soil erosion. Re-vegetate exposed areas as a result of construction activities. Rehabilitate soil/land compacted due to the construction activities. Stockpile and reuse top soil from excavation work. Provide runoff protection or interception structures such as bunds, terraces, and berms in areas that are susceptible to erosion. Practice good soil and land management practices to improve the soil organic matter and vegetation growth capacity. Practice good agricultural methods in the catchment to reduce soil erosion and land degradation. Manage both the source and destination of wastewater and storm water. Dispose of surplus soil and construction wastes at designated and approved disposal sites. 	 Number of treas planted Area of land rehabilitated and revegetated Number or length of flood protection structures constructed Designated waste/spoil disposal sites used 	Quarterly	PMCU at MoWE, PIT at MoWE, Construction supervisor, Woreda water office, Woreda environmental office	Part of sub- project implementation budget

Project Activities / Components	Impacts	Mitigation Measures	Monitoring Indicator	Frequency of Monitoring per Sub-project	Responsibility for Monitoring	Budget
Site clearing, leveling and compaction and removal of vegetation cover	Impacts on terrestrial flora and fauna (loss of biodiversity due to removal of vegetation)	 As much as possible, retain the vegetation cover of the sub-project area to reduce exposed land and ultimately soil erosion. Re-vegetate exposed areas as a result of construction activities. Avoid construction in sites of importance or sensitive habitats and ecosystems. Conduct regular monitoring of the terrestrial flora and fauna species and changes due to project implementation and operation. 	 Number of trees planted Area of land revegetated Number of sensitive habitats/ecosystem preserved/protected 	Biannually	PMCU at MoWE, PIT at MoWE, Construction supervisor, Woreda water office, Woreda environmental office	Part of sub- project implementation budget
Operation of the sub-projects (water supply schemes) and potential depletion of the water resource of the area	Impact on aquatic flora and fauna	 Maintain environmental flows in surface water resources at all times Monitor the flow or level of surface water resources and based on the finding provide appropriate correction measures including reduction on extraction rate of groundwater Conduct regular monitoring of aquatic species diversity Conduct water quality monitoring of surface water resources Delineate important aquatic habitats and ecosystems so that appropriate attention and protection can be provided. 	 Surface water levels Surface water baseflow Reduction in aquatic species diversity Important aquatic habitats/ecosystem protected 	Biannually	Woreda agricultural office, Woreda water office, Woreda environmental office	As part of sub- project operation budget
Land acquisition and site preparation activities	Impact on settlements and loss of properties or loss of land and assets on land (crops, trees and structures) due to construction works, hence resulting in people's displacement and assets loss	 As much as possible, avoid unnecessary land uptake and damage on properties. Preparation of a resettlement action plan (RAP) according to the RF to fully compensate for lost/damaged property and resettles the displaced persons. Compensation of land acquired permanently for project purposes will be handled under client responsibility based on the provisions of the RF. 	 No. of PAPs (i.e., out of the total PAPs) who received all compensation entitlements before commencement of project construction activities. No. of resettled PAPs whose livelihoods are restored and re- 	Quarterly	PMCU at MoWE, PIT at MoWE, Construction supervisor, Woreda administration	To be determined based on the occurrence and scale of resettlement issues per subproject

Ministry of Water and Energy (MoWE) Ministry of Irrigation and Lowlands (MoIL)

Project Activities / Components	Impacts	Mitigation Measures	Monitoring Indicator	Frequency of Monitoring per Sub-project	Responsibility for Monitoring	Budget
			established.			
All construction activities and operation of the sub-projects (water supply schemes)	Occupational health and safety impacts associated with the operational phase of water and sanitation project such as: accidents and injuries, chemical exposure, exposure to pathogens and vectors and noise	 The construction area shall be surveyed before work begins to ensure that adequate ingress and egress is provided for personnel and equipment. Good housekeeping to remove potential slip, trip, and fall hazards. As much as possible avoid work at height. If not, use proper access equipment, such as scaffold/work platform, for all work at height required. Access equipment (where necessary) shall be checked before work commences to ensure stability. Sides of excavation must be supported/battered where there is a risk to collapse. Inspect supported excavations before work commences each day. Personnel must stay within the protection of the excavations. Substantial barriers to be erected around excavations. Suitable signs and barriers to be provided to warn of the work being undertaken. Ladders, stairs or ramps to be provided for safe access/egress, where necessary. Work shall be coordinated so as to reduce risks to workers from falling objects. Site traffic must avoid the area where work is in progress as far as practicable. First-aid kit shall be available on site. The placing of a second person (fire watch) on stand-by in case of emergency should be 	 Presence of responsible and functional OHS management personnel Presence of functional site safety procedures and first aid support facilities Provision of safety equipment and tools such as scaffolds, barriers, traffic cones, safety tapes, etc Provision of safety signs Provision of first-aid kits Provision of first-aid kits Provision of fire extinguishers Provision of PPE OHS incidents, accidents, and near misses Incident reporting including Lost Time Accident (LTA) and Lost Time Injury (LTI) 	On a day-to-day basis	PMCU at MoWE, PIT at MoWE, Construction supervisor, Woreda labor office, Woreda water office, Woreda environmental office	Part of sub- project implementation and operation budget

Project Activities Componen	/ Impacts ts	Mitigation Measures	Monitoring Indicator	Frequency of Monitoring per Sub-project	Responsibility for Monitoring	Budget
		 Work shall be undertaken away from flammable materials (at least 15 m). Where other operations are being undertaken adjacent to welding, the combined effect must be considered and suitable systems work put in place. Materials shall be properly staked (low stake rise, anchored and barricaded off). Practice safe manual handling techniques (plan, get help if needed, place your feet firmly, bend your knees – not your back, firm grip, lift with legs, etc). Where possible, manual handling to be reduced by use of mechanical devices. Material safety data sheet (MSDS) shall be provided for all products so that workers are informed on precautionary measures. Hand washing facilities shall be made available. Provision and use of PPE (high visibility vests, hard hats, safety boots, hand gloves, face masks, ear plugs, welding visors, overalls, safety harness, safety glasses, etc.) Implement a training program for operators who work with chlorine and ammonia regarding safe handling practices and emergency response procedures. Provide appropriate personal protective equipment (including, for example, self-contained breathing apparatus) and training on its proper use and maintenance during sub-project operation. 				

Project Activities / Components	Impacts	Mitigation Measures	Monitoring Indicator	Frequency of Monitoring per Sub-project	Responsibility for Monitoring	Budget
Most construction	Community health and	 might be a chlorine or ammonia emission. Install safety showers and eye wash stations near the chlorine and ammonia equipment and other areas where hazardous chemicals are stored or used. Recommended measures related to traffic safety: 	• Water and wastewater	On a day-to-day	PMCU at MoWE,	Part of project
activities including excavation (pits, trenches), operation of vehicles and machines, etc Operation of the sub-projects (water supply schemes) and use of water by the community Water treatment and waste disposal Operation of construction camps	safety impacts	 Reduce construction vehicles and trucks speed to acceptable level so that accidents could be avoided (particularly in settlement areas and in areas where there is pedestrian traffic) Provide barriers or exclusion zones around sites where machines and tracks are operated as part of the construction process Provide flagmen to direct vehicular and pedestrian traffic Training the construction crew on safe driving to protect the community in the construction area Follow all traffic rules when sub-project vehicles and trucks are using main roads and highways. Provide safety signs awarding the community the damager ahead. Recommended measures for risk of community members falling into open pits and trenches: Provide temporary edge protection around pits and trenches Do not leave open pits and trenches, particularly in settlement areas and where there is pedestrian traffic Complete construction of dug wells, valve chambers, soak-away pits, and installation of pipes as quick as possible so that the open pits 	 quality Number of waterborne disease affected people Number of water supply points in the community in operation Improved maintenance capacity of the community in maintaining the water schemes Number of traffic accidents resulting in injuries and fatalities Number of other accidents due to the sub-projects implementation and operation resulting in injuries and fatalities Number of water system leakage events 	basis	PIT at MoWE, Construction supervisor, Woreda water office, Woreda health office, Woreda environmental office, WaSHCOMs	implementation and operation budget

Project Activities / Components	Impacts	Mitigation Measures	Monitoring Indicator	Frequency of Monitoring per Sub-project	Responsibility for Monitoring	Budget
		and trenches could be covered.Provide safety signs awarding the community the damager ahead.				
		 Recommended measures for health risk due to water-borne diseases: Drain and keep dry inundated areas due to the various construction activities Provide drainage channels and soak-away pits for the water supply schemes so that splashed water during fetching will not inundate the area Taking the necessary environmental and social measures, use pesticides to eliminate disease vectors. <u>Recommended measures related to water treatment include:</u> Ensure that treatment capacity is adequate to meet anticipated water demand. Construct, operate and maintain the water treatment facility (if required) in accordance with national requirements and internationally accepted standards to meet national water quality standards or, in their absence, <i>WHO Guidelines for Drinking Water Quality</i>. 				
		 Evaluate the vulnerability of the treatment system and implement appropriate security measures, such as background checking of employees and perimeter fencing. Improve the reliability of electrical power feeds to water treatment facilities (if any) to ensure continuous operation. 				
		Recommended measures to prevent or minimize				

Project Activities / Components	Impacts	Mitigation Measures	Monitoring Indicator	Frequency of Monitoring per Sub-project	Responsibility for Monitoring	Budget
		potential community health risks associated with				
		the water distribution system include:				
		• Construct, operate, and manage the water				
		distribution system in accordance with				
		applicable national requirements and				
		internationally accepted standards;				
		• Construct and maintain the distribution system				
		so that it acts as a barrier and prevents external				
		contamination from entering the water system				
		by, for example:				
		o Maintain adequate water pressure and now throughout the system for example by:				
		• Implementing a leak detection and repair				
		nrogram				
		\circ Reducing residence time in pipes				
		• Monitoring hydraulic parameters, such as				
		inflows, outflows, and water levels in all				
		storage tanks, discharge flows and pressures				
		for pumps, flows and/or pressure for				
		regulating valves, and pressure at critical				
		points, and using system modeling to assess				
		the hydraulic integrity of the system				
		• Prevent introduction of contamination from				
		the distribution system itself, for example by				
		minimizing microbial growth and biofilm				
		development (e.g. by ensuring adequate				
		residual disinfection levels).				
		• Collect samples from several locations				
		the forthest point and test for hoth free and				
		applied applied and test for both free and				
		adequate chloring residual is maintained				
		• Choosing residual disinfectant (e.g. chloring				
		or chloramines) to balance control of				
		of childrannics, to balance control of				

Project Activities / Components	Impacts	Mitigation Measures	Monitoring Indicator	Frequency of Monitoring per Sub-project	Responsibility for Monitoring	Budget
		 pathogens and formation of potentially hazardous disinfection byproducts Using construction materials that do not contribute to release undesirable metals and other substance or interact with residual disinfectants. 				
Operation of the sub-projects (water supply schemes)	Impact of groundwater quality on human health	 All water supply schemes developed shall be texted for physical, chemical, and biological parameters before handover and use by the community. If the water quality test result show exceedance of health-based parameters (such as Nitrate, Fluoride, Arsenic, Coliform, etc), the scheme shall be abandoned unless there is an economical and practical water treatment option. Provide water treatment facilities where it is technically and economically feasible. Disinfect all water supply schemes periodically. Seek the community's acceptance of water for drinking purpose (palatability) in the case of non-health based (or secondary) parameters exceedance. Periodically monitor the water quality of the scheme during sub-project operation. 	 Water quality tests Treatment facilities provided 	Monthly	Woreda water office, Woreda health office, Woreda environmental office, WaSHCOMs	Part of sub- project operation budget
Construction of sub-projects	Impacts due to construction camp and other ancillary facilities	 Locate construction camps away from environmentally, socially, and culturally sensitive sites. Locate construction camps away from local communities' settlement areas, villages, and towns. Get the local authorities' concurrence in locating construction camps. Provide amenities in the camp. 	 Location of construction camp from settlement areas Amenities provided 	Quarterly	PMCU at MoWE, PIT at MoWE, Construction supervisor, Woreda administration, Woreda environmental office	Part of sub- project implementation budget

Project Activities / Components	Impacts	Mitigation Measures	Monitoring Indicator	Frequency of Monitoring per Sub-project	Responsibility for Monitoring	Budget
All sub project	Impact of public health	 Provide potable and reliable water supply for the camp. Provide reliable and sufficient energy supply to the camp. Provide proper waste storage area or facility. Provide sufficient ingress and egress from/to the camp with internal roads and storm drainage structures. Provide reliable health care facility in the camp. Provide around the clock security personnel to prevent unauthorized entrance to the camp. 	• The queilability of	Monthly	PMCU at MoWE	Port of sub
All sub-project implementation and operation activities that involve use of labor	Impact of public health	 Provide education for local communities regarding the spread of HIV/AIDs and STDs in public places, schools, and through community clubs and groups Work closely with local health service giving institutions to control the spread of STD and HIV/AIDS Provide care and support for HIV/ AIDS affected groups Free distribution of condoms both male and female type Produce leaflets and posters about HIV/AIDS. 	 The availability of data in the health center that show the number of victims in sexually transmitted diseases 	Monthly	PMCU at MoWE, PIT at MoWE, Construction supervisor, Woreda water office, Woreda health office, Woreda environmental office, WaSHCOMs	Part of sub- project implementation and operation budget
Borehole testing, excavation work and during the maintenance of the water points	Problem of malaria intensification	 Draining out the stagnant water and appropriately filling back excavated trenches and pits. Apply vector control measures, interventions for preventing malaria transmission by Anopheles mosquito, including indoor spraying with insecticide, use of chemical and environmental management to remove breeding sites. 	 The number of people affected by malaria Complaint of the community on infestation of malaria causing mosquitoes Number of pits, trenches, and other areas which are properly backfilled 	Monthly	PMCU at MoWE, PIT at MoWE, Construction supervisor, Woreda water office, Woreda health office, Woreda environmental office, WaSHCOMS	Part of sub- project implementation and operation budget

Project Activities / Components	Impacts	Mitigation Measures	Monitoring Indicator	Frequency of Monitoring per Sub-project	Responsibility for Monitoring	Budget
			and rehabilitated			
All construction activities requiring employment of labor workforce	Influx of migrant workers leading to competition of job opportunities in subprojects involving construction subprojects.	 Conduct labor influx risk screening prior to sub-projects implementation (as part of ES instruments). Ensure that sub-project planning considers workforce estimates, skills required, workforce recruitment policy and management, and availability of workforce housing and other utilities. As much as possible, recruit sub-projects workforce from the local labor (particularly unskilled labor). Monitor change in labor influx throughout the life cycle of a sub-project, effectiveness of mitigation measures, Conduct training for all sub-project participants on the likelihood, significance and management of labor influx. 	Percent of total labor employment opportunities offered to locals	Quarterly	PMCU at MoWE, PIT at MoWE, Construction supervisor, Woreda administration, Woreda labor office	Part of sub- project implementation budget
All construction activities requiring employment of labor workers	Risk of child labor to undertake sub-project activities	 Child labor shall be restricted and all employees shall satisfy the requirements set in the labor law. Contractors shall be bound in contracts to commit against the use of child and forced labor. Device and implement Contractor's Code of Conduct which include commitment against child labor. Workers need to be employed and managed following national regulations, and should be monitored during implementation period. 	• Occurrence and magnitude of child labor cases within sub-project workforce	Quarterly	PMCU at MoWE, PIT at MoWE, Construction supervisor, Woreda administration, Woreda labor office	Part of sub- project implementation budget

Proje Activit Compor	ect ies / Impacts nents	Mitigation Measures	Monitoring Indicator	Frequency of Monitoring per Sub-project	Responsibility for Monitoring	Budget
All construct and operation activities reconstruction employment labor workes	tion Gender base Violence (GBV) risks of rs	 Prepare and implement a Gender Action plan (contractors and implementing agencies), Prepare and enforce GBV action plan (implementing agencies and Contractors) Educate all workers and nearby communities on preventing and responding to GBV. Establish partnerships with relevant government agencies and NGOs Follow survivor centered approach Ensure that women are given adequate employment opportunities during recruitment and job postings Provide gender disaggregated bathing, cloth changing, sanitation facilities for men and women Impose zero tolerance on gender-based violence and discrimination 	Occurrence and magnitude of GBV cases within sub- project workforce	On a day-to-day basis	PMCU at MoWE, PIT at MoWE, Construction supervisor, Woreda administration, Woreda labor office	Part of project implementation and operation budget
All construct and operation activities reader employment labor worke	tion Labor risks n juiring of rs	 Sub-project contractors shall be required to have a written contract with their workers materially consistent with objective of ESS2 and in compliance of this LMP, in particular about child and forced labor. Sub-project contractors shall be required to develop and implement written labor management procedures, including procedures to establish and maintain a safe working environment as per requirements of ESS2. Ensure fair and transparent hiring and staff management procedures and culturally appropriate communication with communities regarding employment opportunities. Work closely with project woreda, kebele administration & local community representative on recruitment of the workforce 	 Observation of complaint in relation with salary increment Observation of complaints in relation to other labor issues 	Quarterly	PMCU at MoWE, PIT at MoWE, Construction supervisor, Woreda administration, Woreda labor office	Part of project implementation and operation budget

Project Activities / Components	Impacts	Mitigation Measures	Monitoring Indicator	Frequency of Monitoring per Sub-project	Responsibility for Monitoring	Budget
		 Consult the project Labor Management Procedure (LMP) Maintain the rights of labor in relation to establishing unions and collective bargaining. Exclude forced labor, including child labor during sub-project implementation and operation Remove discrimination in employment and occupation with respect to gender and disability. Set minimum wages, working hours, and occupational health and safety. When practical, consider a labor contract with a lump-sum payment for a certain type of service or scope of work. 				
Site clearance and excavation of subproject area and use of vehicles and heavy machineries	Impact on cultural heritages	 The screening/scoping exercise to be carried out for each subproject should strive to identify if any specific impacts on cultural heritages will arise in the process of subproject implementation. The ES instruments should propose necessary site-specific mitigation measures to prevent and avoid adverse impacts on the cultural heritages. 	 Complaint of the community on cultural heritage related issues Cultural heritage sites that undergo proper chance find procedures 	Quarterly	PMCU at MoWE, PIT at MoWE, Construction supervisor, Woreda administration, Woreda cultural and tourism	Part of sub- project implementation budget
All sub-project activities	Impacts on indigenous people	• Good faith negotiations should be conducted with local communities, based on transparent disclosure of risks and benefits of the project as well as capacity support for local communities and integration of international expertise prior to documenting the targeted FPIC outcome.	 FPIC obtained Complaints of indigenous people 	Quarterly	PMCU at MoWE. PIT at MoWE, Woreda administration, Regional states	Part of project implementation budget
All project activities	Impact of exclusion of women and other community groups	• Involve women and other community groups/members in the planning and management of water schemes/services with an understanding of the socio-cultural norms.	Observation and community complain	Quarterly	PMCU at MoWE, PIT at MoWE, Woreda administration, Woreda labor	Part of sub- project implementation and operation budget

Project Activities / Components	Impacts	Mitigation Measures	Monitoring Indicator	Frequency of Monitoring per Sub-project	Responsibility for Monitoring	Budget
					office	
MAR at Dire Dawa plains	 Impacts of MAR at the Dire Dawa plains Water quality issues may result due to untreated flood water/runoff to be used to recharge the target aquifer. Chemical differences between the water injected into and the water in the receiving aquifer could result in chemical reactions (such as transporting contaminants through flood and dissolving surrounding geological formations in the injected water) resulting water quality changes. Clogging of injection wells or infiltration reservoirs/ponds can reduce the amount of recharged water. Construction of small and micro- 	 Assess the quality of flood water/runoff to be used for aquifer recharge and identify potential contaminant sources within the catchment. Depending on the water quality assessment above, avoid the use of low-quality floodwater for recharge. Assess groundwater quality after aquifer recharge and consider appropriate technology to treat the water is quality is poor, particularly if there are health based hazardous chemicals are present. Determine the optimal combination of flooding and drying periods that yield maximum long-term accumulated infiltration rates. Conduct soil conservation and catchment management to reduce sediment load of flood water which could lead to clogging of infiltration reservoirs and wells. Small or micro-dam and associated reservoir locations should avoid, as much as possible, farmlands and lands with vegetation cover. This can also be considered as one of te criteria in locating the small or micro-dam and axis/location. Assess the safety of the small or micro-dams and determine potential risk downstream in the event of failure. Use renewable energy sources (such as photovoltaic systems) to lift water from boreholes. 	 Water quality test results Aquifer recharge rate or borehole yield and water level Sediment load in reservoirs Renewable energy used 	Quarterly	PMCU at MoWE. PIT at MoWE, Contractors, Woreda environmental office, WaSHCOMs	Part of sub- project implementation and operation budget

Project Activities / Components	Impacts	Mitigation Measures	Monitoring Indicator	Frequency of Monitoring per Sub-project	Responsibility for Monitoring	Budget
	dams could lead to					
	land uptake.					
	 Vegetation clearing 					
	could be required for					
	reservoirs which are					
	used to impound					
	flood water/runoff.					
	• Although it is not					
	expected to be					
	significant, there is a					
	risk of failure of the					
	constructed small					
	and micro-dams and					
	associated risk on					
	downstream					
	infrastructure (one of					
	the objectives of					
	aquifer recharge is to					
	store excess water in					
	underground aquifers					
	so that large dams					
	are not needed).					
	• Recovery of the					
	injected water will					
	require energy (for					
	pumps).					

POTENTIAL ENVIRONMENTAL AND SOCIAL BENEFITS, RISKS, IMPACTS AND MITIGATION MEASURES OF IRRIGATION SUB-PROJECTS

GENERAL

This chapter describes the general potential environmental and social benefits and risks of the HoA-GW4RP irrigation sub-projects. The irrigation sub-project activities will be site specific and generating impacts that are of high, substantial, and moderate significance which can be mitigated. The main irrigation sub-projects are summarized below.

- Pressurized irrigation development (~200 ha) in four woredas (namely Dire, Dillo, Yabello and Teltele) in Borena zone of the Oromia region including 7 irrigation development sites (namely Eldema, Mermero, Melka Sadek, Elkune, Elkune 2, Kobo and Hobok)
- Promotes the use of efficient renewable energy, such as wind and solar to lift water
- Promote soil conservation measures
- Enhance service delivery management capacity through strengthening community-level scheme management (WUAs) and building local operation and management capacities
- Strengthening groundwater institutions and information.

The environmental and social risks associated with the HoA-GW4RP irrigation sub-project activities are described as follows.

BENEFICIAL ENVIRONMENTAL AND SOCIAL IMPACTS OF IRRIGATION SUB-PROJECTS

Rural Employment and Income Generation

Construction work of irrigation structures require skilled, semiskilled and unskilled man power and create temporary job opportunity for several workers. As a result of increased population other job opportunities like supply of different commodities, accommodations, food outlets, restaurants etc. will be emerged and provide job opportunity for several jobless people.

It is also anticipated that indirect employment opportunities will be created within local communities through the provision of services to the construction teams, such as the sale of food and beverages. Truck and machine owners will earn money from renting out their vehicles for excavation and transportation of construction material and machines that will do various construction activities (excavations, clearing, and loading, among others). The irrigation equipment and agricultural inputs will be bought and supplied to the project sites.

Increased Farm Incomes from Crop Output

An increase in farm incomes as a result of increased and improved agricultural inputs and increased marketed crop output is anticipated. This would additionally be due to better and reliable market access of high-value crop produce that would fetch a good selling price as well as increased volumes of marketable output of different crops. As a result of increased incomes,

farmers will be able to access inputs which they will use to expand existing enterprises. The proceeds could also enable them purchase more pieces of land elsewhere where they could grow food crops that do not require irrigation, in order to utilize the irrigable land for commercial farming only.

Gender Impacts

Women could work as daily laborers and skilled workers during the micro and small dam construction and irrigation field preparation. Female-headed households in particular could benefit from the construction work through employment opportunities that would be created. They also gain working skill that can be applied in other similar activities. It also helps to develop confidence and self-sufficiency among women who involve in the construction work. The other benefit of the project for the women during the construction phase is that it would help to start small business such as opening tea houses, meal houses and small shops etc.

Poverty Reduction through Increased Agricultural Production

Developing and Expansion of irrigation farm would contribute to overcome recurring drought problems and associated failure of rain fed farming system. It will assure sustainable crop production at all years without depending on the rain fall. This would contribute for the overall economic development of the country through reducing dependence on rainfall and creating reliable job opportunity for many jobless people. This would solve frequently appearing shortage of food crops in the country as well as contribute to get foreign exchange through exporting the excess.

The HoA-GW4R project will promote increased agricultural productivity, diversification of agricultural crops and commercialization of agriculture from subsistence. The improvement in crop productivity will raise the income for the rural poor above the poverty line of less than a dollar a day. This is an indirect impact that will take a long process that will be felt after many years.

Improved Nutrition

Increased and diversified crop productivity is anticipated under the HoA-GW4RP. This implies that if the production is improved, there will be more food thus resulting in a decrease in prices hence making it affordable to all the members within the community to have access to food. In addition, the project plans to organize trainings of farmers on food nutritional aspects, healthy cooking menu /demo meals, promote nutrient-rich crops and animal proteins sources; kitchen garden demos with provision of bio-fortified seeds and promotion and distribution of poultry and small livestock, etc. This will lead to improved nutrition of project beneficiaries.

Environmental Protection

The project will promote intensification of agriculture as opposed to subsistence agriculture. It will reduce pressure of farmers to push onto more fragile lands or sensitive natural habitat or to rely on labor intensive gathering activities off-farm. HoA-GW4RP will thus intensify farm production through the increased and adequate use of improved inputs that increase productivity. This is an indirect impact that will protect marginal areas and sensitive ecosystems from agricultural encroachment. The Project will also maintain irrigation infrastructure (terraces, canals, etc.) in order to be efficient in controlling erosion. Though the project will prioritize

integrated pest management practices (IPM), it may also use pesticides for pest and diseases control. However, the increased use of pesticides on the fields may be a threat to the birdlife and beneficial insects (e.g., bees). The selection and adequately application of pesticide will be of great importance in fauna protection.

Efficient Use of Available Water and Land Resource

The current use of the proposed land is mainly grazing and not as such productive. Converting this land into irrigated farm would provide better production and efficient use of the land resource for the betterment of the local people as well as for the country.

HoA-GW4RP will invest in provision of equipment for water harvesting and water distribution for irrigation purpose. This will minimize water losses and increase water availability to more areas and crops. It will also protect the hydrological systems from sedimentation, flooding and contamination. This will control the rate of irrigation in the area and the country.

Impact of Labor Influx

Labor influx refers to people who typically do not reside in a project area who come to reside temporarily in the project area during the development or construction phase for the purpose of project-related employment, capturing economic opportunity. Project-induced labor influx may be direct, indirect, or associated.

Therefore, labor influx consists of the rapid migration to and settlement of workers in the project area, typically in circumstances where the labor/skills and goods and services required for a project are not available locally. In such cases, projects need to bring in the workforce (in whole or in part) from outside the project area. Projects can also attract additional people for speculative reasons ("followers"), including those hoping to find employment or businesses hoping to sell their goods and services to the temporary project workforce, as well as "associates" who often follow the first two groups to exploit opportunities for criminal or illicit behavior (e.g., prostitution, crime).

When located near an existing community, labor influx can have a positive effect on community wellbeing through supporting local businesses, volunteering, and mentoring local workers. It can also contribute to strengthening local community capacity and human capital (e.g., knowledge and skill resources held in the population). Labor influx, for example, can improve business for some local suppliers of goods and services and create new employment opportunities; and migrants' need for transportation, accommodation, and food can stimulate the local economy and create alternate livelihood and employment opportunities for current residents. More typically, though, labor influx is associated with negative effects.

ADVERSE ENVIRONMENTAL AND SOCIAL IMPACTS OF IRRIGATION SUB-PROJECTS

Impact due to Groundwater Aquifer Depletion

Similar to the water supply su-projects, groundwater used for irrigation could lead to resource over-exploitation and depletion. Although the planned irrigation interventions are mostly small-scale irrigation schemes, some of the schemes could extract considerable amount of groundwater and in areas where the groundwater resource is scarce (such as the lowlands where recharge is

limited), its impact could be significant and thus should be accounted. Groundwater development must be sustainable on a long-term basis.

To avoid or reduce impact due to groundwater depletion, mitigation measures to consider include identifying groundwater recharge and discharge conditions and determining the sustainable amount of groundwater to be extracted without causing appreciable reduction in groundwater level/yield (more information is provided under the water supply sub-projects impact analysis section, under the same heading).

•

Impact due to Groundwater Abstraction on Water Resources of the Area

Surface water and groundwater resources have the same reservoir and the two are interconnected with one another. Abstraction of the groundwater resources will affect the surface water flow regime and vice versa. Groundwater-surface water interaction, recharge and discharge, potential modification of surface water flow regime shall be considered as a potential risk. In general, impact on surface water resources such as elimination of streams or reduction of base flows of rivers could occur due to groundwater abstraction unless appropriate precautions are taken. Experience in some part of the country indicates that spring or stream flows could be reduced or eliminated due to over abstraction of groundwater. To reduce the impact of groundwater abstraction between surface and groundwater, and modifying groundwater extraction rates can be considered (more information is provided under the water supply sub-projects impact analysis section, under the same heading).

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Impact due to Water Use Right

In areas where water is scarce (such as the lowlands), it is inevitable that water use rights and associated conflicts occur. Water use rights could arise between domestic water users, animal water users, irrigation water use, and pasture lands. All these modes require water, directly or indirectly. Conflict can also be between other groundwater source users or surface water users.

Water use conflict can be mitigated through the following measures:

- Improve water use efficiency and reduce water wastage so that more water is available for use by the various modes or groups
- Avoid or reduce over-extraction surface and groundwater by the various modes or groups so that water will be available for all to fairly use
- Design and implement efficient irrigation systems such as lined canals or sprinkler systems so that water loss can be minimized (furrow irrigation with unlined canals will result in considerable loss of water, in some cases up to 50% of the irrigation water could be lost through percolation)
- In areas where groundwater is scarce, avoid planting water intensive plants such as sugarcane.
- Consider pricing water use to pay for effective management of the resource (the pricing, however, should protect access to water for the poor and disadvantaged communities)
- Engage all water users, communities, and other stakeholders in the management of the water resources including development, operation, and maintenance.

Impact due to Inefficient Water Use and Management

During sub-projects implementation and most importantly during operation of the sub-projects, inefficient water use and management will result in wastage of the resource that would have been available for other uses and beneficiaries. Water could be wasted through inefficient irrigation systems such as unlined furrows.

The following mitigation measures can be considered for efficient use of water:

- Estimate water balance at sub-project level during operation period to identify water management issue
- Implement effective water management system.
- Implement water conservation measures.
- Design and implement efficient irrigation systems such as lined canals or sprinkler systems so that water loss can be minimized (furrow irrigation with unlined canals will result in considerable loss of water, in some cases up to 50% of the irrigation water could be lost through percolation)
- Install water meters to monitor and control consumption, particularly for multi-village water supply systems.
- Ensure the proper sealing of all pipelines, valves and storage structures to avoid water loss.
- Avoid using the local communities' water sources and, as much as possible, try to develop own source during the construction period.

Impact due to Inefficient Energy Use and Management

Some of the small-scale irrigation schemes to be developed will entail use of electro-mechanical equipment (to pump water from wells) which require energy from fossil fuels, photovoltaic systems, and from the national electric grid. Further, energy is required for various sub-projects construction activities, particularly by machines such as drilling rig, compressors, mixers, vibrators, trucks, etc. Unless an efficient energy use and management is practiced, it will result in wastage of energy that could have been used for other purposes and resource exploitation. Implementing efficient energy management system shall be considered to mitigate impact related to energy use (more information is provided under the water supply sub-projects impact analysis section, under the same heading).

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Impact on Water Quality

During operation of the small-scale irrigation schemes, there is a potential risk of surface and groundwater pollution due to agricultural intensification and increased use of agro-chemicals. Water quality can be affected by residual agricultural chemicals (chemical fertilizers, pesticides and biocides) used for irrigation. Leaching of chemicals like nitrates and phosphates from agricultural activities and contamination of surface and groundwater by toxic and other undesirable chemicals could occur. In addition, the salinity of surface and groundwater may increase due to inefficient or improper irrigation practices. The actual effects of the chemicals are dependent on several factors such as the nature of the chemicals (pollutants) themselves, the physico-chemical characteristics of the recipient soils, the general climatic conditions prevailing in the area, and the dilution capacity of the recipient water body. The rate of groundwater contamination mainly depends on soil permeability, depth to groundwater and recharge rate, the

type of chemicals and intensity of application. Residual chemicals/pollutants may leach into groundwater or carried out to drainage ditches, and then to nearby streams, rivers and/or wetlands.

Leaching of nitrate is one of the potential sources of water pollution. Leaching occurs when the soil is wetted beyond field capacity and water drains from the root zone. This drainage water may contain significant amounts of nitrate in solution which eventually be carried to drainage ditches or leach into groundwater especially in areas where the water table is shallow and the aquifer is recharged locally with a residence time of shorter period.

Water pollution by residuals of persistent chemicals may cause adverse effects on human health and aquatic ecology. Contaminated water sources could be consumed by downstream users for drinking and other domestic purposes. In addition, aquatic organisms could be affected by residual chemicals.

The other possible source of water pollution will be due to mixing of saline water and freshwater abstracted from aquifers at different depths. If the aquifer has to be fully penetrated, there will be a likely risk of pollution due to mixing of the saline water abstracted from the underlying aquifer with the freshwater in the top layer aquifer. This situation may reduce the amount of usable freshwater. Continuous use of the polluted or saline groundwater for irrigation may result in accumulation of salt in the agriculturally fertile topsoil that ultimately may cause soil incrustation.

Unless appropriate care and water quality management and monitoring activities are undertaken as an integral part of the planned irrigation schemes, water quality problems could be one of the constraints. Therefore, detailed assessment of these issues needs to be carried out during subprojects planning and design.

The following mitigation measures can be considered to avoid or minimize impact on water quality:

- Avoid inappropriate waste disposal in the sub-project influence areas such as the surface water/groundwater catchments and sub-basins.
- Avoid application of persistent pesticides and herbicides in the planned small-scale irrigation schemes.
- Nitrogen and Phosphorous based fertilizers application shall only meet plant demand or avoid excess application of fertilizers.
- Encourage farmers to set realistic crop yield goals in order to provide an accurate account of plant nutrients need.
- Minimize irrigation erosion and runoff to reduce soil bound Phosphorous moving off the site.
- Adopt strategies that maintain soil structure and protect the soil surface to minimize Phosphorous losses.
- Educate and train farmers in techniques to manage and minimize nutrient losses through trainings and field demonstrations.
- Develop continuous groundwater and surface water quality monitoring system including pesticides and other agro-chemicals.

• Incorporate extension training programs to advise farmers on the most appropriate chemicals to buy, how to apply them, dosage, the need for PPE, and how to avoid accidents, etc.

Impact due to Water Logging and Salinization

Irrigation schemes often result is adverse soil modification which mostly depends on the quality of irrigation water, physical and chemical characteristics of the soil, frequency and efficiency of irrigation, adequacy of drainage, and climatic conditions. Among the adverse soil modification problems in irrigation schemes is waterlogging. It is a condition in the soil where free drainage is restricted so that excess water in the root zone area exists.

The likelihood of groundwater rise and the risk of soil salinization problem will depend on the depth of water table, water balance (recharge-discharge/abstraction rate), and the groundwater quality. In areas where groundwater is withdrawn for irrigation and efficient irrigation systems are applied, the risk of groundwater table rise will be minimal. Nevertheless, a perched water table could develop particularly in the areas of heavy clay soils if surplus irrigation water is applied. In areas where groundwater table is shallow and is not abstracted for irrigation or other purposes, efficient water application and sufficient drainage systems are highly required in order to minimize the risk of groundwater level rise. In addition, groundwater level monitoring will be required in order to check any potential problem.

The following mitigation measures can be considered to reduce the impacts of water logging and salinization:

- Use irrigation water economically by applying only the amount that will be required for the crop production.
- As much as possible, use irrigation system that minimizes water use, such as sprinkle and drop irrigation.
- Avoid unlined furrow irrigation where the groundwater table is shallow and saline.
- Improve water application efficiency.
- Provide appropriate drainage canals to minimize the risk of water-logging problem.
- Select salt tolerant crops in areas where salinity is a problem for salt sensitive crops.
- Conduct regular soil, groundwater and surface water quality monitoring.
- Conduct regular groundwater level monitoring to check any potential problem.

Impact on Ecosystems

Development of groundwater for irrigation could convert currently uncultivated land into permanent cropland. Expansion of irrigation development could encroach into ecologically important and sensitive ecosystems. Such an encroachment could adversely affect the habitats and ecosystems of the area. Application of agro-chemicals to increase soil fertility and to prevent pests and weeds could also negatively affect micro- and macro-organisms that dwell in downstream areas and could destroy the established food chain of the ecosystems.

The following mitigation measures could be considered:

- Minimize encroachment of irrigation farms into important and sensitive ecosystems.
- Avoid use of persistent agro-chemicals.

- Conduct regular monitoring of species diversity.
- Conduct water quality monitoring, particularly in sensitive ecosystem areas.

Impact due to Land Subsidence

Unmanaged groundwater utilization sometimes contributes to land subsidence. Land subsidence problem usually occurs when the water is over extracted from the aquifers. Through time, the hollow or vacuum created in the aquifer may collapse and sink to the bottom and form land subsidence. The following mitigation measures can be considered:

- Balance amount of water to be extracted with the amount of recharge.
- Develop groundwater level monitoring wells and establish critical level blow which extraction cannot be proceeded.
- Enhance groundwater recharge through soil and water conservation activities in the catchment.
- Create awareness among the users and planners that over extraction of wells could cause land subsidence.

Impact due to Degradation of Vegetation Cover and Groundwater Recharge

Loss of vegetation cover from the catchment for irrigation development could cause adverse impact on the rate of infiltration and percolation of water into the soil. Loss of vegetation would also increase surface runoff and reduce contact time of water in the soil. Moreover, loss of vegetation would adversely affect the micro- and macro- climate of the region and may contribute to the local climatic change and decline of rainfall. These eventually would reduce the recharging capacity of the groundwater and leads to shortage of groundwater.

The following mitigation measures can be considered to mitigate the impact due to loss of vegetation cover and associated reduction in groundwater recharge:

- Implement afforestation in sub-project influence areas.
- Promote agroforestry practices in sub-project influence areas.
- Identify groundwater recharging areas in catchment and plant selected trees which promote soil porosity and increase the hydraulic conductivity of the soils.
- Plant selected tree species on the boundaries of farming plots and on the side of irrigation canals.

Impact of Air Emissions and Decreased Air Quality

Construction and operation of the irrigation sub-project will result in emission of dust and other pollutants. The source of theses emissions could be excavation activities and operation of vehicles and heavy machinery which release exhaust gases. Air pollution affects people's health, affects the environment through reducing visibility, and blocking sunlight, causing acid rain, and harming forests, wildlife and agriculture. Also, vehicle exhaust emission results in greenhouse gases emission. Greenhouse gases pollute the air and result in the cause of climate change which affects the entire planet. Efficient energy use and application emission control techniques can be considered to mitigate the impact (more information is provided under the water supply sub-projects impact analysis section, under the same heading).

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Impacts of Wastewater and Water Quality

Wastewater may be generated during sub-projects implementation and operation including wastewater from irrigation schemes operations, storm water, sanitary sewage, used oils and lubricants from the pump stations and from vehicles engaged during sub-project construction. Wastewater can pose pollution risk to water resources thereby harming the environment and water users. Especially, borehole drilling operations apply drilling foams and bentonites to enhance the drilling efficiency. As a result, drilling discharge or sludge contaminated with chemicals are released from the operation (more information is provided under the water supply sub-projects impact analysis section, under the same heading).

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Impact due to Hazardous Materials

Hazardous materials can be classified according to the hazard they pose such as explosives, compressed gases, toxic gases, flammable gases, flammable liquids, flammable solids, oxidizing substances, toxic materials, radioactive materials, and corrosive substances.

Construction and decommissioning activities may pose a potential for release of petroleum-based products, such as lubricants, hydraulic fluids, or fuels during their storage, transfer, or use in equipment. These materials may also be encountered during decommissioning activities from electro-mechanical equipment, storages, and water supply treatment facilities. Mitigation measures to consider include providing adequate secondary containment tanks, using impervious surfaces for refueling area, and training workers on proper handling and disposal of hazardous materials (more information is provided under the water supply sub-projects impact analysis section, under the same heading).

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Impact due to Solid Wastes

Solid (non-hazardous) wastes generally include any garbage, domestic waste, construction refuse, and construction spoils. Examples of such waste include domestic trash and garbage, inert construction / demolition materials, construction refuse such as metal scrap and empty containers (except those previously used to contain hazardous materials which should, in principle, be managed as a hazardous waste), and residual waste from irrigation schemes operations. Solid wastes shall be properly collected, segregated, stored, transported, and disposed at designated and approved sites.

Noise and Vibration Impacts

Construction activities of sub-project will cause noise and vibration in the environment. The main sources of noise and vibration are operation of drilling rigs and compressors, machines used for foundation and trench excavation, machines used for access road construction, vehicles and trucks used for various construction activities, and power tools and equipment used during construction. Also, operation of electro-mechanical equipment such as surface pumps and generators will generate noise and vibrations. Noise and vibration reduction measure to be considered include selecting equipment with lower sound, using mufflers, and maintenance of equipment periodically since faulty equipment make more noise (more information is provided under the water supply sub-projects impact analysis section, under the same heading).

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Impact of Contaminated Land

Land is considered contaminated when it contains hazardous materials above background or naturally occurring levels. Contaminated lands may involve surficial soils or subsurface soils that, through leaching and transport, may affect groundwater, surface water, and adjacent sites. Where subsurface contaminant sources include volatile substances, soil vapor may also become a transport and exposure medium, and create potential for contaminant infiltration to indoor air spaces of buildings/dwellings. Preparation of a management plan to manage obsolete, abandoned, hazardous materials or oil consistent with the approach to hazardous waste management shall be considered to mitigate the impact (more information is provided under the water supply subprojects impact analysis section, under the same heading).

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Impact of Soil Erosion and Land Degradation

Soil erosion may be caused by exposure of soil surfaces to runoff and wind during site clearing, earth moving, and excavation activities. Mobilization and transport of soil particles may, in turn, result in sedimentation of surface drainage networks, which may result in impacts to the quality of natural water systems and ultimately the biological systems that use these waters. Construction of access road will require vegetation clearing, excavation, and filling with selected materials. Material production sites can expose the soil structure to erosion unless necessary precautions are taken. Mitigation measures include avoiding land clearing as much as possible, frequently removing construction spoil, revegetation of exposed areas, providing runoff protection measures, and rehabilitating excavation and construction materials production sites once their use is completed (more information is provided under the water supply sub-projects impact analysis section, under the same heading).

Impact on Terrestrial Ecosystem and Biodiversity

Construction of irrigation infrastructure and development of the command area could remove existing ecosystems and permanently take up bushland, grassland, woodland, riverine woodland and wetland which are important ecosystems the loss of which would significantly affect the ecosystem of the area.

HoA-GW4RP irrigation sub-projects will be implemented in the lowlands of Borena zone of the Oromia region. These areas are mainly covered by Acacia-dominated woodland having a highly fragile ecosystem. Site clearing activities to prepare the various sub-project sites will result in the removal of the existing and limited fauna and flora, further affecting the fragile ecosystem in the project areas. Thus, there will be a need to minimize and mitigate potential risks to the fauna and flora resources in the project area.

Impact on Aquatic Biodiversity

Implementation of sub-projects could indirectly affect the aquatic flora and fauna. Unmanaged abstraction and utilization of groundwater may have an impact of surface water resources of a specific sub-project area. Elimination or reduction of water level or baseflow in surface water resources (such as streams, rivers, wetlands, lakes, etc..) could, in turn, eliminate or restrict the

aquatic habitat or ecosystem resulting on impacts on the aquatic flora and fauna. Further, water quality deterioration of surface water resources as a result of sub-project activities could affect the aquatic species. Maintain environmental flows in surface water resources and where necessary reduction in the rate of groundwater extraction shall be considered to reduce the risk (more information is provided under the water supply sub-projects impact analysis section, under the same heading).

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Impact of Loss of Properties and Settlements

Loss of land and assets on land (crops, trees and structures) due to construction works is anticipated during HoA-GW4RP implementation; hence resulting in people's displacement and assets loss. The preparation of a resettlement action plan (RAP) according to the RF to fully compensate for lost/damaged property and resettle the displaced persons is compulsory to mitigate this impact.

Some crops and trees established in the site selected for post-harvest infrastructure will have to be cleared before construction. The project affected people (PAPs) would lose all benefits they expect from these enterprises including food for home consumption, produce for sale and fodder for livestock. The risks of introduction of invasive species into the area through construction machines or labor force are also anticipated.

The scope of impact will be localized and felt in the construction area. The impact will also be long term in terms of duration on construction sites because the crops and land will be lost for as long as the project is implemented.

This impact is unavoidable and will be mitigated through compensation measures which will include compensation of land, crops and trees on construction sites. The tree or grass clearing should only be limited to construction site and the introduction of invasive species in the area should be avoided. Tree or grass planting should also be planned to replace lost plant species. It is also important to avoid construction in sites of importance within the broader region or landscape.

Impacts of Occupational Health and Safety

Sub-projects will employ labor force for their various construction activities. Communicable diseases like tuberculosis, malaria, diarrhea, etc. are therefore likely to be disseminated especially during peak demand for manpower. Further, different types of accidents at sub-project sites can cause injuries and fatalities including through handling of construction equipment's, spills and leakage of hazardous materials, stepping on or using sharp objects, fires, and accidents by vehicles and heavy machineries, etc. The OHS risks and impacts are likely to increase due to large manpower and traffic involved in construction activities. The occupational health safety risk include:

- Risk of hitting by moving parts during operation of heavy machineries (such as drilling rigs, compressors, and generators) and during installing materials and equipment (well casings, pumps, generators, pipes, fittings, etc)
- Traffic safety during movement of machines and vehicles
- Risk of falling in due to open pits and canals (this is also a community health and safety issue)

- Hazardous chemical related risks (such as drilling foam, bentonite, oil, fuel, etc ...)
- Solid waste related risks
- Manual handling risks during most of the construction work
- Housekeeping (often resulting in slips, trips, and falls).

The occupational health and safety risk can be mitigated through the following measures:

- The construction area shall be surveyed before work begins to ensure that adequate ingress and egress is provided for personnel and equipment.
- Good housekeeping to remove potential slip, trip, and fall hazards.
- As much as possible avoid work at height. If not, use proper access equipment, such as scaffold/work platform, for all work at height required.
- Access equipment (where necessary) shall be checked before work commences to ensure stability.
- Sides of excavation must be supported/battered where there is a risk to collapse.
- Inspect supported excavations before work commences each day.
- Personnel must stay within the protection of the excavation at all times.
- Substantial barriers to be erected around excavations.
- Suitable signs and barriers to be provided to warn of the work being undertaken.
- Ladders, stairs or ramps to be provided for safe access/egress, where necessary.
- Work shall be coordinated so as to reduce risks to workers from falling objects.
- Site traffic must avoid the area where work is in progress as far as practicable.
- First-aid kit shall be available on site.
- Fire extinguishers shall be available on site.
- The placing of a second person (fire watch) on stand-by in case of emergency should be considered.
- Work shall be undertaken away from flammable materials (at least 15 m).
- Materials shall be properly staked (low stake rise, anchored and barricaded off).
- Practice safe manual handling techniques (plan, get help if needed, place your feet firmly, bend your knees not your back, firm grip, lift with legs, etc).
- Where possible, manual handling to be reduced by use of mechanical devices.
- Material safety data sheet (MSDS) shall be provided for all products so that workers are informed on precautionary measures.
- Hand washing facilities shall be made available.
- Provision and use of PPE (high visibility vests, hard hats, safety boots, hand gloves, face masks, ear plugs, welding visors, overalls, safety harness, safety glasses, etc.)

Loss of Biodiversity due to Inappropriate Pesticides Application

During pesticides application, some residues are released into the air and can settle on the ground, broken down by sunlight and water in the atmosphere or dissipate into the surrounding air. Pesticides in the air become a health risk depending on toxicity level, quantity of the pesticides in the air, the quantity that a person breathes or gets exposed to. Furthermore, there exists different species of birds, beneficial insects like bees in the project areas which could be affected by pesticides. In all instances, where high input-dependent crop/pest practices are adopted, pesticide misuse is known to be common and can result in the following impacts:

• Destruction of crop pollinators leading to poor crop yields;

- Elimination of the natural enemies of crop pests and subsequent loss of natural pest control that keeps the populations of crop pests very low;
- Development of pest resistance to pesticides, encouraging further increases in the use of chemical pesticides,
- Contamination of soil and water bodies and toxicity to fish and birds;
- Proliferation of aquatic weeds;
- Pesticide poisoning of farmers and deleterious effects on human health and unacceptable levels of pesticide residues in harvested produce and in the food chain; and
- Loss of biodiversity in the environment, particularly of the aquatic non-target species.

Impact on Public Health

The major health problem during the operation phase of sub-projects would be waterborne and water related diseases. Malaria is the most prevalent of the top ten diseases of the project area. The reservoir and irrigation canals would create more conducive places for the multiplication of mosquito and other water related diseases. Schistosomiasis/bilharzias could also be increased during the implementation of the irrigation project. Health risks like sexually transmitted diseases including HIV/AIDS and COVID 19 are also expected to persist during the operation phase of the project.

Impacts due to Construction Camp Site and Other Ancillary Facilities

During construction period, there are different adverse impacts emanating from construction of ancillary facilities, such as camp site, storage areas, garages, etc. These impacts will be induced soil erosion and sedimentation leading to subsequent deterioration of water quality, dust, and noise pollution, respiratory illnesses related to dust pollution, compaction of soil; traffic accident on local community and workforce, solid waste (household wastes & spoil material), competition for electricity, land use change; disfiguring of landscape; spillage of oils, lubricants and other chemicals. Thus, there could be adverse impacts stemming from inappropriate management of waste disposal, air pollution, competition for water and electricity around these camp sites.

Impact on Gender Based Violence (GBV)

The recent socio-economic processes in small-scale irrigation agriculture exacerbate gender disparities to the detriment of women. The increasingly low profitability of small-scale agriculture (typical for the subsistence type of agriculture in Ethiopia) puts at risk the viability of livelihood strategies of small and increasingly impoverished farmers, notably elderly and female farmers with caring responsibilities. In Ethiopia, these serious problems could be addressed by extension work providing knowledge in improved farming practices, access to market and the cost-effective use of irrigation water for high-value crops and crop diversification. In Ethiopia (both for pastoral and non-pastoral communities), support is needed in the development of communal water-saving irrigation systems and infrastructure (e.g., water reservoirs, pressurized irrigation systems), plus support in accessing suitable financial instruments. The explicit consideration of specific financial, knowledge and capacity development needs of different groups of women is vital.

Interestingly, despite very significant cultural and socio-economic differences between study locations (Oromia, SNNP and Somali), the RF allowed to identify patterns common to both places, understand the effects of the interacting processes on governance outcomes and livelihood strategies, and highlight opportunities for sector policy and donor-funded interventions
that are conducive to overcome gender and other social inequality constraints. Policy recommendations arising from these findings focus on the need for (1) explicit analysis of gender-specific effects of technical properties of irrigation development, (2) special attention paid on the design of tailored extension programs for female and male farmers, and (3) support to overcome gendered cultural limitations to participation in the management and governance of irrigation systems. It seems advisable that researchers, project planners and implementers extend the 'usual' audience of their gender analyses to technical experts in irrigated agriculture, as they are typically not engaged in gender analysis of programs.

Gender-based constraints vary by irrigation type, and specifically by (1) household technology adoption, such as private wells and pumps, and (2) shared water resources, such as canals or small reservoirs. Women often face constraints in both areas, and lack of access to shared water resources may preclude adoption of household technologies. Because these issues manifest distinctly in different contexts, flexible, participatory approaches are required to identify and respond to the specific constraints in a given setting.

Impact of Labor Influx

The project will require labor for construction. Work may be taken by "outsiders" rather than local residents, creating tensions and missing opportunities for mitigation of disruption to local lifestyles due to project implementation. The population is poor and resources are scarce. Therefore, although construction wages are not high, the temporary employment opportunities offered by the project will be significant and competition is likely to be intense. "Outsiders" are likely to be attracted to the area in search of work.

The project does not contain information on construction planning, so the probable size and skills of the workforce are unknown at this stage. The project involves a large volume of earthworks, but much of this has to be carried out with considerable accuracy and therefore is likely to be machine-intensive rather than labor intensive. However, there will still be a large unskilled labor requirement.

Recruitment policies will need to consider social issues and project acceptability. Considering the high local impact of the project in terms of land and disruption of existing lifestyles, together with the distrust of "outsiders", it is probably wise to maximize local employment. Local residents are looking forward to construction-related employment opportunities, especially women and landless youth. Local benefits would be maximized and some of the negative impacts of construction mitigated if local residents, especially the most severely project-affected people (PAPs), are given priority for recruitment.

Impact of Child Labor

Children involved in child labor are more likely to experience worse health outcomes later in life. The impact of hazardous work can cause profound and long-lasting health problems that may only become evident in adulthood. This makes them difficult to measure or even prove. Cancer, infertility and chronic back pain are just some of the possible long-term negative health outcomes. The consequences are worsened by poverty and the lack of efficient health and social security schemes.

There is also the potential impact of child labor on individual's mental health. However, like other aspects of health and child labor, the magnitude of the issue is hard to measure and is

therefore less known. First and foremost, child labor should be stamped out, especially in its worst forms. The international community has committed to the eradication of child labor.

The Sustainable Development Goals sets the target of ending child labor in all its forms by 2025. However, this is increasingly looking less likely. This is why we need renewed commitments and efforts by all, especially by governments where there is high prevalence of child labor, the private sector involved in supply chains that involve child labor, civil society and other stakeholders. The solutions are known, it is the commitment and resources that need reinvigorating.

In terms of health, there needs to be trained and sufficiently resourced health and safety or child protection officers to respond to the health and safety impacts on child labor. While the elimination of child labor is the ultimate goal, in the interim, when child labor is still prevalent, we must do our utmost to prevent injury, harm or even the death of children involved in child labor. When children are freed from the burden of child labor, they are able to fully realize their right to healthy development.

Children are exposed to accidental and other injuries at work. They should thus be protected to prevent social, economic and physical harm, which persist to affect them during their lifetime. Such injuries include:

- General child injuries and abuses like cuts, burns and lacerations, fractures, tiredness and dizziness, excessive fears and nightmares.
- Sexual abuse, particularly sexual exploitation of girls by adults, rape, prostitution, early and unwanted pregnancy, abortion, Sexually Transmitted Diseases (STDs) and HIV/AIDS, drugs and alcoholism.
- Physical abuse that involves corporal punishment, emotional maltreatment such as blaming, belittling, verbal attacks, rejection, humiliation and bad remarks.
- Emotional neglect such as deprivation of family love and affection, resulting in loneliness, and hopelessness.
- Physical neglect like lack of adequate provision of food, clothing, shelter and medical treatment.
- Lack of schooling results in missing educational qualifications and higher skills thus perpetuating their life in poverty.
- Competition of children with adult workers leads to depressing wages and salaries.

Apart from the above, lack of opportunity for higher education for older children deprives the nation of developing higher skills and technological capabilities that are required for economic development/transformation to attain higher income and better standards of living.

Impact on Community, Health and Safety

Intensification of agriculture as a result of the irrigation scheme development is highly likely to result in the intensification of problems from pests and diseases. At present, crop pests and diseases cause major economic losses in the Borona zone. Most damage is caused by insects, followed by weeds, storage pests, and plant diseases. Irrigation and drainage will remove primary constraints to crop productivity; after plant nutrition is dealt with (by fertilizers), biotic constraints (weeds, insects and diseases) are likely to prove the most significant limiting factors, especially for horticultural crops.

At present, the landscape is relatively diverse and provides habitat for a variety of birds, some of which are insectivorous and therefore provide a form of natural pest control (although some birds are now regarded as occasional pests on cereal crops due to changing agricultural practices. After development, the landscape may become less diverse, especially if wetlands are drained, with potential loss of these natural predators. More importantly, the intensified cropping systems will rely on improved crop varieties which tend to require agrochemical inputs to reach their yield potentials.

On the other hand, as noted under Construction activities, sexually transmitted infections and HIV/AIDS are not linked to the environment but to human behavior. The consequences of operation of the scheme for sexual behavior of the population are hard to predict. Improved general education and specific awareness of STD and HIV/AIDS prevention techniques can both be expected to improve, in line with a general increase in living standards. At the same time, increased economic activity resulting from the scheme, especially at market centers, is likely to result in more bars and prostitution in these locations. Of particular importance for sexual disease prevention is the degree to which women are socially and economically empowered by the project.

In general, operation of the project is likely to change the incidence of some other diseases and causes of injury, ill-health and death. Some of the changes will be positive, others negative unless mitigated.

Impact of Groundwater Quality on Human Health

Groundwater will normally look clear and clean because the ground naturally filters out particulate matter. However, natural and human-induced chemicals can be found in groundwater. As groundwater flows through the soil, metals such as iron and manganese are dissolved and may later be found in high concentrations in the water. Hydro-chemical characteristics are widely used to indicate the source of the main components of ions, types of groundwater, water-rock interactions, and groundwater reservoir environments. Knowledge of hydro-chemical characteristics is useful for evaluating groundwater quality because it provides an understanding of groundwater suitability for various purposes. Investigations have shown that exposure to potentially toxic chemicals, such as heavy metals, fluorides, and nitrate in groundwater can pose major risks to human health. Moreover, industrial discharges, urban activities, agriculture, groundwater pumping, and disposal of waste all can affect groundwater quality. Contaminants can be human-induced, as from leaking fuel tanks or toxic chemical spills. Pesticides and fertilizers applied to grasses and crops can accumulate and migrate to the water table. Leakage from septic tanks and/or waste-disposal sites also can introduce bacteria to the water, and pesticides and fertilizers that seep into farmed soil can eventually end up in water drawn boreholes. A borehole might be placed in land that was once used for something like a garbage or chemical dump site if not carefully selected.

Impact of Cultural Heritages

The impact of HoA-GW4RP sub-projects on cultural heritage sites is going to depend on the presence of such cultural, historical, religious or archeological sites in the sub-projects implementation areas. Given that the supported HoA-GW4RP activities will be carried out in most regional states and 67 woredas the potential location of subproject sites under HoA-GW4RP will cover a wider geographical area and hence there still exist a potential for certain subprojects to affect cultural heritage sites valued and recognized by the local communities.

The sub-project works would involve earthworks, temporary and permanent land uptake in areas with significant level of known physical cultural heritages, and thus there is a possibility of encountering previously unknown heritages (archaeological remains such as stone tools made by Early Man). Construction activities could physically destroy artifacts or change conditions so that artifacts are affected through changed hydrological conditions, improved access and therefore risk of vandalism and theft. Construction of temporary access roads and construction materials production sites could pose the same risk of affecting unknown cultural heritages.

The screening/scoping exercise to be carried for each subproject should strive to identify if any specific impacts on cultural heritages will arise in the process of subproject implementation. In the event that cultural heritages are identified, the ES instruments should propose necessary site-specific mitigation measures to prevent and avoid adverse impacts on the cultural heritages. In the course of construction, archeological, cultural or historic sites identified are treated by the chance find procedures developed for the project (see Annex VIII).

Impact on Traffic

The proposed HoA-Groundwater for resilience project is likely to cause temporary impacts on traffic volume and traffic flow in the area. This is mainly associated with movement of drilling rigs, heavy trucks, compressors, water trucks, and other machineries that will be used for well drilling and construction of other components of the water supply schemes. As a result, during the construction phase, it is anticipated that the traffic flow will be slightly disturbed on main and rural roads available around a specific sub-project area. Traffic signs and safety guides should be arranged in advance and be in place to avoid unnecessary traffic interruptions and associated risks.

Impact of Exclusion of Women and Other Community Groups/Members

In the case of this project, possible losers are (i) female-headed households, who may not have been treated fairly during the land reallocation process due to their social marginalization, and/or may be landless in any case, and/or may not be able to provide the skills and labor needed to manage their land and irrigation scheme under the new conditions; (ii) fishing families, if fish stocks are affected by the changes in habitat associated with the project, and (iii) individuals adversely affected by new technologies, especially pesticides. Note that although land reallocation is likely to disrupt some existing mutual support networks, such as the tradition edir or equb, over time these should become re-established.

Possible winners will include, in addition to most farming households, (i) existing landless individuals (mostly the young) who will be able to benefit from the increased demand for irrigation scheme construction labor and employment in the various service industries which will be required, (ii) women able to develop microenterprises (which assumes that the necessary support mechanisms are provided), and (iii) households using the lakeshore resources, if individuals from the households become involved in a benefit from the proposed irrigation scheme.

Impact due to Labor Issues

The goal of the project is to transform the GW water supply use and management practices in Ethiopia. The project is intended to construct small-scale irrigation schemes in Borena zone-Oromia regional state. The way of life is associated with deeply entrenched cultural and religious

traditions. It is also associated with heavy labor demands, especially on women, low returns, low standards of living, and few prospects for upward mobility.

Changing this system to one based on double or triple cropping through irrigation-based cultivation for both domestic staples and outside markets will require very large adjustments in household lifestyles and practices: .new tools will be needed, and new skills; the need for cultivations will increase and therefore the demands on large livestock; labor demands over the year will increase above the existing high levels, with differential impacts on men and women. In addition, there will be a need for new institutions, for irrigation backed cultivation, crop processing and storage facilities, for marketing, and for changes in knowledge, attitudes and behavior. There is a clear requirement for trials and proof-of-concept at household level and farm level before scaling up to full implementation. This will be necessary in any case, as part of the research required to identify and develop the various extension and inputs packages that will be required.

Impacts on Indigenous People (as described in ESS 7)

It has been determined that some of the people resident in the project areas meet the criteria such as pastoral communities in Afar, Benishangul Gumuz, Gambela and Somali regions and parts of Oromia and SNNP are regarded as meeting the Bank safeguards category 'indigenous peoples', hence fell into that category. The woredas in Afar, Somali, some part of Southern Nations and Nationalities and People (SNNP) and Oromia regions cover underserved, pastoralist communities. Some of these pastoralist communities are vulnerable to chronic food insecurity and a home to historically underserved groups. Owing to their limited access to socioeconomic development and underserved status over the decades, Afar and Somali are among the four regions the Ethiopian government has designated as Developing Regional States.

Findings of the community and stakeholder consultation and other World Bank financed projects, which looked at the potential impact of interventions of the HoA-GW4RP on the most vulnerable and historically underserved populations were reviewed and analysed. Moreover, as part of the program's and GBV risk assessment exercises, extensive community consultations with vulnerable groups were conducted, and discussions were made with federal level stakeholders including development partners. As the result, women in male headed and female-headed households, polygamous households, pastoralist households, unemployed rural youth, labor-poor households, the elderly, pregnant and lactating mothers and malnourished children, were identified as the most vulnerable and historically underserved populations in relation to the project's implementation.

Addressing Security Risks/impacts

Using a shared problem and shared solution approach: There is a need to shift the national narratives around water resources and their governance-moving from a narrative of competition and tension to one of shared problems and shared solutions. For this it is necessary to identify a trusted community leader and community mediator who can shape the narrative around water, energy and land, and raise this narrative to the highest political levels. It will be crucial to enable regional states and various ethnic groups to develop a joint vision for the nation that stresses opportunities and implements cooperative solutions for Ethiopia.

Develop domestic trans-boundary diagnostic analysis and a strategic action program: There is a need for more solid, shared and jointly accepted information. Reliable data can guide policies

and decision makers in dealing with the current challenges as well as better anticipate climate impacts and climate-related security risks. The domestic trans-boundary diagnostic analysis can be used to develop a strategic action program like the HoA-GW4RP that supports actors in identifying clear priorities, identify reforms and resolve problems. In addition to the project itself; it is essential to develop 'Security Risk Management Plan', Stakeholder Engagement Plan, Grievance Redress Mechanism and Benefit Sharing Plan.

Better understanding on the national socio-economic and political dynamics: a comprehensive and better understanding is needed on how to change the political, economic, and sociocultural incentives that undermined resilience and social cohesion in the first place or prevented necessary actions to be taken – in other words, the political action and inaction that created the "cracks in the system" or ignored them until it was too late. It means thinking about timescales or in whose political interests building resilience might fit; i.e., short-term electoral cycles, financial markets, program cycles versus what Krznaric (2020) has called "cathedral thinking" – building now for future generations rather than just our own. This needs better understanding of how to shift elites' incentives. While the historical evidence provides some important insights, there is need for much more systematic research on this in a range of areas and contexts.

Using existing conflict resolution methods and employing time tested solutions: As the project is going to be implemented in both farming and pastoral communities, it is important to take into account their modes of livelihood activities that pass through significant dynamism due to ecological, social and political pressures and the resultant decline in their economy. Such changes have had an impact on the pattern of their relationships of the communities living in the project implementation regions. It further affects the relationships among pastoral and agropastoral clans on one hand and between the pastoral and agro-pastoralists and non-pastoral neighboring communities on the other hand. From the desk review on the E&S safeguards instruments of the WB-financed projects, lessons were learnt how to proceed in the process of conflict management. First, clear understanding about the root causes and magnitude of the conflict. Second, discuss the ways to resolve the conflict with group leaders, elders, and regular members. In this case, it is advised that, be as inclusive as possible and make sure you have not omitted anyone who is directly or indirectly part of the conflict. Third, identify members having extremely negative positions and work with them individually. Fourth, stress repeatedly that group members must be immune from bias in the process of managing conflict and that the common enemy is poverty, not each other. Fifth, give a chance for group members to resolve the conflict themselves using their own problem-solving mechanisms. If this fails, then outside mediators can become involved. Sixth, change anything linked with religion or culture as it needs a slower process, but progress can be achieved. In this respect, the support of community leaders must be sought at the start. Lastly, in some cases, conflicts cannot be resolved and some people may have to leave their groups. Such a process needs to be formalized and include recovery of outstanding resources and other property that belongs to the group.

Tradition Dispute Resolution Mechanism for HUTLCs

The main causes of conflicts among pastoral and agro-pastoral communities of the lowland areas of Ethiopia selected for this RF were: pasture or grazing land, shortage of water, cattle raids and adultery. In all Woredas selected for this, ESMF drought brought scarcity of grazing land and water resources for their livestock and human being; as a result, PAP communities are forced to travel longer distance even crossing their boundaries where they can get available feeds and water. This in turn resulted in the causes of inter-ethnic conflicts that claim life and property.

Cattle raid is the outcome of marriage practices of the community among the Hamar and Benna, because for a man to marry a girl, the need for bride wealth forced him to loot a nearby ethnic group's livestock. Adultery in some ethnic groups, such as the Afar and Somali, is not allowed and a cause for conflict.

Pastoral and agro-pastoral communities have their own traditional conflict resolution mechanisms even if the approach of solving and managing the conflict differ according to the traditional practice of a certain ethnic group. The traditional conflict management mechanism is through the traditional elders without the involvement of government officials. First of all, elders from the mobile community will approach the host elders and with the permission of the host elders migrating animals are allowed to graze and use the water whenever the mobility is within the same clan. In SNNPR, for instance, the PAP communities of the Hamar and Benna Tsemai manage conflicts by way of the Denb system, which is a local institution that play role in sociocultural, political and legal aspects. In addition to the traditional inter-ethnic grievance redress mechanisms, the participation of regional, zonal, Woreda and Kebele government officials play vital role in solving conflicts. More than this, the involvement of community committee comprised of elders and balabats from the two conflicting parties take part and try to settle the problem as much as possible by cooling down the family of dead person. The Hamar and Kara ethic group have a tradition of correcting the perpetrators through whipping them seriously using a traditional Baraza stick and pay compensation for the relatives of the dead person. Likewise, clan leaders play a key role in maintaining social order, coordinating social activities, and managing common property resources such as pasture and water where collective action is embedded in Afar culture. The longstanding conflict resolution system of the Afar is known as Makboon, which varies across clans. In the context of Kori and Dubti Woredas, the source of conflict could be grazing land, water; unexpected killing of a person and looting of livestock. Such conflicts may be experienced in intra-clan, inter-clan or inter-ethnic. The conflict may also be among individual pastoralists of households. The tradition of Makabon is helpful in resolving most of the disputes in the Afar community. Through these traditional laws resource conflict, divorce and theft cases are handled. Whenever this traditional law fails to resolve the conflict, the community leaders and the Woreda administrative bodies will handle it together, for example, the issue of sexual abuse of women and any type of death.

In Gambella, conflict can result due to cattle theft, unarranged or unapproved marriage and murder. In both circumstances, the role of the customary conflict resolution mechanism is essential. For example, the process of solving conflicts by elders of the Nuer traditionally called 'Duol'. Among the Somali pastoralists and agro-pastoralists in Harshin and Gursum Woredas, the traditional conflict resolution system is known as 'odiyash deganka'. According to this system, when conflict happens, the community informs the clan leader. Clan leaders manage inter-clan and intra-clan conflicts through Ola system by bringing together the two foes in order to reconcile and stop their enmity. If the conflict is with non-Somali ethnic groups, it is handled and settled by the Ugas who is the leader of clans in Somali ethnic groups that has the supreme power and any decision made by the Ugas is automatically accepted by the ethnic group. So, the Ugas together with clan leaders are responsible to resolve inter-ethnic conflict. The Oromo have also their own traditional conflict resolution called Jarsuma (conciliation of elderly) which is under the bigger umbrella of the Gada system. Parallel to resolving issues through the Gada system, more specifically Jarsuma, conflicts in the area are resolved through the formal government structures from Kebele to higher judiciary system.

ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLANS FOR IRRIGATION SUB-PROJECTS

Environmental and Social Management Plan for Irrigation Sub-projects

(<u>Note</u> – This ESMP is indicative and shall be further developed and updated prior to sub-projects implementation. Further, Contractor's-Environmental and Social Management Plan (C-ESMP) shall be prepared prior to sub-projects implementation.)

No	Potential Positive and Negative Environmental Impact	Possible Mitigation / Enhancement Measures	Implementation Period	Responsible Institution	Budget Estimation
Positi	ve Environmental and S	Social Impact			
1	Rural employment and income generation	 Temporary job opportunities shall be available during the construction phase of the project and shall include casual laborers, food catering, artisans, etc. As much as possible, workforce during project implementation and operation shall be from the local community. As much as possible, encourage the local labor force to work on skilled labor categories in addition to the unskilled job opportunities. 	During implementation and operation periods	PMCU at MoWE, PIT at MoIL, Contractors, Woreda administration, Local administrations and communities	Part of sub-project implementation and operation budget
2	Increased farm incomes from crop output	 Facilitate selling of agricultural products by farmers through creating access to market. Provide adequate credit facilities at reasonable rates to be used by farmers to increase production and income. Farmers shall be provided with quality inputs at the right time and price. Provide agricultural warehouses and parts stores to support farmers. 	During operation period	Woredas agricultural offices	Part of sub-project operation budget
3	Poverty reduction through increased agricultural production	 Adopt more diversified cropping pattern and switch from low-value subsistence production to high-value market- oriented production. Increased agricultural production to make food available to the rural poor. 	During operation period	Woredas agricultural offices	Part of sub-project operation budget

Table 0-1 Environmental and Social Management Plan (ESMP) for Irrigation Sub-projects

No	Potential Positive and Negative Environmental Impact	Possible Mitigation / Enhancement Measures	Implementation Period	Responsible Institution	Budget Estimation
		 Ensure equitable access to land, particularly by the rural poor. Ensure proper water management to make the resource available to all, particularly to the rural poor. Use modern agricultural technology to increase production. 			
4	Improved nutrition	 Nutrient rich crops shall be considered for irrigation farming. Consider diversified cropping pattern to enable consumption of different food groups with varying nutrient contents. 	During operation period	Woredas agricultural offices	Part of sub-project operation budget
5	Efficient use of available water and land resource	 Construct or install water efficient irrigation systems such as lined furrows or sprinklers. Parodically and properly maintain irrigation systems to avid water loss. Consider irrigation systems that allow efficient use of available land (furrow irrigation is governed by topography of an area while sprinkler technology allows use of land that would have been technically unusable through furrow irrigation). 	During implementation and operation periods	PMCU at MoWE, PIT at MoIL, Contractors, Regional agricultural offices, Woreda agriculture offices	Part of sub-project operation budget
Negat	ive Environmental and	Social Impact			
1	Impact due to groundwater aquifer depletion	 Conduct well pump testing to characterize the capacity of recharge and discharge (to determine the safe yield and recovery rate) Measure discharge of springs, particularly the lean discharge during dry periods. Determine sustainable amount of groundwater to be extracted without causing appreciable reduction in groundwater level Assess/model groundwater recharge and discharge rates for the specific catchment or sub-basin Monitor the groundwater characteristics such as static water level, dynamic water level, drawdown, and safe 	During implementation and operation periods	PMCU at MoWE, PIT at MoIL, Contractors, Woreda agricultural office, Woreda environmental unit	Part of sub-project implementation and operation budget

No	Potential Positive and Negative Environmental Impact	Possible Mitigation / Enhancement Measures	Implementation Period	Responsible Institution	Budget Estimation
		 yield periodically, particularly during dry periods (some of the existing or proposed boreholes in a specific well field or catchment can be used as monitoring wells) Modify or control the groundwater abstraction rate depending on the outcome of groundwater monitoring If possible, consider artificial recharge of groundwater using stored runoff water or other practical means. 			
2	Impact due to groundwater abstraction on water resources of the area	 Assess groundwater flow direction in relation to existing springs and streams in adjacent or downstream areas Register the existing flow rate of springs, streams, and rivers as well as their use prior to commencement of any development scheme based on groundwater Assess/model groundwater level changes and resulting impacts to surface water flows and its socio-economic impacts on the population depending on those surface water resources Monitor the groundwater characteristics such as static water level, dynamic water level, drawdown, and safe yield periodically, particularly during dry periods (some of the existing or proposed boreholes in a specific well field or catchment can be used as monitoring wells) Modify groundwater extraction rate depending on impact on current and future surface water flows Avoid construction of irrigation in sensitive ecosystems Allow environmental flows in surface waters. 	During implementation and operation periods	PMCU at MoWE, PIT at MoIL, Contractors, Woreda agricultural office, Woreda environmental unit	Part of sub-project implementation and operation budget
3	Impact due to water use right	 Improve water use efficiency and reduce water wastage so that more water is available for use by the various modes or groups Avoid or reduce over-extraction surface and groundwater by the various modes or groups so that water will be available for all to fairly use Design and implement efficient irrigation systems such as lined canals or sprinkler systems so that water loss can be minimized (furrow irrigation with unlined canals will 	During operation period	Woreda agricultural office, Woreda administration	Part of sub-project operation budget

No	Potential Positive and Negative Environmental Impact	Possible Mitigation / Enhancement Measures	Implementation Period	Responsible Institution	Budget Estimation
4	Impact due to inefficient water use and management	 result in considerable loss of water, in some cases up to 50% of the irrigation water could be lost through percolation) In areas where groundwater is scarce, avoid planting water intensive plants such as sugarcane. Consider pricing water use to pay for effective management of the resource (the pricing, however, should protect access to water for the poor and disadvantaged communities) Engage all water users, communities, and other stakeholders in the management of the water resources including development, operation, and maintenance. Estimate water balance at sub-project level during operation period to identify water management issue Implement effective water management system. Implement water conservation measures. Design and implement efficient irrigation systems such as lined canals or sprinkler systems so that water loss can be minimized (furrow irrigation with unlined canals will result in considerable loss of water, in some cases up to 50% of the irrigation water could be lost through percolation) Install water meters to monitor and control consumption, particularly for multi-village water supply systems. Ensure the proper sealing of all pipelines, valves and storage structures to avoid water loss. Avoid using the local communities' water sources and, as much as possible, try to develop own source during the construction period 	During implementation and operation periods	PMCU at MoWE, PIT at MoIL, Contractors, Woreda agricultural office, Woreda environmental unit	Part of sub-project implementation and operation budget
5	Impact due to inefficient water use and management	 Implement effective energy management system. Operate energy intensive machines and plants at the lowest level possible. Ensure efficient operation of machines and systems so that energy loss from leaks and other failures can be 	During implementation and operation periods	PMCU at MoWE, PIT at MoIL, Contractors, Woreda agricultural office, Woreda environmental unit	Part of sub-project implementation and operation budget

No	Potential Positive and Negative Environmental Impact	Possible Mitigation / Enhancement Measures	Implementation Period	Responsible Institution	Budget Estimation
		 avoided Install energy meters to monitor and control energy consumption by electro-mechanical equipment. Periodically check and evaluate the efficiency of energy systems and where necessary replace problem components so that energy loss due to ageing of components can be avoided. Encourage use of electrical energy from the national grid since it is mostly produced from hydropower plants, which are environmentally friendly. Reduce the overall carbon footprint of the construction work and operation of systems. 			
6	Impact on water quality	 Avoid inappropriate waste disposal in the sub-project influence areas such as the surface water/groundwater catchments and sub-basins. Avoid application of persistent pesticides and herbicides in the planned small-scale irrigation schemes. Nitrogen and Phosphorous based fertilizers application shall only meet plant demand or avoid excess application of fertilizers. Encourage farmers to set realistic crop yield goals in order to provide an accurate account of plant nutrients need. Minimize irrigation erosion and runoff to reduce soil bound Phosphorous moving off the site. Adopt strategies that maintain soil structure and protect the soil surface to minimize Phosphorous losses. Educate and train farmers in techniques to manage and minimize nutrient losses through trainings and field demonstrations. Develop continuous groundwater and surface water quality monitoring system including pesticides and other agro-chemicals. 	During implementation and operation periods	PMCU at MoWE, PIT at MoIL, Contractors, Woreda agricultural office, Woreda environmental unit	Part of sub-project implementation and operation budget

No	Potential Positive and Negative Environmental Impact	Possible Mitigation / Enhancement Measures	Implementation Period	Responsible Institution	Budget Estimation
		them, dosage, the need for PPE, and how to avoid accidents, etc.			
7	Impact due to water logging and salinization	 Use irrigation water economically by applying only the amount that will be required for the crop production. As much as possible, use irrigation system that minimizes water use, such as sprinkle and drop irrigation. Avoid unlined furrow irrigation where the groundwater table is shallow and saline. Improve water application efficiency. Provide appropriate drainage canals to minimize the risk of water-logging problem. Select salt tolerant crops in areas where salinity is a problem for salt sensitive crops. Conduct regular soil, groundwater and surface water quality monitoring. Conduct regular groundwater level monitoring to check any potential problem. 	During operation period	Woreda agricultural office, Woreda environmental unit	Part of sub-project operation budget
8	Impact on ecosystems	 Minimize encroachment of irrigation farms into important and sensitive ecosystems. Avoid use of persistent agro-chemicals. Conduct regular monitoring of species diversity. Conduct water quality monitoring, particularly in sensitive ecosystem areas. 	During implementation and operation periods	PMCU at MoWE, PIT at MoIL, Contractors, Woreda agricultural office, Woreda environmental unit	Part of sub-project implementation and operation budget
9	Impact due to land subsidence	 Balance amount of water to be extracted with the amount of recharge. Develop groundwater level monitoring wells and establish critical level blow which extraction cannot be proceeded. Enhance groundwater recharge through soil and water conservation activities in the catchment. Create awareness among the users and planners that over extraction of wells could cause land subsidence. 	During operation period	Woreda agricultural office, Woreda water offices, Woreda environmental unit	Part of sub-project operation budget
10	Impact due to degradation of vegetation cover and	 Implement afforestation in sub-project influence areas. Promote agroforestry practices in sub-project influence 	During operation period	Woreda agricultural office, Woreda water	Part of sub-project operation budget

No	Potential Positive and Negative Environmental Impact	Possible Mitigation / Enhancement Measures	Implementation Period	Responsible Institution	Budget Estimation
	groundwater recharge	 areas. Identify groundwater recharging areas in catchment and plant selected trees which promote soil porosity and increase the hydraulic conductivity of the soils. Plant selected tree species on the boundaries of farming plots and on the side of irrigation canals. 		offices, Woreda environmental unit	
11	Impact due to air emissions and decreased air quality	 Vehicles and machinery must be kept in good condition to prevent excessive smoke from exhausts and reduce dust by watering the access road surface Prevent the generation of air pollutants during the construction period by procuring such materials from the market for checking whether suppliers satisfy ES requirements shall be considered. Proposed investments should require that construction contractors operate only well-maintained engines, vehicles, trucks and equipment. A routine maintenance program for all equipment, vehicles, trucks and power generating engines should be in place. The project should ensure the use of good quality fuel and lubricants only Practice wetting of sites especially during dry season to reduce dust emission. Contractors to provide protection gears to the construction workers. 	During implementation and operation periods	PMCU at MoWE, PIT at MoIL, Contractors, Woreda agricultural office, Woreda environmental unit	Part of sub-project implementation and operation budget
12	Impact of wastewater and water quality	 Select well site where water drains away from the well. As much as possible, do not construct well in a depression or on low-lying, poorly drained site. Construct drainage ditches to divert runoff water around well site. Construct concrete pad around the base of the wellhead Build soak away pit to allow wastewater percolation and partial treatment Coordinate activities with ongoing Rural Water Supply 	During implementation and operation periods	PMCU at MoWE, PIT at MoIL, Contractors, Woreda agricultural office, Woreda environmental unit	Part of sub-project implementation and operation budget

No	Potential Positive and Negative Environmental Impact	Possible Mitigation / Enhancement Measures	Implementation Period	Responsible Institution	Budget Estimation
		 and Sanitation Project as appropriate Conduct awareness creation campaign 			
13	Impact due to hazardous materials	 Training of operators on release prevention, including drills specific to hazardous materials as part of emergency preparedness response training Implementation of inspection programs to maintain the mechanical integrity and operability of pressure vessels, tanks, piping systems, relief and vent valve systems, containment infrastructure, emergency shutdown systems, controls and pumps, and associated process equipment · Preparation of written Standard Operating Procedures (SOPs) for filling underground storage tanks (USTs), above ground storage tanks (ASTs) or other containers or equipment as well as for transfer operations by personnel trained in the safe transfer and filling of the hazardous material, and in spill prevention and response · Prepare SOPs for the management of secondary containment structures, specifically the removal of any accumulated fluid, such as rainfall, to ensure that the structures are not accidentally or willfully compromised. Identification of locations of hazardous materials and associated activities on an emergency plan site map · Documentation of availability of specific personal protective equipment and training needed to respond to an emergency · 	During implementation and operation periods	PMCU at MoWE, PIT at MoIL, Contractors, Woreda agricultural office, Woreda environmental unit	Part of sub-project implementation and operation budget
14	Impact due to solid waste and effluent waste	 Adequate waste receptacles and facilities should be provided at project sites/camp sites Training and awareness shall be given on safe waste disposal in construction camps for all workers Reduce - re-use and recycle wastes whenever possible 	During implementation and operation period	PMCU at MoWE, PIT at MoIL, Contractors, Woreda agricultural office, Woreda environmental unit	Part of sub-project implementation and operation budget

No	Potential Positive and Negative Environmental	Possible Mitigation / Enhancement Measures	Implementation Period	Responsible Institution	Budget Estimation
	Impact				
		• Final disposal should be at dumpsites approved by the local government authorities			
15	Noise and vibration impacts	 Construction traffic speed control measures should be enforced on unpaved roads No use of noisy machinery within 50m of residential areas and near institutions. As much as possible, manual labor can be used at such locations. Engines of vehicles/trucks and earth-moving equipment should be switched off when not in use. Good maintenance and proper operation of construction machinery to minimize noise generation. Good maintenance and proper operation of equipment such as surface pumps and generators (if any) during subprojects operation. Proposed sub-projects should require contractors to use equipment and vehicles that are in good working order, well maintained, and that have some noise suppression equipment (e.g. mufflers, noise baffles) intact and in working order. Such provision could be part of the contractors will be required to implement best driving practices when approaching and leaving the site (speed limit of ≤30 km/hr) to minimize noise generation and breaking squeal. Engines of vehicles/trucks and earth-moving equipment should be switched off when not in use. Setting up temporary noise barriers where possible Provide necessary PPE such as ear plugs and mufflers during operation such as well drilling. 	During implementation and operation periods	PMCU at MoWE, PIT at MoIL, Contractors, Woreda agricultural office, Woreda environmental unit	Part of sub-project implementation and operation budget
16	Impact of contaminated land	 Prevent or control the release of hazardous materials, hazardous wastes, or oil to the environment including on soil/land. When contamination of land is suspected or confirmed 	During implementation and operation periods	PMCU at MoWE, PIT at MoIL, Contractors, Woreda agricultural office, Woreda	Part of sub-project implementation and operation budget

No	Potential Positive and Negative Environmental Impact	Possible Mitigation / Enhancement Measures	Implementation Period	Responsible Institution	Budget Estimation
		 during any project phase, the cause of the uncontrolled release should be identified and corrected to avoid further releases and associated adverse impacts. Managing contaminated media with the objective of protecting the safety and health of occupants of the site, the surrounding community, and the environment post construction or post decommissioning Understanding the historical use of the land with regard to the potential presence of hazardous materials or oil prior to initiation of construction or decommissioning activities Preparing plans and procedures to respond to the discovery of contaminated media to minimize or reduce the risk to health, safety, and the environment Contaminated lands should be managed to avoid the risk to human health and ecological receptors. The preferred strategy for land decontamination is to reduce the level of contamination. Preparation of a management plan to manage obsolete, abandoned, hazardous waste management. 		environmental unit	
17	Impact of soil erosion and land degradation	 As much as possible, reduce unnecessary soil disturbance during the various construction activities. As much as possible, retain the vegetation cover of the sub-project area to reduce exposed land and ultimately soil erosion. Re-vegetate exposed areas as a result of construction activities. Rehabilitate soil/land compacted due to the construction activities. Stockpile and reuse top soil from excavation work. Provide runoff protection or interception structures such as bunds, terraces, and berms in areas that are susceptible to erosion. 	During implementation and operation periods	PMCU at MoWE, PIT at MoIL, Contractors, Woreda agricultural office, Woreda environmental unit	Part of sub-project implementation and operation budget

No	Potential Positive and Negative Environmental Impact	Possible Mitigation / Enhancement Measures	Implementation Period	Responsible Institution	Budget Estimation
		 Practice good soil and land management practices to improve the soil organic matter and vegetation growth capacity. Practice good agricultural methods in the catchment to reduce soil erosion and land degradation. Manage both the source and destination of wastewater and storm water. Dispose of surplus soil and construction wastes at designated and approved disposal sites. 			
18	Impact on terrestrial ecosystem and biodiversity (loss of biodiversity due to removal of vegetation)	 As much as possible, retain the vegetation cover of the sub-project area to reduce exposed land and ultimately soil erosion. Re-vegetate exposed areas as a result of construction activities. Avoid construction in sites of importance or sensitive habitats and ecosystems. Conduct regular monitoring of the terrestrial flora and fauna species and changes due to project implementation and operation. 	During implementation period	PMCU at MoWE, PIT at MoIL, Contractors, Woreda agricultural office, Woreda environmental unit	Part of sub-project implementation and operation budget
19	Impact on aquatic biodiversity	 Maintain environmental flows in surface water resources at all times Monitor the flow or level of surface water resources and based on the finding provide appropriate correction measures including reduction on extraction rate of groundwater Conduct regular monitoring of aquatic species diversity Conduct water quality monitoring of surface water resources Delineate important aquatic habitats and ecosystems so that appropriate attention and protection can be provided. 	During implementation and operation periods	PMCU at MoWE, PIT at MoIL, Contractors, Woreda agricultural office, Woreda environmental unit	Part of sub-project implementation and operation budget
20	Impact of loss of properties and settlements	 As much as possible, avoid unnecessary land uptake and damage on properties. Preparation of a resettlement action plan (RAP) according 	During implementation period	PMCU at MoWE, PIT at MoIL, Contractors, Woreda administration	Part of sub-project implementation budget

No	Potential Positive and Negative Environmental Impact	Possible Mitigation / Enhancement Measures	Implementation Period	Responsible Institution	Budget Estimation
21	Impacts of ingrasso	 to the RF to fully compensate for lost/damaged property and resettles the displaced persons. Compensation of land acquired permanently for project purposes will be handled under client responsibility based on the provisions of the RF. 	During implementation and	DMCU at MoWE DIT	Part of sub-project
21	Impacts of increase occupational health and safety (increased occupational accidents and safety hazards)	 Integrity of workplace structures, workspace and exit, fire precautions, potable water supply, clean eating area, lighting, safe access, lavatories and showers, first aid, etc. should be incorporated in the designs Promoting collaboration with local authorities to enhance access of workers families and the community to public health services and promote immunization Awareness campaigns for the prevention of communicable diseases. The construction area shall be surveyed before work begins to ensure that adequate ingress and egress is provided for personnel and equipment. Good housekeeping to remove potential slip, trip, and fall hazards. As much as possible avoid work at height. If not, use proper access equipment, such as scaffold/work platform, for all work at height required. Access equipment (where necessary) shall be checked before work commences to ensure stability. Sides of excavation must be supported/battered where there is a risk to collapse. Inspect supported excavations before work commences each day. Personnel must stay within the protection of the excavation at all times. Substantial barriers to be erected around excavations. Suitable signs and barriers to be provided to warn of the work being undertaken. 	operation periods	PMCU at MowE, PI1 at MoIL, Contractors, Woreda agricultural office, Woreda environmental unit	Part of sub-project implementation and operation budget

No	Potential Positive and Negative Environmental Impact	Possible Mitigation / Enhancement Measures	Implementation Period	Responsible Institution	Budget Estimation
		 access/egress, where necessary. Work shall be coordinated so as to reduce risks to workers from falling objects. Site traffic must avoid the area where work is in progress as far as practicable. First-aid kit shall be available on site. Fire extinguishers shall be available on site. The placing of a second person (fire watch) on stand-by in case of emergency should be considered. Work shall be undertaken away from flammable materials (at least 15 m). Materials shall be properly staked (low stake rise, anchored and barricaded off). Practice safe manual handling techniques (plan, get help if needed, place your feet firmly, bend your knees – not your back, firm grip, lift with legs, etc). Where possible, manual handling to be reduced by use of mechanical devices. Material safety data sheet (MSDS) shall be provided for all products so that workers are informed on precautionary measures. Hand washing facilities shall be made available. Provision and use of PPE (high visibility vests, hard hats, safety boots, hand gloves, face masks, ear plugs, welding visors, overalls, safety harness, safety glasses, etc.). 			
22	Water pollution by sediments from exposed areas mainly from vegetation clearing or dumping of wastes/surplus soil into water bodies and increase of stagnant water and waterborne disease	 Construct retention ditches downstream of the construction area to control water pollution by surplus soil. Prevent adding solid wastes in runoff channels. Suitable stormwater treatment systems should be availed at the sites Empty/drain all areas that may hold standing water. 	During implementation period	PMCU at MoWE, PIT at MoIL, Contractors, Woreda agricultural office, Woreda environmental unit	Part of sub-project implementation budget
23	Water logging increasing	• Awareness and sensitization on waterborne diseases and	During operation period	Woreda agricultural	Part of sub-project operation

Ministry of Water and Energy (MoWE)

No	Potential Positive and Negative Environmental Impact	Possible Mitigation / Enhancement Measures	Implementation Period	Responsible Institution	Budget Estimation
	the spread of waterborne diseases	 spraying of nearby homes with insecticides. Provide communities with good sanitation and alternatives to the irrigation canals for domestic supply (e.g., boreholes). Involving the health centers in the vicinity of areas to be irrigated at the planning stage 		office, Woreda environmental unit	budget
24	Soil contamination due to use of non-adequate irrigation water (polluted water)	 Classify irrigation field according to soil salinity class and grow salt tolerant crops on saline plots. Apply periodic leaching of saline soils. Avoid excessive application of fertilizers and pesticides. Drain water logging areas of the farm. Avoid over use of water in the irrigation field. 	During operation period	Woreda agricultural office, Woreda environmental unit	Part of sub-project operation budget
25	Exposure to pesticides and to toxic agrochemicals	• Contamination can be reduced using personal protective equipment, selecting adequate pesticides to use (avoid Pesticides WHO Class 1&2), and preferably use selective pesticides with low environmental impact quotient (EIQ), following the recommended practices for the storage, transport, handling application and disposal of each agrochemical.	During operation period	Woreda agricultural office, Woreda health office, Woreda environmental unit, Local community	Part of sub-project operation budget
26	Population declines and mortality in reptiles caused by agrochemicals pesticides can eliminate some animals' essential food sources, causing the animals to relocate, change their diet or starve.	 Avoidance of introduction of invasive/exotic species and degradation of habitat. Use IPM practices to control pests. Adequately select and apply pesticides and monitor the weather when applying pesticides and avoid very hot or windy days. 	During operation period	Woreda agricultural office, Woreda environmental unit, Local community	Part of sub-project operation budget
27	Impact on public health	 Provide education for local communities regarding the spread of HIV/AIDs and STDs in public places, schools, and through community clubs and groups Work closely with local health service giving institutions to control the spread of STD and HIV/AIDS Provide care and support for HIV/ AIDS affected groups Free distribution of condoms both male and female type 	During project implementation and operation periods	PMCU at MoWE, PTT at MoIL, Contractors, Woreda agricultural office, Woreda health office, Woreda environmental unit	Part of sub-project implementation and operation budget

No	Potential Positive and Negative Environmental Impact	Possible Mitigation / Enhancement Measures	Implementation Period	Responsible Institution	Budget Estimation
		• Produce leaflets and posters about HIV/AIDS.			
28	Impacts due to construction camps and other ancillary facilities	 Locate construction camps away from environmentally, socially, and culturally sensitive sites. Locate construction camps away from local communities' settlement areas, villages, and towns. Get the local authorities' concurrence in locating construction camps. Provide amenities in the camp. Provide potable and reliable water supply for the camp. Provide reliable and sufficient energy supply to the camp. Provide sufficient ingress and egress from/to the camp with internal roads and storm drainage structures. Provide reliable health care facility in the camp. Provide around the clock security personnel to prevent unauthorized entrance to the camp. 	During implementation period	PMCU at MoWE, PIT at MoIL, Contractors, Woreda administration, Woreda water offices, Woreda environmental unit	Part of sub-project implementation budget
29	Child labor risks	 Child labor shall be restricted and all employees shall satisfy the requirements set in the labor law. Contractors shall be bound in contracts to commit against the use of child and forced labor. Device and implement Contractor's Code of Conduct which include commitment against child labor. Workers need to be employed and managed following national regulations, and should be monitored during implementation period. 	During implementation and operation periods	PMCU at MoWE, PIT at MoIL, Contractors, Woreda administration,	Part of sub-project implementation and operation budget
30	Risk of labor influx	 Conduct labor influx risk screening prior to sub-projects implementation (as part of ES instruments). Ensure that sub-project planning considers workforce estimates, skills required, workforce recruitment policy and management, and availability of workforce housing and other utilities. As much as possible, recruit sub-projects workforce from the local labor (particularly unskilled labor). 	During implementation and operation phases	PMCU at MoWE, PIT at MoIL, Contractors, Woreda labor unit	Part of sub-project implementation budget

No	Potential Positive and Negative Environmental Impact	Possible Mitigation / Enhancement Measures	Implementation Period	Responsible Institution	Budget Estimation
		 Monitor change in labor influx throughout the life cycle of a sub-project, effectiveness of mitigation measures, Conduct training for all sub-project participants on the likelihood, significance and management of labor influx. 			
31	Gender base Violence (GBV) impacts	 Prepare and implement a Gender Action plan (contractors and implementing agencies), Prepare and enforce GBV action plan (implementing agencies and Contractors) Educate all workers and nearby communities on preventing and responding to GBV. Establish partnerships with relevant government agencies and NGOs Follow survivor centered approach Ensure that women are given adequate employment opportunities during recruitment and job postings Provide gender disaggregated bathing, cloth changing, sanitation facilities for men and women Impose zero tolerance on gender-based violence and discrimination 	During implementation and operation periods	PMCU at MoWE, PIT at MoIL, Contractors, Woreda administration	Part of sub-project implementation and operation budget
32	Impact on community health and safety	 Recommended measures related to traffic safety: Reduce construction vehicles and trucks speed to acceptable level so that accidents could be avoided (particularly in settlement areas and in areas where there is pedestrian traffic) Provide barriers or exclusion zones around sites where machines and tracks are operated as part of the construction process Provide flagmen to direct vehicular and pedestrian traffic Training the construction crew on safe driving to protect the community in the construction area Follow all traffic rules when sub-project vehicles and trucks are using main roads and highways. Provide safety signs awarding the community the 	During implementation and operation periods	PMCU at MoWE, PIT at MoIL, Contractors, Woreda agricultural office, Woreda health office, Woreda environmental unit	Part of sub-project implementation and operation budget

No	Potential Positive and Negative Environmental Impact	Possible Mitigation / Enhancement Measures	Implementation Period	Responsible Institution	Budget Estimation
		 damager ahead. Recommended measures for risk of community members falling into open pits, trenches, canals, and drainages: Provide temporary edge protection around pits and trenches Do not leave open pits and trenches, particularly in settlement areas and where there is pedestrian traffic Provide safety signs awarding the community the damager ahead. Recommended measures for health risk due to water-borne diseases: Drain and keep dry inundated areas due to the various construction activities Restrict potential use of irrigation water for drinking purpose Aware the community not to use irrigation water for domestic water supply Taking the necessary environmental and social measures, use pesticides to eliminate disease vectors. 			
33	Impact of groundwater quality on human health	 Irrigation water should not be used for human consumption Depending on the outcome of water quality tests, assess the risk on human health due to uptake of groundwater by plants and domestic animals (biomagnification and bioaccumulation resulting pollutants entering the food chain) Periodically monitor the water quality of the irrigation scheme during sub-project operation. 	During operation period	Woreda agricultural office, Woreda health office, Woreda environmental unit	Part of sub-project operation budget
34	Labor Risk	• Sub-project contractors shall be required to have a written contract with their workers materially consistent with objective of ESS2 and in compliance of this LMP, in particular about child and forced labor.	During implementation and operation periods	PMCU at MoWE, PIT at MoIL, Contractors, Woreda administration,	Part of sub-project implementation and operation budget

No	Potential Positive and Negative Environmental Impact	Possible Mitigation / Enhancement Measures	Implementation Period	Responsible Institution	Budget Estimation
		 Sub-project contractors shall be required to develop and implement written labor management procedures, including procedures to establish and maintain a safe working environment as per requirements of ESS2. Ensure fair and transparent hiring and staff management procedures and culturally appropriate communication with communities regarding employment opportunities. Work closely with project woreda, kebele administration & local community representative on recruitment of the workforce Consult the project Labor Management Procedure (LMP) Maintain the rights of labor in relation to establishing unions and collective bargaining. Exclude forced labor, including child labor during subproject implementation and operation Remove discrimination in employment and occupation with respect to gender and disability. Set minimum wages, working hours, and occupational health and safety. When practical, consider a labor contract with a lump-sum payment for a certain type of service or scope of work. 		Woreda labor unit	
35	Impact on cultural heritages	 The screening/scoping exercise to be carried out for each subproject should strive to identify if any specific impacts on cultural heritages will arise in the process of subproject implementation. The ES instruments should propose the necessary site-specific mitigation measures to prevent and avoid adverse impacts on cultural heritages. 	During implementation period	PMCU at MoWE, PIT at MoIL, Contractors, Woreda agricultural office, Woreda environmental unit	Part of sub-project implementation budget
36	Impacts on indigenous people	• Good faith negotiations should be conducted with local communities, based on transparent disclosure of risks and benefits of the project as well as capacity support for local communities and integration of international expertise prior to documenting the targeted FPIC outcome.	During implementation period	PMCU at MoWE, PIT at MoIL, Woreda administration	Part of sub-project implementation budget

No	Potential Positive and Negative Environmental Impact	Possible Mitigation / Enhancement Measures	Implementation Period	Responsible Institution	Budget Estimation
37	Impact of exclusion of women and other community groups	• Involve women and other community groups/members in the planning and management of their water services with an understanding of the socio-cultural norms.	During implementation and operation periods	PMCU at MoWE, PIT at MoIL, Contractors, Woreda administration, Woreda women affairs office	Part of sub-project implementation and operation budget

Environmental and Social Monitoring Plan for Irrigation Sub-projects

(<u>Note</u> – This monitoring plan is indicative and shall be further developed and updated prior to sub-projects implementation.)

Project Activities / Components	Impacts	Mitigation Measures	Monitoring Indicator	Frequency of Monitoring per Sub-project	Responsibility for Monitoring	Budget
Operation of sub- projects (groundwater wells)	Impact due to groundwater aquifer depletion	 Conduct well pump testing to characterize the capacity of recharge and discharge (to determine the safe yield and recovery rate) Measure discharge of springs, particularly the lean discharge during dry periods. Determine sustainable amount of groundwater to be extracted without causing appreciable reduction in groundwater level Assess/model groundwater recharge and discharge rates for the specific catchment or sub-basin Monitor the groundwater characteristics such as static water level, dynamic water level, drawdown, and safe yield periodically, particularly during dry periods (some of the existing or proposed boreholes in a specific well field or catchment can be used as monitoring wells) Modify or control the groundwater abstraction rate depending on the outcome of groundwater monitoring If possible, consider artificial recharge of groundwater using stored runoff water or other practical means. 	 Borehole water levels Borehole yield 	Biannually	Woreda water office, Woreda environmental office, Regional water bureau,	Part of sub-project operation budget
Operation of sub- projects (groundwater wells)	Impact due to groundwater abstraction on water resources of the area	 Assess groundwater flow direction in relation to existing springs and streams in adjacent or downstream areas Register the existing flow rate of springs, streams, and rivers as well as their use prior to 	 Borehole water levels Borehole yield Surface water levels Surface water baseflow 	Biannually	Woreda agricultural office, Woreda water office, Woreda environmental	Part of sub-project operation budget

Table 0-2 Environmental	and Social Monitoring	Plan for 1	[rrigation §	Sub-projects
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Project Activities / Components	Impacts	Mitigation Measures	Monitoring Indicator	Frequency of Monitoring per Sub-project	Responsibility for Monitoring	Budget
Operation of sub		 commencement of any development scheme based on groundwater Assess/model groundwater level changes and resulting impacts to surface water flows and its socio-economic impacts on the population depending on those surface water resources Monitor the groundwater characteristics such as static water level, dynamic water level, drawdown, and safe yield periodically, particularly during dry periods (some of the existing or proposed boreholes in a specific well field or catchment can be used as monitoring wells) Modify groundwater extraction rate depending on impact on current and future surface water flows Avoid construction of irrigation in sensitive ecosystems Allow environmental flows in surface waters. 			office Regional water bureau	Dort of sub
Operation of sub- projects (irrigation schemes)	Impact due to water use right Non-compliance with provisions of agreement on irrigation water delivery; Non uniformity of irrigation water delivery to water users along the canal; Irregular irrigation water delivery to water users; Lack of irrigation water	 Improve water use efficiency and reduce water wastage so that more water is available for use by the various modes or groups Avoid or reduce over-extraction surface and groundwater by the various modes or groups so that water will be available for all to fairly use Design and implement efficient irrigation systems such as lined canals or sprinkler systems so that water loss can be minimized (furrow irrigation with unlined canals will result in considerable loss of water, in some cases up to 50% of the irrigation water could be lost through percolation) Develop an appropriate irrigation plan and schedule, and monitor consumption and compare regularly with targets which should be based on available supplies of water Ensure regular maintenance of the irrigation 	 Absence of water use conflicts Water conflicts resolved 	As required, quarterly	Woreda administration, Woreda agricultural office, Woreda water office, Woreda environmental office	Part of sub- projects operation budget

Project Activities / Components	Impacts	Mitigation Measures	Monitoring Indicator	Frequency of Monitoring per Sub-project	Responsibility for Monitoring	Budget
	delivery during the growing season due to emergency on the canal	 system, as well as that of its associated channels and infrastructure. In areas where groundwater is scarce, avoid planting water intensive plants such as sugarcane. Consider pricing water use to pay for effective management of the resource (the pricing, however, should protect access to water for the poor and disadvantaged communities) Engage all water users, communities, and other stakeholders in the management of the water resources including development, operation, and maintenance. 				
Most construction activities and operation of sub- projects (irrigation schemes)	Impact due to inefficient water use and management	 Estimate water balance at sub-project level during operation period to identify water management issue Implement effective water management system. Implement water conservation measures. Design and implement efficient irrigation systems such as lined canals or sprinkler systems so that water loss can be minimized (furrow irrigation with unlined canals will result in considerable loss of water, in some cases up to 50% of the irrigation water could be lost through percolation) Install water meters to monitor and control consumption, particularly for multi-village water supply systems. Ensure the proper sealing of all pipelines, valves and storage structures to avoid water loss. Avoid using the local communities' water sources and, as much as possible, try to develop own source during the construction period. 	 Water volume used vs. produced Water loses (percentage) in the irrigation system 	Quarterly	PMCU at MoWE, PIT at MoIL, construction supervisor, Woreda agricultural office, Woreda water office, Woreda environmental office	Part of sub-project implementation and operation budget

Project Activities / Components	Impacts	Mitigation Measures	Monitoring Indicator	Frequency of Monitoring per Sub-project	Responsibility for Monitoring	Budget
Most construction activities and operation of sub- projects (irrigation schemes)	Impact due to inefficient energy use and management	 Implement effective energy management system. Operate energy intensive machines and plants at the lowest level possible. Ensure efficient operation of machines and systems so that energy loss from leaks and other failures can be avoided Install energy meters to monitor and control energy consumption by electro-mechanical equipment. Periodically check and evaluate the efficiency of energy systems and where necessary replace problem components so that energy loss due to ageing of components can be avoided. Encourage use of electrical energy from the national grid since it is mostly produced from hydropower plants, which are environmentally friendly. Reduce the overall carbon footprint of the construction work and operation of systems. 	 Energy consumed vs. produced Energy loss in the system Amount of fossil fuel used to generate power 	Quarterly	PMCU at MoWE, PIT at MoIL, Construction supervisor, Woreda agricultural office, Woreda water office, Woreda environmental office	Part of sub-project implementation and operation budget
Most construction activities and operation of the irrigation schemes (particularly use of fertilizers, pesticides, and other agro-chemicals)	Impact on water quality	 Avoid inappropriate waste disposal in the sub- project influence areas such as the surface water/groundwater catchments and sub-basins. Avoid application of persistent pesticides and herbicides in the planned small-scale irrigation schemes. Nitrogen and Phosphorous based fertilizers application shall only meet plant demand or avoid excess application of fertilizers. Encourage farmers to set realistic crop yield goals in order to provide an accurate account of plant nutrients need. Minimize irrigation erosion and runoff to reduce soil bound Phosphorous moving off the site. Adopt strategies that maintain soil structure and protect the soil surface to minimize Phosphorous 	• Water quality tests (surface and groundwater)	Quarterly	PMCU at MoWE, PIT at MoIL, Construction supervisor, Woreda agricultural office, Woreda water office, Woreda environmental office	Part of sub-project implementation and operation budget

Project Activities / Components	Impacts	Mitigation Measures	Monitoring Indicator	Frequency of Monitoring per Sub-project	Responsibility for Monitoring	Budget
		 losses. Educate and train farmers in techniques to manage and minimize nutrient losses through trainings and field demonstrations. Develop continuous groundwater and surface water quality monitoring system including pesticides and other agro-chemicals. Incorporate extension training programs to advise farmers on the most appropriate chemicals to buy, how to apply them, dosage, the need for PPE, and how to avoid accidents, etc. 				
Operation of the irrigation schemes	Impact due to water logging and salinization	 Use irrigation water economically by applying only the amount that will be required for the crop production. As much as possible, use irrigation system that minimizes water use, such as sprinkle and drop irrigation. Avoid unlined furrow irrigation where the groundwater table is shallow and saline. Improve water application efficiency. Provide appropriate drainage canals to minimize the risk of water-logging problem. Select salt tolerant crops in areas where salinity is a problem for salt sensitive crops. Conduct regular soil, groundwater and surface water quality monitoring. Conduct regular groundwater level monitoring to check any potential problem. 	 Groundwater level Water quality tests (surface and groundwater) Soil test Decrease of land productivity 	Quarterly	Woreda agricultural office, Woreda water office, Woreda environmental office	Part of sub-project operation budget
Site/land clearing and operation of the irrigation schemes	Impact on ecosystems	 Minimize encroachment of irrigation farms into important and sensitive ecosystems. Avoid use of persistent agro-chemicals. Conduct regular monitoring of species diversity. Conduct water quality monitoring, particularly in 	Sensitive ecosystems protectedWater quality tests	Quarterly	PMCU at MoWE, PIT at MoIL, Construction supervisor, Woreda agricultural office,	Part of sub-project implementation and operation budget

Project Activities / Components	Impacts	Mitigation Measures	Monitoring Indicator	Frequency of Monitoring per Sub-project	Responsibility for Monitoring	Budget
		sensitive ecosystem areas.			Woreda water office, Woreda environmental office	
Operation of the irrigation schemes	Impact due to land subsidence	 Balance amount of water to be extracted with the amount of recharge. Develop groundwater level monitoring wells and establish critical level blow which extraction cannot be proceeded. Enhance groundwater recharge through soil and water conservation activities in the catchment. Create awareness among the users and planners that over extraction of wells could cause land subsidence. 	• Groundwater extraction rate vs. recharge	Biannually	Woreda agricultural office, Woreda water office, Woreda environmental office	Part of sub-project operation budget
Site/land clearing	Impact due to degradation of vegetation cover and groundwater recharge	 Implement afforestation in sub-project influence areas. Promote agroforestry practices in sub-project influence areas. Identify groundwater recharging areas in catchment and plant selected trees which promote soil porosity and increase the hydraulic conductivity of the soils. Plant selected tree species on the boundaries of farming plots and on the side of irrigation canals. 	Number of trees plantedArea re-vegetated	Quarterly	PMCU at MoWE, PIT at MoIL, Construction supervisor, Woreda agricultural office, Woreda water office, Woreda environmental office	Part of sub-project implementation budget
Site clearing, excavation, backfilling, concrete work, application of paints and other solvents, access road construction and use, Construction and	Impact due to air emissions and decreased air quality	 Vehicles and machinery must be kept in good condition to prevent excessive smoke from exhausts and reduce dust by watering the access road surface Prevent the generation of air pollutants during the construction period by procuring such materials from the market for checking whether suppliers satisfy ES requirements shall be considered. Proposed investments should require that 	 Number of sound reducing machinery and equipment purchased Availability of equipment and machinery maintenance plan Frequency of 	Quarterly	PMCU at MoWE, PIT at MoIL, Construction supervisor, Woreda agricultural office, Woreda water office, Woreda environmental office	Part of sub-project implementation and operation budget

Project Activities / Components	Impacts	Mitigation Measures	Monitoring Indicator	Frequency of Monitoring per Sub-project	Responsibility for Monitoring	Budget
operation activities that involve operation of vehicles, machines, compressors, drilling rigs, pumps, other electro- mechanical equipment		 construction contractors operate only well- maintained engines, vehicles, trucks and equipment. A routine maintenance program for all equipment, vehicles, trucks and power generating engines should be in place. The project should ensure the use of good quality fuel and lubricants only Practice wetting of sites especially during dry season to reduce dust emission. Contractors to provide protection gears to the construction workers. 	 watering of surfaces to reduce dust related impacts Inclusion in contract air pollution mitigation measures PPE purchased and used. 			
Most construction activities, operation of construction camps, and operation of the sub- projects (irrigation schemes)	Impact of wastewater and water quality	 Select well site where water drains away from the well. As much as possible, do not construct well in a depression or on low-lying, poorly drained site. Construct drainage ditches to divert runoff water around well site. Construct concrete pad around the base of the wellhead Build soak away pit to allow wastewater percolation and partial treatment Coordinate activities with ongoing Rural Water Supply and Sanitation Project as appropriate Conduct awareness creation campaign 	 Water quality tests (surface water and groundwater) Wastewater quality tests 	Quarterly	PMCU at MoWE, PIT at MoIL, Construction supervisor, Woreda agricultural office, Woreda water office, Woreda environmental office	Part of sub-project implementation and operation budget
Construction and operation activities that involve the use of hazardous materials such as operation of vehicles, machines, electro-mechanical equipment, etc.	Impact due to hazardous materials	 Training of operators on release prevention, including drills specific to hazardous materials as part of emergency preparedness response training Implementation of inspection programs to maintain the mechanical integrity and operability of pressure vessels, tanks, piping systems, relief and vent valve systems, containment infrastructure, emergency shutdown systems, controls and pumps, and 	 Hazardous materials management procedure prepared Absence of hazardous materials spill No. of hazardous materials spill Acceptable standard 	Quarterly	PMCU at MoWE, PIT at MoIL, Construction supervisor, Woreda agricultural office, Woreda water office, Woreda health office,	Part of sub-project implementation and operation budget

Ministry of Water and Energy (MoWE)

Ministry of Irrigation and Lowlands (MoIL)

Project Activities / Components	Impacts	Mitigation Measures	Monitoring Indicator	Frequency of Monitoring per Sub-project	Responsibility for Monitoring	Budget
Use of paints and other solvents Borehole drilling and use of foam and bentonite Use of pesticides and biocides		 associated process equipment · Preparation of written Standard Operating Procedures (SOPs) for filling underground storage tanks (USTs), above ground storage tanks (ASTs) or other containers or equipment as well as for transfer operations by personnel trained in the safe transfer and filling of the hazardous material, and in spill prevention and response · Prepare SOPs for the management of secondary containment structures, specifically the removal of any accumulated fluid, such as rainfall, to ensure that the structures are not accidentally or willfully compromised. Identification of locations of hazardous materials and associated activities on an emergency plan site map · Documentation of availability of specific personal protective equipment and training needed to respond to an emergency · Documentation of availability of spill response equipment sufficient to handle at least initial stages of a spill and a list of external resources for equipment and personnel, if necessary, to supplement internal resources 	of chemicals purchased and used • No. of awareness training held • No. of communities and chemical handlers training given		Woreda environmental office	
Most construction activities including site clearing, excavation, demolishing, etc. Operation of camps and ither ancillary facilities	Impact due to solid waste and effluent waste	 Adequate waste receptacles and facilities should be provided at project sites/camp sites Training and awareness shall be given on safe waste disposal in construction camps for all workers Reduce - re-use and recycle wastes whenever possible Final disposal should be at dumpsites approved by the local government authorities 	 No. of Litter bins and receptacles purchased and used at the project site. Volume of effluent produced and properly disposed No of awareness training held. Amounts of final 	Quarterly	PMCU at MoWE, PIT at MoIL, Construction supervisor, Woreda agricultural office, Woreda water office, Woreda health office, Woreda	Part of sub-project implementation and operation budget

Project Activities / Components	Impacts	Mitigation Measures	Monitoring Indicator	Frequency of Monitoring per Sub-project	Responsibility for Monitoring	Budget
Operation of the sub-projects (irrigation schemes)			waste disposed at designated site.		environmental office	
Construction and operation activities that involve vehicles, machines, compressors, drilling rigs, pumps, other electro- mechanical equipment Drilling of boreholes is a major sound emitter	Noise and vibration impacts	 Construction traffic speed control measures should be enforced on unpaved roads No use of noisy machinery within 50m of residential areas and near institutions. As much as possible, manual labor can be used at such locations. Engines of vehicles/trucks and earth-moving equipment should be switched off when not in use. Good maintenance and proper operation of construction machinery to minimize noise generation. Good maintenance and proper operation of equipment such as surface pumps and generators (if any) during sub-projects operation. Proposed sub-projects should require contractors to use equipment and vehicles that are in good working order, well maintained, and that have some noise suppression equipment (e.g. mufflers, noise baffles) intact and in working order. Such provision could be part of the contractual obligations with the contractors. Contractors will be required to implement best driving practices when approaching and leaving the site (speed limit of ≤30 km/hr) to minimize noise generation and breaking squeal. Engines of vehicles/trucks and earth-moving equipment should be switched off when not in use. Setting up temporary noise barriers where possible Provide necessary PPE such as ear plugs and mufflers during operation such as well drilling. 	 Number of sound reducing machinery and equipment purchased Availability of equipment and machinery maintenance plan Inclusion in contract issues of noise pollution. PPE purchased and used. 	Quarterly	PMCU at MoWE, PIT at MoIL, Construction supervisor, Woreda agricultural office, Woreda water office, Woreda health office, Woreda environmental office	Part of sub-project implementation and operation budget
Project Activities / Components	Impacts	Mitigation Measures	Monitoring Indicator	Frequency of Monitoring per Sub-project	Responsibility for Monitoring	Budget
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Most construction activities involving use of fossil fuel for vehicles, machines, electro-mechanical equipment Drilling activity and associated use of chemicals (foam, bentonite) Operation of camps and other ancillary facilities Handling, transport, use, storage, and disposal of other hazardous materials Operation of sub- project (irrigation schemes) such as use of fertilizers and pesticides.	Impact of contaminated land	 Prevent or control the release of hazardous materials, hazardous wastes, or oil to the environment including on soil/land. When contamination of land is suspected or confirmed during any project phase, the cause of the uncontrolled release should be identified and corrected to avoid further releases and associated adverse impacts. Managing contaminated media with the objective of protecting the safety and health of occupants of the site, the surrounding community, and the environment post construction or post decommissioning Understanding the historical use of the land with regard to the potential presence of hazardous materials or oil prior to initiation of construction or decommissioning activities Preparing plans and procedures to respond to the discovery of contaminated media to minimize or reduce the risk to health, safety, and the environment Contaminated lands should be managed to avoid the risk to human health and ecological receptors. The preferred strategy for land decontamination is to reduce the level of contamination at the site while preventing the human exposure to contamination. Preparation of a management plan to manage obsolete, abandoned, hazardous waste management. 	 Contaminant(s): Presence of hazardous materials, waste, or oil in any environmental media at potentially hazardous concentrations Receptor(s): Actual or likely contact of humans, wildlife, plants, and other living organisms with the contaminants of concern Exposure pathway(s): A combination of the route of migration of the contaminant from its point of release (e.g., leaching into potable groundwater) and exposure routes (e.g., ingestion, transdermal absorption), which would allow receptor(s) to come into actual contact with contaminants 	Quarterly	PMCU at MoWE, PIT at MoIL, Construction supervisor, Woreda agricultural office, Woreda water office, Woreda health office, Woreda environmental office	Part of sub-project implementation and operation budget

Project Activities / Components	Impacts	Mitigation Measures	Monitoring Indicator	Frequency of Monitoring per Sub-project	Responsibility for Monitoring	Budget
Construction activities such as site/land clearing, excavation, spoil disposal, etc. Movement of heavy machinery on access road and other parts of the sub-project area	Impact of soil erosion and land degradation	 As much as possible, reduce unnecessary soil disturbance during the various construction activities. As much as possible, retain the vegetation cover of the sub-project area to reduce exposed land and ultimately soil erosion. Re-vegetate exposed areas as a result of construction activities. Rehabilitate soil/land compacted due to the construction activities. Stockpile and reuse top soil from excavation work. Provide runoff protection or interception structures such as bunds, terraces, and berms in areas that are susceptible to erosion. Practice good soil and land management practices to improve the soil organic matter and vegetation growth capacity. Practice good agricultural methods in the catchment to reduce soil erosion and land degradation. Manage both the source and destination of wastewater and storm water. Dispose of surplus soil and construction wastes at designated and approved disposal sites. 	 Number of trees planted Area of land rehabilitated and revegetated Number or length of flood protection structures constructed Designated waste/spoil disposal sites used 	Quarterly	PMCU at MoWE, PIT at MoIL, Construction supervisor, Woreda agricultural office, Woreda water office, Woreda environmental office	Part of sub-project implementation budget
Land acquisition and site preparation activities	Loss of land and assets on land (crops, trees and structures) due to construction works, hence resulting in people's displacement and assets loss	 As much as possible, avoid unnecessary land uptake and damage on properties. Preparation of a resettlement action plan (RAP) according to the RF to fully compensate for lost/damaged property and resettles the displaced persons. Compensation of land acquired permanently for project purposes will be handled under client responsibility based on the provisions of the RF. 	 No. of PAPs (i.e., out of the total PAPs) who received all compensation entitlements before commencement of project construction activities. No. of resettled PAPs whose livelihoods are 	Quarterly	PMCU at MoWE, PIT at MoIL, Construction supervisor, Woreda administration	To be determined based on the occurrence and scale of resettlement issues per subproject.

Project Activities / Components	Impacts	Mitigation Measures	Monitoring Indicator	Frequency of Monitoring per Sub-project	Responsibility for Monitoring	Budget
			restored and re- established.			
All construction activities and operation of the sub- projects (irrigation schemes)	Increased occupational accidents and safety hazards	 Integrity of workplace structures, workspace and exit, fire precautions, potable water supply, clean eating area, lighting, safe access, lavatories and showers, first aid, etc. should be incorporated in the designs Promoting collaboration with local authorities to enhance access of workers families and the community to public health services and promote immunization Awareness campaigns for the prevention of communicable diseases. The construction area shall be surveyed before work begins to ensure that adequate ingress and egress is provided for personnel and equipment. Good housekeeping to remove potential slip, trip, and fall hazards. As much as possible avoid work at height. If not, use proper access equipment, such as scaffold/work platform, for all work at height required. Access equipment (where necessary) shall be checked before work commences to ensure stability. Sides of excavation must be supported/battered where there is a risk to collapse. Inspect supported excavations before work commences each day. Personnel must stay within the protection of the excavations. Substantial barriers to be erected around excavations. 	 Presence of responsible and functional OHS management personnel Presence of functional site safety procedures and first aid support facilities Provision of safety equipment and tools such as scaffolds, barriers, traffic cones, safety tapes, etc Provision of safety signs Provision of first-aid kits Provision of fire extinguishers Provision of PPE OHS incidents, accidents, and near misses Incident reporting including Lost Time Accident (LTA) and Lost Time Injury (LTI) 	On a day-to-day basis	PMCU at MoWE, PIT at MoIL, Construction supervisor, Woreda labor office, Woreda water office, Woreda environmental office	Part of sub-project implementation and operation budget

Project Activities / Components	Impacts	Mitigation Measures	Monitoring Indicator	Frequency of Monitoring per Sub-project	Responsibility for Monitoring	Budget
		 of the work being undertaken. Ladders, stairs or ramps to be provided for safe access/egress, where necessary. Work shall be coordinated so as to reduce risks to workers from falling objects. Site traffic must avoid the area where work is in progress as far as practicable. First-aid kit shall be available on site. Fire extinguishers shall be available on site. The placing of a second person (fire watch) on stand-by in case of emergency should be considered. Work shall be undertaken away from flammable materials (at least 15 m). Materials shall be properly staked (low stake rise, anchored and barricaded off). Practice safe manual handling techniques (plan, get help if needed, place your feet firmly, bend your knees – not your back, firm grip, lift with legs, etc). Where possible, manual handling to be reduced by use of mechanical devices. Material safety data sheet (MSDS) shall be provided for all products so that workers are informed on precautionary measures. Hand washing facilities shall be made available. Provision and use of PPE (high visibility vests, hard hats, safety boots, hand gloves, face masks, ear plugs, welding visors, overalls, safety harness, 				
Most construction activities including excavation (pits, canals, drainages),	Impact on community health and safety	 safety glasses, etc.). Recommended measures related to traffic safety: Reduce construction vehicles and trucks speed to acceptable level so that accidents could be avoided (particularly in settlement areas and in areas where 	 Number of waterborne disease affected people Improved 	On a day-to-day basis	PMCU at MoWE, PIT at MoIL, Construction supervisor, Woreda health	Part of sub-project implementation and operation budget

Project Activities / Components	Impacts	Mitigation Measures	Monitoring Indicator	Frequency of Monitoring per Sub-project	Responsibility for Monitoring	Budget
operation of vehicles and machines, etc Operation of the sub-projects (irrigation schemes) and use of water by the community Operation of construction camps		 there is pedestrian traffic) Provide barriers or exclusion zones around sites where machines and tracks are operated as part of the construction process Provide flagmen to direct vehicular and pedestrian traffic Training the construction crew on safe driving to protect the community in the construction area Follow all traffic rules when sub-project vehicles and trucks are using main roads and highways. Provide safety signs awarding the community the damager ahead. Recommended measures for risk of community members falling into open pits, trenches, canals, and drainages: Provide temporary edge protection around pits and trenches Do not leave open pits and trenches, particularly in settlement areas and where there is pedestrian traffic Provide safety signs awarding the community the damager ahead. Recommended measures for health risk due to waterborne diseases: Drain and keep dry inundated areas due to the various construction activities Restrict potential use of irrigation water for drinking purpose Aware the community not to use irrigation water for domestic water supply Taking the necessary environmental and social measures, use pesticides to eliminate disease 	 maintenance capacity of the community in maintaining the irrigation schemes Number of traffic accidents resulting in injuries and fatalities Number of other accidents due to the sub-projects implementation and operation resulting in injuries and fatalities 		office, Woreda environmental office	

Project Activities / Components	Impacts	Mitigation Measures	Monitoring Indicator	Frequency of Monitoring per Sub-project	Responsibility for Monitoring	Budget
		vectors.				
Site clearing, leveling and removal of vegetation cover	Loss of biodiversity due to removal of vegetation	 As much as possible, retain the vegetation cover of the sub-project area to reduce exposed land and ultimately soil erosion. Re-vegetate exposed areas as a result of construction activities. Avoid construction in sites of importance or sensitive habitats and ecosystems. Conduct regular monitoring of the terrestrial flora and fauna species and changes due to project implementation and operation. 	• Extent of plantation carried to re-vegetate site areas affected during site clearing.	Biannually	PMCU at MoWE, PIT at MoIL, Construction supervisor, Woreda agricultural office, Woreda environmental office	Part of sub-project implementation budget
Operation of the sub-projects (irrigation schemes) and potential depletion of the water resource of the area	Impact on aquatic biodiversity	 Maintain environmental flows in surface water resources at all times Monitor the flow or level of surface water resources and based on the finding provide appropriate correction measures including reduction on extraction rate of groundwater Conduct regular monitoring of aquatic species diversity Conduct water quality monitoring of surface water resources Delineate important aquatic habitats and ecosystems so that appropriate attention and protection can be provided. 	 Surface water levels Surface water baseflow Reduction in aquatic species diversity Important aquatic habitats/ecosystem protected 	Biannually	Woreda agricultural office, Woreda water office, Woreda environmental office	As part of sub- project operation budget
Operation of irrigation schemes and agricultural production	Exposure to pesticides and to toxic agrochemicals	 Contamination can be reduced using personal protective equipment, selecting adequate pesticides to use (avoid Pesticides WHO Class 1&2), and preferably use selective pesticides with low environmental impact quotient (EIQ), following the recommended practices for the storage, transport, handling application and disposal of each agrochemical. Avoidance of introduction of invasive/Exotic 	 Presence of responsible and functional OHS management personnel Presence of functional site safety procedures and first aid support facilities 	Monthly	Woreda agricultural office, Woreda health office, woreda environmental office	Part of sub-project operation budget

Project Activities / Components	Impacts	Mitigation Measures	Monitoring Indicator	Frequency of Monitoring per Sub-project	Responsibility for Monitoring	Budget
		 species and degradation of habitat; Use IPM practices to control pests Adequately select and apply pesticides and monitor the weather when applying pesticides and avoid very hot or windy days 	• Use of PPE •			
All sub-project implementation and operation activities that involve use of labor	Impact on public health	 Provide education for local communities regarding the spread of HIV/AIDs and STDs in public places, schools, and through community clubs and groups Work closely with local health service giving institutions to control the spread of STD and HIV/AIDS Provide care and support for HIV/ AIDS affected groups Free distribution of condoms both male and female type Produce leaflets and posters about HIV/AIDS. 	• The availability of data in the health center that show the number of victims in sexually transmitted diseases	Monthly	PMCU at MoWE, PIT at MoIL, Construction supervisor, Woreda health office, Woreda environmental office	Part of sub-project implementation and operation budget
Operation of the sub-projects (irrigation schemes)	Impact of groundwater quality on human health	 Irrigation water should not be used for human consumption Depending on the outcome of water quality tests, assess the risk on human health due to uptake of groundwater by plants and domestic animals (biomagnification and bioaccumulation resulting pollutants entering the food chain) Periodically monitor the water quality of the irrigation scheme during sub-project operation. 	 Water quality tests Effects of water quality on human health 	Monthly	Woreda water office, Woreda health office, Woreda environmental office	Part of sub-project operation budget
Construction of sub- projects	Impacts due to construction camp and other ancillary facilities	 Locate construction camps away from environmentally, socially, and culturally sensitive sites. Locate construction camps away from local communities' settlement areas, villages, and towns. Get the local authorities' concurrence in locating construction camps. Provide amenities in the camp. 	 Location of construction camp from settlement areas Amenities provided 	Quarterly	PMCU at MoWE, PIT at MoIL, Construction supervisor, Woreda administration, Woreda environmental office	Part of sub-project implementation budget

Project Activities / Components	Impacts	Mitigation Measures	Monitoring Indicator	Frequency of Monitoring per Sub-project	Responsibility for Monitoring	Budget
		 Provide potable and reliable water supply for the camp. Provide reliable and sufficient energy supply to the camp. Provide proper waste storage area or facility. Provide sufficient ingress and egress from/to the camp with internal roads and storm drainage structures. Provide reliable health care facility in the camp. Provide around the clock security personnel to prevent unauthorized entrance to the camp. 				
All construction activities requiring employment of labor workers	Child labor risks	 Child labor shall be restricted and all employees shall satisfy the requirements set in the labor law. Contractors shall be bound in contracts to commit against the use of child and forced labor. Device and implement Contractor's Code of Conduct which include commitment against child labor. Workers need to be employed and managed following national regulations, and should be monitored during implementation period. 	• Occurrence and magnitude of child labor cases within sub-project workforce	Quarterly	PMCU at MoWE, PIT at MoIL, Construction supervisor, Woreda labor office, Woreda administration office	Part of sub-project implementation budget
All construction activities requiring employment of labor	Risk of labor influx	 Conduct labor influx risk screening prior to sub- projects implementation (as part of ES instruments). Ensure that sub-project planning considers workforce estimates, skills required, workforce recruitment policy and management, and availability of workforce housing and other utilities. As much as possible, recruit sub-projects workforce from the local labor (particularly unskilled labor). Monitor change in labor influx throughout the life 	• Percent of total labor employment opportunities offered to locals	Quarterly	PMCU at MoWE, PIT at MoIL, Construction supervisor, Woreda labor office, Woreda administration office	Part of sub-project implementation budget

Project Activities / Components	Impacts	Mitigation Measures	Monitoring Indicator	Frequency of Monitoring per Sub-project	Responsibility for Monitoring	Budget
		cycle of a sub-project, effectiveness of mitigation measures,Conduct training for all sub-project participants on the likelihood, significance and management of labor influx.				
All construction and operation activities requiring employment of labor workers	Gender base Violence (GBV) impacts	 Prepare and implement a Gender Action plan (contractors and implementing agencies), Prepare and enforce GBV action plan (implementing agencies and Contractors) Educate all workers and nearby communities on preventing and responding to GBV. Establish partnerships with relevant government agencies and NGOs Follow survivor centered approach Ensure that women are given adequate employment opportunities during recruitment and job postings Provide gender disaggregated bathing, cloth changing, sanitation facilities for men and women Impose zero tolerance on gender-based violence and discrimination 	Occurrence and magnitude of GBV cases within sub- project workforce	On a day-to-day basis	PMCU at MoWE, PIT at MoIL, Construction supervisor, Woreda labor office, Woreda administration office	Part of sub-project implementation and operation budget
All construction and operation activities requiring employment of labor workers	Labor Risk •	 Sub-project contractors shall be required to have a written contract with their workers materially consistent with objective of ESS2 and in compliance of this LMP, in particular about child and forced labor. Sub-project contractors shall be required to develop and implement written labor management procedures, including procedures to establish and maintain a safe working environment as per requirements of ESS2. Ensure fair and transparent hiring and staff management procedures and culturally appropriate communication with communities regarding employment opportunities. 	 Observation of complaint in relation with salary increment Observation of complaints in relation to other labor issues 	Quarterly	PMCU at MoWE, PIT at MoIL, Construction supervisor, Woreda labor office, Woreda administration office	Part of project implementation and operation budget

Project Activities / Components	Impacts	Mitigation Measures	Monitoring Indicator	Frequency of Monitoring per Sub-project	Responsibility for Monitoring	Budget
Site clearance of subproject area and use of vehicles and	Impact on cultural heritages	 Work closely with project woreda, kebele administration & local community representative on recruitment of the workforce Consult the project Labor Management Procedure (LMP) Maintain the rights of labor in relation to establishing unions and collective bargaining. Exclude forced labor, including child labor during sub-project implementation and operation Remove discrimination in employment and occupation with respect to gender and disability. Set minimum wages, working hours, and occupational health and safety. When practical, consider a labor contract with a lump-sum payment for a certain type of service or scope of work. The screening/scoping exercise to be carried for each subproject should strive to identify if any specific impacts on cultural heritages will arise in 	• Complaint of the community on cultural heritage	Quarterly	PMCU at MoWE, PIT at MoIL, Construction	Part of sub-project implementation budget
		 The ES instrument should propose the necessary site-specific mitigation measures to prevent and avoid adverse impacts on the cultural heritages. 	Terated issues		Woreda cultural ad tourism office, Woreda administration office	
All sub-project activities	Impacts on indigenous people	• Good faith negotiations should be conducted with local communities, based on transparent disclosure of risks and benefits of the project as well as capacity support for local communities and integration of international expertise prior to documenting the targeted FPIC outcome.	 FPIC obtained Complaints of indigenous people 	Quarterly	PMCU at MoWE, PIT at MoIL. Woreda administration, Regional states	Part of sub-project implementation budget
All project activities	Impact of exclusion of women and other	• Involve women and other community groups/members in the planning and management	Observation and community complain	Quarterly	PMCU at MoWE, PIT at MoIL,	Part of sub-project implementation

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Project Activities / Components	Impacts	Mitigation Measures	Monitoring Indicator	Frequency of Monitoring per Sub-project	Responsibility for Monitoring	Budget
	community groups	of their water services with an understanding of the socio-cultural norms.			Woreda administration, Woreda labor office	and operation budget

PROCEDURES FOR PREPARATION, REVIEW, CLEARANCE, AND IMPLEMENTATION OF ESF INSTRUMENTS

OVERVIEW OF THE ESS REQUIREMENTS AND SUB-PROJECT CATEGORIZATION

The ESMF is designed to support the application of World Bank Environmental and Social Standards in combination with Ethiopian legislation on environmental and social impact assessment to HoA-GW4RP components and sub-components. ESS1 on Assessment and Management of Environmental and Social Risks and Impacts is among the standards triggered by the HoA-GW4R project and thus the relevant principles in relation to sub-project categorization are briefly outlined as follows.

HoA-GW4RP consist of sub-project activities to be identified and implemented in several places across the 67 project woredas found in eight regions of the country. The risks and impacts cannot be determined until the sub-project location and design details have been identified. Though Components 1 and 2 sub-project sites are not identified at this stage, there is a need to prepare appropriate and necessary safeguard instruments for the sub-projects. MoWE and MoIL PMCU and PITs will carry out appropriate environmental and social assessment of the sub-projects, and prepare and implement the sub-projects as follows:

- a) High Risk sub-projects, in accordance with the ESSs;
- b) Substantial Risk, Moderate Risk and Low Risk sub-projects, in accordance with national law and any requirements of the ESSs that the Bank deems relevant to such sub-projects as determined during its review of the sub-projects for "no objection" clearance and based on project ES instruments including ESMF. Where sub-projects are likely to have minimal or no adverse environmental or social risks and impacts (i.e., low risk), such subprojects do not require further environmental and social assessment following the initial scoping but requires generic ESMPs and will include any necessary ESHS terms and conditions in procurement bids and contracts.

The HoA-GW4R project is environmentally categorized as "Substantial Risk" and socially as a "High Risk" project with an overall "High" risk rating. The environmental "Substantial Risk" categorization is mainly linked to the activities of Component 1 and the construction of the water supply and irrigation scheme in 59 woredas in eight regions of the country. The specific interventions like capacity building under Components 3 are not expected to lead to extensive risks as compared to Components 1 and 2, hence are generally expected to be "Substantial risk" or lower sub-projects. Thus, MoWE and MoIL PMCU and PITs will be required to employ independent consultants to undertake the appropriate environmental and social assessment of Components 1 and 2 sub-projects in accordance with the national law and any requirements of the ESSs deemed relevant to the sub-projects. Accordingly, the most important national guideline that defines the categorization of sub-projects into various schedules is the ESIA Procedural Guideline issued by the Federal Environment Protection Authority in November 2003. The ESIA Procedural Guideline Categorizes all development projects into three Schedules of activities or projects. The full list of Schedule I, II and III subprojects are available in the ESIA procedural guideline (2003). It should also be noted that the relevant ESSs that are likely to be triggered by the HoA-GW4RP components are broadly assessed.

Under the HoA-GW4R project, it is anticipated that the majority of Components 1 and 2 subproject activities will fall into Schedule I and II sub-projects and may require Full ESIA or Preliminary/Partial ESIAs respectively. Note that some sub-projects are anticipated to have "High" risk rating due to social impacts related to water use and management in the borderland areas.

PROCESS AND PROCEDURES OF THE ESMF

Step 1: Sub-projects Identification

A sub-project refers to the set of activities derived from the HoA-GW4RP Components 1, 2 and 3 activities including technical assistance studies and consultancies for which support through investment project financing is sought by the client. Under Component 1, two types of complementary investments will be made: delivering inclusive groundwater services to priority areas, namely, the construction and maintenance of water supply to pastoral, rural and towns and development of irrigation scheme at key locations in the Woredas

Identification of these sub-projects will be carried through a consultative process by the lead implementing agencies MoWE (WSSD & WRMD) and MoIL (IDPD) with the local communities and authorities in the beneficiary woredas. WSSD, WRMD and IDPD with regional water bureaus will facilitate smooth communications between the project affected communities and itself during sub-projects identification and implementation refining the final mutually agreed sites. The Project Operation Manual (POM) to be prepared for the HoA-GW4R project will provide practical details of these prioritization tools and other relevant selection criteria for sub-projects under Component 1. The identified sub-projects and ground water study submitted to National Groundwater Resource Management Steering Committee (NGWRSC) will be reviewed and approved. The approved sub-projects will be integrated into the annual action plan of the HoA-GW4R Project will be eligible for ES screening.

The major sub-project types to be implemented under HoA-GW4RP are mostly identified and known at this stage. These include the water supply and irrigation development sub-projects. The PMCU and PITs with the participation of seconded experts from the beneficiary institutions (i.e., WSSD, WRMD and IDPD) will work to identify new sub-projects that will drive from Components 1, 2 and 3 activities. The technical assistance and capacity building sub-projects under Component 2 will be identified by the implementing agencies, i.e., MoWE and MoIL in collaboration with the Ethiopian Institute of Water Resources through needs assessments to identify the gaps.

Step 2: Scoping/Screening

Screening is a key environmental and social management process aiming at determining appropriate studies and follow up that might be required for sub-project activities. The screening aims at categorizing the sub-projects into one of the environmental and social categories consistent with National ESIA Guidelines and the ESSs of the WB. Screening will be carried out on specific project activities once they have been identified during the annual planning phase of the HoA-GW4R project.

This ESMF requires that all HoA-GW4RP components 1 and 2 sub-projects having specified site location be scoped/screened for social and environmental impacts as well as all studies.

Scoping/screening will be required where investments will be made on components 1 and 2 subprojects included in the endorsed action plan of HoA-GW4RP.

In order to fulfill the requirements of ESS-1 and National ESIA guidelines, the environmental and social scoping/screening will follow two stages. Initially, a scoping/screening of sub-projects will be carried to categorize it into one of High, Substantial, Moderate or Low risk according to the WB ESF ES risk criteria (the risk classification criteria is indicated in Annex II). During this first stage, the sub-project will be scoped/screened using the scoping/screening form attached in Annex I. Once the sub-projects are scoped/screened, then further categorization will be carried by applying the national screening system to identify the schedule of activities into which the sub-project will fall (Schedule I, II & III). Based on the nature and scale of the HoA-GW4RP Components 1 and 2 sub-projects, it is expected that most will fall under Schedule I or II which may require Full or Preliminary/Partial ESIA. If, on the other hand, the sub-project is categorized as High-Risk sub-project, the ESIA will be prepared in accordance with the ESSs.

The MoWE (WSSD & WRMD) and MoIL (IDPD) of PMCU and PITs environmental and social staff will initiate the scoping/screening process by completing the form contained in Annex I: environmental and social screening/scoping form. The aim of the screening/scoping form is to assist in identifying potential environmental and social impacts based on field investigations in the area of the sub-project site. The form helps to determine the characteristics of the prevailing local bio-physical and social environment with the aim of assessing the potential impacts of the construction and rehabilitation activities on the environment by the sub-project. The screening/scoping exercise should also involve the cultural heritages and resettlement aspects of the sub-project. While completing the screening/scoping form the assessor should undertake the assignment after:

- Gaining adequate knowledge of baseline information of the area.
- Gaining knowledge of proposed project activities.
- Having been briefed / trained on environmental and social screening.

The outcome of environmental and social screening/scoping will be classifying the proposed subproject into one of High, Substantial, Moderate, or Low Categories and Schedule I, II or III activities. A Schedule I sub-project could be categorized as "High" or "Substantial" risk subproject according to the WB ESF classification.

Once scoping/screening of a sub-project is completed, a Scoping/Screening Report will be prepared. The Scoping/Screening report to be produced will describe:

- The proposed sub-project and its potential impacts,
- Characteristics of the location (sensitivity of the area),
- Size (small, medium and large scale) of the sub-project,
- Degree of public interest,
- Main environmental impacts and mitigation considerations,
- Categorization of the sub-project (High, Substantial, Moderate, Low risk and Schedule I, II or III)

The completed scoping/screening report will be submitted first to the MoWE as well as to MoIL of PMCU and PITs coordinator for internal checking and approval. It will then be submitted to the relevant federal, regional, zonal or local environmental protection

commissions/bureaus/offices with an official application letter for review and approval (**Note**: It is important for Components 1 & 2 sub-project E&S screening reports to be submitted to environment protection offices at federal, regional or zonal level as appropriate for review and approval procedures. For sub-projects implemented in Dire Dawa City Administrations, the E&S screening reports will be submitted to the city level environment protection offices). The federal, regional, zonal or local environmental protection commissions/bureaus/offices will review the Scoping/Screening Report and will:

- a. Accept the document with conditions relating to implementation;
- b. Accept the documents with required and/or recommended amendments; or
- c. Reject the document with comments as to what is required to submit an acceptable Screening Report.

Following the approval of the sub-project environmental screening/scoping report by the relevant offices, the sub-project will be fed into one of the following processes based on its approved Categorization.

- i. Schedule I sub-projects will require a full ESIA and will necessitate the inclusion of environmental and social mitigation and enhancement measures in the design and implementation of sub-projects.
- ii. Schedule II sub-projects will require a partial or preliminary ESIA (PESIA) and will similarly necessitate the inclusion of environmental and social mitigation and enhancement measures in the design and implementation of sub-projects.
- iii. Schedule III sub-projects are not subject to environmental assessment as no potential impacts are anticipated. Thus, no further action is required. However, generic ESMP shall be prepared and EHS terms and conditions will be included, as applicable, in the procurement bid and contract documents and the environmental guideline for construction contractors will be applicable.

The next step in the ESMF process is to prepare ES instruments based on the outcomes and recommendations of the Scoping/Screening Report..

Step 3: Schedule I & II Sub-projects (Full and Preliminary/Partial ESIA Preparation)

If the outcome of the E&S screening/scoping finally results in categorizing the sub-project as Schedule I or II sub-project, the following actions need to be pursued. Schedule I and II sub-projects will be subject to a full ESIA or preliminary ESIA (PESIA), respectively, that could be carried out with the help of registered and licensed environment and social consultants. Guideline for ESIA is provided in Annex III. For sub-projects involving land acquisition, according to the new ESF, ESS-5 requires the development of Resettlement Plans (RP) proportionate to the scale and magnitude of the land acquisition impacts, regardless of the number of affected parties.

Whereas it is apparent for the need for full ESIA for Schedule I sub-projects, Schedule II subprojects are required to prepare "Preliminary" or also otherwise called "Partial" ESIAs in which the depth of its information requirement can be defined in consultation with the relevant federal, regional, zonal, or local environmental protection offices. Generally, the scope of ESIA for Schedule II sub-project may vary, but it is narrower than that of Schedule I ESIA. Like Schedule I ESIA, it examines the project's potential negative and positive environmental impacts and recommends any measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance which will be summarized in the ESMP. Undertaking the preparation of both the full and preliminary ESIAs and RP involves:

- A field assessment of the sub-project area to identify likely environmental and social impacts;
- Consultation with beneficiaries and affected communities;
- Preparation of an ESMP and RP.

During the study of the full ESIA, preliminary environmental and social impact assessment and resettlement plan preparation the environment and social risk management staff of MoWE and MoIL of PMCU and PITs will have to ensure the quality of the assessment by conducting interim review of the draft full ESIA, PESIA and RP reports. The full ESIA, PESIA and RP will then be presented by the MoWE PMCU as well as the PITs for further executive review and approval. Following that, the full ESIA, PESIA and RP will be sent to the World Bank Country office for review and clearance /no-objection. Finally, the Full ESIA, PESIA and RP will be submitted by the MoWE PMCU to the relevant federal, regional, zonal, or local environmental protection offices with an official application for review and approval.

Note: If, on the other hand, the outcome of the E&S screening/scoping finally results in categorizing the sub-project as Schedule III, no further actions to conduct Environmental Assessment will be needed. However, based on the nature of the Schedule III sub-project, if it is deemed necessary, a distinct ESMP will be prepared to address and mitigate the expectedly few and minor environmental and social impacts of the sub-project and attach it with the E&S screening report for further implementation. In other cases, generic ESMP shall be prepared.

Step 4A: Review and Decision

The relevant federal. regional, zonal, protection or local environmental commissions/authorities/bureaus/offices will review the full ESIA, PESIA and RP submitted to it by the MoWE PMCU as well as the PITs. The purpose of review is to examine and determine whether the Full ESIA, PESIA and RP are adequate assessment of the environmental and social/resettlement effects of the HoA-GW4RP sub-project under consideration and sufficiency of its relevance and quality for decision-making. Reviewing by the competent federal, regional, zonal, or local environmental protection commissions/authorities/bureaus/offices may include considerations of the adequacy of:

- The examination of alternatives, assessment of impacts, appropriateness of mitigation measures and monitoring schemes as well as implementation arrangements;
- The extent of public involvement and reflection of community/stakeholder concerns; and
- The presence of adequate information required in the report.

The outcome of the review of the Full ESIA, PESIA and RP by the federal, regional, zonal, or local environmental protection commissions/authorities/bureaus/offices will result in either one of the following:

- a) Accept the documents with conditions relating to implementation;
- b) Accept the documents with required and/or recommended amendments; or
- c) Reject the documents with comments as to what is required to submit an acceptable ESIA PESIA or RP.

Step 4B: Disclosure

During in the review and approval process, as required by the World Bank guidelines and the National ESIA proclamation, the ESIA, PESIA and RP documents must be disclosed for public review at a place accessible to local people (e.g., at a local government office i.e., woreda council, city/town and regional bureaus, at the federal, regional, zonal, or local environmental protection commissions/authorities/bureaus/offices, MoWE and MoIL website, etc), and made available in a form, manner, and language they can understand. Disclosure of the ESIA, Preliminary ESIA and RP in the World Bank's info shop is also a requirement for the HoA-GW4R project. The approved ESIA, PESIA and RP will be sent to the World Bank Country office for further disclosures in the info shop.

Step 5: Implementation & Supervision

When approval has been given to the ESIA, PESIA and RP, implementation of mitigation measures and systemic follow-up is needed for the sub-projects. In order to enforce the implementation of recommended mitigation measures, there is a need to include ESHS clauses in the procurement bid documents and contract agreements to be signed with the construction contractors or other entities. Standard ESHS clauses can be prepared for the main types of subprojects. The ESHS clauses should demand the construction contractor to implement and monitor all proposed mitigation measures in the ESIA, PESIA and RP that are applicable during the construction phase. The contractors are expected to prepare Contractor-ESMP (C-ESMP) which needs to be approved prior to any construction activity. The MoWE PMCU as well as the PITs will also be required to enforce implementation of proposed mitigation measures as proposed in the ESMP and RP by all responsible institutions and stakeholders. The ESMPs prepared prior to implementation of the sub-projects shall include measures required during the operation of the sub-projects. The ESMPs shall be further updated by the sub-project operators (WUAs and WaSHCOMs) with support and monitoring from local government bodies. The local government bodies (including local environmental offices) will be responsible for supervision and monitoring of implementation of the ESMPs, including reporting to the implementing agencies and/or regional bureaus.

Internal monitoring to ensure the compliance of HoA-GW4RP Components 1 and 2 subproject implementation activities against the mitigation measures set out in its ESMP and RP, will be carried out by the environment and social risk management staff of the MoWE PMCU as well as the PITs who are responsible for environmental and social management as well as the supervisory engineer at the construction sites. The relevant MoWE PMCU and PITs environment and social risk management staff in collaboration with the design and supervision consultant will have the primary responsibility for carrying out this monitoring by regularly visiting the subprojects, and pursuing the corrective measures as required. Periodic reports of internal monitoring should be prepared quarterly by the environment and social risk management staff of MoWE PMCU and PITs and then submitted to Project Steering Committee as part of the regular HoA-GW4RP M&E process.

The implementation of the recommended mitigating measures will also be monitored by the concerned federal, regional, zonal, or local environmental protection commissions / authorities / bureaus / offices . The MoWE PMCU and PITs will have to collaborate in the planning for external compliance monitoring and inspections that will be conducted by the relevant federal, regional, zonal, or local environmental protection commissions/authorities/bureaus/offices. The planning for external compliance monitoring/inspection could be initiated by environmental

offices themselves or (if that is not coming forward their side) by the MoWE PMCU and PITs in line with the M&E system.

Compliance monitoring comprises on site-inspection of construction activities to verify that measures identified in the ESMP and RP and those included as environmental clauses in the contractual agreements for contractors are being implemented. Compliance monitoring and supervision of the ESMP/RP covers:

- determining whether the sub-project is being carried out in conformity with environmental and social risk management instruments and legal agreements;
- ensuring that the anticipated impacts are maintained within the levels predicted,
- identifying problems as they arise during implementation and recommend means to resolve them;
- seeing that the un-anticipated impacts are managed and or mitigated before they become problems,
- recommending changes in sub-project concept/design, as appropriate, as the sub-project evolves or circumstances change; and
- realizing and optimizing the benefits expected, and
- providing information for a periodic review and alteration of the environmental management plan and enhance environmental protection through good practice at all stages of the sub-project.

It is, therefore, necessary that Environmental and Social Management Plan is supervised, monitored and reported on together with other progresses of the sub-projects.

Step 6: Environmental and Social Risk Management and Monitoring Reports

During the course of ESMF implementation, the reporting arrangement for Environmental and Social Monitoring and Performance will follow the arrangements preferred by the key implementing agencies. Instead of preparing a single consolidated E&S performance report for all the components of the HoA-GW4R project by aggregating the component reports by either of the lead implementing agencies, which is believed to be a major obstacle for delayance on timely reporting, MoWE PMCU and PITs prefer to follow an independent E&S monitoring and performance reporting on the Component activities they implement. Accordingly, MoWE PMCU will prepare and submit regular quarterly, biannual and annual E&S monitoring and performance reports for the project.

The environmental and social risk management monitoring reports should be submitted internally to MoWE PMCU and to NGWMSC, externally to the federal, regional, zonal, or local environmental protection commissions / authorities / bureaus / offices, and the World Bank for review.

The purpose of these reports is to provide:

• Status on compliance with ESHS requirements established for the Project including those in sub-projects

- A record of HoA-GW4RP subproject activities, experience and issues running from yearto-year throughout the HoA-GW4RP that can be used for identifying difficulties and improving performance; and
- Practical information for undertaking an annual review.

Step 7: Annual Reviews

The ESMF implementation review will also be supported by conducting annual environmental and social performance audit (including audit of implementation of ESIA and RP as appropriate) that will be carried out by a third party. The third-party annual environmental and social performance audits will be conducted on the HoA-GW4RP subproject activities to evaluate the overall implementation of the ESMF. The annual environmental and social performance audits will be considered to be the principal source of information to project management for improving environmental and social performance. It is expected that these annual performance audits will be carried out by registered and licensed independent consultancy firm that is not otherwise involved in the Project. The purpose of the annual performance audit includes:

- To assess compliance with ESMF procedures, learn lessons, and improve future ESMF performance; and
- To assess the occurrence of, and potential for, cumulative impacts due to Project-funded and other development activities.



Figure 0-1 ESMF Process Flow

Fable 0-1	Outline o	of Roles	and Res	ponsibilities	for	the E	SMF
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Activity	Lead Role for Preparation and/or	Lead Role for Review,	
Activity	Implementation	Approval & Monitoring	
Completion of ES screening	E&S staff of the MoWE & MoIL (PMCU &	Federal, regional, zonal, or	
using the form in Annex I:	PITs)	local environmental	
Screening Form.		protection offices, World	
Preparation of ESIA, PESIA,	ESIA, PESIA, and RAP preparation by	Bank for review and	
ESMP, and RP	registered/licensed consultant/firm, ESMP (for	clearance of full ESIAs and	
	schedule III) preparation by environmental and	PESIAs	

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Activity	Lead Role for Preparation and/or Implementation	Lead Role for Review, Approval & Monitoring
	social staff in MoWE & MoIL (PMCU & PITs)	
Implementation monitoring of Full ESIA, PESIA, ESMP, and RP	E&S staff of the MoWE & MoIL (PMCU & PITs) , Contractors, Consultants WUAs and WaSHCOMs during operation of sub-projects	
Annual Environmental and	External registered/licensed environment and	
Social Audit (by independent consultant)	& MoIL (PMCU & PITs)	

SUB-PROJECTS REQUIRING A SPECIAL PROCEDURE AND GUIDELINES

Projects Involving Cultural Heritage Management

As the HoA-GW4RP Component 1 activities are likely to involve subproject activities with linear and non-linear infrastructure development, acquiring small plot of land and/or usage of properties, and activities such as constructing irrigation schemes, water supply schemes, and water trough for livestock, it can potentially pose an impact on cultural heritage sites. Therefore, it is important that the environmental and social assessment for sub-projects consider direct, indirect and cumulative sub-project-specific risks and impacts on cultural heritage. Through the environmental and social assessment, the potential risks and impacts of the proposed activities of the project on cultural heritage will be determined.

The HoA-GW4RP sub-project activities should consider avoiding impacts on cultural heritage. When avoidance of impacts is not possible, it should identify and implement measures to address impacts on cultural heritage in accordance with the mitigation hierarchy. The mitigation measures will need to be integrated into the ESMP to avoid damage to cultural properties.

The mitigation plan in the ESMP should be consistent with Proclamation No 209/2000 on Research and Conservation of Cultural Heritage, the World Bank ESS8 for Cultural Heritage, and should take into account institutional capabilities relating to the management and preservation of physical cultural resources. Mitigation measures include:

- consultations with the appropriate authorities and local inhabitants to identify known or possible sites during subproject planning;
- relocating of subprojects to avoid identified sites;
- relocating or modifying the physical footprint of the project;
- conservation and rehabilitation in situ;
- relocation of cultural heritage;
- establishment of a monitoring system to track the progress and efficacy of these activities;
- establishment of an implementation schedule and required budget for the identified mitigation measures; and cataloguing of finds.

In case of chance find of heritage encountered during subproject implementation activities, the procedures that should be followed are stipulated under article (41) "Fortuitous Discovery of Cultural Heritage" of the Proclamation No 209/2000 which includes:

- i. Any person who discovers any Cultural Heritage in the course of an excavation connected to mining explorations, building works, road construction or other similar activities or in the course of any other fortuitous event, shall forthwith report same to the Authority, and shall protect and keep same intact, until the Authority takes delivery thereof.
- ii. 'The Authority' shall, upon receipt of a report submitted pursuant to Sub-Article (I) hereof, take all appropriate measures to examine, take delivery of, and register the Cultural Heritage so discovered.
- iii. Where the Authority fails to take appropriate measures within six months in accordance with Sub- Article (2) of this Article, the 'person who has discovered the Cultural Heritage may be released from his responsibility by submitting, a written, notification with a full description of the situation to the Regional government official.
- iv. The Authority, shall ensure that the appropriate reward is granted to the person who has handed over a Cultural Heritage discovered fortuitously in accordance with sub-Articles (I) and (2) of this Article. And such person shall be entitled to reimbursement of expenses, if any, incurred in the course of discharging his duties under this Article.

A complete chance find procedure incorporating the above procedure of the proclamation enriched with other necessary good practice procedures is presented in Annex VIII.

Sub-projects Involving Land Acquisition or Restriction of Access to Land Use

It may occur that some of the Component 1 sub-projects might involve involuntary loss of assets or restriction of access to land use. ESS 5 applies to all land acquisition and any changes in access to resources due to a sub-project. ESS 5 aims to avoid involuntary resettlement to the extent feasible, or to minimize and mitigate its adverse social and economic impacts. Under circumstances ESS 5 requires that borrowers prepare adequate resettlement planning instruments (RP) prior to Bank appraisal of proposed sub-projects. A separate Resettlement Framework (RF) document is prepared for the HoA-GW4RP Component 1 project to provide guidance on the principles and procedures associated with implementation of ESS 5 requirements including the resettlement planning instruments (i.e., RP). The RF is intended to be applied in conjunction with this ESMF. In the event that there are differences between national legislation and ESF ESS 5 requirements, the provision of the later will prevail during project implementation.

CERC ELIGIBILITY AND IMPLEMENTATION

A CERC project component which is a mechanism for financing eligible expenditures in the event of crisis or emergency (such as a major natural disaster) has been included in the HoA-GW4R project. Similar to the other three components of the project, the CERC (including any activities or sub-projects) shall be implemented according to the ESMF. The ESMF processes presented in this section including scoping/screening and preparation of applicable ES instruments are applicable for CERC sub-projects or activities which could be triggered depending on the need.

INSTITUTIONAL ARRANGEMENT FOR ESMF IMPLEMENTATION

The lead responsibility for the overall coordination and implementation of the HoA-GW4RP activities lay on the Ministry of Water and Energy (MoWE) Water Resources Management Division (WRMD) which will host the Project Management and Coordination Unit (PMCU). The Ministry of Water and Energy (MoWE) will be the responsible lead agency for implementing the ESMF process for the project activities. The PMCU will assign ES safeguards specialist to manage ES aspects of the project. In addition, it is expected that the PIT to be established at MoWE and MoIL will assign their respective ES safeguards experts for managing implementation of ESMF and other instruments to be developed at sub-projects level. WaSHCOMs and WUAs will be responsible for ES management during operation of the sub-projects.

THE PROJECT MANAGEMENT AND COORDINATION UNIT (PMCU) AND PROJECT IMPLEMENTATION TEAMS (PITS)

The main ESMF implementation units are:

- The Project Management and Coordination Unit (PMCU) to be established under the Water Resources Management Division (WRMD) of the Ministry of Water and Energy (MoWE) which will be the lead unit for implementation of the ESMF.
- The Project Implementation Team (PIT) under the Water Supply and Sanitation Division (WSSD) of the MoWE.
- The Project Implementation Team (PIT) under the Irrigation Development Project Division (IDPD) of the Ministry of Irrigation and Lowlands (MoIL).

Under the above units, it is expected that the following ES staffing will be employed:

- An environmental specialist at the PMCU
- A social specialist at the PMCU
- A gender specialist at the PMCU
- An ES expert at the PIT of the WSSD (unless centralization of the safeguards responsibilities at the MoWE is decided depending on the recent structuring of the ministry)
- An ES expert at the PIT of the IDPD.

The project implementation units have the following responsibilities in managing ES risks:

- Appoint the ES staff as described above (or any other requirements envisaged prior to project implementation)
- Ensure that the project is implemented in compliance with the WB ESF and relevant government ES requirements
- Ensure that all project participants, from federal to local levels, are informed of their responsibilities for the day-to-day compliance of the ESMF

- Undertake environmental screening, preparation of ES safeguards instruments, address comments from project participants and stakeholders on the screening reports and ES instruments, disclose the relevant ES reports and instruments, and lead the overall preparation and quality assurance of project and sub-projects documents, reports, and instruments.
- Conduct public and stakeholders consultations
- Building the capacities of project participants in understanding and implementing the ESMF
- Monitor the implementation of sub-projects based on the ESMF and specific ES instrument prepared
- Prepare and keep record of reports, minutes of meetings, presentations, and other deliverables regarding ES aspects
- Timely and properly report and keep records of environmental and OHS incidents, accidents, or near misses that occur during sub-projects implementation
- Provide overall leadership for effective implementation of the ESMF
- Overall support for the smooth implementation of the HoA-GW4RP.

SPECIFIC ROLES OF HOA-GW4RP ES STAFF

The ES staff under the implementation units have the following specific responsibilities:

- Prepare screening reports for sub-projects under all project components
- Review and follow-up on ES safeguard instruments preparation by consultants based on the outcome of the sub-projects screening
- Prepare ES instruments (such as ESMPs) based on the outcome of sub-projects screening
- Follow-up and address comments given on screening reports and ES instruments by stakeholders
- Follow-up and ensure that all ES instruments (including screening reports) are reviewed and approved/cleared by the concerned government entities
- Review and approve contractors' ESMPs based on the ESMF and specific sub-projects ES instruments prepared
- Prepare regular quarterly, bi-annual, and annual ES performance reports and present the same for the stakeholders
- Participate in meetings, missions, and other project discussions with stakeholders
- Liaise with stakeholders on ES matters including government bodies, the WB, the communities, consultant, contractors, NGOs, etc ...
- Coordinate and deliver ES related capacity building training for stakeholders
- Conduct public consultations and establish dialogue with local communities to ensure that ES concerns addressed and incorporated in the sub-projects implementation plan
- Periodically review or follow-up third-party reviews of the performance of the project regarding ES safeguards implementation.

ROLES AND RESPONSIBILITIES OF OTHER GOVERNMENT BODIES

A number of government bodies at federal, regional, zonal, and local settings are expected to participate during implementation and operation of the HoA-GW4R project along with the implementation of the ESMF. The following points summarizes key government bodies and their main roles in implementation of the ESMF.

- Ministries and federal offices responsible for environmental and social issues will provide policy, regulatory, and enforcement guidance on environmental and social risks and impacts mitigation. These include Ministry of Finance, Ministry of Agriculture, Ministry of Women and Social Affairs, Ministry of Health, Ministry of Labor and Skills, Agricultural Transformation Agency, Ethiopian Meteorological Institute, and the National Disaster Risk Management Commission.
- Regional government bureaus and offices could participate in the project implementation if it is delegated to the regions after adequacy of their ES safeguard implementation capacity is confirmed through capacity and risk assessment acceptable to the World Bank.
- Zonal, Woreda, and local/town government line offices (such as administrations, agricultural offices, health offices, etc...) will participate in sub-projects identification, community mobilization, and in other implementation and operation activities.
- Federal, regional, zonal, and local/woreda/town environmental protection commissions/authorities/bureaus/offices will be responsible in review and approval of ES instruments. Also, these bodies will be responsible for monitoring the implementation of ES measures recommended in the instruments.

ROLES OF LOCAL COMMUNITIES

The local communities in the sub-projects influence area should participate in the project during planning, design, implementation, and operation stages. The communities shall put forward their wishes and concerns on environmental and social matters through various mediums to be put in place by the project. Community organizations such as WaSHCOMs and WUAs (supported by local government bodies) will be responsible in overseeing environmental and social measure implementation during sub-projects operation.

ROLES AND RESPONSIBILITIES OF THE WORLD BANK

The World Bank will be responsible for the following tasks:

- Provide guidance on the compliance of the project with Bank ESF and ESSs
- Perform compliance monitoring of the HoA-GW4R project to ensure that its ESF and standards are complied with and conduct regular project review missions
- Maintain an oversight role, review and approve HoA-GW4R projects' ESMF, and environmental assessment instruments such as ESIAs or PESIAs of sub-projects
- Conduct regular supervision missions to check on the performance of the HoA-GW4RP and assess its compliance to agreed covenants
- Recommend measures for improving the performance of the HoA-GW4R project implementation units (PMCU and PITs)
- Recommend the holding of appropriate training program intended to improve the capacity of the implementation units (PMCU and PITs) as necessary.

UPDATING THE ESMF

This ESMF shall be updated following new developments, guidelines, national legislations, etc... issued by the concerned stakeholders during the course of the HoA-GW4R project implementation.

GRIEVANCE REDRESS MECHANISM

GENERAL

A Grievance Redress Mechanism (GRM) is an essential part of the safeguard instruments that intends to address complaint concern and complaints related to project implementation promptly and effectively. The project GRM will be gender responsive, culturally appropriate and readily accessible to all persons. Communities should be aware of their rights to access the GRM. The main objective of a Grievance Redress Mechanism (GRM) is to respond to concerns and grievances of project-affected parties related to the environmental and social performance of the project, including Gender-Based Violence (GBV), in a timely, effective and efficient manner. Grievance redress mechanism improves the outcome of the project, helps to prioritize supervision, identify systematic implementation issues and trends and promote accountability through creating more predictable, timely and result oriented response to citizen concerns. Additionally, in accordance with ESS10, the project will establish a worker grievance mechanism (WGM), to enable all direct workers and contracted workers to raise workplace concerns, including in relation to workplace sexual harassment.

PROPOSED GRIEVANCE REDRESS MECHANISM FOR THE HOA-GW4R PROJECT

The Grievance Redress committee will be established at Woreda and Kebele levels. The committee will be established by city council or woreda administration at the initial stage of the project implementation. The committee will constitute of three to five members varying at Kebele and woreda levels. The Woreda Committee will be drawn from the different Offices including from office of Women and Social Affairs and the Kebele GRM committee members will be drawn from Kebele Cabinet members and representative of PAPs. Special considerations will be given for women and persons with disability in the composition of the committee.

The functions of each GRM Committee are as follows:

a) Kebele GRM

Complaints of PAPs provided on any environmental and social aspects related to subproject activities shall first be lodged either in writing or orally to the committee, which will be resolved by using customary rules and existing grievance resolution mechanisms. The lower level GRM units must have reporting mechanisms for issues related to non-title holders which are not even recognized by the national laws. The Grievance Resolution Committee will try as much as possible to arrive at a compromise for the complaints raised. This will be obtained through series of consultations, mediations and negotiations exercises conducted with the PAPs. If the grievance is not resolved, the case will be forwarded to Woreda GRM. The seat of the Kebele GRM committee will be at Kebele administration.

Both Woreda and Kebele GRM committee will follow the procedures outlined below:

i. Registration of grievance: an aggrieved party registers a grievance at the Kebele office or with project liaison officer using "Grievance Registration Form" and within seven days

the committee meeting is convened by the chair. The secretary of the committee will login the Grievance into the Grievance Register and the aggrieved person is informed of the scheduled hearing. A maximum of 7 days shall be given between the date the case is recorded and the date when the hearing is held;

- ii. The committee will be meeting on a weekly basis to deal with emerging cases. At these meetings, hearings with the affected persons and related witnesses will be held;
- iii. The committee will communicate its judgment to the affected persons within 7 days;
- iv. If the PAPs will dissatisfy with the Kebele GRM committee judgment, the committee chairperson deliver the decision to Woreda (Appeal Hearing Council) within 7 days;
- v. If the PAP is still not satisfied with the judgment of Woreda GRM committee, he or she will be allowed to move his/her case to the next formal court.

b) Woreda GRM

- Receive responses of complaints from Kebele GRM;
- Accept/receive grievance, complaints and discontents from PAPs;
- The GRM committee will look at the scene/spot or investigate any available data to give fair decision; and
- Give response within one week

Grievance Resolution Process

The grievance procedure will be simple and administered as far as possible at the local levels to facilitate access, flexibility and ensure transparency. All the grievances will be managed through the Grievance Resolution Committees. Complaints will be received in writing or orally and will be filled in a Grievance Registration Form by the committee.

The steps for grievance redress are as follows:

First Step: Registration of the grievances with the Grievance Resolution Committee at Kebele level as discussed above. The committee will seek to eliminate nuisance claims and engage with legitimate claimants endeavoring to reconcile the aggrieved PAP(s) concern or depending upon the issue to negotiate for a resolution. Where the complaint and grievance cannot be resolved by the committee, the complaint is referred to the Woreda GRM Committee.

Second Step: The Woreda GR committee receives grievance forwarded by the Kebele GRM committee concerning the aggrieved PAP(s) to negotiate and forward possible resolution. The Woreda GRM Committee having heard the concern, the meeting will respond to the aggrieved PAP(s) within one week of the date of the meeting.

Third Step: In instances where the project, in this case HoA-GW4RP is unable to resolve the matter, the same will be referred to the Courts for settlement. The aggrieved PAP(s) have the right to pursue the matter up to the Supreme Court if necessary. The Woreda GRM committee will give all the necessary documents and information to the aggrieved PAPs, who are dissatisfied with the committee decision.

Fourth Step: Expropriation of land will be used as a last resort when either all the above procedures have failed or caused extensive delays to the project are foreseen with the deposition of the compensation amount in the closed account opened on his/her behalf. The decisions of the

action to be taken will be communicated to all involved parties mainly in Grievance resolution form.

All measures will be undertaken to ensure that the grievance is solved amicably between the concerned parties and the courts will be the last resort. Efficiency in solving of the grievances will be of paramount importance. The above steps are summarized in the figure below.



Figure 0-1 PAPs Grievance Resolution Channel

Appeal to Court: Whenever misunderstandings and disputes arise between the principal parties (e.g. local government bodies and affected parties) involved, the preferred means of settling disputes is through arbitration (Proclamation No.1161/2019). The number and composition of the arbitration tribunal may be determined by the concerned parties. Though Proclamation No. 1161/2019 provides for appeals from valuation decision, such action will not delay the transfer of possession of land to the proponent. Courts of law shall be considered as a "last resort", which in principle should only be triggered where first instance amicable mechanisms (which has similar role with the GR committee but formally established by government) have failed to settle the

grievance/dispute. However, the Constitution allows any aggrieved person the right of access to court of law as well as access to compensation while appeal continues.

Grievance Mechanism	Length of Time	Remarks	
Assigning local elder// traditional grievance redress institution/kebele/woreda	During the public meeting through the first phase of the project.	The flow of the project grievance redress mechanism will be introduced to the assigned party	
Accepting grievances submitted through a channel of: in person in oral /written form, phone, text message, mail, e-mail	1 day		
grievances are registered in writing and maintained as a database	2 days		
Acknowledgement of grievances	2 days		
Presenting Grievance to appropriate body	3-5 days		
Development of verified response	2 days		
Redress action implemented and update of progress on resolution communicated to complainant	1 week		

Table 0-1 Tentative Time Allocation for GRM Activit

The effectiveness of resolution of complaints and appeals will be monitored during implementation. The grievance form will be made available in the woreda, Kebele offices and on the construction sites, alongside of the description of the grievance mechanisms.

Dispute Resolution

In case disputes arise on the implementation RF, preferred options of the project affected persons for settlement through amicable means should be taken as an option. This will save time and resources as opposed to taking the matter into serious litigation procedures. To ensure that the PAP have avenues for redressing grievances related to any aspect of land acquisition and resettlement, procedures for the redress of grievances are aimed to be solved based on Proclamation No. 1161/2019, Article 18,19, and 20 on Expropriation of Landholdings for Public Purpose, Payments of Compensation and Resettlement. Detail dispute resolution issues of land expropriation are also indicated on the Council of Ministers Regulation No 472/2020. World Bank Framework on ESS5 also indicates that grievance redress mechanism that could be raised related to disputes arising from displacement or resettlement should take into account the availability of judicial recourse and community and traditional dispute settlement mechanisms. An additional GRM step (using traditional dispute resolution mechanisms) has been suggested for HUTLCs in the SEP.

ADDITIONAL GRM CASES

Grievance Mechanism for Project Workers

Establish and maintain labor grievance mechanism for E-HoA-GW4RP workers (direct workers, community workers and contract workers) as described in the LMP and consistent with ESS2. It must be backed with a more effective band confidential mechanism for GBV/SEAH complaints handling.

Grievance Mechanism for IPs

The MoWE and MoIL shall ensure that the Grievance Redress Mechanism established and/or strengthened under ESS10 as part of the SEP shall be accessible and that it is culturally appropriate for the underserved communities. Besides, the other related projects (One-WASH-CWA and SUWSSP) have put in place Grievance Redress Procedures for communities and individuals in the projects operation sites who believe that they are adversely affected by the program. The PAPs/PACs may submit complaints to the program-level Grievance Redress Mechanism (GRM), which is already under implementation. The E-HoA-GW4RP GRM builds on Ethiopian grievance redress systems as part of a robust risk mitigation measure.

The Grievance mechanism supports resolution of E-HoA-GW4RP related complaints or grievances by citizens in a formalized, transparent, cost-effective and time –bound manner consistent with the ESS7. All PAPs and PACs shall be informed about how to register grievances or complaints, including specific concerns on any HoA-GW4RP activities. The HoA-GW4RP GRM ensures that complaints received are promptly reviewed to address program-related concerns.

Special GRM Procedure for GBV

For the GRM to effectively address the issues/incidents related to sexual exploitation and other forms of gender-based violence, the project in general, and the Woreda level GRC, must create a proactive mechanism that is functional throughout the project cycle. In this regard, the Woreda Women and Children Affairs Office head will be the focal person on issues related with sexual exploitation and other forms of gender-based violence. The following are the working procedures of the Woreda Women and Children Affairs Office to handle GBV in the project area.

- The respective Woreda Women and Children Affairs Office should receive capacity building/training on key principles of GBV/SEA case management including confidentiality, non-judgmental, best interest of the survivor, services and referrals;
- Establish a proper channel to receive reports or project-related risks of sexual harassment and GBV, i.e., the risk factors that exacerbate or expose people to GBV;
- Conduct awareness raising campaign regarding the risks of GBV to both men and women in the project area; and key principles of GBV/SEA case management including confidentiality, non-judgmental, best interest of the survivor, services and referrals.
- The respective Woreda Women and Children Office representative in the Woreda GRC will be the focal point who can confidentially receive complaints or reports from the survivors through various forms of uptake channels including telephone call (hot line if any), text message, email, face-to-face, and others.
- The Woreda Women and Children Affairs will immediately (maximum 24 hours) communicate the complain to MoWE. MoWE will report the case to the World Bank.
- The Woreda Women and Children Office will not investigate the GBV/SEA case. Rather, maintaining the key principles of GBV/SEA case management including confidentiality, non-judgmental, best interest of the survivor will report the case to MoWE and MoIL, facilitate survivors to services and referrals.,
- The GBV/SEA case will be investigated, and further information will be collected by GBV/SEA specialists based on the scope of risk involved.,

• Record all the reported incidents based on the level of risks and follow-up or track the response process of the referred agency or court until the achievement of satisfactory resolution.

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 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 the Bank's Inspection Panel, see www.inspectionpanel.org.

STAKEHOLDER CONSULTATION AND DISCLOSURE OF ES INSTRUMENTS

STAKEHOLDER CONSULTATION

A stakeholder consultation meeting was convened on 19 November 2021. The main issues covered during the consultation meeting consists of existing OHS as well as E & S risk management capacities in the project implementing institutions, proposed institutional arrangements for project E & S management and flow of reporting, status and experience of conflicts regarding water supply use and management, and receiving concerns, views and opinions of the stakeholders regarding any potential E & S risks of the proposed project. At the start of the stakeholder consultation meeting a brief presentation was made to introduce the participants the HoA GW4RP.

The stakeholder meeting commenced with discussions on the existing capacities and experiences of the key project implementing institutions. The meeting participants expressed that the previous MoWIE has had an Environment, Social and Climate Change Directorate which was responsible for managing the E & S activities in the water sector. In addition, the major commissions under MoWIE, such as Water Development Commission (WDC), Irrigation Development Commission (IDC), Water Supply and Sanitation Division (WSSD) and Ground Water Assessment Divisions have E & S expert staff who support their projects. It was noted that the former MoWIE and its sub divisions have manpower and extensive experience in Environmental and Social Management of the various projects financed by different Partners. However, the participants expressed that, following the establishment of the new Government in October 2021, the MoWIE was changed to MoWE and is currently undergoing a major organizational restructuring. Accordingly, the former WDC and BDA are dissolved and IDC elevated to Ministry of Irrigation and Lowlands (MoIL). Instead, Water Resource Management Division and Water Supply and Sanitation Division are retained under the new MoWE. The Former Environment Directorate of the Ministry is also restructuring itself and its new formation is yet awaited. It is expected that the MoWE will have a pool of E&S staff under the new Environment Directorate and will be in a position to share their experiences and support the various projects under the MoWE. The new MoIL is also expected to retain its former E & S management team present under the commission.

The participants also reflected on the possible arrangement of these various E & S teams under the MoWE and MoIL. The participants expressed that the HoA-GW4RP is planned to have a Groundwater Project Steering Committee (GWPSC) and Project Coordination and Management Committee (PCMU) at central level within the MoWE. In addition, Project Management Units (PMUs) are going to be established under the MoIL, WSSD and WRMD to carry out the day-today activities under their respective subcomponents in support of the PCMU and PCS. It was expressed that the PCMU and PMUs are going to get E&S staff support either from the pool of experts present in the environment directorate of the MoWE or employ their own E&S staff. Other participants emphasized on the presence of several projects under the WSSD and other divisions which can keep the E&S staff in the pool fully engaged and reflected possible shortage of manpower to occur.

On the other side the role of regional water bureaus in the implementation of the overall project and E & S risk management was also discussed. In this regard participants emphasized that this

project is going to be managed at Federal level and all E & S risk management works will be handled by the PCMU and PMUs in MoWE and MoIL. Other participants also aired their views on the need to learn from similar projects managed at Federal level such as the One WASH program. In such projects, focal persons are rather assigned instead of establishing PMUs at regional level to support project implementation in their respective regions. Under such arrangements, the E & S safeguard staff at regional level carries the E&S screening process follow up and implementation monitoring. A participant from the Federal Environment Protection Authority (FEPA) also expressed that, as the delegation to review and approve ESIA in the water sector formerly conferred to MoWE is now revoked, PESIA or ESIA instruments to be prepared for projects by Federal organs will need to be submitted to the FEPA for review and approval.

The existing capacities and experiences of the implementing institutions regarding the handling of land acquisition and resettlement issues as well as grievance mechanisms to address emerging complaints were discussed. In this regard participants emphasized again on the need to learn from other similar federally managed programs by the MoWE. It was stressed that, the focal persons to be assigned at regional level will have to work in arranging with the local woreda level offices to extend a grievance redress mechanism to the project and receive complaints. It was noted that the regional focal persons will take the lead role in handling and adressing the complaints in collaboration with the woreda level complaint handling offices.

The stakeholder consultation meeting also discussed issues related to occupational health and safety (OHS), child labor, and GBV. The participants explained that for the MoWE exercises, OHS is enforced both at the office and project levels by applying proper mechanisms. For projects involving construction related works, the Ministry has experience in including OHS and child labor prevention articles in the construction contract agreement and its enforcement is supervised both by the contractor at site level and relevant staff of the MoWE. It was also stated that there OHS issues are usually made to be included in the Environmental and Social Management Plan of the specific projects and implemented together with the elements of the ESMP. GBV is usually addressed, it was explained by the participant, by preparing a Gender Action Plan for the projects and its implementation monitored by the focal persons assigned by the Women, youth and children directorate of the MoWE and its divisions.

The other issue discussed in the stakeholder consultation meeting was regarding institutional arrangement and E&S reporting mechanisms. The participants expressed that the two PIUs in the MoWE and the third PIU in MoIL will send the E&S performance and monitoring reports to the PCMU which will consolidate it and send to the GWPSC and the World Bank. It was noted during the discussion that the PMUs in WRMD, WSSD and MoIL will be accountable to the PCMU which will serve as a secretariate and steering committee member of the project and will be in charge to coordinate the day-to-day activities of the overall project in conjunction them.

The meeting also shared experiences by discussing conflict sources related to water supply use and management. Participants expressed that conflict often emerge in areas of water supply and irrigation development projects. The source of these conflicts is usually linked to water sources and compensations. For example, when water supply is sourced or developed at one point and transferred to supply other woredas, urban centers or regions it often become source of conflict. Such conflicts are usually managed and solved by involving the communities, local authorities and other stakeholders in the conflict resolution process. The stakeholder consultation meeting was finally opened to participants to air their concerns, views and opinions regarding the E&S risks of the project. One of the meeting participants expressed a concern by stating that some subprojects are going to be implemented close to the Borderlands. Water supply subprojects, for example, developed along the borderlands can potentially be used by communities on both sides of the border. The participant wondered if there could be mechanisms to introduce appropriate use of the water resource by the beneficiary communities originally targeted by the subproject. The other participant expressed his concern on the potential use of developed water resources both for human consumption and animal watering and reflected on the proper portioning of it for both purposes.

The virtual stakeholder consultation meeting continued for about 2:30 hrs and was finally adjourned after reaching consensus agreements on the above discussed issues.

Issues and Concerns	Responses to Address Concerns and Issues
Information about Ethiopia: HoA-GW4RP: this is a first platform that enabled as to get information about the project. Could you send us the soft copy of the document so that we can share our comment and view on it through mail communication (Stakeholder-Welaiyta zone- water, mines and energy bureau; and Fafan zone- water, mines and energy bureau).	We believe the then MoWIE have consulted you during the target area selection and screening process. If these efforts were not enough to inform you about the project; we are using this platform to inform you about it as an initial effort and MoWE and MoIL will try to address through additional stakeholder and community consultation sessions such as; region, zone and woreda level consultation sessions. In additions to that, the FPIC process and other safeguards material preparation efforts will consider this gap and address it. Besides, there will be an official project launching session.
Stakeholder and Customer Involvement: this project and other similar one is more effective if they are implemented through the active involvement of all stakeholders and the community as well (Stakeholder-Welaiyta zone-water, mines and energy bureau).	Apart from active role of the government and professional experts in identifying the strategic national problems like water scarcity, lack of access to potable water supply and irrigation water scheme related problems. Otherwise, the very nature of the project is characterized by Community Demand Driven approach. Thus, we are involving the community and stakeholders at different stages of the project design activities and we will keep involving them on the implementation and M and E activities of the project.
Benefits of the Project: it will improve the reliability of water supply and also increase the access on the irrigation scheme in Borena zone (Stakeholder-Federal GW Directorate) The project will help to reduce many compliant related to water service delivery; that is by solving water supply interruption (Stakeholder- federal WSSD)	
 Water Supply: water source human being is far from the kebele (Stakeholder-Welaiyta zone-water, mines and energy bureau; and Fafan zone- water, mines and energy bureau). Potable Water: There is serious problem at different woredas of SNNP and Somali (Stakeholder-Welaiyta zone-water, mines and energy bureau; and Fafan zone- water, mines and energy bureau). Irrigation: The agricultural land allocated to the kebele is vast. They complained that the size of the canals supplying water to their agricultural land are not adequate to deliver 	Water supply: can be addressed under 'utilization of GW for water supply (human and livestock)' sub project and strategic investment on water supply facilities. Potable water: can be addressed under 'utilization of GW for water supply (human and livestock)' sub project and strategic investment on water supply facilities. Irrigation: can be addressed under strategic investments, particularly under 'utilization of GW for irrigation-increasing GW irrigation development'-sub component.

Table 0-1 Summary of Issues Raised during Stakeholder Consultation

Issues and Concerns	Responses to Address Concerns and Issues
water to the agricultural field and will need to be widened in order to prevent the overflow of water (Stakeholder-Fafan zone- water, mines and energy bureau).	
GBV: the practices are more prevalent at Oromia and SNNPR (Stakeholder-Federal WSSD). HTP: are more common in Somali and Afar. There is Genital Mutilation, early marriage and inheritance marriage (Stakeholder-Federal- WRMD).	GBV and HTP: can be addressed under improving basic services and capacity building component of the project particularly under institutional capacity building and knowledge management sub-components. Continuous awareness raising programs need to be practiced and a joint committee consisting of BoWSA; police and justice department; community members and Woreda and Kebele development committees should work on resolving the GBV and HTP related problems.
Land Acquisition and Compensation: On the issues of land acquisition and compensation and reduce access to natural resource that might result because of involuntary resettlement by Ethiopia: HoA-GW4RP, the participants explained that they knew the implementation of community subprojects and other household based interventions obviously need a piece of land and people may be affected because acquired land will not be possible during and after the Ethiopia: HoA-GW4RP investment project is implemented(Stakeholder-Federal WSSD).	 Land acquisition and Compensation: the Ethiopian constitution gives the right of ownership of land to the public /state. Individual citizens are given the right to use the fruit of labour expended on the land. Therefore, it is not possible to take any individual land or communal land for public development without adequate compensation. The individual lands are given voluntarily the compensation are not needed but if the individual land are taken involuntarily for public investment the affected peoples should be compensated. In short, the World Bank safeguards policy will be applied Compensation for all affected communities regardless of their land holding is effected; Land-to-land replacement in the case of loss of land; Displaced persons should be assisted in their efforts to improve or restore their livelihoods (capacity building opportunities):
Monitoring and Evaluation: documentation, follow up and Monitoring and Evaluation activities related problems. Especially, they expressed that there is a gap on the project management, because the project is expected to be managed through the federal based team and supported by the regional level project focal persons; so how is the project screening and approval and compensation, resettlement and grievance handling activities will be managed.	Monitoring and evaluation: Strict follow-up and monitoring will be in place to complete the project on time. This will be primarily carried out by the establishment of community level monitoring systems to oversee the overall implementation of the project at the grass root level. GRM: will be linked with the formal government structure that works on complaint handling and to this end they will work in collaboration with the existing other MoWE managed projects like one WASH and Urban Water Supply and Sanitation projects. Compensation and Resettlement: They will hire sufficient staff at federal level and the regional focal person will be supported by intensive capacity building training. Thus, they will work in collaboration with the existing other Bank financed projects- which are managed by MoWE and with the woreda and regional water and irrigation bureaus/offices. The same approach will be used to deal with site specific sub-project screening and approval processes.

Table 0-2 Summary of Participants of Stakeholder Consultations

Institutions	Total	Participants		
		Total	Male	Female
MoWE	1	9	8	1
MoIL	1	1	1	
MoWSA	1	4	3	1
FEPA	1	1	1	
SNNP Region-Woliyta	1	2	2	

Institutions	Total	Participants		
		Total	Male	Female
Oromia Region-Borena	1	1	1	
zone				
Somali Region-Fafan	2	2	1	
zone				
Total	8	19	17	2

ESMF DISCLOSURE PLAN

The HoA-GW4RP ESMF has been prepared in consultation with the key stakeholder's representative of MoWE and MoIL. Public consultations will be carried out with the communities found in the project Woredas in the run up to prepare related E & S risk management instruments such as the ESIA.

In order to ensure that all other interested and affected parties involved get access to express their views, opinions and comments on the ESMF, it will be disclosed to the public via the official websites of MoWE and MoIL prior to effectiveness and implementation. It will also be disclosed at the same time through the World Bank official Infoshop website as a requirement.
SAFEGUARDS CAPACITY NEEDS ASSESSMENT AND TRAINING PLAN

INSTITUTIONAL CAPACITY ASSESSMENT

Effective implementation of ESMF and RF will require technical capacity within the MoWE (WSSD & WRMD) PMCU as well as MoIL (IDPD) PMU, partner and beneficiary institutions, sub-project construction contractors, other institutions responsible for monitoring HoA-GW4RP activities including line ministries and departments as well as operators of the sub-projects. There will be need for in depth understanding of the operationalization mechanism for ESMF to be provided to various the lead, partner and beneficiary institutions and key stakeholders involved in the implementation of HoA-GW4RP activities. Capacity building will be integral to support the teams in appreciating their roles in providing supervision, monitoring, evaluation and environmental reporting on the project activities. Therefore, a special initiative is needed to develop the capacity of the project implementing unit, staff from partner and beneficiary institutions to support implementation of the HoA-GW4RP with regard to social and environmental aspects. The following sections outline the capacity building needs of the implementing agencies, partner and beneficiary institutions.

Capacities and Experiences of Implementing Agencies on Environmental and Social Management

The main implementing agency of the HoA-GW4RP Components 1, 2 & 3 project are the Ministry of Water and Energy (MoWE) and the Ministry of Irrigation and Lowlands (MoIL) involved in implementing components 1 and 2 subprojects in collaboration with MoWE the rural pipe system of water supply component and MoIL will implement the irrigation development scheme. Beneficiaries of local authority institutions representing the beneficiary communities include the kebele, woreda and zonal administrations and related sector offices.

The existing capacities and practical experiences of the main HoA-GW4RP Components 1, 2 and 3 project implementing and partner institutions in the area of environmental management is found to be generally encouraging. MoWE and MoIL are the main implementing agency for components 1, 2 and 3, have extensive experience in project level environmental and social management (ESM) and is supported by a solid organizational structure that puts the WSS and WRM Directorate Ministry of water and Energy directly under the state minister, which link it to the organization's top management team. The WSS Directorate has specialized teams under it that consists of the Environmental and Social Management, the Occupational Health and Safety, as well as the Right of Way (RoW) teams which are well staffed and functional. WSSD also have a separate Directorate for Women and Youth. Similarly, the existing capacities and practical experiences of the MoIL (IDPD) implementing and partner institutions in the area of environmental management are found to be generally strong. The existing organizational structure does constitute an environmental unit and have environment and social staff deployed. MoWE and MoIL has managed several Water supply and sanitation and large-scale irrigation development scheme projects financed by the World Bank in the past and as a result the teams under the two Ministries have qualified and experienced staff for environmental and social risks management of projects financed by the World Bank.

Capacities and Practical Experiences of Regional, Zonal and Woreda EPAs

The role of the environmental regulatory agencies in implementing the HoA-GW4RP ESMF is unavoidably important. As shown in table in earlier section there are environment regulatory institutions at Federal and Regional levels in all the eight regions and one city administrations of the Country. Many of the regional states also have operating environment protection office branches at zonal, woreda and city levels. Some large cities in Amhara and Oromia regions such as Dessie, Gondar, Jimma, Adama e.t.c have city EPA offices with a status of Zone level authority. Such City EPA offices are reported to be vertically accountable to their regional EPA offices and horizontally to the City Administrations. Whereas most of the city level environment protection offices are observed to be directly accountable to the Mayor of the city, the Zone level EPAs are vertically accountable to the regional EPAs. The woreda EPA offices are usually accountable to the Zone EPA offices. On the other hand, apart from the major city environment offices having a zone authority status, the responsibility of the remaining city level offices found in the regional states mainly focus on carrying environmental monitoring and inspections of development projects implemented in their jurisdiction. Similarly, the responsibility of the Woreda level environment protection offices are mainly focused towards providing services to the rural parts of the Woreda found outside urban City administrations. As a result, it will be important for HoA-GW4RP subproject E&S screening reports to be submitted to environment protection offices at federal, regional or zonal level for review and approval procedures. For subprojects implemented in Dire Dawa City Administrations, the E&S screening reports will be submitted to the respective City level environment protection offices.

Most regional and zonal level environmental protection offices where World Bank funded projects has been implemented have acquired a certain level of experiences in reviewing the required environmental and social management reports such as E&S screening, partial/full ESIA, etc. However, these capacities need to be further strengthened in order to fill the gaps in the area of conducting rigorous reviews of the E&S screening and ESMP reports, gaps in conducting environmental monitoring and inspection on subproject ESMP implementations. Therefore, it is necessary that a sound understanding, and dependable level of capacity exists in these institutions that would enable the implementation of the present ESMF, RF and the new World Bank ESSs in general.

Training requirements

One of the capacity building areas sought for by the lead implementing institution MoWE, MoIL and the Partner Institutions involved in the implementation of the HoA-GW4RP subprojects is the provision of training. The training to be offered will also need to address target groups from different beneficiary (e.g., focal persons from regional EPA and health sectors & MoA, Ministry of Finance, Agriculture Transformation Agency, National Metrological Agency) and stakeholder institutions (e.g., private sector operators/contractors) which will have a role in implementing the ESMF and RF at various levels. The training is also necessary for high level project coordination and management groups, (such as members of project steering committee and technical committee) as well as to relevant members of the broader beneficiary community to create awareness on environment management aspects of the HoA-GW4RP. As a result, the type of trainings necessary to these various target groups will vary and is briefly outlined as the followings:

a) Technical training on ESMF

This detailed training will mainly focus on the technical staffs that will be involved in directly applying the ESMF and RF procedures. It includes the E&S experts in PMCU and PMU at the lead implementing agency MoWE and MoIL E&S Focal Persons at partner, beneficiary and stakeholder institutions, member of technical committees, professionals from the Regional, Zonal and City level Environment Protection Offices and etc. Members of the Federal, Regional and Zonal REPAs will have to participate in the training to facilitate for smooth implementation of HoA-GW4RP ESMF and RF. The training will focus in explaining the details of the National and World Bank environmental requirements and the procedures that need to be fulfilled to comply with it. Implementation of the ESMF and RF including all aspects of the World Bank ESSs, environmental management, ESIA, public consultation, and integration of environmental management into development planning will be the center topics for the training. The training would also cover skills upgrading refreshment topics such as, environmental and social screening and categorization processes, ESIA review and quality assurance, environmental audits, environmental guidelines and others as necessary. Detailed topics that would need to be covered by the training include the following:

- Overview of enabling policy, legal and institutional framework for ESMF and RF
- Basic principles of ESMF and RF
- Potential Environmental and Social Impacts for HoA-GW4RP
- Environmental and social screening process
- Assignment of environmental risk categories
- Scoping and the preparation of preliminary and full ESIAs
- Preparation of terms of reference for carrying out ESIA/ESMPs
- Review and clearance of the screening results and separate ESIA/ESMP reports
- Supervision, monitoring, evaluation and environmental reporting
- Participatory public consultation and engagement
- Gender Based Violence (GBV) prevention
- Grievance Redress Mechanisms (GRM) of the HoA-GW4RP
- Stakeholder Engagement
- Public consultation process in view of the ESMF and RF requirements
- Requirements and procedures for ARAP/RAP
- ESS7 application to SSAHUSTLCs
- Discussion of, and amendments to, the environmental and social screening form.

b) Awareness Raising

Integrating environmental and social considerations into development planning will encompass defining processes, procedures and responsibilities for environment related activities and actions into the preparation of the HoA-GW4RP annual plans and budgets. Thus, there will be a need to carry out environmental awareness workshops for officials of project implementing and stakeholder institutions such as members of project steering committee and technical committee on environmental management principles and ESMF procedures. The awareness raising workshops and trainings should target the higher officials, HoA-GW4R project management and coordination organs including relevant directorates of the federal and regional lead, partner and beneficiary institutions. This will help to ensure that there is good knowledge of HoA-GW4RP ESMF and RF requirements at different levels in the lead implementing agency, partner and beneficiary institutions, stakeholders and other professional and technical staffs.

The awareness raising should focus on clarifying HoA-GW4R project objectives and components, its institutional arrangements for implementation and coordination, the need for complying with Environmental and Social Management Framework (ESMF) and so on. It is important to clarify the roles and responsibilities of each stakeholder based on established guidelines such as the ESMF and RF. The awareness raising workshop will also be an important venue to introduce the contents of the new ESF and its Environmental and Social Standards (ESSs), ESMF and RF procedures and associated implementation requirements of the World Bank and the GoE.

HoA-GW4RP beneficiary institutions and relevant REPAs in the regions, zones and cities will have to obtain copies of the ESMF, RF as well as all relevant Federal and regional laws, guidelines and procedures relating to environmental protection, cultural heritage and resettlement issues.

c) Sensitization

The beneficiary communities at the grass root level will need to be sensitized about the overall objectives of the HoA-GW4R project component and subcomponents, environmental sustainability and the need to consider environmental concerns with regard to waste management and others while preparing proposals/applications for matching fund competitions.

MONITORING, EVALUATION, AND REPORTING OF THE IMPLEMENTATION OF THE ESMF

After the approval of subprojects for implementation (i.e., after obtaining clearance of the safeguards instruments) by the Environment Protection Authority, the recommended mitigation measures will be implemented at construction and operational levels of the project site. The MoWE and MoIL safeguards focal persons will be responsible for the effective implementation monitoring of the mitigation measures at stage of the project construction and operation. Hence, the safeguards specialists, either as a team or individually, will inspect the implementation of the mitigation measures. The specialists will monitor that the proper procedures are being followed in screening the HoA-GW4RP activities and in the implementation of the mitigation measures in the project site.

Safeguards performance monitoring in HoA-GW4RP will involve monitoring of the compliance, effectiveness of the ESMF and RF. Purpose of result monitoring is to support compliance with ESS, to identify the occurrence of any unforeseen safeguard issues, to determine lessons learnt during project implementation, to provide recommendations for improving future performance, and to provide an early warning about potential cumulative impacts. Performance monitoring requires that inspection of:

- The various safeguards instruments will be prepared for HoA-GW4RP subprojects to the required standard, within the required timelines;
- The safeguards instruments shall be reviewed and approved by the Regional or federal Environmental Authorities;
- Environmental and social mitigation measures are being implemented and that mitigation measures are effective;
- Relevant Federal, Regional, level HoA-GW4RP staff have been trained in accordance with the capacity building proposals;
- Reports are prepared and delivered as required.

The monitoring requirements of HoA-GW4RP are summarized in the table below:

Table 0-1 Monitoring Requirement of the ESMIT implementation								
Requirement	Stage	By Whom	Final Review / Approval					
Environmental and	After identification and	MoWE and MoIL Environmental	REPAs or FEFCC					
social screening of each	design of subproject	and social safeguards specialists						
subproject	sites							
ESIA/ESMP	Prior to start of any	ESIA/PESIA/RP (by independent	REPAs or FEFCC					
preparation	physical works of	consultant)	and World Bank					
	subprojects	ESMP (by MoWE and MoIL						
		Environmental and social						
		safeguards specialists)						
		C-ESMP (sub-project contractors)						
Environmental and	Regularly during project	MoWE and MoIL Environmental						
social safeguards	implementation	and social safeguards specialists,						
monitoring		Supervisory engineer, REPAs or						
		FEFCC and World Bank						
Joint implementation	Every six months (twice	MoWE, MoIL, FEFCC, and						

 Table 0-1 Monitoring Requirement of the ESMF Implementation

Requirement	Stage	By Whom	Final Review / Approval
monitoring and support	a year) in all program	development partners (e.g. the	
mission	implementing regions.	World Bank)	
Environmental and	Quarterly and annually	Ministry of Water and Energy and	World Bank
social monitoring and	during project	Ministry of Irrigation and	
reporting	implementation	Lowlands	
Audits on ESMF and	Mid-term	An independent consultant	MoWE, MoIL and
RF implementation			WB

In sum, to ensure proper implementation of the ESS tools and/or address other unforeseen environmental impacts, environmental and social monitoring will be conducted at all levels regional and federal. Environmental monitoring will involve periodic checkups of subprojects to look for efficiency of control measures. Periodic monitoring will be conducted as reviewing of reports produced and physical inspections on site. Every water supply and irrigation scheme is required to monitor or conduct physical checks at regular intervals during the year and ensure on at least 50% or more of their respective subprojects annually. Subprojects that require preparation of an ESMP need to be monitored as per the proposed monitoring plan. Spot checks/inspections will be conducted bi-annually by MoWE and MoIL to ensure compliance. MoWE and MoIL will prepare quarterly and annual on environmental and social standards compliance reports. A brief annual environmental monitoring report will be developed and prepared by MoWE and MoIL and submitted to the REPA or FEFCC and World Bank.

All the project implementing ministries (MoWE and MoIL) will develop brief quarterly and annual ESHS monitoring report. The report contents the following:

- A summary of Environmental and Social Screening reports, with a table summarizing which subprojects have been assigned each of the screening categories;
- A summary of ESIAs and Preliminary ESIAs (ESMPs) developed during the year;
- A summary of ESHS monitoring carried out on systems at both construction and operation phases;
- Lists of outstanding issues and the responsible body for implementation;
- Types of training provided or training demands;
- If an environmental permit was not granted by REPA or FEFCC, explain why;
- If no objection is obtained for ESIA studies from the World Bank, and whether these documents are disclosed on time both through the implementing agencies website and the World Bank info shop based on the disclosure requirements
- Documentation practices for environmental instruments (ESS reports, ESMP, ESIA, RAP/ARAP, etc.); and,
- Specific challenges encountered in the course of project implementation processes, including aggregated data from sites.

These reports from all project implementing regions will be verified, consolidated and summarized into a federal level annual report to be prepared by the MoWE and MoIL using the quarterly and annual environmental compliance reporting templates (Annex VI).

Environmental and social audits on ESMF and RF implementation will be prepared by the environmental and social specialists contracted by MoWE and MoIL and delivered to the World Bank. Therefore, an independently-commissioned environmental and social audit will be carried out at least twice in the program life cycle. An audit is necessary to indicate, among others: To

what extent environmental and social considerations are being incorporated into the local government planning process during the project cycle; whether the screening is being applied correctly; whether ESIAs and / or ESMPs are being prepared and the contracts reviewed and updated to reflect particular sub-project issues; that mitigation measures are being identified and implemented by the implementing entities; and to check that HoA-GW4RP sub-projects are being correctly implemented. The audit will be able to identify any amendments in the ESMF approach that are required to improve its effectiveness.

Overall, the following indicators and parameters will be used for compliance monitoring:

- Documentation of community consultation in planning, implementation and monitoring
- Environmental and social screening checklist filled or not;
- Environmental Management Plan (ESMP) was prepared or not;
- Documentation of safeguards tools
- Approval of safeguards instruments by the competent authority
- Environmental enhancement and impact mitigation measures mentioned in Environmental and Social Management Plan have been incorporated and considered during project planning, site selection, design, implementation, and operation;
- Social adverse impact identified, and mitigation measures mentioned in Environmental and Social Management Plan, social management plan within RF have been incorporated and considered during project planning, design and site selection;
- Compensation effected according to the agreement made
- Establishment and functionality of GRM.

PROPOSED ESMF IMPLEMENTATION BUDGET

The breakdown of estimated costs for putting the ESMF into operation is provided in the table below. This includes the costs of providing the capacity building and training set out in earlier section. The total estimated costs for mainstreaming environment into the HoA-GW4RP PMCU sub-component is USD 857,000 the disaggregated budget consisting of:

- ES staffing in PMCU and PITs
- Payments for consultants
- Capacity building training costs
- Annual external audits consultant(s) fee.

The following table provides breakdown of costs for ESMF implementation.

Activity	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Use for consultants procured to provide ESIAs/Preliminary ESIAs/ESMPs for HoA- GW4RP PMCU sub-projects involving physical construction	44,000	44,000	44,000	44,000	44,000	220,000
Preparation and printing of ESMF training materials	5,000	5,000	5,000	5,000	5,000	25,000
Delivery of ESMF training	34,000	34,000	34,000	34,000	34,000	170,000
Provision of an Environmental and Social expert in HoA-GW4RP PMCU and PITs for the five years duration of the project	45,000	45,000	45,000	45,000	45,000	225,000
HoA-GW4RP to undertake annual external Environmental and social performance audit	31,000	31,000	31,000	31,000	31,000	156,000
Implementation and monitoring of GBV/SEAH action plan	12,400	12,400	12,400	12,400	12,400	62,000
Total ESMF Costs	171,400	171,400	171,400	171,400	171,400	857,000

 Table 0-1 Proposed ESMF Implementation Budget

The above costs will be funded from HoA-GW4R project. The HoA-GW4RP PMCU Environmental and Social Specialists will report on HoA-GW4RP ESMF expenditure. This will

provide for another way of monitoring on the extent that environmental and social issues are being addressed by the project beneficiaries and stakeholders.

Costs related to the required mitigation measures for HoA-GW4RP sub-projects are not set out in the budgets presented here. These will be assessed and internalized by beneficiary institutions as part of the overall HoA-GW4RP sub-project cost. It is extremely difficult to estimate the proportion of project costs that can be expected to be devoted to mitigation measures. However, a rough rule of thumb is that they should be expected to cost between 2% and 5% of the total project cost. Compensation and resettlement costs will be borne by beneficiaries.

ANNEX I: ENVIRONMENTAL SCOPING/SCREENING FORM

Introduction

This Environmental and Social Screening Form (ESSF) has been designed to assist in the evaluation of construction and refurbishment/rehabilitation activities under HoA-GW4RP Components 1, 2 & 3. The form will assist the sub-project implementers and reviewers to identify environmental and social impacts and their mitigation measures, if any. It will also assist in the determination of requirements for further environmental work (such as environmental and social management plan), if necessary. The form helps to determine the characteristics of the prevailing local bio-physical and social environment with the aim of assessing the potential impacts of the construction and rehabilitation activities on the environment by the sub-projects. The ESSF will also assist in identifying potential socio-economic impacts that will require mitigation measures and/or resettlement and compensation.

Guidelines for Screening

The evaluator should undertake the assignment after:

- 1. Gaining adequate knowledge of baseline information of the area
- 2. Gaining knowledge of proposed sub-project activities
- 3. Having been briefed / trained in environmental and social screening

The form is to be completed by consensus of at least three people, knowledgeable of the screening process.

Environmental & Social Screening Form

(<u>Note</u> – This ES screening form shall be further developed and updated prior to project implementation.)

Project Name :	District/City :
Project Location :	Nature/Size :
Type of Activity (new construction, rehabilitation,	periodic maintenance):
Name & Signature of Evaluators:	Date of Field Evaluation:
1	1
2	2
3	3

NB: The evaluation results to be a consensus of at least three officials.

				Risk S	bignific	cance I	Rating	
No	Criteria	Appraisal (Yes/No)	None	Low	Moderate	Substantial	High	Unknown
1	Environmental Screening (ESS 1)							
Will t	he sub-project generate the following impacts?							
1.1	Potential long-term impact on groundwater depletion							
1.2	Potential impact on other water resources due to abstraction of groundwater							
1.3	1.3 Create unhygienic environment during use (human and animal water use)							
1.4	.4 Result in water logging							
1.5	Result in salinization of soil							
1.6	1.6 Result in land subsidence							
1.7	Create water use right issue or conflict							
1.8	Result in inefficient use and management of water							
1.9	Result in inefficient use and management of energy							
1.10	10 Result in water quality issue and associated impact on human health							
1.11	.11 Result in wastewater quality issue and potentially pollute receiving water bodies							
1.12	12 Result in solid waste management issues							
1.13	Hazardous materials management issues							
1.14	Affect ecosystem and habitats, particularly							

				Risk S	Signific	cance l	Rating	1
No	Criteria	Appraisal (Yes/No)	None	Low	Moderate	Substantial	High	Unknown
	sensitive ecosystems and habitats							
1.15	Result in loss of trees and other flora (including aquatic flora)							
1.16	Result in loss of fauna including aquatic organisms							
1.17	Result in soil erosion/siltation and land degradation in the area							
1.18	Risk of pollution of land or contamination of land							
1.19	Dust emissions and air quality deterioration							
1.20	Exposure to pesticides							
1.21	Solid and liquid wastes generation							
1.22	Results in pools of stagnant water							
1.23	Result in rubble/heaps of excavated soils							
1.24	1.24 Nuisance from noise, vibration or smell							
1.25	Potential for incidence of flooding							
1.26	Cross through, located within or nearby environmentally sensitive areas (e.g. national parks, intact natural forests, wetlands, etc.)?							
1.27	Cause poor water drainage and increase the risk of water-related diseases such as malaria or bilharzias?							
	Will certain ES risks and adverse impacts be difficult to avoid, or minimize, or mitigate because:							
1.28	 i. the project involves a technology that is new and/or complex, and the risks and/or impacts of this technology are not fully understood, and/or ii. the project involves (a) complex mitigation measure(s) that its implementation success is not fully assured? 							
1.29	Does the scale of the project have the potential to cause diverse and multiple ES risks and impacts extended over a large area? This applies to both direct and indirect risks and impacts.							
1.30	Does the project have associated facilities (as per paras. 11 of ESS 1) that could lead to wide- ranging ES risks and impacts? Does the project design take into consideration such associated							

				Risk S	Signific	cance l	Rating	5
No	Criteria	Appraisal (Yes/No)	None	Low	Moderate	Substantial	High	Unknown
	facilities?							
2	Labor and Working Conditions and Communit	y Health and Sa	afety (]	ESS 2	and E	SS 4)	<u></u>	<u> </u>
2.1	Risk of exposing the workers to extremely hazardous working conditions including concerns of structural safety. Will the sub-project have an overall OHS risk?							
2.2	Will the development of the sub-project have the potential for immigration of workers and persons seeking employment (e.g., seasonal, transient)?							
2.3	Is there potential for employment of community Workers?							
2.4	Is there any institutional impediment to fair treatment, non-discrimination and/or equal opportunity?							
2.5	Is there risk or potential for the employment of child labor and/or forced labor?							
2.6	Could the sub-project expose communities to emergency events or hazards that involve health or safety risks and impacts?							
2.7	Are sub-project activities, civil works or buildings located in areas prone to natural disasters or extreme weather events?							
2.8	Will the sub-project result in potential traffic and road safety risks to workers, communities and road users throughout the project life cycle?							
2.9	Does the sub-project involve a potential for community exposure to water-borne, water- based, water-related and vector-borne diseases, and communicable and non- communicable diseases?							
2.10	Does the sub-project have risk of workers to extreme exposure for GBV/SEA?							
2.11	Spread of HIV/AIDS and other STI							
3	Resettlement Screening (ESS 5)				•	•		
Will t	he project generate the following negative social a	and economic ir	npacts	s?				
3.1	Loss of land to households							
3.2	Loss of properties -houses, structures							
3.3	Loss of trees, fruit trees by households							

				Risk S	Signific	cance l	Rating	
No	Criteria	Appraisal (Yes/No)	None	Low	Moderate	Substantial	High	Unknown
3.4	Loss or affects existing public utilities							
3.5	Loss of crops							
3.6	Loss of access to river/forests/grazing area							
3.7	Conflicts over use of local water resources							
3.8	Disruption of important pathways, footpath/roads							
3.9	Loss communal facilities such as churches, mosques							
3.10	Loss of livelihood system							
4	Cultural Heritage Screening (ESS 8)							
4.1	Impact heritage site, graveyard land, etc							
4.2	Will the sub-project activities involve excavations, demolitions, earth movements, flooding or changes to physical environment that could affect cultural heritage values?							
4.3	Are sub-project activities likely to affect tangible and/or intangible cultural heritage as defined under ESS 8 (e.g., archaeological sites that comprise any combination of structural remains, artifacts, human or ecological elements, and may be located entirely beneath, partially above, or entirely above the land or water							
4.4	Are project activities located in legally recognized and/or legally protected areas or defined buffer zones designated for the protection of cultural heritage?							
4.5	Will the sub-project activities affect cultural heritage in non-designated or legally recognized areas or protection zones?							
4.6	Will the sub-project affect cultural heritage assets that are movable (i.e., rare books, manuscripts, paintings, etc.) that could be endangered by the project?							
5	Gender, Vulnerable and Disadvantaged Group	Screening						
5.1	Does the sub-project present risks to and impacts on individuals or groups who, because of their circumstances, may be disadvantaged or vulnerable due to their:							

				Risk S	Signific	cance l	Rating	
No	Criteria	Appraisal (Yes/No)	None	Low	Moderate	Substantial	High	Unknown
	 Age, gender, ethnicity, or race Religion and belief systems Socio-cultural grouping or nationality Sexual orientation and identity Climate change and seasonal factors 							
5.2	Is the sub-project likely to affect disadvantaged or vulnerable individuals or groups who would require specialized approaches to participation or consultation for the project?							
5.3	Is the sub-project likely to face any barriers to information disclosure, transparent sharing of project information among stakeholders, or other aspects that could affect meaningful consultations?							
5.4	Is there a potential for prejudice or discrimination in accessing project benefits for those who may be disadvantaged or vulnerable?							
5.5	Will the sub-project affect indigenous people as described in ESS7?							

Categorization & Recommendations

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

1. World Bank ESF Categorization (place tick in the below box)

High Risk	If the subproject falls under "High Risk" the Environmental and social Assessment should be conducted in accordance with the World Bank Environmental and Social Standards (ESSs).
Substantial Risk	If the subproject falls under "Substantial Risk" the Environmental and social Assessment of the subproject should be conducted in accordance with National law and any requirements of the ESSs that the Bank deems relevant to such subprojects
Moderate Risk	Environmental and social Assessment of the subproject should be conducted in accordance with National law and any requirements of the ESSs that the Bank deems relevant to such subprojects.
Low Risk	Sub project is not subject to environmental assessment as no potential impacts are anticipated. However, preparation/inclusion of simple ESMP or Environmental Guideline for Construction Contractors will be acceptable.

2. National EIA Procedural Guideline (2003) Categorization (place tick in the below box)

Schedule I	Component 1(ancillary facilities), 2 & 3subproject highly unlikely to fall under "Schedule-I" Category. In the unlikely event that subproject falls under "Schedule-I" the subproject is to be fed into the standard ESIA process determined by the Federal or Regional EPFCCCs
Schedule II	Subproject will require a partial/preliminary ESIA, and will necessitate the preparation of Preliminary ESIA / ESMP.
Schedule III	Subproject is not subject to environmental assessment as no potential impacts are anticipated.

Note: Note that the Federal EIA Procedural Guideline (2003) is widely applied in many regions as it is. However, regional environmental protection organs such as Amhara EFWPPDA has issued ESIA guideline Directive 01/2010 that outline the list of projects to be reviewed and approved at different levels of its Zonal and Woreda offices. Thus, it is advisable to consult such regional guidelines while determining the screening Category in addition to the Federal EIA procedural guideline.

Prepared by	:
Name	:
Signature	:
Reviewer	:
Name	:
Signature	:

ANNEX II: GUIDANCE FOR SUB-PROJECT RISK CATEGORIZATION

Pursuant to the ESF, sub-projects are classified as *High Risk*, *Substantial Risk*, *Moderate Risk* or *Low Risk* taking into account relevant potential risks and impacts.

- 1. A sub-project is classified as **High Risk** after considering, in an integrated manner, the risks and impacts of the sub-project, taking into account the following, as applicable.
 - a) The sub-project is likely to generate a wide range of significant adverse risks and impacts on human populations or the environment. This could be because of the complex nature of the sub-project, the scale (large to very large) or the sensitivity of the location(s) of the sub-project. This would take into account whether the potential risks and impacts associated with the sub-project have the majority or all of the following characteristics:
 - i. Long term, permanent and/or irreversible (e.g., loss of major natural habitat or conversion of wetland), and impossible to avoid entirely due to the nature of the sub-project;
 - ii. High in magnitude and/or in spatial extent (the geographical area or size of the population likely to be affected is large to very large);
 - iii. Significant adverse cumulative impacts;
 - iv. Significant adverse transboundary impacts; and
 - v. A high probability of serious adverse effects to human health and/or the environment (e.g., due to accidents, toxic waste disposal, etc.);
 - b) The area likely to be affected is of high value and sensitivity, for example sensitive and valuable ecosystems and habitats (legally protected and internationally recognized areas of high biodiversity value), lands or rights of Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities and other vulnerable minorities, intensive or complex involuntary resettlement or land acquisition, impacts on cultural heritage or densely populated urban areas.
 - c) Some of the significant adverse ES risk and impacts of the sub-project cannot be mitigated or specific mitigation measures require complex and/or unproven mitigation, compensatory measures or technology, or sophisticated social analysis and implementation.
 - d) There are significant concerns that the adverse social impacts of the sub-project, and the associated mitigation measures, may give rise to significant social conflict or harm or significant risks to human security.
 - e) There is a history of unrest in the area of the sub-project or the sector, and there may be significant concerns regarding the activities of security forces.
 - f) The sub-project is being developed in a legal or regulatory environment where there is significant uncertainty or conflict as to jurisdiction of competing agencies, or where the legislation or regulations do not adequately address the risks and impacts of complex projects, or changes to applicable legislation are being made, or enforcement is weak.

- g) The past experience of the implementing agencies in developing complex sub-projects is limited; their track record regarding ES issues would present significant challenges or concerns given the nature of the sub-project's potential risks and impacts.
- h) There are significant concerns related to the capacity and commitment for, and track record of relevant sub-project parties, in relation to stakeholder engagement.
- i) There are a number of factors outside the control of the sub-project that could have a significant impact on the ES performance and outcomes of the sub-project.
- 2. A sub-project is classified as **Substantial Risk** after considering, in an integrated manner, the risks and impacts of the sub-project, taking into account the following, as applicable.
 - a) The sub-project may not be as complex as High Risk sub-projects, its ES scale and impact may be smaller (large to medium) and the location may not be in such a highly sensitive area, and some risks and impacts may be significant. This would take into account whether the potential risks and impacts have the majority or all of the following characteristics:
 - i. They are mostly temporary, predictable and/or reversible, and the nature of the Subproject does not preclude the possibility of avoiding or reversing them (although substantial investment and time may be required);
 - ii. There are concerns that the adverse social impacts of the sub-project, and the associated mitigation measures, may give rise to a limited degree of social conflict, harm or risks to human security;
 - iii. They are medium in magnitude and/or in spatial extent (the geographical area and size of the population likely to be affected are medium to large);
 - iv. The potential for cumulative and/or transboundary impacts may exist, but they are less severe and more readily avoided or mitigated than for High Risk sub-projects; and
 - v. There is medium to low probability of serious adverse effects to human health and/or the environment (e.g., due to accidents, toxic waste disposal, etc.), and there are known and reliable mechanisms available to prevent or minimize such incidents;
 - b) The effects of the sub-project on areas of high value or sensitivity are expected to be lower than High Risk Projects.
 - c) Mitigatory and/or compensatory measures may be designed more readily and be more reliable than those of High Risk sub-projects.
 - d) The sub-project is being developed in a legal or regulatory environment where there is uncertainty or conflict as to jurisdiction of competing agencies, or where the legislation or regulations do not adequately address the risks and impacts of complex sub-projects, or changes to applicable legislation are being made, or enforcement is weak.
 - e) The past experience of the implementing agencies in developing complex sub-projects is limited in some respects, and their track record regarding ES issues suggests some concerns which can be readily addressed through implementation support.

- f) There are some concerns over capacity and experience in managing stakeholder engagement but these could be readily addressed through implementation support.
- 3. A sub-project is classified as **Moderate Risk** after considering, in an integrated manner, the risks and impacts of the sub-project, taking into account the following, as applicable:
 - a) The potential adverse risks and impacts on human populations and/or the environment are not likely to be significant. This is because the sub-project is not complex and/or large, does not involve activities that have a high potential for harming people or the environment, and is located away from environmentally or socially sensitive areas. As such, the potential risks and impacts and issues are likely to have the following characteristics:
 - i. Predictable and expected to be temporary and/or reversible;
 - ii. Low in magnitude;
 - iii. Site-specific, without likelihood of impacts beyond the actual footprint of the subproject; and
 - iv. Low probability of serious adverse effects to human health and/or the environment (e.g., do not involve use or disposal of toxic materials, routine safety precautions are expected to be sufficient to prevent accidents, etc.).
 - b) The sub-project's risks and impacts can be easily mitigated in a predictable manner.
- 4. A sub-project is classified as **Low Risk** if it's potential adverse risks to and impacts on human populations and/or the environment are likely to be minimal or negligible. These sub-projects, with few or no adverse risks and impacts and issues, do not require further ES assessment following the initial screening.

ANNEX III: OUTLINE FOR ESIA

(Note – This ESIA outline shall be further developed and updated prior to sub-projects implementation)

An environmental and social impact assessment (ESIA) report for an infrastructure project should focus on the significant environmental and social issues of the proposed project, whether it is/or includes new construction or rehabilitation. The report's scope and level of detail should be commensurate with the project's potential impacts.

The ESIA report should include the following items (not necessarily in the order shown):

- 1. The Consultant's scope of work will include **initial consultation**:
 - i. with the implementing agency (identify the implementing agency),
 - ii. with the EPA at federal level,
- iii. with the REPA,
- iv. With the World Bank's country office.

2. Review of the regulatory and policy background:

- i. Based on Ethiopian pieces of legislation and regulation identified in the ESMF, the Consultant will identify any relevant changes occurred since the time the ESMF was prepared, and identify the practical implications thereof in preparing the ESIA;
- ii. Based on World Bank policies identified as applicable in the ESMF, the Consultant will review any relevant changes and identify practical implications thereof;
- iii. The Consultant will summarize in the ESIA report the applicable regulatory and policy background with a focus on practical implications in terms of:
 - ESIA process, including public consultation and disclosure,
 - ESIA scope of work,
 - Contents of the ESIA report,
 - What the implications of the regulatory framework is for the sub-project:

3. Public consultation:

The Consultant will implement the following phases of public consultation, in coordination with the implementing agency, which may be willing to participate in this public consultation process:

- i. Identification of interested parties (beneficiary neighboring communities, communities potentially affected by the sub-project, downstream water users, local authorities, regional authorities);
- ii. Initial step of consultation, before further environmental assessment work is undertaken: one initial meeting with each of the identified parties, presenting the sub-project and seeking input on the scope of work for further environmental assessment work and to seek to identify any concerns or issues that the local communities and stakeholders may have in relation to the sub-project;
- iii. Second step of consultation, after further environmental assessment work is complete: presentation of the results of the environmental assessment, including presentation of identified impacts and proposed mitigations, seeking input on these proposed environmental management measures and to demonstrate the measures that have been taken in the design to address the concerns raised by the local communities/stakeholders;

this second step will include dissemination to identified interested parties of a brief summary of the environmental assessment in local language

- iv. Any public consultation meeting undertaken by the Consultant will be documented using the form appended to these Terms of Reference (see Appendix 6);
- v. Main issues raised during consultation meetings will be summarized in the ESIA report, with a description of the manner in which these issues were addressed in the ESIA process.

4. **Baseline assessment:**

The baseline assessment will address:

- i. Physical and bio-physical environment (climate, topography at the sub-project site(s), geology, hydrogeology, surface water, soils, erosion sensitivity, flora, fauna, including the identification of any protected or endangered species);
- ii. Land use at the sub-project site(s) and in its (their) vicinity;
- iii. Human environment: description of neighboring communities (population size, population structure and demography, socio-political organization, livelihoods, access to public services);

The baseline assessment will be summarized using the format presented in the "typical ESIA report structure" hereunder. Reports of field observations and bibliography used will be presented as appendices.

5. Impact assessment:

The methodology for impact assessment shall be briefly presented. Typically, direct, indirect, and cumulative impacts will be assessed along the following lines:

- i. Extension in space,
- ii. Duration in time,
- iii. Probability of occurrence,
- iv. Magnitude

The combination of these parameters will be summarized in an all-encompassing measure of "significance", which will be the basis for impact assessment and prioritization of mitigations. Where changes in the project design (such as the re-siting or re-routing of a sub-project facility) may allow eliminating one or several identified impacts, these changes (and generally any project alternative) will be discussed.

6. Analysis of alternatives.

Systematically compares feasible alternatives to the proposed project site, technology, design, and operation—including the "without project" situation—in terms of their potential environmental impacts; the feasibility of mitigating these impacts; their capital and recurrent costs; their suitability under local conditions; and their institutional, training, and monitoring requirements. For each of the alternatives, quantifies the environmental impacts to the extent possible, and attaches economic values where feasible. States the basis for selecting the particular project design proposed and justifies recommended emission levels and approaches to pollution prevention and abatement.

7. Mitigations and ESMP:

Based on the typical ESMP presented in the HoA-GW4RP ESMF, the Consultant will develop a sub-project ESMP, which will include as a minimum for each identified impact:

- i. A description of the mitigation measures,
- ii. A description of monitoring measures,
- iii. Implementation responsibilities,
- iv. Cost,
- v. Assessment of residual impact after implementation of the mitigation

As necessary, specific additional protection measures to those included in the Environmental Guidelines for Construction Contractors presented as an appendix to the ESMF will be proposed by the Consultant.

8. **Deliverables**:

The Consultant will produce:

- i. A summary project description in local language for purposes of public consultation (see above),
- ii. A draft ESIA report for submission to the Client,
- iii. After initial Client's comments have been included in a revised version, a second draft ESIA report, including a brief summary in local language for purposes of public consultation,
- iv. After public consultation results have been included, a final draft ESIA will be circulated for Competent
- v. Agency and World Bank comment.
- vi. After satisfactory incorporation of comments, a final ESIA report for public disclosure according to arrangements presented in the ESMF.

ANNEX IV: GUIDELINE FOR ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

Depending on the sub-project, an ESMP may be prepared as a stand-alone document or the content may be incorporated directly into ESIA or PESIA. The content of the ESMP will include the following:

a) Mitigation

The ESMP identifies measures and actions in accordance with the mitigation hierarchy that reduce potentially adverse environmental and social impacts to acceptable levels. The plan will include compensatory measures, if applicable. Specifically, the ESMP:

- i. identifies and summarizes all anticipated adverse environmental and social impacts (including those involving indigenous people or involuntary resettlement);
- ii. describes—with technical details—each mitigation measure, including the type of impact to which it relates and the conditions under which it is required (e.g., continuously or in the event of contingencies), together with designs, equipment descriptions, and operating procedures, as appropriate;
- iii. estimates any potential environmental and social impacts of these measures; and
- iv. takes into account, and is consistent with, other mitigation plans required for the subproject (e.g., for involuntary resettlement, indigenous peoples, or cultural heritage).

b) Monitoring

The ESMP identifies monitoring objectives and specifies the type of monitoring, with linkages to the impacts assessed in the environmental and social assessment and the mitigation measures described in the ESMP. Specifically, the monitoring section of the ESMP provides (a) a specific description, and technical details, of monitoring measures, including the parameters to be measured, methods to be used, sampling locations, frequency of measurements, detection limits (where appropriate), and definition of thresholds that will signal the need for corrective actions; and (b) monitoring and reporting procedures to (i) ensure early detection of conditions that necessitate particular mitigation measures, and (ii) furnish information on the progress and results of mitigation.

c) Capacity Development and Training

To support timely and effective implementation of environmental and social sub-project components and mitigation measures, the ESMP draws on the environmental and social assessment of the existence, role, and capability of responsible parties on site or at the agency and ministry level.

Specifically, the ESMP provides a specific description of institutional arrangements, identifying which party is responsible for carrying out the mitigation and monitoring measures (e.g., for operation, supervision, enforcement, monitoring of implementation, remedial action, financing, reporting, and staff training).

To strengthen environmental and social management capability in the agencies responsible for implementation, the ESMP recommends the establishment or expansion of the parties responsible, the training of staff and any additional measures that may be necessary to support

implementation of mitigation measures and any other recommendations of the environmental and social assessment.

d) Implementation Schedule and Cost Estimates

For all three aspects (mitigation, monitoring, and capacity development), the ESMP provides (a) an implementation schedule for measures that must be carried out as part of the sub-project, showing phasing and coordination with overall project implementation plans; and (b) the capital and recurrent cost estimates and sources of funds for implementing the ESMP. These figures are also integrated into the total project cost tables.

e) Integration of ESMP with Sub-project

Each of the measures and actions in the ESMP to be implemented will be clearly specified, including the individual mitigation and monitoring measures and actions and the institutional responsibilities relating to each, and the costs of so doing will be integrated into the sub-project's overall planning, design, budget, implementation, and operation.

ANNEX V: ENVIRONMENTAL GUIDELINES FOR CONSTRUCTION CONTRACTORS

(Note – This guideline shall be further developed and updated to include measures recommended in this ESMF, sub-projects ESMP, and the WB standard ES conditions of contract prior to sub-projects implementation. ESHS clauses shall be included in sub-projects procurement and contract documents.)

General: Applicability of these Environmental Guidelines and ESMP

These general environmental guidelines apply to any work to be undertaken under the HoA-GW4RP. For certain work sites entailing specific environmental and/or social issues, a specific Environmental and Social Impact Assessment, including an Environmental and Social Management Plan (ESMP), has been prepared to address the above-mentioned specific issues. In addition to these general Environmental Guidelines, the Contractor shall therefore comply with any specific ESMP for the works he is responsible for. The Contractor shall be informed by the Client about such an ESMP for certain work sites and prepare his work strategy and plan to fully take into account relevant provisions of that ESMP. If the Contractor fails to implement the approved ESMP after written instruction by the works supervisor to fulfill his obligation within the requested time, the Client reserves the right to arrange for execution of the missing action by a third party on account of the Contractor.

Notwithstanding the Contractor's obligation under the above clause, 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 where such an ESMP applies.

These Environmental Guidelines, as well as any specific ESMP, apply to the Contractor. They also apply to any sub-contractors present on Program work sites at the request of the Contractor with permission from the Client.

General Environmental Protection Measures

In general, environmental protection measures to be taken at any work site shall include but not be limited to:

- Minimize the effect of dust on the environment resulting from earth mixing sites; vibrating equipment, construction related traffic on temporary or existing access roads, etc. to ensure safety, health and the protection of workers and communities living in the vicinity of work sites and access roads.
- Ensure that noise levels emanating from machinery, vehicles and noisy construction activities (e.g. excavation, blasting) comply with Ethiopian standards and are generally kept at a minimum for the safety, health and protection of workers within the vicinity of high noise levels and nearby communities.
- Ensure that 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.
- Prevent any construction-generated substance, including bitumen, oils, lubricants and waste water used or produced during the execution of works, from entering into rivers, streams, irrigation channels and other natural water bodies/reservoirs.
- Avoid or minimize the occurrence of standing water in holes, trenches, borrow areas, etc.

- Prevent and minimize the impacts of quarrying, earth borrowing, piling and building of temporary construction camps and access roads on the biophysical environment including protected areas and arable lands, local communities and their settlements. Restore/rehabilitate all sites to acceptable standards.
- Upon discovery of graves, cemeteries, cultural sites of any kind, including ancient heritage, relics or anything that might or believed to be of archeological or historical importance during the execution of works, immediately report such findings to the Client so that the Ministry in charge of Culture may be expeditiously contacted for fulfillment of the measures aimed at protecting such historical or archaeological resources.
- Prohibit construction workers from engaging in the exploitation of natural resources such as hunting, fishing, and collection of forest products or any other activity that might have a negative impact on the social and economic welfare of the local communities. Prohibit explicitly the transport of any bush meat in Contractor's vehicles.
- Prohibit the transport of firearms in Program-related vehicles.
- Prohibit the transport of third parties in Program-related vehicles.
- Implement soil erosion control measures in order to avoid surface run off and prevent siltation, etc.
- Ensure that garbage, sanitation and drinking water facilities are provided in construction workers camps.
- Ensure that, in as much as possible, local materials are used to avoid importation of foreign material and long-distance transportation.
- Ensure public safety and meet Ethiopian traffic safety requirements for the operation of work to avoid accidents.
- Ensure that any trench, pit, excavation, hole or other hazardous feature is appropriately demarcated and signposted to prevent third-party intrusion and any safety hazard to third parties.
- Comply with Ethiopian speed limits, and for any traffic related with construction at the project sites, comply with the following speed limits unless Ethiopian speed limits are lower:
- Ensure that, where unskilled daily-hired workforce is necessary, such workers are hired from neighboring communities.
- Generally, comply with any requirements of Ethiopian law and regulations.

Besides the regular inspection of the sites by the supervisor appointed by the Client for adherence to the Contract conditions and specifications, the Client may appoint an environmental inspector to oversee the compliance with these environmental conditions and any proposed mitigation measures. State or Regional Environmental Authorities may carry out similar inspection duties. In all cases, as directed by the Client's supervisor, the Contractor shall comply with directives from such inspectors.

Drilling

The Contractor will make sure that any drilling fluid, drilling mud, mud additives, and any other chemicals used for drilling at any water supply sanitation and hygiene project construction site complies with Ethiopian health and safety requirements. In general, only bio-degradable materials will be used. The Contractor may be required to provide the detailed description of the materials he/she intends to use for review and approval by the Client. Where chemicals are used, general prescriptions of the World Bank's ESF and EHS Guideline shall be considered and shall be complied with.

Drilling fluids will be recycled or disposed of in compliance with Ethiopian regulations in an authorized disposal site. If drilling fluids cannot be disposed of in a practical manner, and if land is available near the drilling site that is free of any usage rights, the Contractor may be authorized to dispose of drilling fluids near the drilling site. In this occurrence, the Contractor will be required to provide to the Client due evidence of their total absence of potential environmental impacts, such as leachate tests certified by an agreed laboratory. In this case, drilling fluids will be dried at site, mixed with earth and spread at site.

Any site affected by drilling work will be restored to its initial condition. This applies to drilling pads, access roads, staging areas, etc... Topsoil will be stripped ahead of any earthmoving, stored near the construction site, and replaced in its original location after the re-contouring of the area affected by the works.

Where successive aquifers are intersected by the drilling works and upon order by the work supervisor, the Contractor may be required to take measures to isolate aquifers from contamination by each other.

The Contractor will take all measures to avoid bacteriological or chemical contamination of the intersected aquifers by the drilling equipment. Similarly, the Contractor will take all measures to avoid bacteriological or chemical contamination of the intersected aquifers from the surface by providing an adequately sealed well-head.

When greasing drilling equipment, the Contractor will avoid any soil contamination. In the event of a limited hydrocarbon spill, the Contractor will recover spilled hydrocarbons and contaminated soils in sealed drums and dispose of them in an authorized waste management facility. Unless duly requested by the Contractor and authorized by the supervisor, no servicing of drilling equipment or vehicles is permitted at the drilling site.

Pipelines

No trench shall be left open for more than 7 days, unless duly authorized by the supervisor upon Contractor's request. Trenches and other excavation works shall be demarcated and/or signposted to avoid third party intrusion. General conditions related with topsoil stripping, storage and restoration apply. The Contractor will take measures to dispose of water used for pressure tests in a manner that does not affect neighboring settlements.

Waste Management

All drums, containers, bags, etc. containing oil/fuel/surfacing materials and other hazardous chemicals shall be stored at construction sites on a sealed and/or bonded area in order to contain potential spillage. All waste containers, litter and any other waste generated during the construction shall be collected and disposed of at designated disposal sites in line with applicable Ethiopian government waste management regulations.

All drainage and effluent from storage areas, workshops, housing quarters and generally from camp sites shall be captured and treated before being discharged into the drainage system in line with applicable government water pollution control regulations. Used oil from maintenance shall be collected, properly stored in sealed containers, and either disposed of appropriately at designated sites or be re-cycled.

Entry of runoff into construction sites, staging areas, camp sites, shall be restricted by constructing diversion channels or holding structures such as berms, drains, dams, etc. to reduce the potential of soil erosion and water pollution. Construction waste shall not be left in stockpiles along the road but removed and reused or disposed of on a daily basis.

Where temporary dump sites for clean excavated material are necessary, they shall be located in areas, approved by the Client's supervisor, where they will not result in supplemental erosion. Any compensation related with the use of such sites shall be settled prior to their use.

Areas for temporary storage of hazardous materials such as contaminated liquid and solid materials shall be approved by the supervisor and appropriate local and/or relevant national or local authorities before the commencement of work. Disposal of such waste shall be in existing, approved sites.

Quarries and Borrow Areas

The Contractor shall obtain appropriate licenses/permits from relevant authorities to operate quarries or borrow areas. The location of quarries and borrow areas shall be subject to review and approval by relevant local and national authorities.

New extraction sites:

- Shall not be located less than 1km from settlement areas, archaeological areas, and cultural sites including churches and cemeteries, wetlands or any other valued ecosystem component, or on high or steep ground.
- Shall not be located in water bodies, or adjacent to them, as well as to springs, wells, well fields.
- Shall not be located in or near forest reserves, natural habitats or national parks.
- Shall be designed and operated in the perspective of an easy and effective rehabilitation. Areas with minimal vegetation cover such as flat and bare ground, or areas covered with grass only or covered with shrubs less than 1.5m in height, are preferred.
- Shall have clearly demarcated and marked boundaries to minimize vegetation clearing and safety hazards for third parties.

Vegetation clearing shall be restricted to the area required for safe operation of construction work. Vegetation clearing shall not be done more than two months in advance of operations.

Stockpile areas shall be located in areas where trees or other natural obstacles can act as buffers to prevent dust pollution, and generally at a distance from human settlements. Wind shall be taken into consideration when siting stockpile areas. Perimeter drains shall be built around stockpile areas.

The Contractor shall deposit any excess material in accordance with the principles of these guidelines, and any applicable ESMP, in areas approved by local authorities and/or the supervisor.

Rehabilitation of Work and Camp Sites

Topsoil shall be stripped, removed and stored for subsequent rehabilitation. Soils shall not be stripped when they are wet. Topsoil shall not be stored in large or high heaps. Low mounds of no more than 1 to 2m high are recommended.

Generally, rehabilitation of work and camp sites shall follow the following principles:

- To the extent practicable, reinstate natural drainage patterns where they have been altered or impaired.
- Remove toxic materials and dispose of them in designated sites. Backfill excavated areas with soils or overburden that is free of foreign material that could pollute groundwater and soil.
- Ensure reshaped land is formed so as to be stable, adequately drained and suitable for the desired long-term land use and allow natural regeneration of vegetation.
- Minimize erosion by wind and water both during and after the process of reinstatement.
- Compacted surfaces shall be deep ripped to relieve compaction unless subsurface conditions dictate otherwise.

Management of Water Needed for Construction Purposes

The Contractor shall at all costs avoid conflicting with water needs of local communities. To this effect, any temporary water abstraction for construction needs from either ground or surface water shall be submitted to the following community consultation process:

- Identification of water uses that may be affected by the planned water abstraction,
- Consultation with all identified groups of users about the planned water abstraction,
- In the event that a potential conflict is identified, report to the supervising authority.

This consultation process shall be documented by the Contractor (minutes of meeting) for review and eventual authorization of the water withdrawal by the Client's supervisor.

Abstraction of both surface and underground water shall only be done with the consultation of the local community as mentioned and after obtaining a permit from the relevant authority.

Abstraction of water from wetlands is prohibited.

Temporary damming of streams and rivers is submitted to approval by the supervisor. It shall be done in such a way as to avoid disrupting water supplies to communities downstream, and to maintain the ecological balance of the river system.

No construction water containing spoils or site effluent, especially cement and oil, shall be allowed to flow into natural water drainage courses. Similarly, wash water from washing out of equipment shall not be discharged into water courses or road drains. Washing bays shall be sited accordingly. Unless site conditions are not favorable, it will generally be infiltrated through soak pits or similar.

Site spoils and temporary stockpiles shall be located away from the drainage system, and surface run off shall be directed away from stockpiles to prevent erosion.

Traffic Management and Community Safety

Location of temporary access roads shall be done in consultation with the local community and based on the screening results, especially in important or sensitive environments. Temporary access roads shall not traverse wetland areas or other ecologically sensitive areas. The construction of any access roads shall be submitted to a prior consultation process with potentially affected communities that will have to be documented (minutes of meetings) for supervisor's review and approval.

Upon the completion of civil works, all temporary access roads shall be ripped and rehabilitated. Measures shall be taken to suppress dust emissions generated by Program traffic. Maximum speed limits for any traffic related with construction at all Water Supply project sites shall be the following, unless Ethiopian speed limits are locally lower:

Salvaging and Disposal of Obsolete Components Found by Rehabilitation Works

Obsolete materials and construction elements such as electro-mechanical equipment, pipes, accessories and demolished structures shall be salvaged and disposed of in a manner approved by the supervisor. The Contractor has to agree with the supervisor 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.

Any asbestos cement material that might be uncovered when performing rehabilitation works will be considered as hazardous material and disposed of in a designated facility.

Compensation of Damage to Property

Compensation of land acquired permanently for Program purposes will be handled under Client responsibility based on the provisions of the RF. However, in the event that the Contractor, deliberately or accidentally, damages 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/user a certificate that the damage has been made good satisfactorily in order to indemnify the Client from subsequent claims.

In any case where compensation for inconveniences, damage of crops etc. are claimed by the owner, the Client has to be informed by the Contractor through the supervisor.

Contractor's Environment, Health and Safety Management Plan (HSE-MP)

Within 6 weeks of signing the Contract, the Contractor shall prepare an EHS-MP to ensure the adequate management of the environmental, health and safety, and social aspects of the works, including implementation of the requirements of these general conditions and any specific requirements of an ESMP for the works. The Contractor's EHS-MP will serve two main purposes:

The Contractor's EHS-MP shall provide at least:

• A description of procedures and methods for complying with these general environmental management conditions, and any specific conditions specified in an ESMP;

- A description of specific mitigation measures that will be implemented in order to minimize adverse impacts;
- A description of all planned monitoring activities and the reporting thereof; and
- The internal organizational, management and reporting mechanisms put in place for such.

The Contractor's EHS-MP will be reviewed and approved by the Client before start of the works. This review should demonstrate if the Contractor's EHS-MP covers all of the identified impacts and has defined appropriate measures to counteract any potential impacts.

EHS Reporting

The Contractor shall prepare bi-monthly progress reports to the Client on compliance with these general conditions, the sub-program ESMP if any, and his own EHS-MP. The Contractor's reports will include information on:

- EHS management actions/measures taken, including approvals sought from local or national authorities;
- Problems encountered in relation to HSE aspects (incidents, including delays, cost consequences, etc. as a result thereof);
- Non-compliance with contract requirements on the part of the Contractor;
- Changes of assumptions, conditions, measures, designs and actual works in relation to EHS aspects; and
- Observations, concerns raised and/or decisions taken with regard to HSE management during site meetings.

The reporting of any significant HSE incidents shall be done as soon as practicable. Such incident reporting shall therefore be done individually. The Contractor should keep his own records on health, safety and welfare of persons, and damage to property. It is advisable to include such records, as well as copies of incident reports, as appendixes to the bi-monthly reports. Details of HSE performance will be reported to the Client.

Training of Contractor's Personnel

The Contractor shall provide sufficient training to his own personnel to ensure that they are all aware of the relevant aspects of these general conditions, any program ESMP, and his own HSE-MP, and are able to fulfill their expected roles and functions. Specific training will be provided to those employees that have particular responsibilities associated with the implementation of the HSE-MP. Training activities will be documented for potential review by the Client. Amongst other issues, training will include an awareness session for all employees on HIV-AIDS and recent epidemic disease of COVID 19 addressing the following topics:

- What is HIV/AIDS?
- How is HIV/AIDS contracted?
- HIV/AIDS prevention.

Labor influx issues

Experiences from One WaSH and other ongoing project and field work findings showed that jobs created by this project have been taken by the locals and no physical infrastructure construction

had resulted labor influx in towns and woredas and hence, associated risks of labor influx including gender-based violence of this project is low. However, to preclude any Gender based violence (GBV) and Sexual Exploitation and Abuse (SEA) risk during construction period, the project will ensure that a zero-tolerance policy on sexual harassment and abuse of female workers and community members is strictly enforced by contractors. Moreover, the project will ensure that the contractor prepares a code of conduct for works and fully implemented it during construction.

ANNEX VI: QUARTERLY AND ANNUAL ENVIRONMENTAL COMPLIANCE REPORTING TEMPLATE

(**Note** – The quarterly and annual compliance reporting templates shall be further developed and updated prior to project implementation.)

Quarterly and Annual Environmental Compliance Reporting Template to be Completed at Federal Levels

Monitoring of implementation of the ESMF, ESMP and ESIA is an important aspect of ensuring that the commitment to environmental sustainability of the project / program is being met. The regular monitoring of implementation of the ESMF and ESMP will be prepared at federal and/or regional level. The environmental specialists from the Ministry of Water and Energy (MoWE) and Ministry of Irrigation and Lowlands (MoIL) have the responsibility to prepare report quarterly annual to submit to the responsible body.

General

Ministry: [Type the correct name here] Reporting Quarter/Year: [type here] Date of the Report: [Type here]

Report Summary (Narrative):

Here narrative of the overall environmental safeguards implementation during the reporting period is summarized. Activities carried out in implementing the ESMF (including aspects monitored), issues identified, proposed solutions and follow up activities are summarized here. Figures will be discussed in the reporting table below. Please also consider other issues, like for e.g.:

- Types of training provided or training demands;
- If an environmental permit was not granted by EPA, explain why;
- If no objection is obtained for ESIA studies from the World Bank, and whether these documents are disclosed on time both through the implementing agencies website and the World Bank info shop (please refer Disclosure requirements);
- Documentation practices for environmental instruments (ESS reports, ESMP, ESIA, etc.); and, Specific challenges encountered in the course of project implementation processes.

Environmental Compliance Reporting Format to be completed at Federal Levels

Name of Ministry	:
Project	: <u>HoA-GW4RP</u>
Date	:

No	Name of Sub-project	Types of Sub- projects	Screened & Approved (Yes/No)	Environmental Category	ESIA Prepared & Approved (Yes/No)	Partial ESIA Prepared & Approved (Yes/No)	ESMP Implemented (Yes/No)	Remark
1								
2								
3								
4								
6								
Tota	al	•						

List of Outstanding Issues and Responsible Body for Implementation

No	Name of Sub-project	Type of Sub-project	Outstanding Issues	Recommended Actions	Responsible Body for Implementation	Time Schedule
1						
2						
3						
4						
5						

Completed by:

Name	:	

Email : _____

Phone :_____

ANNEX VII. GUIDELINE ON WATER AND WASTEWATER QUALITY

(Note - This is general guideline to ensure and monitor water and wastewater quality. The WB and other guidelines on water and wastewater quality shall be referred during development of sub-projects ES instruments).

Water Quality:

- Protection of ground water and surface water;
- Determine applicability of water quality standards: if national drinking water quality policy is not available, use WHO drinking water quality standards;
- Ensure testing and treatment for parasites, hazardous chemicals, bacteria, viruses;
- Frequency and responsibility for water quality testing;
- Frequency and responsibility for treatment of water sources;
- Responsibility for monitoring and water quality control at the household level (beneficiaries, water user associations)
- Responsibility for monitoring and water quality control at the Woreda level/project level (official authorities);
- Technical adequacy, quality and safety of bulk storage facilities;
- Technical adequacy, safety and protection of pumping facilities.

Source Protection:

Look at the natural and human activities that take place around the well or spring box; If a surface water source is used, there needs to be an understanding how these activities affect the water quality at the point of withdrawal;

- Take steps to minimize the negative impacts of these activities, i.e. standing water that could become a breeding site for vector (malaria);
- Consider methods such as pollution prevention or conservation and land use management to prevent source contamination;
- Plant shrubs, grasses and other types of indigenous plants to serve as a natural filter
- Consider source protection activities such as waste reduction and recycling;
- Distance of a water supply system intake from potential sources of contamination should be: (i) 50 m from latrines, cattle pens, refuse pits; (ii) 100 m from soak pits, trenches and sub-surface sewage disposal; (iii) 150 from cesspools, sanitary land fill areas, and graves;
- Use of water has to take place downstream and at a distance from the water source;
- Effective design and construction of abstraction facilities.

Water Reuse:

- As appropriate, consider technologies and management strategies designed to reuse waste water in rural agriculture which in turn can reduce environmental pollution;
- Adopt standards for waste water reuse;
- As appropriate, consult EPA guidelines for reclaimed water treatment processes and water quality limits for both, non-potable water and indirect potable reuse applications.
- Environmental and social monitoring indicators:
- Microbiological indicators such as E. coli, the single most important indicator of fecal contamination of water by humans or animals. It can be tested in the field (using field test kits with portable incubators) or in the laboratory;

- Physical-chemical indicators such as fluoride, nitrate/nitrite, pH, turbidity, chlorine residual;
- If necessary, identify sources of secondary information that allows for the monitoring of health impacts (i.e., decline in the number of cases of diarrhea; increase in the number of latrines used);
- Consult the publication "Environmental Performance Indicators" for guidance in the development of environmental monitoring indicators.

Proposed Effluent Discharge Requirements

The WWTP will be designed and operated to achieve discharges that fall within the maximum values set out in the table below. These values comply with National requirements or the WBG EHS Guidelines, whichever is the more stringent. The following table proposes effluent discharge requirements.

Parameter	Maximum Value	Unit
pH	6-9	pH
BOD	30	mg/l
COD	125	mg/l
Oil and Grease	10	mg/l
Total Suspended Solids	50	mg/l
Ammonium	10	mg/l
Phosphorus	2	mg/l
Sulfate	1	mg/l
Coli forms	400	Most probable number per 100 ml
Temperature increase	3	°C

Source: World Bank
ANNEX VIII. SAMPLE CHANCE FIND PROCEDURES

Cultural, historical, natural or archaeological heritage may be damaged or lost during excavations and ensuing construction work activities. In addition, chance finds of heritages during excavations would be at risk of loss, unless due measures are taken to protect and save this heritage. Chance finds procedures will be an integral part of the project ESMP and civil works contracts. If the Contractor discovers archeological sites, historical sites, remains and objects, including graveyards and/or individual graves during excavation or construction, the Contractor shall:

Chance Find Procedures	
Step 1	Stop the construction activities in the area of the chance find;
Step 2	Delineate the discovered site or area;
Step 3	Secure the site to prevent any damage or loss of removable objects.
Step 4	In cases of removable antiquities or sensitive remains, a night guard shall be arranged until the responsible local authorities for Culture and Tourism or the Federal Authority for Research and Conservation of Cultural Heritages take over;
Step 4	Notify the sub-project beneficiary/implementing institution E&S Focal Persons and PIT E&S staff, Project Supervisory Engineer who in turn will notify the responsible local authorities for Culture and Tourism or the Federal Authority for Research and Conservation of Cultural Heritages (within 24 hours or less);
Step 5	The responsible local authorities for Culture and Tourism or the Federal Authority for Research and Conservation of Cultural Heritages would then be in charge of protecting and preserving the site before deciding on subsequent appropriate procedures. This would require a preliminary evaluation of the findings to be performed by the archaeologists of the local/regional or Federal Authorities. The significance and importance of the findings should be assessed according to the various criteria relevant to Proclamation No. 209/2000 on research and conservation of cultural heritage.
Step 6	Decisions on how to handle the finding shall be taken by local authorities for Culture and Tourism or the Federal Authority for Research and Conservation of Cultural Heritages This could include changes in the layout (such as when finding irremovable remains of cultural or archeological importance) conservation, preservation, restoration and salvage.
Step 7	Implementation for the authority decision concerning the management of the finding shall be communicated in writing by the relevant authorities.
Step 8	Construction work may resume only after permission is given by the relevant local/regional or Federal Authorities concerning safeguard of the heritage

<u>Note</u>:

According to Article 41 of Proclamation No. 209/2000 on research and conservation of cultural heritage the measures that should be taken during chance finding of heritages (i.e., Fortuitous Discovery of Cultural Heritage) are the following:

- i. Any person who discovers any Cultural Heritage in the course of an excavation connected to mining explorations, building works, road construction or other similar activities or in the course of any other fortuitous event, shall forthwith report same to the Authority, and shall protect and keep same intact, until the Authority takes delivery thereof.
- ii. 'The Authority' shall, upon receipt of a report submitted pursuant to Sub-Article (I) hereof, take all appropriate measures to examine, take delivery of, and register the Cultural Heritage so discovered.
- iii. Where the Authority fails to take appropriate measures within six month in accordance with Sub- Article (2) of this Article, the 'person who has discovered the Cultural Heritage may be released from his responsibility by submitting, a written, notification with a full description of the situation to the Regional government official.
- iv. The Authority, shall ensure that the appropriate reward is granted to the person who has handed over a Cultural Heritage discovered fortuitously in accordance with sub-Articles (I) and (2) of this Article. And such person shall be entitled to reimbursement of expenses, if any, incurred in the course of discharging his duties under this Article.

ANNEX IX. TERMS OF REFERENCE FOR HOA-GW4RP ENVIRONMENTAL AND SOCIAL SPECIALISTS

(Note – ToR for ES specialist shall be updated prior to project implementation.)

Objective

To provide technical advice on environmental management and mitigation and ensure that the HoA-GW4RP ESMF is fully implemented.

Main Tasks

- Coordinate and support the system of E&S screening, review and approval process set out in this ESMF, and oversee its smooth operation including advice to beneficiary institutions on the procurement of consultants for any required ESIA studies;
- Coordinate screening, development of mitigation plan and implementation for Social Risk management including GBV, Labor Management, Stakeholder Engagement Plan and Grievance redress mechanisms,
- Liaise with the Federal and Regional EFCCC on a regular basis to support implementation of the ESMF
- Lead the delivery of capacity building programs on Environmental management for lead implementing institutions, GRM committees as well as beneficiary and other stakeholders.
- Provide technical advice to beneficiary institutions on all technical issues related to natural resources and environmental management. These issues will relate to impacts on surface water, groundwater, agricultural resources and vegetation, human health, ecology and protected areas, land and soil degradation;
- Organize training workshops to raise awareness of officials of project implementing and stakeholder institutions, technical and management officers;
- Liaise with the project beneficiary and stakeholder institutions to ensure the project's compliance with the ESMF, RF and all resettlement aspects of the project;
- Liaise with the project beneficiary and stakeholder institutions to ensure gender mainstreaming, implementation of recommendations of the Social Assessment, GBV action plan and GRM.
- Provide specific technical advice on mitigation measures for subprojects as necessary;
- Spearhead/coordinate the commissioning of an independent consulting firm to carry out an environmental and social performance audit of HoA-GW4RP on an annual basis;
- Undertake review of Preliminary ESIA/ESMP to ensure compliance with the ESMF and RF; and in collaboration with the appropriate bodies initiate and carry periodic environmental monitoring and inspection on selected subprojects.
- Compile and submit quarterly, biannual and annual E&S performance reports of the HoA-GW4RP to the World Bank and Federal and Regional EPFCCC as appropriate.