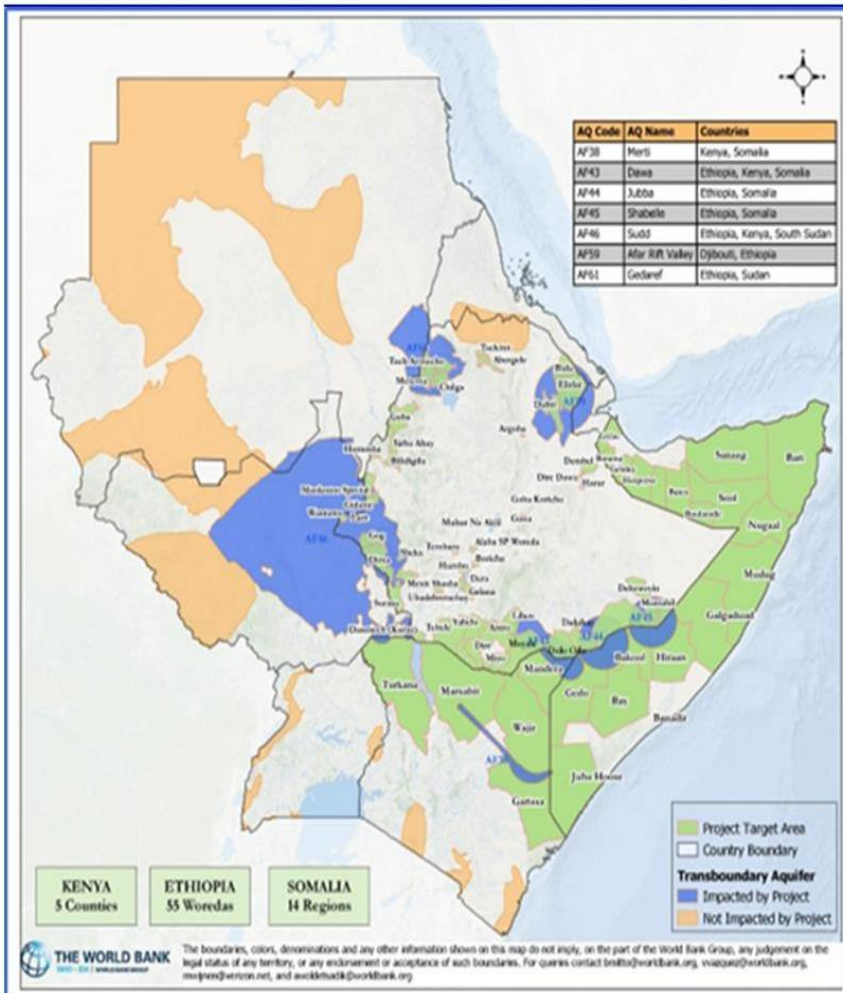




STRATEGIC ENVIRONMENTAL AND SOCIAL ASSESSMENT (SESA)

SESA FINAL REPORT



IGAD-Water Unit

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Horn of Africa Groundwater for Resilience Program-P174867**

Strategic Environmental and Social Assessment-Final Report

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ABBREVIATIONS AND ACRONYMS

AfDB	African Development Bank
ANBO	African Network of Basin Organizations
ARAP	Abbreviated Resettlement Action Plan
BGR	Federal Institute for Geoscience and Natural Resources
CBA	Community Based Conservation Area
CERC	Contingent Emergency Response Component
CHA	Controlled Hunting Area
CHMP	Cultural Heritage Management Plan
CSA	Climate Smart Agriculture
EAC	East African Community
EHS	Environment, Health and Safety
ESCP	Environmental and Social Commitment Plan
ESF	Environmental and Social Framework
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESSs	Environmental and Social Standards
ESSS	Environmental and Social Safeguard Specialist
EU	European Union
FCV	Fragility, Conflict and Violence
FDRE	Federal Democratic Republic of Ethiopia
FIDIC	International Federation of Consulting Engineers
FRS-MEWR	Federal Republic of Somalia Ministry of Energy and Water Resources
GBVAP	Gender Based Violence Action Plan
GDEs	Groundwater Dependent Ecosystems
GEF	Global Environment Facility
GHG	Greenhouse Gas
GMA	Global Mangrove Alliance
GMW	Global Mangrove Watch
GW	Groundwater
GWB	Groundwater-based
GWC	Groundwater Center
GW4R	Groundwater for Resilience
GW4RP	Groundwater for Resilience Program
GWIS	Groundwater Information System
HoA	Horn of Africa
HoAI	Horn of Africa Initiative
IDDRSI	IGAD-Drought Disaster Resilience and Sustainability Initiative
IFC	International Finance Corporation
IGAD	Intergovernmental Authority on Development
IGRAC	International Groundwater Resources Assessment Centre
IP	Indigenous Peoples
IUCN	International Union for Conservation of Nature-Eastern and Southern Africa Regional Office
ESARO	
IFRAH	The IGAD Food Security, Nutrition and Resilience Analysis Hub
IWMI	Integrated Water Resources Management Institute

IWU	IGAD Water Unit
LMP	Labour Management Procedures
MDGs	Millennium Development Goals
MoIL	Ministry of Irrigation and Lowlands
MoLSA	Ministry of Labour and Social Association
MoWE	Ministry of Water and Energy
MoWSI	Ministry of Water Sanitation and Irrigation
MS	Member States
NEMA	National Environment Management Authority
NFG	National Focus Group
NFPA	National Forest Priority Area
NRMU	Natural Resource Management unit
OHS	Occupational Health and Safety
OP	Operational Policy
PAP	Project Affected Person
PCA	Project Command Area
PDO	Project Development Objective
PIU	Project Implementation Unit
PPP	Plan, Program and Policy
RAP	Resettlement Action Plan
RPF	Resettlement Policy Framework
RSESA	Regional Strategic Environmental and Social Assessment
SEA	Strategic Environmental Assessment
SEA	Sexual Exploitation and Abuse
SEP	Stakeholder Engagement Plan
SESA	Strategic Environmental and Social Assessment
SH	Sexual Harassment
SHW	Stakeholder Workshop
SSA	Sub-Saharan Africa
SSAHUTLC	Sub-Saharan African Historically Underserved Traditional Local Communities
SWOT	Strength, Weaknesses, Opportunities and Threats
TAMP	Traffic and Accident Management Plan
TBAs	Transboundary Aquifers
TBLs	Transboundary Lakes
TBRs	Transboundary Rivers
TPM	Third-party Monitoring
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNTC	United Nations Treaty Collection
VMGPF	Vulnerable and Marginalized Groups Planning Framework
WB	World Bank
WBG	World Bank Group
WIOLAB-SAP	Strategic Action Programme for the Protection of the Western Indian Ocean from Land-Based Sources and Activities
WI	Wetlands International
WMO	World Meteorological Organization
WU	Water Unit

EXECUTIVE SUMMARY

PROJECT BACKGROUND AND CONTEXT

The Horn of Africa Groundwater for Resilience (HoA GW4R) Program aims to increase sustainable access and management of groundwater (GW) in the Horn of Africa as a key contribution to strengthen the climate resilience of targeted communities, using the Multiphase Programmatic Approach (MPA). Three countries, the Federal Democratic Republic of Ethiopia, the Republic of Kenya, the Federal Republic of Somalia, and the Intergovernmental Authority on Development (IGAD), are included in phase-I of this regional program. The Project Development Objective (PDO) is to improve groundwater management and access in the borderlands of the Horn of Africa. Considering regional-level, transboundary, and cumulative impacts through Regional Strategic Environmental and Social Assessment (RSESA) before implementing the HoA GW4R Program ensures sustainable groundwater management and access. Prior to the implementation of the proposed program, it is essential to strategically identify environmental and social issues to provide information for decision-making and integrate environmental and social considerations into higher levels of decision-making. Taking this fact into account, HoA's GW4R Program implemented RSESA processes.

OBJECTIVES OF SESA

General Objectives of SESA: The overall objective of HoA GW4R's strategic environmental and social assessment is to evaluate the environmental and social impacts of the proposed program and its alternatives to make sure they are fully considered and taken into account at the earliest possible stage of decision-making.

Specific Objectives of SESA: The specific objectives of the strategic environmental and social assessment are to: (1) review regional and national policy, legal, and institutional frameworks and propose measures to streamline the gaps in region-wide strategies, policies, and regulatory and institutional frameworks for the management of beneficial and adverse issues identified and prioritized for the program; (2) establish baseline environmental and social conditions that will serve as a benchmark against which to measure environmental and social changes and assess the impacts of the proposed program; (3) assess key stakeholders' interests, concerns, and values with respect to the HoA-GW4RP; (4) identify and prioritize key strategic environmental and social issues to be addressed in the SESA of HoA GW4RP; (5) conduct alternative scenario analysis using selected multi-criteria indicators (technical or engineering, environmental, and social indicators); (6) appraise environmental and social sustainability of the HoA-GW4R Program against Sustainability Objectives for HoA GW4RP; (7) conduct environmental and social impact analysis and determine the overall significance level of the impacts; (8) propose enhancement measures for beneficial impacts and mitigation measures for adverse impacts of the program; (9) prepare an environmental and social management and monitoring plan framework; and (10) develop institutional strengthening plan and monitoring, evaluation, and reporting system of SESA.

APPROACHES AND METHODOLOGY OF SESA

The SESA methodology is comprised of a series of steps as described below:

1. **Scoping:** In this SESA stage, the main scoping tasks were: (a) description of key program elements and components; (b) determination of key environmental and social issues; and (c) development of SESA sustainable objectives.
2. **Review of Policy, Legal and Institutional Frameworks:** These included: (1) Availability by applicable IGAD member states of national policies and strategies for the groundwater sector with a focus on groundwater, environmental, and social management; (2) applicable member states national legislation; (3) applicable relevant international conventions and protocols (ratified by the member states) related to the water sector,

with a focus on groundwater and environmental and social management as relevant; (4) World Bank's Environmental and Social Framework (ESF); (5) applicable aspects from the World Bank Group's Environmental, Health, and Safety (EHS) Guidelines; (6) legislative gap analysis between WB ESSs and HoA-GW4R Program MSs legal frameworks; and (7) country-specific ESMFs and measures to fill identified gaps.

3. **Baseline Assessment:** Environmental and social baseline conditions and situational analysis were done through a desk study of existing secondary baseline data from the IGAD website and Google searches using key words such as Horn of Africa, groundwater, resilience, strategic environmental and social assessment, and IGAD Region. Where these searching terms will not prove successful for any individual HoA GW4RP member state, a search by country name was conducted, followed by a lengthy examination of the resulting 'hits'. The following basic environmental and social baseline conditions of the region are included in this SESA report: (a) regional physical environment (topography, climate, geology, land use/cover, groundwater, surface water, transboundary Rivers, Lakes and Aquifers, and marine and coastal resources); (b) regional biological environment (flora, fauna, Key Biodiversity Areas (KBAs)); and (c) regional socio-economic environment (population, traditionally underserved communities, cultural and natural heritage sites, conflicts, gender based violence, and unemployment).
4. **Stakeholder Identification and Consultations at Regional Level:** Region-wide stakeholder identification and analysis was conducted as part of the strategic environmental and social assessment of HoA GW4RP with the objective of involving the stakeholders in informing strategic environmental and social issues related to the proposed program and the decision-making processes. The main tasks included: stakeholder identification for HoA GW4RP SESA; stakeholder workshop on designing resilient rural water supply systems in the HoA; stakeholder consultation on identification and prioritization of key strategic environmental and social issues in spatial contexts associated with HoA GW4RP; and disclosure of SESA information to the stakeholders.
5. **Analysis of Alternative Scenarios:** The four identified alternative scenarios were : (a) Alternative Scenario (So): No action alternative scenario that considers maintaining the current status quo or business-as-usual scenario in the region without improving management and access to water resources in the IGAD Region for resilience; (b) Alternative Scenario (S1): improving management and access to surface water for resilience in HoA; (c) Alternative Scenario (S2): improving management and access to conjunctive use of both surface and groundwater for resilience in HoA; and (d) Alternative Scenario (S3): improving management and access to groundwater for resilience in HoA .These alternative scenarios were evaluated using the Decision Support System Software of DEFINITE to select the best alternative for development.
6. **Environmental and Social Impact Analysis:** This SESA identified potential environmental and social impacts and risks that may result from the proposed HoA-GW4RP. The environmental and social risks and impacts were focused on those issues that particularly have region-wide effects. Further, the SESA was focused on environmental and social impacts or risks that are predicted to be significant in their likelihood and consequences. The impacts identified were both beneficial (positive) and adverse (negative).
7. **Propose Environmental and Social Mitigation Measures:** Potential environmental and social risks and impacts that will result from the proposed program implementation were provided with suggestions on enhancements for benefits and impact mitigation measures for negative impacts.

PROJECT DEVELOPMENT COMPONENTS

The Project development objective is envisioned to be achieved through the 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.

POLICY, LEGAL AND INSTITUTIONAL FRAMEWORKS

The IGAD regional policy and legal framework review work of SESA for HoA GW4RP concluded that there is no regionally specific coordinated policy on groundwater in the IGAD region. Instead, groundwater has occupied a cross-sectoral position in different IGAD regional policies and strategies. The review work on applicable international conventions and agreements ratified by the member states revealed that IGAD member states have not yet ratified the UN Watercourses Convention of 1997, which is instrumental to the development of transboundary water resources in the interest of all the river basin or aquifer states concerned as well as maintaining their peaceful coexistence. According to the World Bank's Environmental and Social Standards (ESSs), projects supported by the bank through investment project financing are required to meet the ESSs. Accordingly, it was noted that all except ESS 9 were potentially applicable to the HoA-GW4RP. The member states environmental management legislation is compared with the World Bank's Environmental and Social Standards. In the comparison, gaps were identified between existing member state laws and regulations and the World Bank's Environmental and Social Standards. Country-specific ESMFs and measures were suggested to fill the identified gaps.

ENVIRONMENTAL AND SOCIAL BASELINE CONDITIONS AND SITUATIONAL ANALYSIS

In this SESA work, sufficient environmental and social baseline conditions and situational analysis were done through a desk study of existing secondary baseline data from the IGAD website and Google searches using key words such as Horn of Africa, groundwater, resilience, strategic environmental and social assessment, IGAD Region, and individual project member states. It is clear from the SWOT analysis output that although there are strengths and opportunities, the HoA Initiative region is also subjected to a range of threats and weaknesses, which include both regional, national, and local processes. SWOT analysis helps to find the best match between environmental trends (opportunities and threats) and internal capabilities (strengths and weaknesses).

STAKEHOLDER CONSULTATIONS

SESA consultant for HoA-GW4RP reviewed records of regional consultation workshop findings that have taken place as part of HoA-GW4RP, if available. Based on this review, a series of stakeholder workshops related to the HoA-GW4RP project that were organized by IGAD revealed that key stakeholders' interests, concerns, and values with respect to the HoA-GW4RP were sufficiently reflected. However, the identification of potential environmental and social risks and impacts associated with the implementation of the HoA-GW4RP was not discussed in these stakeholder workshops.

During this SESA Study, two stakeholder consultations were conducted. One of the stakeholders' workshops was on designing resilient rural water supply systems in the HoA. IGAD took the initiative to organize a comprehensive two-part regional workshop around the Horn of Africa (HoA) Groundwater for Resilience (IGAD-GW4R) project: Designing Resilient Rural Water Supply Systems in the HoA from May 8th - 10th 2023 at Addis Ababa, Ethiopia. Total participants were 60. The workshop brought together delegates in charge of water resources from Ethiopia, Kenya, and Somalia, representatives from The World Bank, the UNDP, and the Rift valley Institute. This groundbreaking event focused on fostering dialogue and cooperation among key project stakeholders from Ethiopia, Kenya, and Somalia. The workshop aimed to enhance regional cooperation and knowledge exchange, with a focus on transboundary groundwater management and the development of resilient rural water supply systems. In this workshop, critical factors for sustainability and suitability for resilient Rural Water Supply Systems (RWSS) Design, which is the main aim of conducting strategic environmental and social assessment, were discussed in the first session. Integrated water planning for livelihood, population, and climate change, conflict assessment and mitigation, and inclusive community

engagement and ownership were highlighted as fragility considerations in Resilient RWSS in the second session. In the fourth session, applying best strategies to procure aquifer assessments, design of schemes, and drilling works in the HoA using FIDIC as a valuable resource in the context of contracting and procurement was considered a mitigation measure to avoid risks associated with the construction of water boreholes.

The second one was a stakeholder consultation workshop on the identification and prioritization of key environmental and social issues associated with HoA-GW4R project. In this virtual mini-workshop, using NFG of the three participating countries and IWU, key strategic environmental and social impacts in the spatial context associated with HoA GW4RP were identified and prioritized.

ENVIRONMENTAL AND SOCIAL RISKS AND IMPACTS

Regional Strategic Environmental and Social Assessment (SESA) for the HoA GW4R Program focused on regional-level, transboundary, and cumulative impacts which included the following:

Beneficial/Positive Strategic Environmental and Social Impacts: On the basis of this RSESA study, the HoA GW4R Program will have a number of significant beneficial or positive socio-economic and environmental impacts that justify the implementation of the program. The potential socio-economic and environmental benefits that are identified in this RSESA study are: strengthening the climate resilience of targeted communities and reduction of GHG emissions; reducing conflicts over water and creating peace and stability in the region; ensuring food security and bringing socioeconomic developments; creating inclusive community-level access to groundwater in the borderlands of the HoA; creating employment opportunities for the local communities and women; generating groundwater information and strengthening regional and national groundwater institutions; and creating strong linkages and alignment with other HoA projects.

Adverse/Negative Strategic Environmental and Social Impacts: Although the implementation of the HoA GW4R Program has many benefits, it will also have a number of adverse or negative impacts. The potential socio-economic and environmental adverse or negative impacts that were identified in this RSESA study are: transboundary aquifer depletion, water quality deterioration, risk of exacerbating existing transboundary water use conflict, cumulative impacts of soil erosion and degradation, impacts on groundwater-dependent ecosystem of lacustrine/palustrine/riverine wetlands, springs and Oasis, impacts on groundwater-dependent ecosystem of terrestrial flora and fauna, impacts on groundwater-dependent ecosystem of estuarine and near-shore marine ecosystems, impact on transboundary key biodiversity conservation areas, impacts on traditional underserved communities of borderlands, impact on transboundary heritage sites, impact on livelihood, exacerbating natural and man-made disasters (flood and drought), spread of water borne diseases and public health risks and risk of exacerbating existing social exclusion, conflict, illicit behavior, crime and Gender-Based Violence (GBV) of borderlands.

Analysis of Alternative Scenarios of the HoA GW4R Program: A "do-nothing" alternative to the base-case form of the program or no action alternative scenario that considers maintaining the current status quo or business-as-usual scenario in the region without improving management and access to water resources in the IGAD Region for the resilience project has been considered. Under the no action alternative scenario, which considers maintaining the current status quo or business-as-usual scenario in the region without improving management and access to water resources in the IGAD Region, these short-term, medium-term, and long-term visions would be compromised and slowed down, as well as the climate resilience of targeted communities, which wouldn't be strengthened. Therefore, from an environmental and socio-economic point of view, the do-nothing alternative, i.e., maintaining the current status quo or business-as-usual scenario in the region without improving management and access to water resources in the IGAD Region, is not preferable to project implementation.

Three alternative scenarios, namely (a) Alternative Scenario (S1); (b) Alternative Scenario (S2); and (c) Alternative Scenario (S3), were further evaluated as alternatives by avoiding the Business-as-usual or "do-nothing" scenario. The evaluation of alternative scenarios was based on ten indicators, including GHG emission, pressure on transboundary

surface and groundwater resources, water use conflict due to transboundary downstream effects, effects on transboundary groundwater-dependent ecosystems (GDEs), number of direct beneficiaries, upfront costs needed to confirm and characterize water resources, capital costs, operational costs, technological maturity level, and implementation timeframe. Alternative scenario (S₃) is the preferred alternative followed by Alternative Scenario (S₂). Alternative Scenario (S₂) of improving management and access of conjunctive use of both surface and groundwater for resilience in HA is the second preferred scenario, followed by Alternative Scenario (S₃) of improving management and access of groundwater for resilience in HoA. Alternative Scenario (S₂) has an intermediate position. Therefore, Alternative Scenario (S₂) of improving management and access to conjunctive use of both surface and groundwater for resilience in HoA shall be also implemented in addition to Alternative Scenario (S₃) for the following advantages: controls waterlogging and salinization, remedies for the problem of salinity ingress, control of over-pumping of groundwater reservoirs, and it makes the use of saline water possible.

ENVIRONMENTAL AND SOCIAL MITIGATION, MANAGEMENT AND MONITORING MEASURES

Environmental and social enhancement measures for beneficial/positive impacts and environmental and social mitigation measures for adverse/negative impacts were suggested. Proportionate enhancement and mitigation measures for the identified E&S risks and impacts were provided by considering the following issues: (a) identification and design of measures to avoid, minimize, or mitigate adverse E&S risks and impacts, (b) integration of sustainability principles and best practices, and (c) identification of opportunities to enhance positive environmental and social outcomes. HoA GW4R Program needs about **758,000** USD for environmental and social management, **435,000** USD for environmental and social monitoring activities, and **1,380,000** USD for capacity building and institutional strengthening.

CONCLUSION AND RECOMMENDATIONS

From the key findings of the draft report of SESA for HoA GW4RP, conclusions were drawn and in light of the key findings of the draft report of SESA for HoA GW4RP, key recommendations were forwarded at section 8.

1. INTRODUCTION

1.1 Project Background and Context

The Horn of Africa Groundwater for Resilience (HoA GW4R) Program aims to increase sustainable access and management of groundwater (GW) in the Horn of Africa as a key contribution to strengthening the climate resilience of targeted communities, using the Multiphase Programmatic Approach (MPA). Three countries, the Federal Democratic Republic of Ethiopia, the Republic of Kenya, the Federal Republic of Somalia, and the Intergovernmental Authority on Development (IGAD), are included in phase I of this regional program. The Project Development Objective (PDO) is to improve groundwater management and access in the borderlands of the Horn of Africa.

The progress toward the PDO will be measured by the following outcome indicators: regional groundwater institutions with increased access to improved information critical for sustainable GW management. Intermediate indicators include, among others: (a) New policies, bylaws, regulations, guidelines, or regional agreements prepared or adapted for sustainable groundwater management and use in participating countries; (b) The Horn of Africa Groundwater Information System (HoA-GWIS) established and operational; and (c) The Regional Platform for Groundwater Collaboration (PGWC) functioning among participating countries. The HoA-GWIS will be essential for sustainable GW management as it will allow countries to generate and share data on transboundary aquifers, adding value to inform decision-making and joint planning. The PGWC will serve as a key collaborative mechanism among IGAD and Member States (MS) to agree on and prioritize joint groundwater activities, decide on their scope and modalities, and support the implementation and validation of regional outputs.

The primary project beneficiaries will be decision-makers, civil servants, and groundwater management professionals of regional and national institutions involved in the planning, development, and management of groundwater resources in the IGAD region, through strengthened capacity, increased availability of relevant information, improved policies, and strengthened regional collaboration. The project will also benefit scientists and experts from universities, professional institutions, and companies in the region that work on groundwater at the transboundary, national, and sub-national levels, as well as indirectly the inhabitants of the IGAD region that will benefit from more sustainable groundwater management and increased resilience to climate shocks.

Considering regional-level, transboundary, and cumulative impacts through Regional Strategic Environmental and Social Assessment (RSESA) before implementing the HoA GW4R Program ensures sustainable groundwater management and access. Prior to the implementation of the proposed program, it is essential to strategically identify environmental and social issues to provide information for decision-making and integrate environmental and social considerations into higher levels of decision-making.

IGAD will implement measures and actions so that the project is implemented in accordance with the Environmental and Social Standards (ESSs). IGAD shall be responsible for compliance with all requirements of the ESCP even when implementation of specific measures and actions is conducted by any unit or division of IGAD or by some other delegate or agent of IGAD. According to ESS-1: Assessment and Management of Environmental and Social Risks and Impacts, conducting a Regional Strategic Environmental and Social Assessment (RSESA) in accordance with terms of reference acceptable to the association is one of the agreed activities included under the ESCP. Taking this fact into account, HoA's GW4R Program implemented RSESA processes. Therefore, the terms of reference and the framework for agreement between IGAD-WU and an individual SESA consultant, Yirga Kebede Wondim, define an agreement to undertake consultancy services for Strategic Environmental and Social Assessment (SESA) for the World Bank/IDA-supported Horn of Africa Groundwater for Resilience Program.

1.2 Rationale of the Program

Groundwater constitutes an area of unprecedented opportunity for the Horn of Africa. However, despite its potential to strengthen the capacity of rural communities to cope with and adapt to the impacts of shocks and stressors, the current level of knowledge and use of groundwater in the region remains low, and ongoing efforts are not enough. The reasons for that situation include the following: (a) the region lacks functioning platforms (in the form of transboundary commissions, basin authorities, or others) to facilitate dialogue, information exchange, joint governance, and monitoring; (b) there is limited country capacity and a lack of commitment to cooperate towards common goals in this area; (c) the status of the five I's (information, institutions, infrastructure, implementation, and innovation) in these countries remains weak; (d) the uneven capacity among countries in the region; and (e) low levels of skills, knowledge, and technology of groundwater resources exploration and understanding in the HoA region.

The set of challenges identified above is the rationale for a program that calls for an enhanced mechanism to support countries in the region to explore and rationally develop groundwater resources to build the resilience of rural communities to shocks and stressors. Such mechanisms can complement ongoing efforts both at the regional and country levels and boost resilience efforts in the region. The specific objective of the proposed project is "to strengthen the resilience of targeted entities and selected communities in the Horn of Africa to cope with and adapt to climate change shocks through enhanced management and use of groundwater resources".

1.3 Objectives of the SESA

1.3.1 General Objectives of SESA

The overall objective of HoA GW4R's strategic environmental and social assessment is to evaluate the environmental and social impacts of the proposed program and its alternatives to make sure they are fully considered and taken into account at the earliest possible stage of decision-making.

1.3.2 Specific Objectives of SESA

The specific objectives of the strategic environmental and social assessment are to:

1. review regional and national policy, legal, and institutional frameworks and propose measures to streamline the gaps in region-wide strategies, policies, and regulatory and institutional frameworks for the management of beneficial and adverse issues identified and prioritized for the program;
2. establish baseline environmental and social conditions that will serve as a benchmark against which to measure environmental and social changes and assess the impacts of the proposed program;
3. assess key stakeholders' interests, concerns, and values with respect to the HoA-GW4RP;
4. identify and prioritize key strategic environmental and social issues to be addressed in the SESA of HoA GW4RP;
5. conduct alternative scenario analysis using selected multi-criteria indicators (technical or engineering, environmental, and social indicators);
6. appraise environmental and social sustainability of the HoA-GW4R Program against Sustainability Objectives for HoA GW4RP;

7. conduct environmental and social impact analysis and determine the overall significance level of the impacts;
8. propose enhancement measures for beneficial impacts and mitigation measures for adverse impacts of the program;
9. prepare an environmental and social management and monitoring plan framework; and
10. develop institutional strengthening plan and monitoring, evaluation, and reporting system of SESA.

1.4 Scope of the SESA

The scope of the Strategic Environmental and Social Assessment (SESA) of the IGAD components of the HoA-GW4R project includes the following:

1. Establish baseline environmental and social conditions that will serve as a benchmark against which to measure environmental and social changes and assess the impacts of the proposed program;
2. Define environmental and social challenges and opportunities for sustainable groundwater development and management;
3. Conduct stakeholder and public consultations at regional and national levels to identify and prioritize the strategic environmental and social concerns in relation to the IGAD components of the project. Through further consultations, update the implementing agencies on the gaps in the current strategies, policies, regulatory, and institutional frameworks for effective management of the identified and prioritized environmental and social concerns resulting from the implementation of the specific project components, subcomponents, and activities;
4. Collate and analyze the findings of the assessment and recommend strategy, policy, regulatory, and institutional adjustments required for effective management of the identified and prioritized environmental and social concerns resulting from implementation of the specific project components, subcomponents, and activities; and
5. Recommend specific timelines, indicators, and targets for monitoring of proposed measures; recommend institutional responsibilities; and recommend capacity building requirements. Further, recommend environmental and social instruments to be used during the project implementation to manage and monitor the concerns identified and prioritized.

1.5 Approaches and Methodology of SESA

1.5.1 SESA Establishing Context

From the three countries included in HoA GW4R, Kenya has a relatively well-developed environmental assessment system, whereas Somalia does not have a well-developed environmental assessment system. The Environmental Management and Coordination Act, which was adopted in 2000, provided the legal foundation for Kenya's SESA framework. According to reports, the Kenyan SESA framework was influenced by the principles of early application, accountability, and open engagement. The Environmental Impact Assessment and Audit Regulations (2002) set supplementing requirements for the SESA procedure, responsibilities, and contents of the SESA report. In 2011, the National Environment Management Authority (NEMA) issued National Guidelines for Strategic Environmental Assessment in Kenya.

SESA has been introduced to Ethiopia quite recently. The EIA proclamation of 2002 makes a clear provision for the assessment of 'public instruments' (policies, strategies, programs, laws, and international agreements). However, procedures and guidelines for SESA are not in place. In Ethiopia, as compared to SESA, EIA is a relatively well-developed environmental assessment system.

However, Somalia lacks a well-developed environmental assessment system, in part because of the country's recent political instability over the last few decades. The autonomous region of Puntland introduced an environmental policy in 2014 and the Puntland Environmental Impact Assessment Regulations in 2016. Project owners active in the region of Puntland should take these regulations into consideration. The autonomous region of Somaliland also introduced an Environmental Management Act in 2014. Apart from member states efforts, IGAD developed a regional environmental impact assessment policy framework and Protocol.

1.5.2 SESA Processes

In general, to undertake SESA for the proposed HoA GW4R program, the following steps were followed, taking into account the IGAD Regional Environmental Impact Assessment Policy Framework and Protocol, and Kenyan SESA national guideline developed by NEMA:

1.5.2.1 Screening

Screening was undertaken to determine whether the proposed Plan, Program and Policy (PPP) required SESA or not. Among the three methods of screening (standardize or positive list screening, case-by-case screening, and mixture of the two methods), the mixture of the two-method applied for this SESA study. In considering whether or not a SESA should be undertaken, it is necessary to take into account (a) the nature of the strategic proposal and (b) the nature of the environment that would be affected. As per the Kenya Strategic Impact Assessment Guidelines, it would be appropriate to carry out a SESA where, amongst others: (a) the PPP is likely to result in significant environmental effects; (b) the proposed PPP is likely to be politically or publicly contentious; (c) there are likely to be trans-boundary effects; (d) risks to health, safety, and/or the integrity of social or ecological systems are considered to be high; (e) social and/or ecological systems have low resilience and high vulnerability to disturbance or impact; (f) there is a definite risk of these limits of acceptable change being exceeded; and (g) the PPP is likely to have a negative impact on unique, special, or highly valued natural or cultural elements.

The Horn of Africa Groundwater for Resilience (HoA GW4R) is a program aims to increase sustainable access and management of groundwater (GW) in the Horn of Africa as a key contribution to strengthen the climate resilience of targeted communities, using the Multiphase Programmatic Approach (MPA) and the implementation of the program will result in significant positive and negative environmental impacts and have a potential for promoting sustainable development. The Program will have a range of environmental and social (E&S) benefits including improved groundwater management and building resilience through technical assistance, capacity building, and institutional strengthening activities of the countries and entities. However, there are various transboundary environmental, social and health risks that may occur if appropriate arrangements for identification and management are not put in place.

HoA GW4RP shall be implemented at high levels of climate risks, frequent and devastating droughts, and already-fragile natural resource base areas, and vulnerable communities, regions of conflict, food insecurity, transboundary

aquifers (TBAs) and border lands of the region. Furthermore, the environmental and social issues of the program have not been previously adequately assessed, and the proposed program is not an emergency plan. Therefore, it requires a full regional strategic environmental and social assessment (RSEA) study. To manage the anticipated risks and impacts, an ESMF has been prepared by each participating country. As most of the country level ESMFs will deal with local risks and impacts, a Regional Strategic Environmental and Social Assessment (RSESA) shall be prepared by IGAD. Thus, IGAD offered a consultancy service for an individual consultant to consider regional level impacts, transboundary and cumulative impacts using a SESA Tool.

According to World Bank's Project Appraisal Document (PAD) for HoA GW4RP, the program's environmental and social risks have been classified as high. The environmental risk rating is substantial as the direct environmental risks of the program are expected to be predictable, reversible, site specific and are not likely to be highly significant. The social risk rating is high given the contextual risks including the security situation in the HoA, the risk of conflict which can be unpredictable and factors such as access to land and inclusion. Each subproject activity will have a specific location and salient physical, biological and socio-economic characteristics which will need to be understood as part of the Environmental and Social Impact Assessment (ESIA).

1.5.2.2 Scoping

In this SESA, the main scoping tasks were: (a) description of key program elements and components; (b) determination of key environmental and social issues; and (c) development of SESA sustainable objectives.

- A. Description of Key Elements and Components of the Proposed HoA GW4RP:** The key elements or components of the overall program as well as IGAD project components in relation to their associated environmental and social concerns were exhaustively described and presented in Section 2 (Project Description).
- B. Scoping Key Environmental and Social Issues:** Scoping is an integral component of both SESA and project-level environmental and social impact assessments (ESIA). At the strategic level, scoping should aim to identify the broad issues to be considered, including environmental or social issues, and possible alternative courses of action. Identification of key environmental and social issues ensured that the SESA focused on issues that were most important for design and decision-making. The identification of key strategic environmental and social issues in this SESA study were based on a review of the proposed HoA GW4RP (nature and its activities), a review of the previous studies on the HoA region, and consultation with different stakeholders. Steps that were followed in this scoping processes were:(a) compile the range of concerns (long list) by reviewing previous studies, the proposed program, and consultation with stakeholders; (b) evaluation of these to establish key issues (short list); (c) organize these into impact themes: beneficial and adverse impacts; and (d) prioritize identified impacts.
- C. SESA Sustainable Objectives:** A set of SESA sustainable environmental and social objectives were compiled for each of the environmental and social aspects identified as key issues, against which the impact and performance of the HoA GW4RP components were to be measured on an ongoing basis. The environmental and social objectives provide a benchmark "indicator" against which the environmental and social effects of the program could be measured.

Table-1: Sustainability Objectives for HoA GW4RP

No	Sustainability objectives
1.	Strengthen the climate resilience of targeted communities
2.	Ensure food security and bring socioeconomic developments
3.	Reducing conflicts over water and create peace and stability in the region
4.	Improve access to irrigation schemes
5.	Improve access to water supply for human and livestock consumption and production
6.	Enhance regional integration and regional cooperation in the management of trans-boundary water resources
7.	Generate groundwater information and strengthening regional and national groundwater institutions
8.	Improve already-fragile natural resource base areas and food insecurity
9.	Reduce flood hazards
10.	Enhance aquifer recharge

1.5.2.3 Review of Policy, Legal and Institutional Frameworks

A detailed review of relevant region-wide regulatory frameworks was done and findings included in the SESA report. All programs and projects carried out by the IGAD and member countries are supposed to be implemented within the framework of the laws, acts, and regulations by which the IGAD, the member countries as well as WB are governed. Taking this background into account, the SESA study for the HoA-GW4R Program reviewed pertinent policies, regulations and standards governing environmental quality, safety, and health, the protection of sensitive areas, and the protection of endangered species at regional and national levels. The HoA-GW4R Program shall abide by the laws and work accordingly to safeguard the environment and the local people's welfare in the IGAD Region. A detailed review of relevant region-wide regulatory frameworks was made to establish the regulatory setting against which the program will be implemented. The reviews of policy, legal, and institutional frameworks included the following:

- Applicable IGAD member states that have national policies and strategies for the groundwater sector with a focus on groundwater, environmental, and social management;
- Applicable member states national legislation (proclamations, acts, bills, regulations, directives, and procedural guidelines) for the water sector, with a focus on groundwater, environmental, and social management;
- Applicable relevant international conventions and protocols (ratified by the member states) as well as applicable regional agreements, cooperative frameworks related to the water sector, with a focus on groundwater and environmental and social management as relevant;
- The World Bank's Environmental and Social Framework (ESF);
- Applicable aspects from the World Bank Group's Environmental, Health, and Safety (EHS) Guidelines;
- Legislative gap analysis between WB ESSs and HoA-GW4R Program Member States legal frameworks; and
- Country-specific ESMFs and measures to fill Identified gaps.

1.5.2.4 Baseline Assessment

Environmental and social baseline conditions and situational analysis were conducted through a desk study of existing secondary baseline data from the IGAD website and Google searches using key words such as Horn of Africa, groundwater, resilience, strategic environmental and social assessment, and IGAD Region. Where these searching terms did not prove successful for any individual HoA GW4RP member state, a search by country name was conducted, followed by a lengthy examination of the resulting 'hits'.

Strategic environmental and social assessment requires knowledge of the current environmental conditions and their likely change in the absence of the PPP. This exhaustive description of the baseline environmental and social condition was primarily intended to serve as a benchmark against which to measure environmental and social changes and assess impacts. The following basic environmental and social baseline conditions of the region included in this SES:

- The regional physical environment (topography, climate, geology, land use/cover, groundwater, surface water, transboundary Rivers, Lakes and Aquifers, and Marine and Coastal Resources);
- The regional biological environment (flora, fauna, Key Biodiversity Areas (KBAs));and
- The regional socio-economic environment (population, traditionally underserved communities, cultural and natural heritage sites, conflicts, gender based violence, and unemployment).

1.5.2.5 Stakeholder Identification and Consultations at Regional Level

Stakeholder engagement is the interaction with, and influence of project stakeholders to the overall benefit of the project and its advocates. World Bank Environmental and Social Standard (ESS10) recognizes two broad categories of stakeholders: 1) those likely to be affected by the project because of actual impacts or potential risks to their physical environment, health, security, cultural practices, well-being, or livelihoods (project affected parties), and 2) other interested parties.

Region-wide stakeholder identification and analysis conducted as part of the strategic environmental and social assessment of HoA GW4RP with the objective of involving the stakeholders in informing strategic environmental and social issues related to the proposed program and the decision-making processes. The main tasks include:

Stakeholders Identified for HoA GW4RP SESA

- IGAD-Climate Predication and Application Center,
- Regional Center on Groundwater Resources (Nairobi, Kenya),
- World Bank, Structured Learning Program (SLP),
- Kenya Ministry of Water, Sanitation and Irrigation,
- Kenya National Environment Management Authority,
- Wetland International East Africa (Nairobi, Kenya),
- Eastern Nile Technical Regional Office (ENTRO) (Addis Ababa, Ethiopia),
- Global Water Partnership Eastern Africa (GWPEA) (Entebbe, Uganda),
- Ethiopia Ministry of Water and Energy (MoWE),
- Ethiopia Ministry of Irrigation and Lowlands (MOLL),

- Ethiopia Environment and Forest Protection Authority,
- Somalia Ministry of Energy and Water Resources, and
- Somalia Ministry for Environment, Agriculture, and Climate Change (MoECC)

Stages and Purposes of HoA GW4RP SESA Stakeholder Consultation

- Stakeholder workshop on designing resilient rural water supply systems in the HoA;
- Stakeholder Consultation on Identification and Prioritization of Key Strategic Environmental and Social Issues in spatial context associated with HoA GW4RP
- Disclose SESA information to the stakeholders

Proposed strategy for region-wide stakeholder consultation

The aftermath effect of COVID-19 crisis in the project region required short-term adaptation of the consultation approach. The project therefore followed (i) WHO guidance on prevention of the spread of the COVID-19 virus; (ii) respective instructions by IGAD; (iii) international good-practice on consultations under Covid-19 and innovative approaches established by World Bank, UN, and other development agencies. Stakeholder engagement is an ongoing process. Besides to Regional level stakeholder consultation at SESA level, IGAD, WU shall conduct consultation with community members and other concerned stakeholders during the preparation of Environmental and Social Impact Assessment (ESIA) as well as the implementation of project activities using communication channels deemed appropriate in relation to the specific stakeholder needs and circumstances.

Therefore, region-wide key virtual consultations were conducted to identify and prioritize key strategic environmental and social issues in spatial context associated with HoA GW4RP.

Proposed strategy for HoA GW4RP SESA information disclosure

HoA GW4RP SESA information (Draft Report) shall be publicly disclosed on IGAD and World Bank websites. Stakeholders encouraged to provide feedback, raise queries on gaps and suggest solutions to enable the improvement of draft SESA Report.

Table-2: HoA GW4RP SESA Stakeholder Consultation Plan

Region/Country	Dates (2023)	Key participants	Method	Purpose	Responsible Party
I. Region-wide Stakeholder Consultation Plan					
HoA GW4RP member Countries (Ethiopia, Kenya & Somalia)	4 th week of May, 2023	IGAD-WU, IGAD-Climate Prediction and Application Center, Regional Center on Groundwater Resources (Nairobi, Kenya), World Bank, Structured Learning Program (SLP), Kenya Ministry of Water, Sanitation and Irrigation Kenya National Environment Management Authority. Wetland International East Africa (Nairobi, Kenya),	virtual consultation	<ul style="list-style-type: none"> • Identify and prioritize Key Strategic Environmental and Social Issues in spatial context associated with HoA GW4RP • Set SESA environmental and social objectives • Set SESA Indicators 	IGAD-WU & SESA Consultant

		Eastern Nile Technical Regional Office (ENTRO) (Addis Ababa, Ethiopia), Global Water Partnership Eastern Africa (GWPEA) (Entebbe, Uganda), Ethiopia Ministry of Water and Energy (MoWE), Ethiopia Ministry of Irrigation and Lowlands (MoIL), Ethiopia Environment and Forest Protection Authority, Somalia Ministry of Energy and Water Resources, Somalia Ministry for Environment, Agriculture, and Climate Change (MoECC)			
II. HoA GW4RP SESA information (Draft Report) disclosure plan					
HoA GW4RP member Countries (Ethiopia, Kenya & Somalia)	3 rd week of June, 2023	IGAD-WU, IGAD-Climate Prediction and Application Center, Regional Center on Groundwater Resources (Nairobi, Kenya), Kenya Ministry of Water, Sanitation and Irrigation Kenya National Environment Management Authority, Wetland International East Africa (Nairobi, Kenya), Eastern Nile Technical Regional Office (ENTRO) (Addis Ababa, Ethiopia), Global Water Partnership Eastern Africa (GWPEA) (Entebbe, Uganda), Ethiopia Ministry of Water and Energy (MoWE), Ethiopia Ministry of Irrigation and Lowlands (MoIL), Ethiopia Environment and Forest Protection Authority, Somalia Ministry of Energy and Water Resources, Somalia Ministry for Environment, Agriculture, and Climate Change (MoECC)	Written requests via official letters and emails	<ul style="list-style-type: none"> • Disclose SESA information to the stakeholders • Get feedback and integrate the findings of the stakeholder engagement into final SESA Report 	IGAD-WU & SESA Consultant

1.5.2.6 Analysis of Alternative Scenarios

A. Identification of Alternative Scenarios

The following alternative scenarios were identified:

- **Alternative Scenario (S₀):** No action alternative scenario that considers maintaining the current status quo or business-as-usual scenario in the region without improving management and access to water resources in the IGAD Region for resilience;

- **Alternative Scenario (S1):** improving management and access to surface water for resilience in HA;
- **Alternative Scenario (S2):** improving management and access to conjunctive use of both surface and groundwater for resilience in HA; and
- **Alternative Scenario (S3):** improving management and access to groundwater for resilience in HA.

B. Evaluation and Selection of Preferred Alternative Scenario

The above-selected alternatives were further evaluated quantitatively and qualitatively using selected multi-criteria indicators (environmental, social, and technical or engineering indicators). Alternative scenarios generated were evaluated using the Decision Support System Software of DEFINITE to select the best alternative for development. DEFINITE (decisions on a finite set of alternatives) is a decision support software package that has been developed to improve the quality of decision-making ¹. The software includes multicriteria methods, cost-benefit analysis, and graphical evaluation methods. DEFINITE supports the whole decision process, from problem definition to report generation. The three steps of multicriteria analysis in DEFINITE include: (1) standardizing, (2) weighting, and (3) ranking.

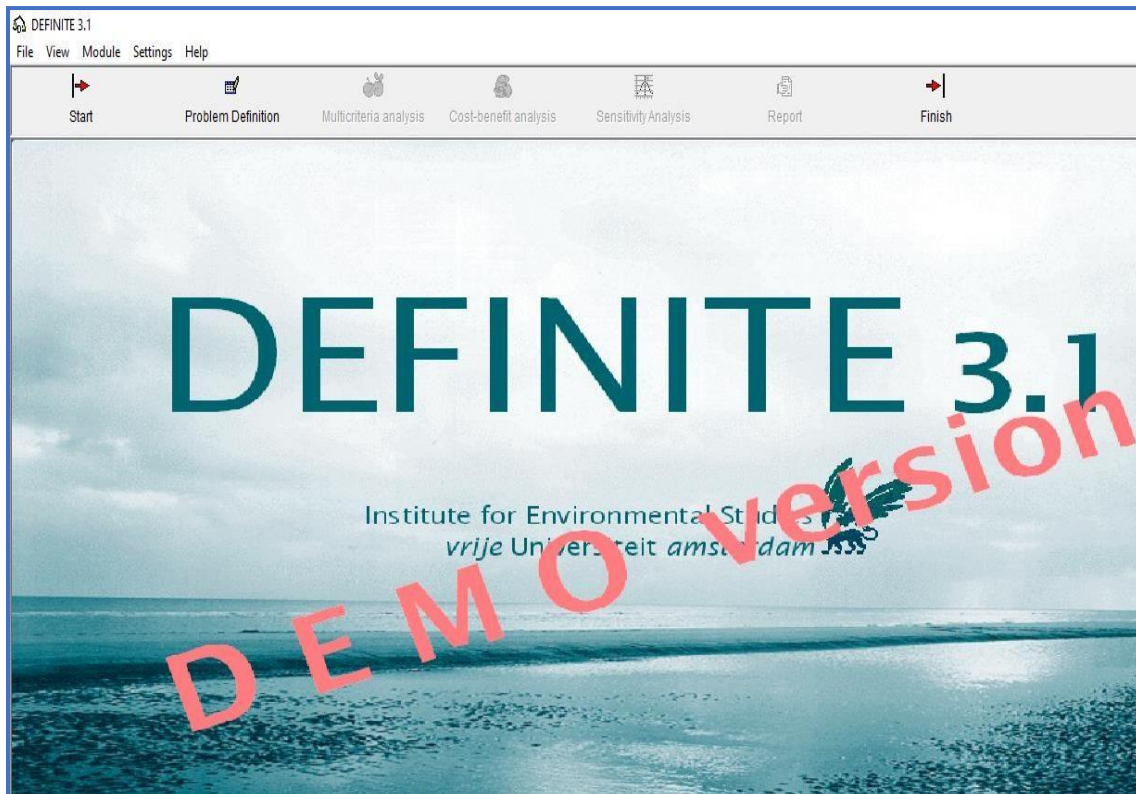


Figure-1: Definite Software Interface for Alternative Scenario Analysis

¹Janssen, R., & van Herwijnen, M., 2006. Decision support for discrete choice problems: the DEFINITE program

1.5.2.7 Environmental and Social Impact Analysis

This SESA identified potential environmental and social impacts and risks that may result from the proposed HoA-GW4RP. The environmental and social risks and impacts were focused on those issues that particularly have region-wide effects in relation to the IGAD components of the project. Further, the SESA was focused on environmental and social impacts or risks that are predicted to be significant in their likelihood and consequences. The impacts identified were both beneficial (positive) and adverse (negative).

The identified beneficial or positive environmental and social impacts were prioritized based on their level of significance in terms of climate resilience, ensuring food security, reducing conflict, creating job opportunities, and enhancing regional cooperation and linkages, while adverse or negative impacts were prioritized based on their risk level of significance, magnitude, and spatial and temporal extent. The nature of the impacts was described as temporary, long-term, and direct, indirect, or cumulative. The significance level of the impact was assessed quantitatively or qualitatively based on the extent, duration, and intensity of the impact. Finally, the overall significance level of the impact before the implementation of mitigation measures was determined by combining those three scales: extent, duration, and intensity.

Table-3: Overall Significance Level Analysis Matrix

		Impact magnitude								
		Negative				Neutral	Positive			
		High	Medium	Low	Negligible		Negligible	Low	Medium	High
Geographical significance	International	Severe	Severe	Major	Moderate		Moderate	Major	Superior	Superior
	National	Severe	Major	Moderate	Minor		Minor	Moderate	Major	Superior
	Regional	Major	Moderate	Minor	Negligible		Negligible	Minor	Moderate	Major
	Local	Moderate	Minor	Negligible	Negligible		Negligible	Negligible	Minor	Moderate

1.5.2.8 Environmental and Social Sustainability Appraisal of the HoA-GW4R Program

Based on the information from scoping, identification, and analysis of significant environmental and social impacts of the HoA-GW4R Program, the likely environmental and social impacts of the proposed program activities were appraised against the sustainability objectives. The following matrix was used to appraise planned aspects, project activities, and features in the HoA-GW4R Program against the SESA objectives listed at Table 1.

By cross-linking sustainable objectives with impact factors of planned aspects, project activities, and features in the program, the levels of effect or significance of a given program in relation to sustainable objectives were determined. This allows us to determine whether or not the planned aspects, project activities, and features of the HoA-GW4R Program are sustainable. The rating criteria are given in the table below:

Table-3: Rating Criteria for Appraisal of the HoA-GW4R Program

Score	Rating Description	Rating Value
+	Highly important to this sustainable Objectives	4
+/-	Moderately important to this sustainable Objectives	3
0	No Significant Effect on this sustainable Objectives	2
-	Not important to this sustainable Objectives	1

1.5.2.9 Environmental and Social Mitigation Measures

Potential environmental and social risks and impacts that will result from the proposed program implementation were provided with recommendations on impact mitigation measures for negative impacts and enhancements for benefits. The effectiveness of the mitigation measures to reduce or eliminate the negative impact was assessed. The mitigation measures were defined with reference to the mitigation hierarchy (avoid, reduce/minimize, remedy and offset/compensate) and organized in a logical sequence of measures to avoid, minimize, restore, and compensate.

1.5.2.10 Prepare Environmental and Social Management Plan

To ensure the sustainability of the HoA GW4R Program, an Environmental and Social Management Plan (ESMP) shall be prepared specifically aimed at the environmental and social management of the program. All mitigation and enhancement measures identified were the basis for the preparation of the environmental and social management plan, where the responsibilities, timelines, and costs for their implementation are described.

The Environmental and Social Management Plan (ESMP) is especially rational at a time when recognition of the necessity to preserve the quality of the environment and the consumption of the groundwater resources of IGAD Regions continue to grow rapidly for the purpose of achieving the objectives of increasing sustainable access and management of groundwater (GW) in the Horn of Africa. Besides this, it would also have importance for the proper use, conservation, and development of transboundary aquifers in the IGAD Region.

The environmental and social management plan framework included the following main components:

- Potential environmental and social benefits and impacts resulting from project implementation (identified in the earlier exercise);
- Recommended enhancement measures for the beneficial or positive impacts;
- Recommended mitigation measures for the adverse impacts to enable the sustainable development and management of groundwater resources;
- Regional institutional responsibility for implementation of the enhancement or mitigation measures;
- capacity-building recommendations for the regional and national institutes;
- Enhancement and mitigation measures implementation timeframe; and
- Estimate of the implementation budget.

1.5.2.11 Prepare Environmental and Social Monitoring Plan

A number of alternative strategic mitigation measures were recommended, which, when implemented, will eliminate or reduce to acceptable levels the negative environmental impacts of the proposed strategic plan. In order to assess the effectiveness of these measures, identify further corrective action, and detect any impacts that may not have been identified during the SESA process, it is essential that an environmental monitoring plan be put in place and implemented. Detailed monitoring programs, including methodologies, scope, responsibilities for each monitoring activity, and estimated costs, were developed for each proposed investment project. Potential indicators and parameters that could be used to monitor the implementation of the HoA GW4R Program were therefore selected according to the specific project context, specified sites, and major anticipated impacts. The main components of the monitoring plan are: key project parameters or aspects to monitor; specific and measurable indicators; frequency of monitoring; responsible regional and national institutions or parties for monitoring; and a monitoring budget.

1.5.2.12 Institutional Strengthening Plan

The SESA for the HoA GW4R Program developed an institutional strengthening plan that would ensure appropriate environmental and social management upon implementation of the program. The institutional framework was developed based on the gaps in environmental and social management skills identified during situational analysis and the future needs for improved environmental and social management. Detailed suggested capacity building areas, including implementation timelines that would need to be covered by the training indicated by the SESA consultant.

1.5.2.13 Monitoring, Evaluation and Reporting System of SESA

The effective implementation of RSESA in HoA-GW4RP's enhancement and mitigation measures shall be monitored by IGAD-WU, particularly the Environmental and Social Safeguard Specialist. Monitoring, Evaluation, reporting, and Continuous Improvement systems suggested for SESA of HoA-GW4RP. Quarterly and annual ESHS monitoring report formats that will be prepared by IGAD-Water Unit and each three member states indicated.

1.6 Structure of the SESA Report

The report is arranged in the format using the suggested outline for the strategic environmental and social assessment (SESA) of the HoAGW4R Project in the Terms of References and the environmental and social impact assessment guidelines of SESA in transboundary development in the IGAD region, the Kenyan SESA framework, the SESA Guidelines of the World Bank, and the SESA Guidelines of the African Development Bank as follows:

- section 1: Introduction;
- section 2: Project description;
- section 3: Regional legal and institutional frameworks;
- section 4: Environmental and social baseline conditions and situational analysis;
- section 5: Stakeholders consultations;
- section 6: Environmental and social risks and impacts;
- section 7: Environmental and social mitigation, management and monitoring measures; and
- Section 8: Conclusions and recommendations.

2. PROJECT DESCRIPTION

2.1 Project Development Objectives

The proposed Project Development Objective (PDO) is to increase the sustainable access and management of groundwater in the Horn of Africa's borderlands.

2.2 Project Development Components

The Project development objective is envisioned to be achieved through the 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.

Component 1. Delivery of inclusive groundwater services to priority areas (US\$293 million IDA equivalent: US\$14 million Somalia, US\$87 million Kenya, US \$192 million Ethiopia). This component will support small/medium scale infrastructure development and inclusive community-level access to groundwater in the borderlands of the HoA, with a strong focus on the sustainability of service delivery. This focus entails the empowerment of local communities and local levels of government, and prioritizes the use of cost-efficient renewable energy sources, including climate-resilient design elements, in the construction of new infrastructure. Physical investments are aimed at increasing and diversifying access to reliable water sources and increasing storage to buffer climate variability and drought, considering resilience-based design principles.

Activities supported under this component include:

- 1.1 Rehabilitation or construction of new, climate resilient groundwater infrastructure for human consumption and livestock.** After the corresponding aquifer sustainability assessments are conducted, the program will invest in the drilling of new boreholes or rehabilitation of existing ones, as well as in the development or retrofitting of water systems for human consumption and for livestock. Groundwater extraction will use, when feasible, solar pumping with the purpose of substituting unsustainable and expensive fuel and contributing to reduction in greenhouse gas (GHG) emissions. Investments and O&M arrangements will focus on enhancing the system's robustness to climate shocks by ensuring that service delivery is resilient to climate impacts (e.g., drought, floods), and/or to increased water demand.
- 1.2 Small-scale irrigation infrastructure to promote CSA practices, contributing to soil conservation and aquifer recharge.** These investments are currently being considered in the area of Borena, Ethiopia, in the border with Kenya. This activity will help farmers switch from rain-fed agriculture to irrigated agriculture, enabling adaptation to changing rainfall patterns and drought events in the lowlands. Irrigation schemes will be fitted with pressurized systems that will utilize renewable energy for water lifting and distribution.
- 1.3 Infrastructure to support aquifer sustainability (recharge) and flood mitigation.** This type of infrastructure will also contribute to enhance water supply during extreme drought (e.g., sand dams, a cost-efficient storage mechanism constructed in dried riverbeds that contributes to retain soil moisture and concentrate water in the dry months), and to mitigate the peaks of high runoff during heavy rains. Other nature-based solutions that will be implemented for enhanced groundwater recharge are ecosystem-based approaches, rainwater harvesting,

afforestation, and soil and water conservation measures to avoid erosion and land degradation. The Program will also promote embedding these interventions in river basin plans, as part of broader water resources management strategies.

1.4 Focus on robust service delivery models to ensure sustainability of the investments. Countries under the Program are considering different models for service delivery, from local public utilities/systems ran by local water departments, to community-managed systems or mechanisms that involve the private sector. Yet, a common approach consists of working closely with users' organizations and strengthening structures at the community and local government level. This CDD approach, which includes supporting the active participation of women (particularly in decision-making capacities), is crucial to ensure high levels of ownership and sustainability. It will be conducted building on previous project experiences, and on proven pre-existing institutional arrangements that can be reinforced through the Program.

1.5 Digital Information and Decision Management Systems. The Program will also develop capacity to monitor relevant information on local service delivery using digital technologies to enhance transparency and accountability. This includes the geo-localization of each water point (including information on groundwater depth and quality of the resource), as well as other indicators related to the quality-of-service delivery in terms of O&M. This will serve to inform decisions to improve service delivery, and/or to enhance local preparedness and response to climate shocks (e.g., floods and drought).

Component 2. Generating groundwater information and strengthening regional and national groundwater institutions (US\$62 million IDA equivalent: IDA US\$5 M Somalia, US\$45 M Kenya, US\$8 M Ethiopia, and IGAD US\$4.1 M.). Activities will focus on generating essential data and information needed for informed decision making on sustainable groundwater management, and at the same time, will strengthen the capacity of key regional and national entities that play a role in the management of the resource, while building trust and fostering collaboration. IGAD will be leading most of the activities under this Component through regional-level efforts that will be articulated with country activities at the national level (Annex 1). Participating countries have agreed on the need for data sharing in order to achieve the joint activities included as part of IGAD's GW4R project. A list of data required to undertake the Program's joint regional activities was validated by participating countries and included in IGAD's POM. Component 2 includes:

2.1. Groundwater data and value-added information.

-Regional Groundwater Center (IGAD-GWC) and network of National Groundwater Centers (NGWC). The creation and operationalization of the IGAD-GWC is central to the achievement of the Program's objectives. This Center aims to fill key gaps in the region related to the lack of valuable information on transboundary aquifers, and to the low capacity of countries to develop legally binding bilateral and/or regional agreements and arrangements on joint groundwater management. The proposed IGAD-GWC will support MS to enhance sustainable management and utilization of groundwater through resource mobilization, data sharing, and capacity building through a network of NGWC, located in MS, to be established and operationalized by the Program.

-IGAD Platform for Groundwater Collaboration (I-PGWC). Regional knowledge generation and capacity building activities, joint studies and transboundary case studies will be implemented through the I-PGWC, for which IWU will fulfill the role of secretariat. The Platform will serve as a key mechanism for IGAD and MS to agree on and prioritize joint groundwater activities, scope, and modalities, and support the implementation of regional actions. IGAD will also facilitate the establishment and operationalization of Groundwater National Focal Groups (GW-NFGs) in the MS,

established as a governmentally convened working groups to serve and augment existing groundwater management structures in the countries.

-Development of joint Regional Studies and Assessments. Under IGAD's leadership and in close collaboration with participating countries, the Program will contribute to the generation of new knowledge at a regional scale. In coordination with the IWU and the NGWCs, the IGAD-GWC will identify priority topics for a regional study or assessment. Examples of topics include 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, and socioeconomics of groundwater.

2.2. Capacity building and institutional development for groundwater management.

-The Program includes intensive capacity building at the national and regional levels on a wide range of topics related to sustainable groundwater management. Examples include the integration of groundwater management into river basin organizations (RBOs), climate informed groundwater management, groundwater data collection, analysis and management, and principles of data sharing and data compatibility across countries, RBOs, Non-Governmental Organizations (NGOs), and other interested parties. Women's representation in decision-making positions in groundwater management institutions will be supported through leadership and technical training for female agency staff, and gender awareness training for groundwater agency staff to support female employment, among others.

-The Program will also support the development of policy instruments for sustainable groundwater exploration and management in the HoA. These include national strategies, policies, guidelines, standards and/or regulations, depending on the case, for sustainable groundwater management. At the regional level, IGAD will contribute by providing guidance on the establishment of borehole drilling and testing guidelines and professional standards, water point O&M guidelines, establishment of groundwater protection zones, pollution impact and economic assessment, flood and drought cost impacts, among other key topics.

2.3. Transboundary Collaboration on Groundwater Management.

- The Program will develop a regional groundwater policy and strategy, and consolidate a sustainable institutional and policy framework for TBA aimed at achieving Ministerial level endorsement by the Program's participating countries. This activity will address the lack of institutional, legal and policy mechanisms in relation to trans-boundary aquifers through the support of gender aware Transboundary Diagnostic Analyses (TDAs) and the development of Strategic Action Plans. The Program will also support trans-boundary dialogue and collaboration on groundwater issues among IGAD MS.

- Feasibility Studies (FS) for joint planning in three TBAs of the HoA. IGAD will support countries in characterizing the complexity of two or three TBAs, as well as in the preparation of joint cooperation mechanisms, such as bilateral/regional agreements and arrangements, including aquifer development and management plans. This will build on the experience of the World Bank financed HoA Groundwater Initiative (HOA-GWI) (P169078), an initiative supporting a Feasibility Study (FS) for the Merti Aquifer, including a complete aquifer mapping, a socio-economic assessment, and a bankable investment project, as well as an Environmental and Social Impact Assessment (ESIA). The FS, in consultation with the governments of Kenya and Somalia, is expected to provide options for joint or bilateral

developments. It is expected that interventions taking place in both sides of the border as part of Component 1, will be guided by the collaboration mechanisms proposed by this FS.

Component 3. Support for project management, knowledge, and operations (US\$30 million IDA equivalent: 4 IDA US\$11 million Somalia*, US\$3 million Kenya, US\$10 million Ethiopia, US\$5.9 million IGAD (including US\$3.7 million for Third Party Monitoring)). This component will finance the operational costs of the Project Implementing Units (PIUs) in participating countries and IGAD, as well as provide project coordination and fiduciary support. This component will also strengthen the capacity of IGAD's Water Unit. The component includes the project's Monitoring and Evaluation (M&E), knowledge management and learning, and evidence-based policy input. It also covers security arrangements and contingencies, and Third-Party Monitoring (TPM) for the entire program for an amount of US\$ 3.7 million. 37.

Component 4. Contingent Emergency Response Component (CERC) (US\$ 0m). This will be integrated in the projects of Kenya and Ethiopia. A CERC is included in the Program, under Kenya and Ethiopia financing agreements. This will allow for rapid reallocation of uncommitted funds under corresponding credit and grant in the event of an eligible crisis or emergency. An eligible emergency is defined as an event that has caused, or is likely to imminently cause, a major adverse economic and/or social impact associated with natural or man-made crises or disasters. Such events include a disease outbreak. The respective POMs will include provisions to guide CERC activation and implementation. For the CERC to be activated, and financing to be provided: (a) the Recipient's relevant authority has to declare a disaster, emergency or catastrophic event; (b) the Association and the Recipient have to agree in writing to address such disaster, emergency or catastrophic event under the Project and in accordance with the provisions of respective Financing Agreement; (c) the Recipient has to ensure that all environmental and social management instruments required for said activities have been prepared and disclosed, and the Recipient has to ensure that any actions which are required to be taken under said instruments have been implemented, all in accordance with the applicable provisions of the respective CERC Manual; (d) the Coordinating Agency in charge of coordinating and implementing the CERC must have adequate staff and resources, for the purposes of said activities; and (e) the Recipient has to adopt a CERC Manual ².

²WB, 2022. Horn of Africa Groundwater for Resilience Project using the Multiphase Programmatic Approach: Project Appraisal Document

2.3 The IGAD Project Components, Subcomponents, and Activities

The project's development objective for the IGAD component is to enhance the collaborative management and use of groundwater resources for climate resilience among targeted regional and national entities. The components being managed by IGAD are:

Component 1: Strengthening Regional Capacity and Information for Groundwater Management (US\$2 M): Building on the achievements of earlier and ongoing projects (see above), IGAD's Water Unit will implement several institutional strengthening and information management activities that bring regional value and complement the activities carried out by the individual Member States, in particular on the topic of regional groundwater governance.

The overall objective of this component is to strengthen and enhance the capacity of Government Institutions in the IGAD Member States and the IGAD Water Unit that are mandated to promote groundwater management services to sustainably develop the region's groundwater resources and thus contribute to more resilient livelihoods.

Component 2: Promoting Regional Integration and Collaboration (US\$ 2.1 M): The aim of this component is to consolidate a sustainable institutional and policy framework for transboundary Aquifers. This will address the lack of institutional, legal, and policy mechanisms in relation to trans-boundary aquifers by implementing management structures at one and/or two trans-boundary aquifers in the IGAD region and by promoting groundwater infrastructure management and development.

In general, the feasibility study is expected to generate a pathway for the joint monitoring, modeling, governance, and eventually development of the shared aquifer. The development of a joint model for the aquifer will contribute to a common understanding of the dynamics and potential of the TB groundwater resource that will facilitate dialogue among the riparian countries to develop a shared vision and support decision-making on the future development and management of the aquifer.

Component 3: Regional Program Coordination, Monitoring, and Evaluation (US\$ 5.9 M): Third Party Monitoring (TPM) and remote supervision tools as essential elements for Program oversight. Given the complexity of the HoA region and the scope of the Program, M&E will be strengthened with the Geo-Enabling Initiative for Monitoring and Supervision (GEMS), launched by the FCV Group to systematically enhance M&E as well as supervision through third-party monitoring (TPM) in FCV settings. The approach will leverage field-appropriate, low-cost, and open-source technology for digital real-time data collection and analysis, using a customized digital M&E system to enhance the transparency and accountability of implementation across the project cycle. The TPM will implement GEMS' platforms for remote supervision, real-time risk and safeguards monitoring, and portfolio mapping for coordination across projects and partners, which is seen as key to ensuring the effectiveness of the regional Program. The Project will also support the administration and management in the Implementation of the Project, the coordination of the Project activities under each component, and providing fiduciary services³.

³IGAD-WU, 2023. Groundwater for Resilience Project. Power Point Presentation by IGAD-WU Project Manager

2.4 The Project Beneficiaries

The Program's primary target groups are (a) vulnerable communities in selected borderlands of the HoA, and (b) selected national, sub-national and regional entities involved in groundwater management. It is estimated that Phase I of the Program will reach 3.3 million direct beneficiaries, of which at least 50 percent are women, through interventions designed to increase access to water supply and reduce vulnerability to climate change impacts, in particular drought and floods. At the institutional level, Program beneficiaries include institutions responsible for groundwater management at the regional, national and subnational levels, including line Ministries, government agencies, national authorities, and agencies at the national and sub-national levels.

2.5 Project Implementation Arrangement

IGAD's Water Unit (IWU): The project will be implemented by IGAD, which has extensive experience in managing World Bank financed projects. Its experience includes the Development Response to Displacement Impacts Project (DRDIP-II) project, IGAD Building Disaster Resilience to Disasters through Risk Management and Climate Change Adaptation project, and the Regional Pastoral Livelihoods Resilience Project (RPLRP). IGAD's performance has been satisfactory.

The regional activities will be implemented by IGAD's Water Unit (IWU), launched by the Ministers of Water Affairs in 2015 to support IGAD member countries in activities that are the core of water resources management and use in the region, a mandate strongly aligned with the Project's objectives. The Unit also provides technical support to IGAD's cross-border 'clusters'. IWU will be strengthened to actively manage and implement the project activities. Current capacity gaps that the project seeks to fill include qualified staffing of the unit so as to ensure that, at the end of the program, it is adequately equipped to continue its regional mandate. The Unit will work closely with the Technical Advisory Committee (TAC), a longstanding Committee on water matters with senior representatives from the MS that reports to the respective Water Ministers. The Project will benefit from the already existing Project Steering Committee (PSC) for the HoA-GWI for approving Work Plans and budgets as well as providing inputs on behalf of the countries. Additional staff, such as Environmental and Social Safeguard specialist, M&E Specialist, and communication specialist shall be deployed.

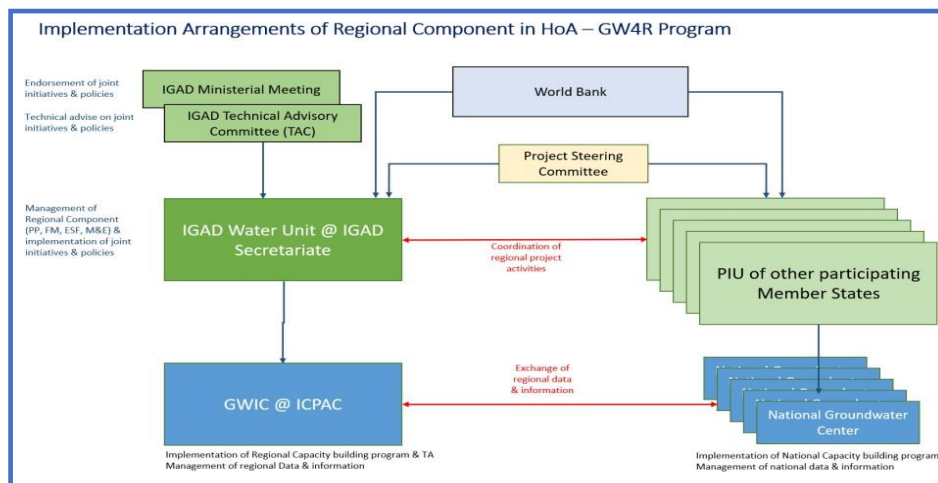


Figure-2: Implementation Arrangements of Regional Component in HOA-GW4RP (Source: WB, 2022: Project Appraisal Document)

Project Steering Committee. The Project will benefit from the already existing Project Steering Committee (PSC) of the HoA-GWI Initiative, which will undertake the same function of approving the Work Plans and budget and providing inputs on behalf of the countries.

IGAD Technical Advisory Committee (TAC) The TAC shall provide technical advice on joint initiatives and policies.

Project Management and Coordination Unit (PMCU) of participating Member States. The PMCU will carry out the overall coordination, planning, monitoring, and supervision of the Project. Accordingly, PMCU will be responsible for i) the consolidation of the annual Project action plan and budget for all components; ii) the consolidation of quarterly physical progress and Interim financial reports; iii) the channeling of resources to the project management units at WSSD-MoWE and IDPD-MoIL based on the approved annual work plan and budget; and iv) coordinating implementing agencies and serving as a secretariat to the National Groundwater Resource Management Steering Committee. The PMCU will deploy critical staff, including a coordinator, Financial Management Specialist, Procurement Specialist, Environmental and Social Safeguard Specialist, M&E Specialist, and Water Resource Management specialist. The PMCU will also be responsible for planning, implementation, and regular reporting of activities under the project.

Project Implementation Unit (PIU) of Participating Member States. For instance, in the case of Ethiopia, implementation of infrastructure development for Water Supply will be managed by a Project Implementation Unit (PIU) to be established at the MoWE water supply and sanitation division. As much as possible, priority will be given to utilizing the capacity of existing PMUs. Similarly, a Project Implementation Team will be established in the Irrigation Development Projects Division at the Ministry of Irrigation and Lowlands for the implementation of Infrastructure Development for Irrigation. Each PIU 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.

IGAD Platform for Groundwater Collaboration (I-PGWC) Regional knowledge generation and capacity building activities, joint studies, and transboundary case studies will be implemented through the I-PGWC, for which IWU will fulfill the role of Secretariat. Activities under the I-PGWC will be prioritized and implementation modalities defined in consultation with MS. This Subcomponent will support the establishment of the I-PGWC and the development of its first multi-year work plan. The governance arrangements for the I-PGWC match the project implementation arrangements, with TAC Members forming the Steering Committee of the Platform and the National Focus Groups, fulfilling an advisory role, and providing technical expertise.

National groundwater centers (NGWC) Data collection and transmission, as well as data analysis for shared watercourses, are invariably carried out at the national level. The establishment of a national groundwater center (NGWC) in every MS is crucial for the development of a harmonized and centralized groundwater information base at the country and regional levels. The NGWC will be established in an existing scientific or government institution involved in groundwater research or management and will be in charge of data collection, compilation, and dissemination, including storage, data processing, retrieval, quality control, and dissemination. The Subcomponent will also support the operationalization of the network of NGWCs.

The National Focal Group. The IGAD Water Unit already established and started operationalization of National Focal Groups (NFGs) to advance the Groundwater footprint within the region. The National Focal Group composed of an

expert group designated by each member state. The NFGs are intended to contribute to advocating for sustainable groundwater management within Member States. The NFGs also provide advisory services to the IGAD-Platform Groundwater Collaboration (I-PGWC). The key functions of the NFGs are to: (a) advocate for sustainable groundwater management for a fully functional I-PGWC; (b) suggest appropriate strategies to implement in the best way every activity under I-PGWC; (c) operate as a lobby group to governmental institutions on matters that require joint effort like data-sharing for studies under I-PGWC activities ;(d) lead capacity-building efforts under I-PGWC; (e) convene multi-stakeholder engagement platforms for national and local discussion, debate, prioritization, and consensus building and a 'collective voice' for groundwater matters in the country; (f) convene meetings with funders when appropriate; (g)facilitate the exchange and sharing of evidence-based good practice in groundwater management, development & use; (h) strengthen the NFG's technical, technological and institutional capacities to achieve its goals and objectives,(i) develop and implement a clear monitoring and evaluation system for the Network of GWCs;(j) support the link between I-GWC and NGWCs,(k)to appoint a restraint group among NFG to report the finding to TAC of IGAD, (l) support I-GWC at the country level to implement the groundwater information portal providing as needed the relevant data;(m) support IGAD at the country level to implement the development on data sharing guidelines/policy for the transboundary aquifers ⁴.

2.6 Project Environmental and Social Risk Ratings

The overall HoA GW4R Program's environmental and social risks have been classified as high. The environmental risk rating is substantial as the direct environmental risks of the program are expected to be predictable, reversible, and site-specific and are not likely to be highly significant. The social risk rating is high given the contextual risks including the security situation in the HOA, the risk of conflict which can be unpredictable and factors such as access to land and inclusion. The SEAH risk is also categorized as Substantial since SEA/SH may occur as a result of the program activities notably those associated with labor influx where even relatively small numbers can lead to increased risks and towards female workers who may be at risk of SEA or SH in the workplace ⁵.

⁴ IGAD-WU, 2023. Groundwater for Resilience Project. Establishment and operationalization of National Focal Groups (NFGs): Agenda of bi-weekly meeting of the National Focal Groups.

⁵WB, 2022. Horn of Africa Groundwater for Resilience Project using the Multiphase Programmatic Approach: Project Appraisal Document

3. POLICY, LEGAL AND INSTITUTIONAL FRAMEWORKS

3.1 IGAD Regional Policy and Legal Framework

The IGAD regional policy and legal framework will be a driver to increase sustainable access and management of groundwater (GW) in the Horn of Africa and for the harmonization of national laws, regulations, and institutional arrangements, which, in turn, will facilitate the implementation of the regional policy, the protocol, and the agreements. However, the legal and policy instruments of IGAD member states related to water management rarely include groundwater. Implementation and enforcement of water laws represent a major challenge in all IGAD member states. The challenge lies primarily in the lack of institutional capacity, especially at the local levels, and in the absence of financial resources. IGAD regional policy and legal framework review work of SESA for HoA GW4RP confirmed that policy and institutional frameworks that enable groundwater to underpin reliable, sustainable and safe water access is a defining challenge for IGAD today. Despite increasing interest in sustainable access and management of groundwater (GW) in the Horn of Africa as a key contribution to strengthen the climate resilience of targeted communities, using the Multiphase Programmatic Approach (MPA), groundwater has to date been no regional specific coordinated policy on groundwater in IGAD region. Instead, groundwater has occupied a cross-sectoral position in the following IGAD regional policies and strategies:

3.1.1 IGAD Regional Water Resources Policy

IGAD developed a regional water resources policy within its framework, which was endorsed by the ministers responsible for water affairs of the member states on January 21, 2015. IGAD is now supporting the negotiation of a regional water resources protocol in line with the policy. The first draft of the protocol was inspired by the Agreement on the Nile River Basin Cooperative Framework (2010), which, although not yet in force, is the result of more than 10 years of work. The reason for the formulation of IGAD's regional water resources policy and protocol is to solve transboundary water challenges in general and in particular: (a) the need for a common approach in water resources management; (b) the need for a regional cooperation framework; (c) the growing need for joint planning; (d) collaborative management in view of climate change; (e) the need to resolve conflicts and inefficiencies associated with the distribution of water between different users; and (f) the absence of legal frameworks to address water resources issues at the regional level ⁶.

IGAD needed policy objectives that would address issues of transboundary water resources management (TWRM) at the regional level, namely: ensuring sustainable management and utilization of transboundary water resources; providing for institutional arrangements; encouraging cooperation amongst riparian states; and facilitating joint information collection, planning, and data sharing on planned measures. Transboundary water resources, covering surface water and groundwater, present opportunities for regional cooperation, development, and management of water resources to support socio-economic development in the region. This shows that groundwater has occupied a cross-sectoral position in the IGAD regional water resources policy and draft protocol.

⁶ IGAD, 2017. The IGAD Regional Water Resources Policy and Protocol

3.1.2 IGAD Regional Environment and Natural Resources Strategy

The primary objective of the IGAD Environment and Natural Resources Strategy is to enhance the integration of environmental and natural resources concerns into development frameworks for environmentally sustainable economic development in the region. The strategy has the following four strategic objectives: Strategic Objective-1 (improve the framework for environmental and natural resources governance in the IGAD region); Strategic Objective-2 (develop information required for sound environmental and natural resources management in the IGAD region and make it readily available); Strategic Objective-3 (enhance the capacity of member states for improved environmental and natural resources management in the IGAD region); and Strategic Objective-4 (enhance the capability for environmental and natural resources research and development in the IGAD region) ⁷.

In this strategy, transboundary natural resources include ecosystems, wildlife populations, and below-ground resources such as minerals, oil and gas, geothermal energy, and groundwater aquifers. This implies that groundwater resources are a cross-sectoral part of the IGAD Regional Environment and Natural Resources Strategy.

3.1.3 IGAD Regional Strategy-2020

The IGAD Strategy 2021-2025 is unique. It is anchored on the region's Vision 2050. This strategy is the first among a series of six lined up in pursuit of the IGAD Vision 2050, whose aim is to provide a trajectory for the next 30 years. The strategy was formulated through a highly participatory approach between the consultant, member states, and IGAD staff. It prioritizes interventions aimed at alleviating poverty, achieving sustainable peace, and achieving gender equity through democratic processes. The 2021-2025 RSP thematic areas have four strategic pillars: Pillar 1 (agriculture development, natural resources management, environment protection, climate variability and change, and disaster risk management), Pillar 2 (regional economic cooperation and integration); Pillar 3 (social development); and Pillar 4 (peace and security) ⁸.

From the above four pillars of the IGAD Regional Strategy-2020, groundwater issues are included under Pillar 1 (agriculture development, natural resources management, environment protection, climate variability and change, and disaster risk management): Program Area 1.3 (Natural Resources Management) In order to achieve the outcome of Improving preservation, exploitation, management, and use of trans-boundary water resources, intervention areas include: (a) expand the knowledge base on regional groundwater resources, (b) strengthen capacities in groundwater development and management in IGAD member countries, (c) maximize the benefits of groundwater to strengthen resilience to drought and economic development in the region, (d) establish a regional framework for collaboration, effective planning and management of transboundary water supply and sanitation, (e) develop and/or scale options for sustainable water harvesting in the IGAD region, and (f) strengthen capacity of participating communities in management of water harvesting projects.

⁷ IGAD, 2007. IGAD Regional Environment and Natural Resources Strategy

⁸ IGAD, 2020. IGAD Regional Strategy Framework.

3.1.4 IGAD Regional Climate Change Strategy and Action Plan (2023-2030)

This IGAD Regional Climate Change Strategy (IRCCS) is organized around five parts. The key priority areas and strategic interventions are presented under four major result areas: (i) enabling the environment to implement climate change strategies and actions, including coordination, capacity building, and resource mobilization; (ii) strengthening and mainstreaming climate change strategies and actions are strengthened and mainstreamed in key economic sectors. The priority economic sectors include agriculture, livestock, and fisheries; renewable energy and energy efficiency; industry and trade; transport; water resources; ecosystems and biodiversity; marine coastal areas; arid and semi-arid lands (ASALs); social development and demographic dynamics under climate security; (iii) regional capacity in climate-related knowledge generation and dissemination; (iv) mitigation and low carbon development. The fifth part proposes a plan for the implementation of the strategy. The institutional arrangement for implementation, the key stakeholders for implementation, and the implementation action plan are discussed in detail ⁹.

From the above four key priority areas and strategic interventions, groundwater has occupied a cross-sectoral position in the second key priority area of climate change strategies and actions in the IGAD Regional Climate Change Strategy and Action Plan. Water resources are identified as one of the priority economic sectors, among others, in order to strengthen and mainstream climate change strategies and actions.

3.1.5 IGAD Peace and Security Strategy-2012

The IGAD Peace and Security Strategy recognizes the strong nexus between water reliability—or, in the worst-case scenario, scarcity—and conflicts in the IGAD region. It further acknowledges that the member states would greatly benefit from an overall regional policy and legal framework for water resource management. Based on this strategy and the Environment and Natural Resources Strategy of 2002, in 2012 IGAD started the implementation of the Inland Water Resources Management Program (INWRMP), with a component focusing on the improvement of policy and legal frameworks. The program's scope did not include the Nile River basin as such, since IGAD did not mean to interfere with programs and projects implemented within the framework of the Nile Basin Initiative (NBI). However, while dealing with transboundary water resources in the region, it drew lessons from the NBI and other initiatives concerning the Nile ¹⁰. This reveals that transboundary aquifers are a cross-sectoral part of the IGAD Regional Environment and Natural Resources Strategy.

⁹ IGAD, 2022. Regional Climate Change Strategy and Action Plan

¹⁰ Marcella Nanni, 2016. Water challenges in the IGAD region: towards new legal frameworks for cooperation, Water International: DOI: 10.1080/02508060.2016.1169620

3.2 Regional Institutional Frameworks

The sections below list the institutions' roles and duties in carrying out the HoA GW4R project, with a focus on environment and social management in the IGAD Region. When defining institutional duties and responsibilities, it is important to consider any potential environmental and social effects of the HoA-GW4R project's supported activities.

3.2.1 IGAD-Water Unit

The overall objective of IWU is to promote peace and stability and support socio-economic development of the region through efficient and effective water management and governance. IGAD will be the implementing agency for the project and will mobilize in house capacity for the project activities. The IGAD Water Unit (IWU) will be strengthened to actively manage and implement the project activities.

The roles and duties of IGAD-Water Unit in carrying out the HoA GW4R project, include:

1. Coordinate and promote joint HoA GW4R project activities between and among IGAD Member Countries;
2. Providing technical support to the IGAD member states of phase-I HoA GW4R Project involving drilling of boreholes and construction of irrigation schemes;
3. Facilitate the establishment and operationalization of National Focal Groups (NFGs), to advance the Groundwater footprint within the region;
4. Conduct strategic environmental and social assessment (SESA) study for HoA GW4R Project by hiring SESA individual consultant;
5. Follow-up the implementation of strategic environmental and social assessment (SESA) study for HoA GW4R Project;
6. Establish clear guidelines for the preparation of Environmental and Social Impact Assessment (ESIA), Environmental and Social Management (ESMP), Resettlement Policy Framework (RPF), Site-specific Environmental and Social Management Plan (SSESMP), GRM, and other necessary instruments as set out in the ESMF and monitor the proper follow-up of procedures by consultants and other relevant bodies;
7. Review and follow up of ESF instruments that help with compliance with World Bank (WB) ESF Standards, such as the Environmental and Social Commitment Plan (ESCP), the Stakeholder Engagement Plan (SEP), the Occupational Health and Safety (OHS) Measures Guideline, the Vulnerable and Marginalized Groups Planning Framework (VMGPF), the Labour Management Procedures (LMP), and the On-Site Traffic and Accident Management Plan (TAMP); and
8. Prepare and submit to the World Bank regular monitoring reports on the environmental, social, health and safety (ESHS) performance of the project, including but not limited to the implementation of the ESCP, status of preparation and implementation of E&S documents required under the ESCP, stakeholder engagement activities, functioning of the grievance mechanism(s).

3.2.2 IGAD-ICPAC, ICPALD and IDDRSI

The Water Unit works closely with IGAD Climate Prediction and Applications Centre (ICPAC), IGAD Centre for Pastoral Areas and Livestock Development (ICPALD) and IGAD Drought Disaster Resilience and Sustainability Initiative (IDDRSI).

ICPAC is a specialized institution of IGAD based in Nairobi, Kenya, mandated to provide timely early warning climate information. The Centre is responsible for eleven member countries. The institution's strategic objective is to contribute towards enhancing the livelihoods of the people of the region to mitigate climate-related risks and disasters. Monitoring and forecasting of water resources are duties of ICPAC which is highly related with HoA GW4R project. The IGAD Centre for Pastoral Areas and Livestock Development (ICPALD) promotes dry lands and livestock development policies in the IGAD member states and Compliment efforts of IGAD member states to sustainably generate wealth, employment and act as regional policy reference institution for livestock and dry lands. Create inclusive community-level access to groundwater in the borderlands of the HoA including livestock is one of the components of the project which is part of the roles of ICPALD. The IGAD Drought Disaster Resilience and Sustainability Initiative (IDDRSI) is a regional platform for the development of innovative sustainable development strategies, policies, and programs at the Member States', cross-border and regional levels, aimed at building resilience to future climatic and economic shocks. The IDDRSI Platform brings together the different partners and stakeholders including IGAD Member States, Development Partners and implementing Partners. Thus. HoA GW4R project owned by IGAD-WU shall be implemented closely with IDDRSI.

Besides the above-mentioned division of IGAD, different specific units and projects of IGAD will have important roles to implement suggested enhancement and mitigation measures in coordination with IWU. These specific units and projects of IGAD, include: IGAD-Rural Livelihood's Adaptation to Climate Change in the Horn of Africa-Phase-II (RLACC-II) Programme, IGAD-Conflict Early Warning and Response Mechanism (CEWARN), IFRAH, IGAD Dryland Research Forum, IGAD-Comprehensive Africa Agriculture Development Programme (CAADP), IGAD Biodiversity Management in the Horn of Africa Programme Unit.

3.3 Member States Legal, Policy and Institutional Frameworks

3.3.1 Member States Legal, and Policy Frameworks

The national policy and legal frameworks for water resources management of Ethiopia, and Kenya are comprehensive and quite developed. While Kenya is currently updating their water policies and legislation to cater for recent institutional reforms, Ethiopia has recently embarked on a revision of regulations relating to the permit system, with the support of the INWRMP. No national policy and legal frameworks for water resources management are yet in place in Somalia, although draft national water laws are now in the process of being discussed. The draft water law of Somalia was also developed with the support of the INWRMP. With the formulation of the IGAD regional water resources policy, the need has been strongly felt to harmonize the existing national legal and institutional frameworks, since common approaches to water resources, management may greatly facilitate the implementation of regional policy and legal instruments.

Ethiopia has enacted the necessary legal frameworks for environmental and social management and institutions to support their implementation and enforcement. The most relevant policies and legislation that support environmental and social management of HoA GW4RP in Ethiopia are the FDRE Constitution, Environmental Policy of Ethiopia,

Climate Resilience Green Economy Strategies of Ethiopia, Water Resource Management Policy/Strategy, EIA Proclamation No. 299/2002, Ethiopia National Occupational Safety and Health Policy and Strategy, Labour Proclamation No. 1156/2019, Proclamation No. 1161/2019 on Expropriation of Land for Public Purposes, Ethiopia Proclamations on Persons with Disability and Vulnerable Groups (Proclamation No. 568/2008), EIA Procedural Guideline (2003), and ESMP Preparation Guideline (2004).

Similarly, Kenya has enacted the necessary legal frameworks for ES management and institutions to support their implementation and enforcement. They include the Constitution of Kenya, Kenya Environmental Policy, Kenya Water Policy, Kenya Wetlands Policy, Kenya Climate Resilience Green Economy Strategy, Kenya Occupational Health and Safety Policy, 2012, Kenya Public Health Act (CAP. 242), Kenya Employment Act, 2007, Kenya Occupational Safety and Health Act (OSHA), and Kenya Work Injury Compensation Benefit Act (WIBA).

Somalia has also enacted the necessary legal frameworks for environmental and social management and institutions to support their implementation and enforcement. The most relevant policies and legislation that support environmental and social management of HoA GW4RP in Somalia are: the Federal Republic of Somalia Provisional Constitution of 2012; the National Environmental Policy of 2020; the National Climate Change Policy of 2020; the National Water Resource Strategy of 2021-2025; the Somalia National Gender Policy of 2016; the Somalia Labour Code of 1972; and the Somalia Agricultural Land Law of 1975.

3.3.2 Member States Institutional Frameworks ¹¹

Ethiopian Ministry of Water and Energy (MoWE): Following the recent establishment of a new government in Ethiopia in October 2021, the then-MoWIE was reorganized into two separate ministries: the Ministry of Water and Energy (MoWE) and the Ministry of Irrigation and Lowlands (MoIL). The 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 for the HoA-GW4RP-Ethiopia.

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

Ethiopia Federal and Regional Environment and Forest Protection Authority: 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. Environmental and social issue will be review and approve by Environment and Forest Protection Authority as well as by regional/zonal/woreda environment protection bureaus/offices.

¹¹ WB, 2022. Horn of Africa Groundwater for Resilience Project using the Multiphase Programmatic Approach: Project Appraisal Document

Kenya Ministry of Water, Sanitation, and Irrigation (MOWSI), Kenya Water Resources Authority, and Kenya Water Sector Trust Fund: In the case of Kenya, MOWSI will have an overall coordination role; the main implementing agencies will be the Water Resources Authority, mainly for component 1, and the Water Sector Trust Fund, mainly for component 2.

Kenya National and County Environment Management Authority (NEMA): The responsibility of the NEMA is to exercise general supervision and co-ordination over all matters relating to the environment and to be the principal instrument of Government in the implementation of all policies relating to the environment. In addition to NEMA, the Environmental Management and Coordination Act provides for the establishment and enforcement of environmental quality standards to be set by NEMA which governs the discharge limits to the environment by the proposed project.

Somalia Ministry of Energy and Water Resources (MoEWR): In the case of Somalia, a federal inter-ministerial project steering committee (PSC) will be established for the purposes of the project and will consist of representatives from the following federal ministries: (i) Ministry of Energy and Water Resources (MoEWR); (ii) Ministry of Finance (MoF); and (iii) Federal Member State Water Ministries.

Somalia Directorate of Environment: The Somali federal government has introduced changes in the institutional set-up dealing with environmental issues in the country. A Directorate of Environment has been formed within the Office of the Prime Minister. The Directorate of Environment is mandated to draft the national environmental policies, regulations and legislations including establishing of the Environmental Quality Standards, Sectoral Environmental Assessments, Environment Impact Assessments and Environmental Audits, among others.

3.4 International Conventions, Agreements and Protocols

IGAD HoA-GW4RP member states are signatories to and have ratified a number of regional and multilateral environmental agreements (MEAs) and conventions that, to varying degrees, provide for regional and sub-regional approaches to implementation. These conventions and agreements are aimed at halting environmental degradation and improving the sustainable use of natural resources, climate change adaptation and mitigation, cross-border cooperation, and labour management, among others. Among the relevant conventions that are ratified by HoA-GW4RP member countries are:

1. United Nations Convention to Combat Desertification (UNCCD);
2. United Nations Framework Convention on Climate Change (UNFCCC);
3. United Nations Convention on Biological Diversity (CBD);
4. Vienna Convention on the Protection of the Ozone Layer (VCPOL);
5. Montreal protocol on substances that deplete the ozone layer- entered into force on 1 January 1989. Only Somalia is not a member;
6. Convention on International Trade in Endangered Species (CITES);
7. International Labour Organization Conventions (ILO);
8. Convention on the Conservation of Migratory Species of Wild Animals (CCMS);
9. Niamey Convention on Cross Border Cooperation (NCCBC);
10. Basel convention on the control of transboundary movements of hazardous wastes and their disposal entered into force on 5 May 1992. Only Somalia is not a member;
11. Ramsar Convention on Wetlands of International Importance (RCWII)-Ethiopia and Somalia are not members;

12. The 1972 Convention of the protection of the World cultural and National Heritage and the 2003 convention for the safeguarding of the intangible cultural Heritage)-except Somalia;
13. United nations convention on the law of the sea (LOS) came into force on 16 November 1994-Ethiopia is not a member; and
14. Nairobi Convention for the Protection, Management and Development of Coastal and Marine Environment of the Western Indian Ocean was signed on Friday, June 21, 1985 and came into force in Thursday, May 30, 1996-except Ethiopia.

The review work on applicable international conventions and agreements ratified by the member states of HoA GW4RP revealed that IGAD member states have not yet ratified the UN Watercourses Convention of 1997, which is instrumental to the development of transboundary water resources in the interest of all the river basin or aquifer states concerned as well as maintaining their peaceful coexistence. The IGAD member states are increasingly aware that the development of transboundary water resources in the interest of all the river basin or aquifer states concerned as well as maintaining their peaceful coexistence depends on the implementation of the principle of equitable and reasonable utilization, which is enshrined in the UN Watercourses Convention of 1997. They also acknowledge that, even if they have not yet ratified the convention, the principle, along with the duty to avoid significant harm and the general duty to cooperate, is a part of international customary water law ¹². Ethiopia and Somalia have not yet ratified the Ramsar Convention on Wetlands of International Importance (RCWII). They have also not yet developed a wetlands policy.

Protocol on Strategic Environmental Assessment to the Convention on Environmental Impact Assessment in a Transboundary Context was adopted on May 21, 2003, by the Extraordinary Meeting of the Parties to the Convention of February 25, 1991, on Environmental Impact Assessment in a Transboundary Context held in Kiev, from May 21 to 23, 2003, and was open for signature at United Nations Headquarters in New York until December 31, 2003, by States members of the Economic Commission for Europe as well as States having consultative status with the Economic Commission for Europe ¹³. Similar to states members of the Economic Commission for Europe who ratified the convention and protocol on Strategic Environmental Assessment in a transboundary context, member states of IGAD shall adopt a convention on Strategic Environmental Assessment in a transboundary context to handle the transboundary environmental and social impacts of the HoA GW4R Program and other similar Programs.

Wetlands are relevant to the HoA GW4RP, and wherever they are found, their cultural, groundwater recharge, and carbon storage value could be enormous. Kenya, in addition to ratifying the Ramsar Convention, developed a wetland policy. The Wetlands Policy of Kenya 2013 is intended to promote the protection of wetlands in Kenya. The policy sets out strategic measures for the protection of existing wetlands in Kenya. The policy also promotes the conservation and protection of wetlands because some are important historical sites that comprise important components of Kenya's cultural heritage.

¹² Marcella Nanni, 2016. Water challenges in the IGAD region: towards new legal frameworks for cooperation, Water International: DOI: 10.1080/02508060.2016.1169620

¹³ UNTC, 2003. Protocol on Strategic Environmental Assessment to the Convention on Environmental Impact Assessment in a Transboundary Context. https://treaties.un.org/pages/ViewDetails.aspx?src=IND&mtdsg_no=XXVII-4-b&chapter=27&clang=en

Natural and cultural heritage are also relevant to the HoA GW4RP because natural heritage sites serve as vital "Sinks" for greenhouse gas emissions and *are key to the protection of biodiversity*. Cultural heritage, on the other hand, *can convey traditional knowledge that builds resilience for change to come and leads us to a more sustainable future*. Furthermore, both natural and cultural heritage have iconic importance for tourism. Both Kenya and Ethiopia are state parties to this Convention. Somalia has never signed the UNESCO charter, making none of its historic sites currently eligible for World Heritage Status. However, the country has a large list of ancient and medieval sites it can put forward as candidates for World Heritage Status. Transboundary and transnational cooperation is at the very heart of the Convention Concerning the Protection of the World Cultural and Natural Heritage, as it reflects the core principles of shared responsibility, international solidarity, and cooperation expressed in its Articles 4 and 6. It is an enriching experience of interculturalism and dialogue between people and offers a unique opportunity to exchange and find effective and sustainable solutions for emerging issues such as climate change, migration, integration, conflict, and many others.

3.5 World Bank Environmental and Social Framework (ESF)

According to the World Bank's Environmental and Social Standards (ESSs), projects supported by the bank through investment project financing are required to meet the ESSs. Accordingly, it was noted that all except ESS 9 were potentially applicable to the HoA-GW4RP. In the context of the present HoA-GW4R program, SESA has been proposed as a management tool for the proposed program. Environmental and Social Commitment Plan (ESCP), and the Stakeholder Engagement Plan (SEP) already prepared by IGAD-Water Unit. The Environmental and Social Management Framework (ESMF) and Resettlement Policy Framework (RPF) also have been already prepared and disclosed by beneficiary countries prior to the project appraisal. The site-specific risk management instruments (ESIA, RAP/ARAP, and ESMP) shall be prepared to mitigate risks associated with the subproject activities. Different management plans will be prepared. Depending on the location of the subprojects and pertinent impacts, Biodiversity Management and Action Plans shall be annexed to the ESIA/ESMP. The application of ESS 8's requirement for a Cultural Heritage Management Plan (CHMP) shall be prepared when appropriate. The application of the ESS 7 requirement for Indigenous Peoples or Sub-Saharan African Historically Underserved Traditional Local Communities (IP/SSAHUTLC) Plans shall be prepared when appropriate. Furthermore, in order to ensure compliance with applicable WB ESF Standards, the following ESF instruments shall be prepared and implemented throughout the project lifecycle: the Occupational Health and Safety (OHS) Measures Guideline, the Vulnerable and Marginalized Groups Planning Framework (VMGPF), the Labour Management Procedures (LMP), Grievance Redress Mechanism (GRM), and the On-Site Traffic and Accident Management Plan (TAMP). Besides, the World Bank identified the need for third-party monitoring (TPM) to assess the status and performance of a project, its compliance status, or emerging issues through a specialized party. TPM is required for ESS1, ESS2, ESS4, ESS5, ESS6, ESS8, and ESS 10. Currently, the IGAD-Water Unit has shortlisted consultants and is procuring a third-party monitoring agent (TPMA).

Table-4: World Bank Environmental and Social Standards and their Applicability for HoA-GW4R program

Standard	Justification	Applicable
ESS1: Assessment and Management of Environmental and Social Risks and Impacts	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.	Yes

	IGAD-WU shall assign Environmental and Social Safeguard Specialist who will follow up the compliance WB Environmental and social Standards	
ESS2: Labor and Working Conditions	The HoA-GW4R project will engage public workers, workers hired by the project (direct workers such as consultants, technical experts and other workers), and workers hired by contractors under the project. The potential risks identified include occupational health and safety (OHS) risks as well as workplace accidents/injuries, lack of use of personal protective equipment (PPE), and dust; community health and safety issues. The SEAH risk is also categorized as Substantial since SEA/SH may occur as a result of the program activities notably those associated with labor influx where even relatively small numbers can lead to increased risks and towards female workers who may be at risk of SEA or SH in the workplace. Thus, ESS2 remains relevant and is triggered by the HoA-GW4R project.	Yes
ESS3: Resource Efficiency and Pollution Prevention and Management	The HoA- GW4RP will finance a variety of subprojects involving development of ground water-based water supply infrastructures and construction of irrigation scheme. IGAD will assess, as part of the environmental and social assessment, the potential cumulative impacts of ground water-based water supply infrastructures upon communities, other users and the environment and will identify and implement appropriate mitigation measures. As a result, ESS 3 will be triggered by the subproject activities and remains relevant to HoA-GW4R project. The following measures will be taken: (a) detailed water balance will be developed, maintained, monitored and reported periodically; (b) Opportunities for improvement in water use efficiency will be identified and implemented; and (c) Specific water use (measured by volume of water used per unit production) will be assessed.	Yes
ESS4: Community Health and Safety	The HoA-GW4R Project will involve construction works and installation of equipment which may result in the presence of workers with the potential to impact community health. Construction activities will result in excavations consisting of trenches and temporary ponds. Open trenches and ponds can cause risks to community safety by serving as malaria breeding site. Increased traffic movements due to subproject construction and equipment installation activities may also cause community safety hazards. Thus, ESS4 is triggered by the HoA-GW4R project.	Yes
ESS5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	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	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.	Yes

of Living Natural Resources	As a result, ESS6 will be triggered by the subproject activities and remains relevant to HoAGW4R project.	
ESS7: Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	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. Hence, ESS7 is triggered for this project.	Yes
ESS8: 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.	
ESS9: Financial Intermediaries	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 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.	Yes

OP 7.50 Projects in International Waters: Besides the above World Bank Environmental and Social Standards, the previous Operational Safeguard Policies of OP 7.50 Projects on International Waterways are applicable to the HOA GW4RP. This is not an ESF standard but part of the legal safeguards policies. Its objective is to ensure that bank-financed projects affecting international waterways will not affect: (a) relations between the bank and its borrowers and among riparian states (whether members of the bank or not); and (b) the efficient use and protection of international waterways. A joint meeting between all participating countries and IGAD was organized to agree on the assessment of transboundary aquifers tapped under the program. The assessment shows that the proposed investments would not adversely affect the quality or quantity of groundwater in the listed transboundary aquifers or the quality or quantity of surface water in other riparian's or adversely affect other riparian's possible water use. Riparian's were notified of the five countries included in the program, including phase I countries (Ethiopia, Kenya, and Somalia) and subsequent ones (Djibouti and South Sudan), plus Sudan and Eritrea.

3.6 World Bank Group's Environmental, Health, and Safety (EHS) Guidelines

IFC-WBG has guidelines for environment, health, and safety (EHS) that projects it finances are expected to comply with. The applicability of the EHS Guidelines should be tailored to the hazards and risks established for each groundwater-based water supply infrastructure and construction of irrigation scheme projects on the basis of the results of an environmental assessment in which site-specific variables, such as HoA-GW4RP member country context, assimilative capacity of the environment, and other project factors are taken into account. In cases where the MSs Requirements differ from the levels and measurements presented in the EHS Guidelines, the more stringent one will be applied in the project specifications. Applicable aspects of the World Bank Group's General Environmental, Health, and Safety (EHS) Guidelines (2007) are indicated in the table below:

Table- 5: IFC-WBG Environmental, Health, and Safety (EHS) Guidelines¹⁴ and their Applicability for HoA-GW4R program

WBG General EHS Guidelines	Applicable	WBG General EHS Guidelines	Applicable
1.Environment		3. Community Health and Safety	
1.1 Air Emissions and Ambient Air Quality	Yes	3.1 Water Quality and Availability	Yes
1.2 Energy Conservation	Yes	3.2 Structural Safety of Project Infrastructure	Yes
1.3 Wastewater and Ambient Water Quality	Yes	3.3 Life and Fire Safety (L&FS)	Yes
1.4 Water Conservation	Yes	3.4 Traffic Safety	Yes
1.5 Hazardous Materials Management	Yes	3.5 Transport of Hazardous Materials	Yes
1.6 Waste Management	Yes	3.6 Disease Prevention	Yes
1.7 Noise	Yes	3.7 Emergency Preparedness and Response	Yes
1.8 Contaminated Land	Yes	4. Construction and Decommissioning	
2. Occupational Health and Safety		4.1 Environment	Yes
2.1 General Facility Design and Operation	Yes	4.2 Occupational Health & Safety	Yes
2.2 Communication and Training	Yes	4.3 Community Health & Safety	Yes
2.3 Physical Hazards	Yes	5. Water Quality and Availability	
2.4 Chemical Hazards	Yes	5.1 Comply with national acceptability standards or with WHO Drinking Water Guidelines	Yes
2.5 Biological Hazards	Yes	5.2 Adverse impacts to the quality groundwater and surface water resources	Yes
2.6 Radiological Hazards	Yes	5.3 Adverse impacts availability of groundwater and surface water resources	Yes
2.7 Personal Protective Equipment (PPE)	Yes	5.4 Assessed through a combination of field testing and modeling techniques	Yes
2.8 Special Hazard Environments	Yes		
2.9 Monitoring	Yes		

Source: IFC-WBG, 2007. Environmental, Health, and Safety (EHS) Guidelines General EHS Guidelines

EHS Guidelines for Water and Sanitation (2007) is also relevant to the project in addition to the General EHS Guidelines. The EHS Guidelines for Water and Sanitation include information relevant to the operation and maintenance of (i) potable water treatment and distribution systems, and (ii) collection of sewage in centralized systems (such as piped sewer collection networks) or decentralized systems (such as septic tanks subsequently serviced by pump trucks) and treatment of collected sewage at centralized facilities.

¹⁴ IFC-WBG, 2007. Environmental, Health, and Safety (EHS) Guidelines General EHS Guidelines

3.7 Legislative Gap Analysis between WB ESSs and HoA-GW4R Program Member States Legal Frameworks

The activities in the HoA-GW4RP need to comply with both existing member state laws and regulations and World Bank environmental and social standards. This sub-section compares the member states environmental management legislation to the World Bank's Environmental and Social Standards. The main objective of this assessment is to help implement this SESA more effectively in IGAD member states through an understanding of existing gaps. Table 6-8 below summarizes a comparison focusing on the WB ESSs and requirements relevant to the program, available member state policies and legislation to fulfill the WB ESSs, gaps identified in existing member state laws and regulations, and measures to fill the gaps.

Table-6: Key Gaps between WB ESSs and Ethiopian Environmental and Social Legislations

WB ESSs and Requirements	Available National Policy and Legislation to Fulfill WB ESSs	Gaps	Country-specific ESMFs and Measures to fill Identified Gaps
<p>ESS-1: Assessment and Management of Environmental and Social Risks and Impacts</p> <ul style="list-style-type: none"> • Environmental and Social Assessment Tools (SESA, ESIA) • Management Tools and Instruments (ESMF, ESMP) • Organizational Structures • Management of Contractors • Licenses, consents and permits • Third-party Monitoring (TPM) 	<p>FDRE EIA Proclamation No. 299/2002 and related regional EIA regulations mandatorily require a project proponent to undertake EIA. The Federal EIA procedural guideline (2003) classifies projects into Schedules I, II, and III to facilitate the undertaking of EIA proportionate to the risks and impacts of each project.</p> <p>The preparation of an ESMP based on the mitigation hierarchy and monitoring plan is also required by the EIA proclamation and associated guidelines.</p> <p>After the ESIA document review, the project proponent obtains from the competent national or regional authorities an Environmental Compliance Certificate (ECC).</p>	<p>The major gaps between National EIA Regulation and ESS 1 are as follows:</p> <ul style="list-style-type: none"> • Procedures and guidelines for SESA are not in place. In Ethiopia, as compared to SESA, EIA is a relatively well-developed environmental assessment system. • The EIA guideline is general. There is no sectoral ESIA guideline (ESIA Guideline for the Water Sector). • There are gaps in the management of contractors. Relevant aspects of the ESCP, including the relevant E&S documents and/or plans and the labor management procedures, were mostly not incorporated into the ESHS specifications of the procurement documents. As a result of this, the contractors do not comply with the ESHS specifications of their respective contracts. • Payment to be effected based on proof of environmental and social performance, issuing an environmental performance/compliance certificate to the contractor upon project completion as incentive and contract termination in case of non-compliance with environmental standards (extreme option) were not yet practice in contract management of irrigation and water supply schemes construction. • Obtaining permits for using quarries, borrowing, water resources, access, etc. from concerned authorities was not 	<p>The major ESF instruments or measures to fill the gaps between National EIA Regulation and ESS 1 are as follows:</p> <ul style="list-style-type: none"> • WBG shall be committed to supporting the Ethiopian Environment and Forest Authority in the development of water sector ESIA and SESA guidelines; • Regional level, transboundary and cumulative impacts shall be addressed by RSESA • The application and use of EHS guidelines as appropriate to subproject ESA is required by the present ESMF. • Incorporating all relevant aspects of the ESCP and ESMP into tender and construction contract agreement documents and effectively monitoring contractor compliance with their contractual commitments, and apply WB Procurement Contract Management Guideline; and • Sites proposed for borrow areas, quarry areas, road access, and water use should be approved by the responsible authority. • Implement Third-party Monitoring (TPM) as per the WBG requirement

WB ESSs and Requirements	Available National Policy and Legislation to Fulfill WB ESSs	Gaps	Country-specific ESMFs and Measures to fill Identified Gaps
		<p>clearly indicated in the available legislation and was not yet implemented.</p> <ul style="list-style-type: none"> • Third-party Monitoring (TPM) is not mentioned in Ethiopian Legislation 	
<p>ESS-2: Labour and Working Conditions</p> <ul style="list-style-type: none"> • Personnel management procedures • Grievance mechanism for project workers • Health and safety measures • Emergency preparedness and response • Training of project workers 	<p>The former Labor Proclamation No. 377/2003 has been substituted by the new Proclamation 1156/2019. The legislation covers the formation of a contract of employment defining the rules and conditions of employment, the obligations of the employer and workers, prohibited acts (sexual exploitation, abuse, and sexual harassment (SEA/SH), discrimination), the working conditions of women and young workers, occupational safety, health, and working environment, occupational accidents, occupational diseases, and the labor relations board. Occupational health and safety are governed by the Occupational Safety and Health Directive (2008).</p>	<p>All the rules of labor law are applicable to employment relations based on a contract of employment that exists between a worker and an employer. As most workers on subprojects are likely to be contracted through the formal employment process, there are major gaps between ESS 2 and the labor law.</p>	<p>Labor Management Procedures (LMP) are a component of the ESF instruments. LMP provides guidance on the required mitigations or management implementations, such as worker GM, code of conduct, etc. stipulated by ESS2 and relevant WB EHS guidelines. In line with the LMP, LM Plans will be developed for the sub-projects as relevant.</p>
<p>ESS-3:Resource Efficiency and Pollution Prevention and Management</p> <ul style="list-style-type: none"> • Resource Efficiency (Energy, water and raw material uses) • Pollution prevention and management (management of air pollution, management of solid and liquid wastes, and pesticide management) 	<p>The Pollution Control Proclamation no. 300/2002 Solid Waste Management Proclamation (513/2007) Pesticide Registration and Control Proclamation No.67/2010</p> <p>Ethiopia has ratified and is party to the following three International Conventions: the Stockholm Convention on POPs, the Rotterdam Convention on PIC procedures, and the Basel Convention on trans-boundary movement of Hazardous wastes.</p>	<p>As compared to pollution prevention and management, detailed guidelines to support efficient use of resources like water and energy are not sufficiently available. Detailed guidelines and practices to support the avoidance, minimization, or reduction of air pollution are not sufficiently available.</p>	<p>The application of relevant sections of the General EHS and sector-specific EHS guidelines is advisable when appropriate.</p>

WB ESSs and Requirements	Available National Policy and Legislation to Fulfill WB ESSs	Gaps	Country-specific ESMFs and Measures to fill Identified Gaps
<p>ESS-4: Community Health and Safety</p> <ul style="list-style-type: none"> Road safety and traffic Community health and safety Risks with GBV and SEA (during the project preparation phase) Risks with GBV and SEA (during project implementation phase) 	<p>Public Health Proclamation No. 200/2000 and Building Proclamation No. 624/2009 contain certain provisions that partly address the issues of community safety in the areas of community exposure and building designs.</p>	<p>There are gaps in fully addressing the community's Health, safety, and Security aspects as defined in the WB ESSs.</p>	<p>Management plans will be prepared for the sub-projects, as relevant, as a part of ESIA/ESMP, such as: Traffic Management Plans, Community Health and Safety Plans, GBV/SEAH Child Protection Prevention and Response Plan Emergency Response and Preparedness Plans and Security Management Plan.</p>
<p>ESS-5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement</p> <ul style="list-style-type: none"> Resettlement Policy Framework (RPF) 	<p>The new Proclamation No. 1161/2019 for expropriation of land for public purposes has provisions that address resettlement and compensation for 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 compensation. Resettlers are also entitled to compensation for the disruption of social ties. Entitlement to compensation is based on legal land holding. The valuation of compensation will be based on current costs and values to replace the properties. The proclamation also consists of a provision for establishing a resettlement fund, a resettlement package to restore the livelihood of resettlers.</p>	<p>The entitlements for compensation of resettlers are based on legal landholding and do not include informal settlers without any legal landholding.</p>	<p>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.</p>
<p>ESS-6: Biodiversity Conservation and Sustainable Management of Living Natural Resources</p> <ul style="list-style-type: none"> Sustainable management of biological natural resources Biodiversity Management and Action Plans 	<p>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:</p> <ul style="list-style-type: none"> -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. 	<p>As per WB ESS.6, depending on the nature and scale of the risks and impacts of the project, the Biodiversity Management Plan may be a stand-alone document or it may be included as part of the Environmental and Social Commitment Plan (ESCP) prepared under ESS1. However, the Ethiopian EIA Proclamation doesn't require a stand-alone Biodiversity Management Plan.</p>	<p>Depending on the location of the subprojects and pertinent impacts, Biodiversity Management and Action Plans can be annexed to the ESIA or ESMP.</p> <p>Sub-projects that have significant impacts in terms of biodiversity will be considered ineligible.</p>

WB ESSs and Requirements	Available National Policy and Legislation to Fulfill WB ESSs	Gaps	Country-specific ESMFs and Measures to fill Identified Gaps
<p>ESS-7: Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities</p> <ul style="list-style-type: none"> IP/SSAHUTLC Plan 	<p>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.</p>	<p>The gaps in the definition of Indigenous people between the national system and ESS 7 have already been bridged through discussions and agreement with the GoE.</p>	<p>The application of the ESS 7 requirement for the IP/SSAHUTLC Plan is advisable when appropriate.</p>
<p>ESS-8: Cultural Heritage</p> <ul style="list-style-type: none"> Conduct field-based surveys, using qualified specialists. Consult Stakeholders in documenting the presence and significance of PCR, Components of a “chance find” procedure 	<p>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 the chance finding of heritage.</p>	<p>Though natural and cultural heritages are required to be included during the EIA process, the preparation of a Cultural Heritage Management Plan (CHMP), as indicated in the ESF, is not required by the national EIA law. Chance-finding issues are usually not incorporated into construction contract agreement documents.</p>	<p>The application of the ESS 8 requirement for CHMP is advisable when appropriate. Chance-finding issues shall be incorporated into construction contract agreement documents.</p>
<p>ESS-10: Stakeholder Engagement and Information Disclosure</p> <ul style="list-style-type: none"> Preparation and implementation of the stakeholder engagement plan Continue consultations throughout project implementation Project grievance mechanism (GRM) 	<p>Article 15 of the EIA Proclamation requires public participation and consultation during the EIA study process and public disclosure of EIA reports. Current practice also shows public consultations are carried out during EIA studies, and minutes of consultation are produced. Incorporation of the views and concerns of stakeholders into the EIA report is usually carried out.</p>	<p>The stakeholder and public consultation requirements are focused on the initial EIA study phase and do not continue through the project lifecycle as required by ESS-10. Thus, the preparation of a stakeholder engagement plan is not required by the EIA proclamation. Establishing GRM to address public concerns is also not required by the EIA proclamation.</p>	<p>HoA-GW4RP SEP shall be operational throughout implementation of the Project, including an overall disclosure of information on subprojects and the grievance mechanism.</p>

Table-7: Key Gaps between WB ESSs and Kenya Environmental and Social Legislations

WB ESSs and Requirements	Available National Policy and Legislation to Fulfill WB ESSs	Gaps	Country-specific ESMFs and Measures to fill Identified Gaps
<p>ESS-1: Assessment and Management of Environmental and Social Risks and Impacts</p> <ul style="list-style-type: none"> • Environmental and Social Assessment Tools (SESA, ESIA) • Management Tools and Instruments (ESMF, ESMP) • Organizational Structures • Management of Contractors • Licenses, consents and permits • Third-party Monitoring (TPM) 	<p>Environmental Management and Coordination (Amendment) Act 2015 (legal Notice No 5 of 2015) and provides for a full ESIA study for high-risk projects. Provides for screening of the proposed development activity and preparation of a Project Report The environmental (impact assessment and audit) regulations, 2003 part iv Environmental Management and Co-ordination (Water Quality) Regulations 2006 Environmental Management and Co- ordination (Waste Management) Regulations 2006 Environmental Management and Coordination (Air Quality) Regulations, 2014 Environmental Impact Assessment and Audit Regulations (2003)-stipulates under section 12, subsection (2) that: “sectoral Environmental Impact Assessment Guidelines shall be developed by the lead agency in consultation with the National Environmental Management Authority (NEMA).”</p>	<ul style="list-style-type: none"> • There are gaps in the management of contractors. Relevant aspects of the ESCP, including the relevant E&S documents and/or plans and the labor management procedures, were mostly not incorporated into the ESHS specifications of the procurement documents. As a result of this, the contractors do not comply with the ESHS specifications of their respective contracts. • Third-party Monitoring (TPM) is not mentioned in Kenya Legislation 	<ul style="list-style-type: none"> • Regional level, transboundary and cumulative impacts shall be addressed by RSESA • The application and use of EHS guidelines as appropriate to subproject ESA is required by the present ESMF. • Incorporating all relevant aspects of the ESCP and ESMP into tender and construction contract agreement documents and effectively monitoring contractor compliance with their contractual commitments, and apply WB Procurement Contract Management Guideline; and • Implement Third-party Monitoring (TPM) as per the WBG requirement
<p>ESS-2: Labour and Working Conditions</p> <ul style="list-style-type: none"> • Personnel management procedures • Grievance mechanism for project workers • Health and safety measures • Emergency preparedness and response • Training of project workers 	<p>Occupational Safety and Health Act (OSHA), 2007;</p> <ul style="list-style-type: none"> • Provides for the safety, health and welfare of workers and all persons lawfully present at work places. • Provides for the registration of workplaces. • provides for maintenance of cleanliness of workplaces, adequate lighting and ventilation, provision of sanitary conveniences, 	<p>There is a gap between the World Bank’s EHS Guidelines and Kenyan laws and regulations.</p>	<p>Labor Management Procedures (LMP) are a component of the ESF instruments. LMP provides guidance on the required mitigations or management implementations, such as worker GM, code of conduct, etc. stipulated by ESS2 and relevant WB EHS guidelines. In line with the LMP, LM Plans will be developed for the sub-projects as relevant.</p> <p>Projects should apply whichever is more stringent.</p>

WB ESSs and Requirements	Available National Policy and Legislation to Fulfill WB ESSs	Gaps	Country-specific ESMFs and Measures to fill Identified Gaps
	<p>Work Injury Compensation Benefit Act (WIBA), 2007-provides guidance for compensating employees on injuries and diseases contracted during employment. The Act also requires provision of compulsory insurance for all employees.</p> <p>The Sexual Offences Act, 2006 and its amendment, 2012-the Act requires workers to observe a standard work ethic to ensure persons from both genders are not subjected to sexual offences.</p>		
<p>ESS-3: Resource Efficiency and Pollution Prevention and Management</p> <ul style="list-style-type: none"> • Resource Efficiency (Energy, water and raw material uses) • Pollution prevention and management (management of air pollution, management of solid and liquid wastes, and pesticide management) 	<p>Environmental Management and Coordination (Amended) Act, 2015 provide the main legal and institutional framework under which the environment in general is to be managed. There are specific regulations that would be of interest to pollution prevention and management including:</p> <ol style="list-style-type: none"> i. EMCA (Noise and Excessive Vibration Pollution Control) Regulations, 2009 ii. Environmental Management and Co-Ordination (Air Quality) Regulations, 2014 iii. Environmental Management and Coordination (Water Quality) Regulations, 2006 iv. Environmental Management and Coordination (Waste Management) Regulations, 2006 Legal Notice No. 121 	<p>No significant gaps.</p>	<p>The application of relevant sections of the General EHS and sector specific EHS guideline is advisable when appropriate.</p> <p>The Project shall promote the sustainable use of resources and avoid or minimize adverse impacts on human health according to the Constitution and the WB’s ESS3.</p>
<p>ESS-4: Community Health and Safety</p> <ul style="list-style-type: none"> • Road safety and traffic • Community health and safety 	<p>The Penal Code (Cap. 63) chapter on Offences against Health and Conveniences, strictly prohibits the release of foul air into the</p>	<p>No significant gaps.</p>	<p>Management plans shall be prepared for the sub-projects, as relevant, as a part of ESIA/ESMP, such as: Traffic Management Plans, Community Health and Safety Plans, GBV/SEAH Child</p>

WB ESSs and Requirements	Available National Policy and Legislation to Fulfill WB ESSs	Gaps	Country-specific ESMFs and Measures to fill Identified Gaps
<ul style="list-style-type: none"> Risks with GBV and SEA (during the project preparation phase) Risks with GBV and SEA (during project implementation phase) 	environment, which affects the health of other persons. The Public Health Act (CAP. 242) Part IX Section 8 & 9 of the Act states that no person/institution shall cause nuisance or condition liable to be injurious or dangerous to human health. Any noxious matter or wastewater flowing or discharged into a water course is deemed as a nuisance.		Protection Prevention and Response Plan Emergency Response and Preparedness Plans and Security Management Plan.
ESS-5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement <ul style="list-style-type: none"> Resettlement Policy Framework (RPF) 	The National Land Commission Act 2012 • Provides for the management and administration of land in accordance with the principles of the land policy set out in Article 60 of the Constitution and the national land policy The Land Act 2012 <ul style="list-style-type: none"> Provides for methods of acquisition of title to land including compulsory acquisition where land is required for public purposes or in the public interest as related to and necessary for fulfilment of the stated public purpose; Provides that just compensation shall be paid promptly in full to all persons whose interests in the land have been determined; and Provides for the creation of a public rights of way (ROW) or wayleave by the National Land Commission. 	No significant gaps.	Resettlement Policy Framework (RPF) also have been already prepared and disclosed by beneficiary countries prior to the project appraisal.

WB ESSs and Requirements	Available National Policy and Legislation to Fulfill WB ESSs	Gaps	Country-specific ESMFs and Measures to fill Identified Gaps
<p>ESS-6: Biodiversity Conservation and Sustainable Management of Living Natural Resources</p> <ul style="list-style-type: none"> Sustainable management of biological natural resources Biodiversity Management and Action Plans 	<p>The Wildlife Conservation and Management Act, 2013 -Prohibits pollution of wildlife habitats and ecosystems</p> <p>The Forest Conservation and Management Act, 2016 -Prohibits the destruction of protected tree species or family of trees and provides for the sustainable management of indigenous forests and woodlands</p> <p>Wildlife conservation and management act, 2013.part vi - conservation, protection and management</p> <p>Forest Conservation and Management Act, 2016.</p>	<p>As per WB ESS.6, depending on the nature and scale of the risks and impacts of the project, the Biodiversity Management Plan may be a stand-alone document or it may be included as part of the Environmental and Social Commitment Plan (ESCP) prepared under ESS1. However, the Kenya EIA Proclamation doesn't require a stand-alone Biodiversity Management Plan.</p>	<p>Depending on the location of the subprojects and pertinent impacts, Biodiversity Management and Action Plans can be annexed to the ESIA or ESMP.</p>
<p>ESS-7: Indigenous Peoples /Sub-Saharan African Historically Underserved Traditional Local Communities</p> <ul style="list-style-type: none"> IP/SSAHUTLC Plan 	<p>The term "Indigenous Peoples" is not used in Kenya; the legal framework recognizes the particular concerns and rights of minorities and marginalized groups. The Constitution defines a marginalized community as: "A community that, because of its relatively small population or for any other reason, has been unable to fully participate in the integrated social and economic life of Kenya as a whole; A traditional community that, out of a need or desire to preserve its unique culture and identity from assimilation.</p>	<p>There is a gap in the use of the term "Indigenous Peoples".</p>	<p>Apply the Kenya legal framework that recognizes the particular concerns and rights of minorities and marginalized groups.</p>
<p>ESS-8: Cultural Heritage</p> <ul style="list-style-type: none"> Conduct field-based surveys, using qualified specialists Consult Stakeholders in documenting the presence and significance of PCR Components of a "chance find" procedures 	<p>The National Museums Heritage Act, 2006, sets out the overarching administrative processes for protecting and preserving cultural heritage and its management by the National Museums of Kenya (NMK). It provides for the establishment, control, management, and development of national museums and the identification, protection, conservation, and transmission of the cultural and natural heritage of Kenya.</p>	<p>The preparation of a Cultural Heritage Management Plan (CHMP), as indicated in the ESF, is not required by the Kenya EIA law.</p> <p>Chance-finding issues are usually not incorporated into construction contract agreement documents.</p>	<p>To fill the gap, any cultural heritage encountered during the work should be recorded according to the procedure provided in the ESMF. To fill the gap, there should be a clause in all work contracts regarding chance finds.</p>

WB ESSs and Requirements	Available National Policy and Legislation to Fulfill WB ESSs	Gaps	Country-specific ESMFs and Measures to fill Identified Gaps
<p>ESS-10: Stakeholder Engagement and Information Disclosure</p> <ul style="list-style-type: none"> Preparation and implementation of the stakeholder engagement plan Continue consultations throughout project implementation as necessary to address EA-related issues that affect them Project grievance mechanism (GRM) 	<p>THE ENVIRONMENTAL (IMPACT ASSESSMENT AND AUDIT) REGULATIONS, 2003 PART IV 21.(1) The Authority shall, within fourteen days of receiving the environmental impact assessment study report, invite the public to make oral or written comments on the report. (2) The Authority shall, at the expense of the proponent - (a) publish for two successive weeks in the Gazette and in a newspaper with a nation-wide circulation and in particular with a wide circulation in the area of the proposed project.</p>	<p>The stakeholder and public consultation requirements are focused on the initial ESIA study phase and do not continue through the project lifecycle as required by ESS-10.</p>	<p>HoA-GW4RP SEP shall be operational throughout the implementation of the Project, including an overall disclosure of information on subprojects and the grievance mechanism.</p>

Table-8: Key Gaps between WB ESSs and Somalia Environmental and Social Legislations

WB ESSs and Requirements	Available National Policy and Legislation to Fulfill WB ESSs	Gaps	Country-specific ESMFs and Measures to fill Identified Gaps
<p>ESS-1: Assessment and Management of Environmental and Social Risks and Impacts</p> <ul style="list-style-type: none"> Environmental and Social Assessment Tools(SESA, ESIA) Management Tools and Instruments (ESMF, ESMP) Organizational Structures Management of Contractors Licenses, consents and permits Third-party Monitoring (TPM) 	<p>Instruments for environmental assessment have not been delineated adequately at the Federal Government of Somalia level and are absent in the Federal Member States. There are no procedures provided in the country's regulations on the conduct of monitoring activities in the collection of environmental and social data. The Directorate of the Environment and Climate Change in the Office of the Prime Minister is responsible for oversight of environmental matters.</p>	<p>EIAs not incorporated into Federal laws, and are weakly captured at State level in only Puntland (and Somaliland) Missing in all the other Federal Member States.</p>	<p>Regional, transboundary, and cumulative impacts shall be addressed by RSESA. The HOA GWR project shall be implemented in accordance with the Environmental and Social Standards (ESSs).</p>
<p>ESS-2: Labour and Working Conditions</p> <ul style="list-style-type: none"> Personnel management procedures Grievance mechanism for project workers Health and safety measures 	<p>Provisional Constitution of the Federal Republic of Somalia Article 24.5 stipulates that all workers, particularly women, have a special right of protection from sexual abuse, segregation and discrimination in the</p>	<p>No significant gaps.</p>	<p>Labor Management Procedures (LMP) are a component of the ESF instruments. LMP provides guidance on the required mitigations or management implementations, such as worker GM, code of conduct, etc. stipulated by ESS2 and relevant WB EHS guidelines. In line with the LMP, LM Plans will be</p>

WB ESSs and Requirements	Available National Policy and Legislation to Fulfill WB ESSs	Gaps	Country-specific ESMFs and Measures to fill Identified Gaps
<ul style="list-style-type: none"> Emergency preparedness and response Training of project workers 	<p>work place. Every labor law and practice shall comply with gender equality in the work place</p> <p>The Puntland Sexual Offences Act 2016 prohibits sexual harassment.</p> <p>The Labour Code of 1972</p> <ul style="list-style-type: none"> The employer is obligated to provide adequate measures for health & safety protecting staff against related risks, including the provisions of a safe and clean work environment and of well-equipped, constructed and managed workplaces that provide sanitary facilities, water and other basic tools and appliances; Workers have the right to submit complaints and the employer must give the complaints due consideration; The Labor Code forbids work for children below the age of 12, but allows employment of children between the age of 12-15; and The Code also recognizes freedom of association. 		<p>developed for the sub-projects as relevant. The Project will fully comply with WB ESS 2. This will be set out in the LMP.</p>
<p>ESS-3: Resource Efficiency and Pollution Prevention and Management</p> <ul style="list-style-type: none"> Resource Efficiency (Energy, water and raw material uses) Pollution prevention and management (management of air pollution, management of solid and liquid wastes, and pesticide management) 	<p>Provisional Constitution of the Federal Republic of Somalia Art. 25 of the Constitution states that every Somali has the right to an environment that is not harmful to them and to be protected from pollution and harmful materials. Every Somali has a right to have a share of the natural resources of the country while being protected from excessive and damaging exploitation of those resources.</p>	<p>Implementation of the laws and Constitution may be hampered due to the weak justice system.</p>	<p>The Project will promote the sustainable use of resources and avoid or minimize adverse impacts on human health, according to the Constitution and the WB's ESS3.</p>
<p>ESS-4: Community Health and Safety</p> <ul style="list-style-type: none"> Road safety and traffic Community health and safety Risks with GBV and SEA (during the project preparation phase) Risks with GBV and SEA (during project implementation phase) 	<p>The Somali Penal Code of 1962. The Code criminalizes rape and other forms of sexual violence as well as forced prostitution.</p> <p>Somalia's National Gender Policy (2016) includes strategies to eradicate harmful traditional practices such as FGM/C and child marriage and to improve services for the management of GBV cases.</p>	<p>No significant gaps.</p>	<p>A GBV/SEAH Child Protection Prevention and Response Plan will be prepared, consulted upon, approved, and implemented. The Project will also implement a Security Management plan and activity-specific ESMFs as required for other community health and safety risks.</p>

WB ESSs and Requirements	Available National Policy and Legislation to Fulfill WB ESSs	Gaps	Country-specific ESMFs and Measures to fill Identified Gaps
<p>ESS-5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement</p> <ul style="list-style-type: none"> Resettlement Policy Framework (RPF) 	<p>Provisional Constitution of the Federal Republic of Somalia. Art. 26 states that every person has the right to own, use, enjoy, sell and transfer property. The State may compulsorily acquire property only if doing so is in the public interest. Any person whose property has been acquired in the name of the public interest has the right to just compensation from the State as agreed by the parties or decided by a court. The Agricultural Land Law (1975). The law transfers all land from traditional authorities to the government.</p>	<p>In Art. 26, people have a right to be compensated, but it is not clear how the amount of the compensation is determined. Somali law does not determine the compensation schedule or cut-off date. ESS5 determines that improvements to the living situations of displaced vulnerable people should be undertaken; Somali Law does not provide for that.</p>	<p>The Resettlement Policy Framework (RPF) has also been prepared and disclosed by the beneficiary prior to the project appraisal. RAP/ARAP shall be developed once the project is effective to guide the resettlement process.</p>
<p>ESS-6: Biodiversity Conservation and Sustainable Management of Living Natural Resources</p> <ul style="list-style-type: none"> Sustainable management of biological natural resources Biodiversity Management and Action Plans 	<p>Provisional Constitution of the Federal Republic of Somalia. Article 45 states that the Government shall give priority to the protection, conservation, and preservation of the environment against anything that may cause harm to natural biodiversity and the ecosystem. Furthermore, all people have a duty to safeguards and enhance the environment and participate in the development, execution, management, conservation and protection of the natural resources and the environment.</p>	<p>Apart from broad constitutional provisions, there are no detailed laws that govern biodiversity conservation and sustainable management of living natural resources.</p>	<p>Measures and actions developed to assess and manage subproject-specific biodiversity risks and impacts as outlined in the RSESA, ESMF, and subsequent subproject ESMPs.</p> <p>Depending on the location of the subprojects and pertinent impacts, Biodiversity Management and Action Plans can be annexed to the ESIA or ESMP.</p>
<p>ESS-7: Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities</p> <ul style="list-style-type: none"> IP/SSAHUTLC Plan 	<p>In Somalia, some vulnerable and disadvantaged groups, such as the Aweer/Boni and Eyle, and possibly some Bantu/Jareer groups, could meet the requirements for ESS7. The project will give special consideration to vulnerable and disadvantaged groups.</p>	<p>The gaps in the definition of Indigenous people between the national system and ESS 7 have already been bridged through discussions and agreement with the GoE.</p>	<p>The application of the ESS 7 requirement for the IP/SSAHUTLC Plan is advisable when appropriate.</p>
<p>ESS-8: Cultural Heritage</p> <ul style="list-style-type: none"> Conduct field-based surveys, using qualified specialists. Consult Stakeholders in documenting the presence and significance of PCR Components of a “chance find” procedure 	<p>No information is available at hand on how the FGS intends to manage cultural heritage.</p>	<p>There are no explicit laws or regulations known to delineate sites as places of cultural importance.</p>	<p>RSESA and ESMF to guide the project implementation. The application of the ESS 8 requirement for CHMP is advisable when appropriate.</p>

WB ESSs and Requirements	Available National Policy and Legislation to Fulfill WB ESSs	Gaps	Country-specific ESMFs and Measures to fill Identified Gaps
<p>ESS-10: Stakeholder Engagement and Information Disclosure</p> <ul style="list-style-type: none"> • Preparation and implementation of the stakeholder engagement plan • Continue consultations throughout project implementation as necessary to address EA-related issues that affect them. • Project grievance mechanism (GRM) 	<p>Provisional Constitution of the Federal Republic of Somalia: Article 32 stipulated that every person has the right of access to information held by the State.</p>	<p>The law on the right of access to information currently only exists as a draft. The stakeholder and public consultation requirements are focused on the initial EIA study phase and do not continue through the project lifecycle as required by ESS-10.</p>	<p>The Project will implement stakeholder consultations throughout the lifetime of the project, as per the SEP. The PIU will ensure that a grievance mechanism for the project is in place in accordance with ESS10 as early as possible in project development to address concerns from project-affected persons.</p>

4. ENVIRONMENTAL AND SOCIAL BASELINE CONDITIONS AND SITUATIONAL ANALYSIS

4.1 Physical Conditions

4.1.1 Overview of the Program Area ¹⁵

Overview of Ethiopia-Horn of Africa Groundwater for Resilience Project: Ethiopia is a large landlocked country, occupying an area of over 1.1 million km². It is located between 3 and 15°N latitude and 33 and 48°E longitude. Ethiopia is bordered by Sudan from the west, Eritrea and Djibouti from the northeast, Somalia from the east and southeast, and Kenya from the south. It is a country of great geographical and climatic diversity, which has given rise to many and varied ecological systems. The Project will be implemented at 55 Woredas (Figure 3), in: (a) design and implementation of Managed Aquifer Recharge (MAR) at Dire Dawa plains; (b) carrying out potential groundwater assessments in 67 Woredas, mainly 15 groundwater investigations and studies including of drilling of test boreholes;(c) groundwater monitoring in 59 prioritized areas including drilling of monitoring wells and development of groundwater monitoring stations fitted with data loggers,(d) 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, (e) 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).

Overview of Kenya-Horn of Africa Groundwater for Resilience Project: Kenya is located between latitude 1.00 N and longitude 38.00 E in Eastern Africa and borders the Indian Ocean between Somalia and Tanzania. Kenya's total area is 580,367 square kilometers, with a landmass of 569,140 square kilometers and a water mass covering 11,227 square kilometers. It is bordered by Ethiopia, Somalia, South Sudan, Tanzania, and Uganda. The project will be implemented at 5 counties namely: Turkana, Marsabit, Wajir, Mandera, and Garissa counties (Figure 3), whose total surface area is 269,409.8 square kilometers, equivalent to 47 percent of the country's total landmass.

Overview of Somalia-Horn of Africa Groundwater for Resilience Project: Somalia is Africa's easternmost country, has a land area of 637,540 km², and occupies the tip of a region commonly referred to as the Greater Horn of Africa that also includes Ethiopia, Eritrea, and Djibouti. It is bordered by Kenya to the south, Ethiopia to the north and northwest, Djibouti to the north, and the Gulf of Eden to the north. Somalia has the longest coastline in Africa of over 3,333 km, which ranges from the Gulf of Aden in the north to the Indian Ocean in the east and south. The country stretches for almost 1,550 km from north to south between latitudes 12° N and 1°S, and 1,095 km from west to east between longitudes 41° and 51° E. Project beneficiaries will be communities that suffer from poor water conditions in Somalia, and that face increasingly future difficult conditions relating to climate change, a rapidly growing population, and increasing conflicts over scarce resources. The total number of beneficiaries is estimated at 350,000 from 14 Regions(Figure 3), including: (a) rural communities; (b) livestock owners;(c) women and girl-children; and (d) urban populations-dependending on rural GW sources and trucked into cities by private operators, sold at often exceedingly high prices.

¹⁵ WB, 2022. Horn of Africa Groundwater for Resilience Project using the Multiphase Programmatic Approach: Project Appraisal Document

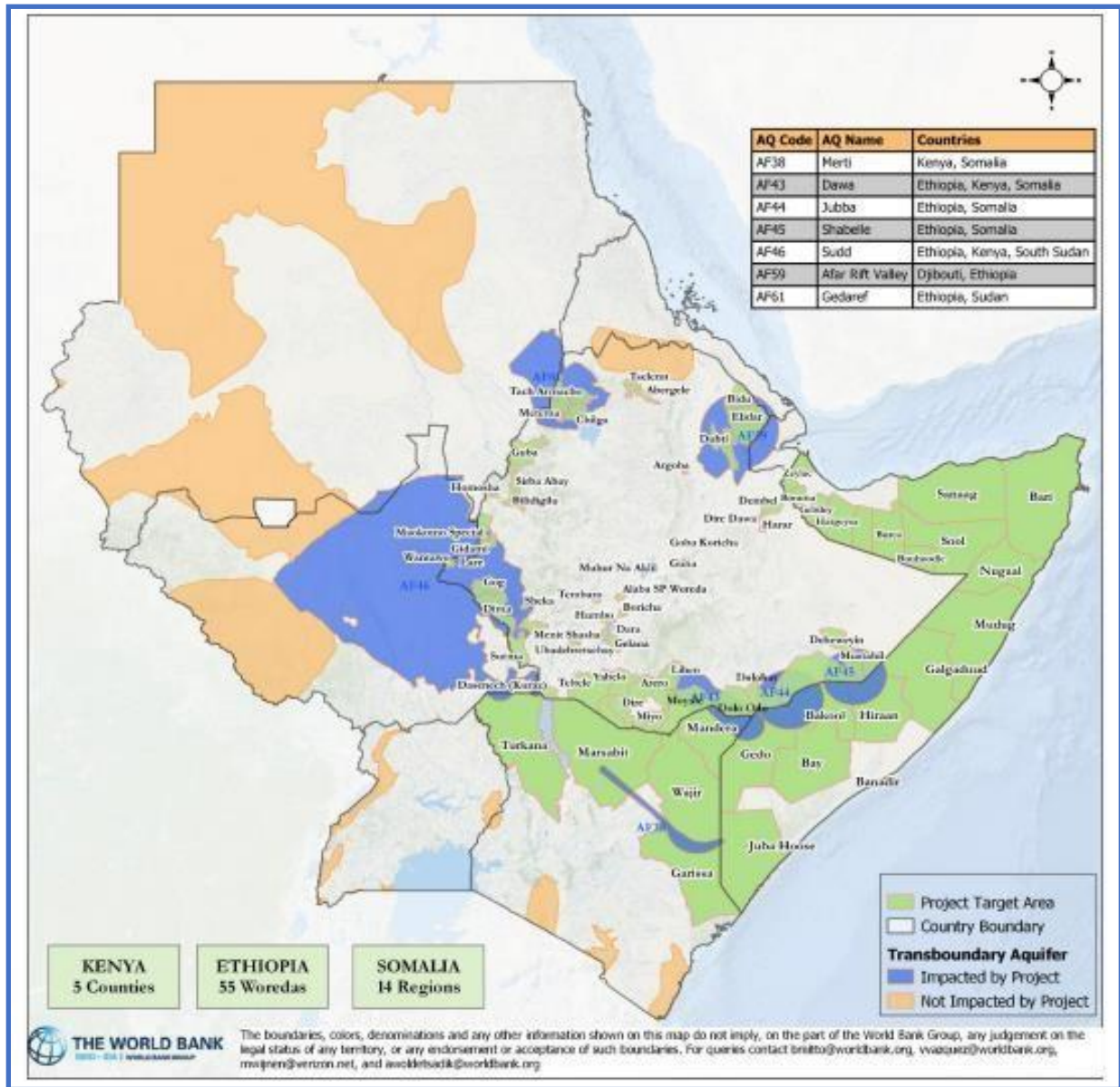


Figure-3: Location of Project Areas and Transboundary Aquifers in IGAD (Courtesy: UNESCO-IGRAC, 2015 modified by WB HoA-GW4R Project Appraisal Document)

4.1.2 Topography and Climate

The IGAD region is characterized by complex geological and topographical formations that exhibit a wide diversity of terrains and landscapes. As we downloaded the elevation mask by country (Ethiopia, Kenya, and Somalia) from <http://www.diva-gis.org/datadown>, Ethiopia has an elevation range of -189 to 4398 meters, Kenya has an elevation range of 0 to 4774 meters, and Somalia has an elevation range of -6 to 2334 meters (Figure 4). This topographic diversity has produced regional variations as manifested in different ecological zones such as the East African Rift Valley,

deserts, arid-, semi-arid, dry-, dry sub-humid, humid, mountainous, and alpine lands in the region. Most parts of member states are made up of Arid and Semi-Arid Lands (ASALs), which receive less than 600 mm of rainfall annually. The rest of the region has a great variety of climates and landscapes, including cool highlands, swamp areas, tropical rain forests, and other features typical of an equatorial region.

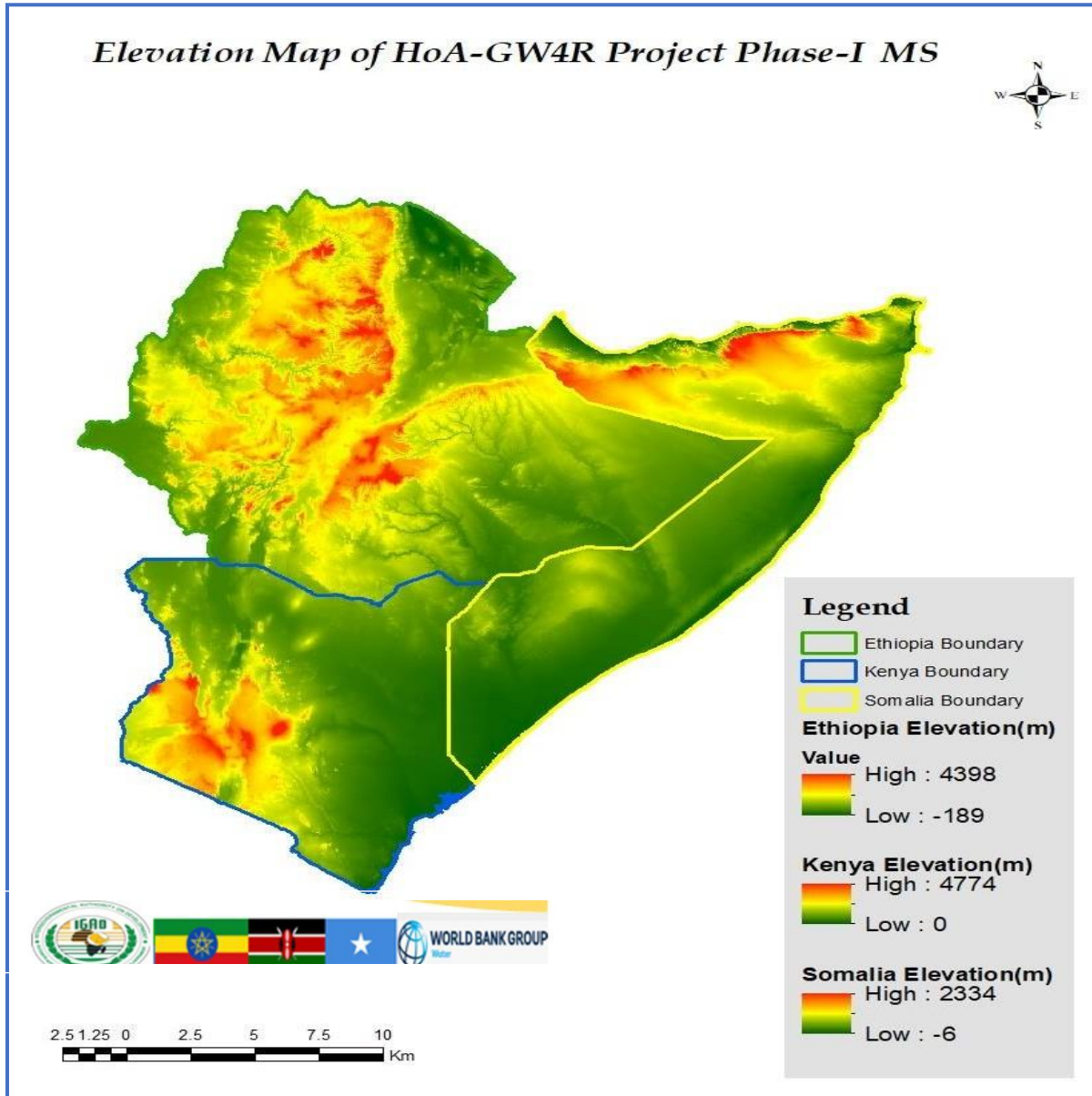


Figure-4: Elevation Map of HoA GW4R Project Phase-I Member States

4.1.3 Geology

A national geology map exists for each member country. This is, however, complicated to join due to the different semantics used, different data levels, and different legends and projections. Thus, the general geology of each of the three member countries is shown separately in [Figure 5](#).

The general geology of Ethiopia is grouped into five major categories: (1) Tertiary and Younger Sediments; (2) Miocene-Quaternary Volcanics; (3) Oligocene-Miocene Volcanics; (4) Mesozoic Sediments; and (5) Precambrian crystalline rocks ([Figure 5\(a\)](#)). Ethiopian Plateau, underlain by Precambrian crystalline rocks and topped with Oligocene-Quaternary volcanic rocks with Mesozoic sedimentary rocks ¹⁶.

The geology of Kenya can be divided into five major geological successions: (1) the Archaean (Nyanzian and Kavirondian), (2) the Proterozoic (Mozambique Belt and Bukoban), (3) Palaeozoic/Mesozoic sediments, (4) Tertiary/Quaternary Volcanics and sediments, and (5) Pleistocene to Recent soils, alluvial beach sands, evaporites, fossil coral reefs, and sandstones at the coast: alluvial and lacustrine sediments of the Rift Valley ([Figure 5\(b\)](#)). There are also volcanic rocks in the Rift Valley from the younger volcanoes. The rocks forming the Nyanza Craton (Nyanzian and Kavirondian systems) are Archaean in age and are the oldest rocks in the country. The Kisii Group is an outlier of volcanic rocks that consists of detrital and shallow-water sediments of the Kisii Group that uncomfortably overlie the Neo-Archaean greenstones and associated granitoid intrusions. The Proterozoic (Mozambique Belt) is a structural unit within which a wide variety of meta-sedimentary and meta-igneous rocks are found, showing a broad concordance of structural style and metamorphic history. The geological history of the Palaeozoic and Mesozoic sediments in Kenya is linked to the evolution, faulting, and subsequent rifting during the break-up of Gondwanaland in the Mesozoic era. The Tertiary and Quaternary Volcanics are predominantly distributed along the East African Rift System (EARS), while the Tertiary sedimentary deposits are closely linked to lacustrine, fluvial, and Aeolian systems ¹⁷.

Most of Somalia lies within the transitional zone between the great arch of East Africa and the deep sedimentary basin defined by geophysical investigations in the Indian Ocean. Three fault systems are recognized and classified according to their trends: (i) the Red Sea system (N-NE), (ii) the Gulf of Aden system (E-NE), and (iii) the East African system (N-NE). All three systems have determined the block structure of Somalia. Tectonic activity was most active in the northern part of the country. Metamorphic and magmatic complexes, probably Late Precambrian-Early Palaeozoic, crop out in uplifted blocks. Two areas of such rocks are known: one in northern Somalia and the other west of Mogadishu, in the Bur region. These areas of ancient rocks are structurally different and belong to the different major structural units of Africa. The Bur region belongs to a large zone known as the Mozambique Belt and consists of Precambrian strata. The northern area is part of an extensive Early Palaeozoic fold belt that occurs along the coasts of both the Red Sea and the Gulf of Aden ([Figure 5\(c\)](#)) ¹⁸.

¹⁶ Ismail, E. H., & Abdelsalam, M. G., 2012. Morpho-tectonic analysis of the Tekeze River and the Blue Nile drainage systems on the Northwestern Plateau, Ethiopia. *Journal of African Earth Sciences*, 69, 34-47.

¹⁷ Akech, N. O., Omuombo, C. A., & Masibo, M., 2013. General geology of Kenya. In *Developments in Earth Surface Processes* (Vol. 16, pp. 3-10). Elsevier.

¹⁸ Grancea, L., Mihalasky, M., Fairclough, M., Blaise, J. R., Boytsov, A., Hanly, A., & Vance, R., 2020. Uranium resources, production and demand 2020 (No. NEA--7551). Organization for Economic Co-Operation and Development.

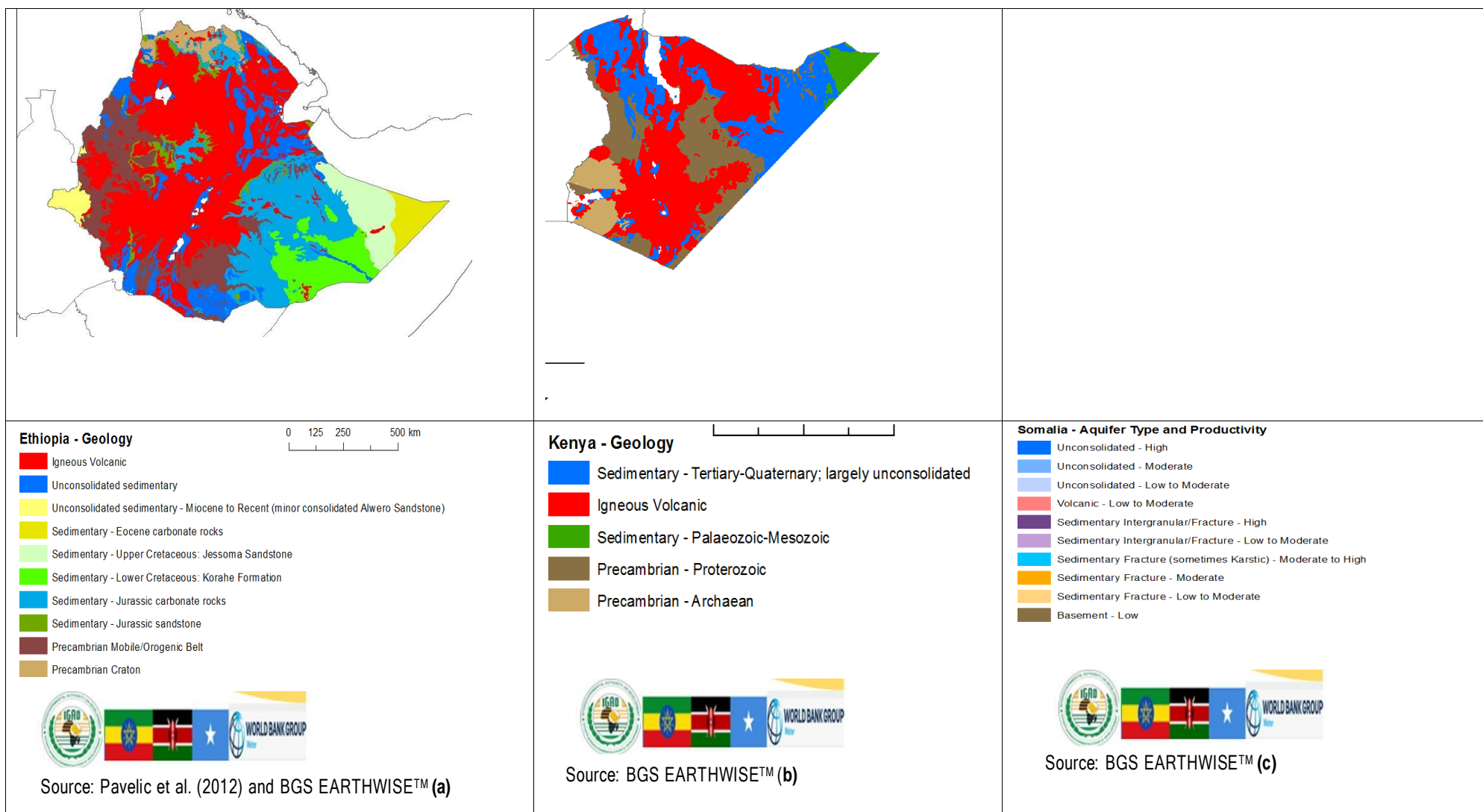


Figure-5: Geology Map of HoA GW4R Project Phase-I Member States

4.1.4 Land Use/Cover

Sentinel-2 10m land use/land cover time series of the world, the layer displays a global map of land use/land cover (LULC) derived from ESA Sentinel-2 imagery at 10m resolution. The algorithm generates LULC predictions for nine classes. For each year (2017-2022) were generated with Impact Observatory's deep learning AI land classification model, trained using billions of human-labeled image pixels from the National Geographic Society ¹⁹.

The year 2022 Sentinel-2 10m land use/land cover downloaded from Sentinel-2 10m land use/land cover time series of the world and processed using Arc GIS 10.7.1 for HoA GW4R Program Area. From nine major land-use/cover types that were generated in Sentinel-2 10m land use/land cover time series of the world including water (areas where water was predominantly present throughout the year), trees (any significant clustering of tall (~15 feet or higher) dense vegetation), flooded vegetation (intermixing of water throughout a majority of the year and seasonally flooded area that is a mix of grass/shrub/trees/bare ground), crops, built area (human made structures; major road and rail networks), bare ground (large areas of sand and deserts with no to little vegetation), rangeland (open areas covered in homogenous grasses with little to no taller vegetation), snow/ice and clouds cover included. The area is predominantly covered by rangeland followed by crops and trees. Land use/cover within TBAs is dominated by rangeland (Figure 6).

¹⁹ Karra, Kontgis, et al. "Global land use/land cover with Sentinel-2 and deep learning." IGARSS 2021-2021 IEEE International Geoscience and Remote Sensing Symposium. IEEE, 2021.

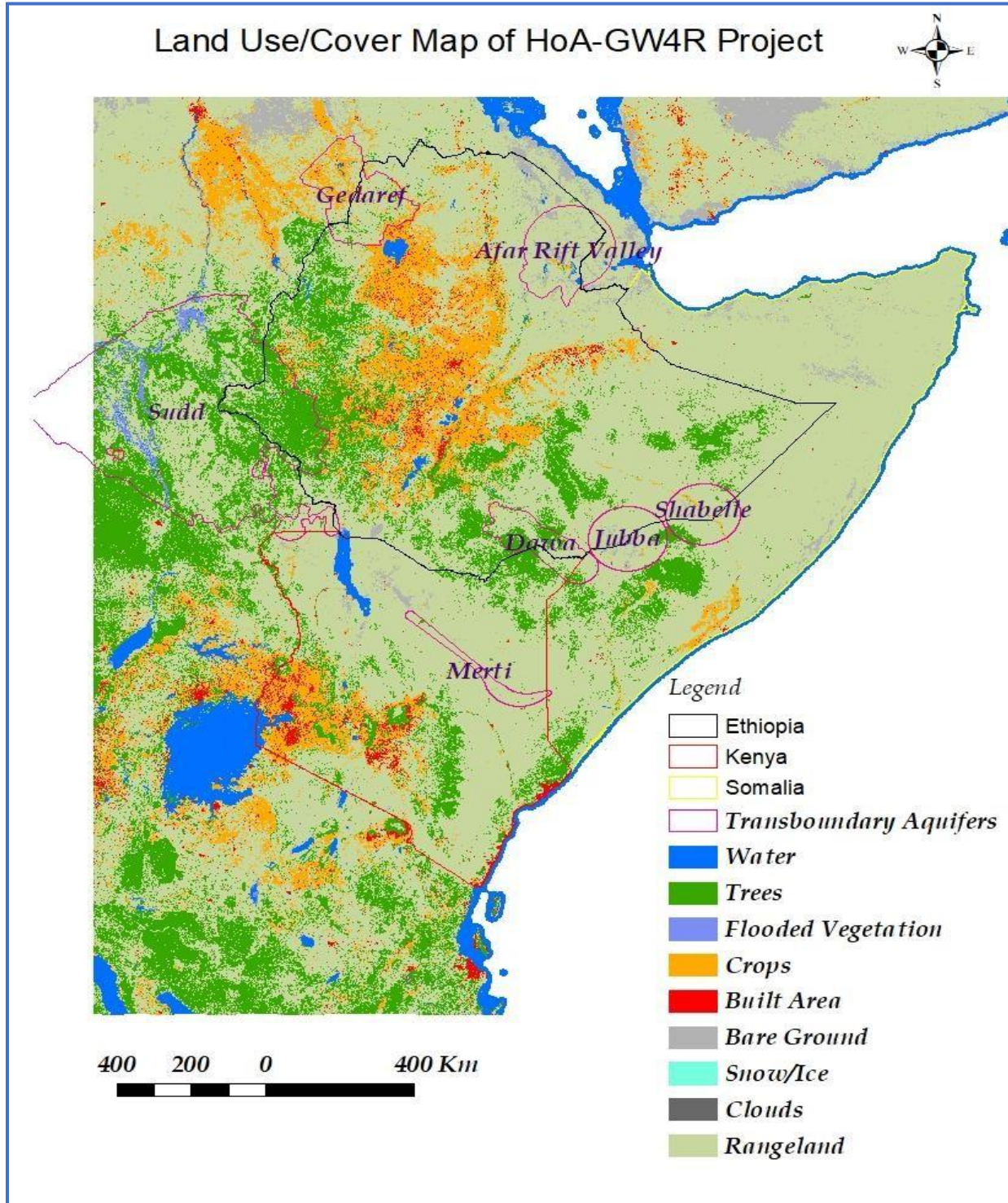


Figure-6: Land use/Cover Map of HoA GW4R Program Areas (Source: downloaded from <https://livingatlas.arcgis.com/landcoverexplorer/#mapCenter=45.258%2C4.676%2C5&mode=step&timeExtent=2017%2C2022&year=2022&downloadMode=true>)

4.1.5 Groundwater Resources

Groundwater is a largely decentralized resource that is widely available and often at shallow depths (<100m). It constitutes an important source for rural and small-town (piped) water supplies and is the largest freshwater reservoir that is annually recharged and not affected by evaporation. It provides a medium to store water to bridge dry periods and adapt to climate change impacts, and it is often of good quality and protected against man-made pollution. Deeper aquifers (>300m) are in reach but still untapped, suggesting the enormous potential that groundwater holds for the region's resilience. The majority of the region has moderate groundwater availability (with aquifer productivity of 1-5 liters per second) and some pocket areas with high productivity (5-20 liters per second). The high-yielding productive aquifers are located along cross-country border lines, including the area between Uganda and Kenya, Somalia and Kenya, Eritrea and Ethiopia, and Djibouti and Ethiopia (Figure 7). The groundwater productivity map indicates what borehole yields can reasonably be expected in different hydrogeological units. The ranges indicate the approximate interquartile range of the yield of boreholes that have been sited and drilled using appropriate techniques ²⁰.

²⁰ MacDonald, A.M, Bonsor, H C, Ó Dochartaigh, B E, Taylor, R G., 2012. Quantitative maps of groundwater resources in Africa .Environmental Research Letters 7, 024009<https://www2.bgs.ac.uk/groundwater/international/AfricanGroundwater/mapsDownload.html>)

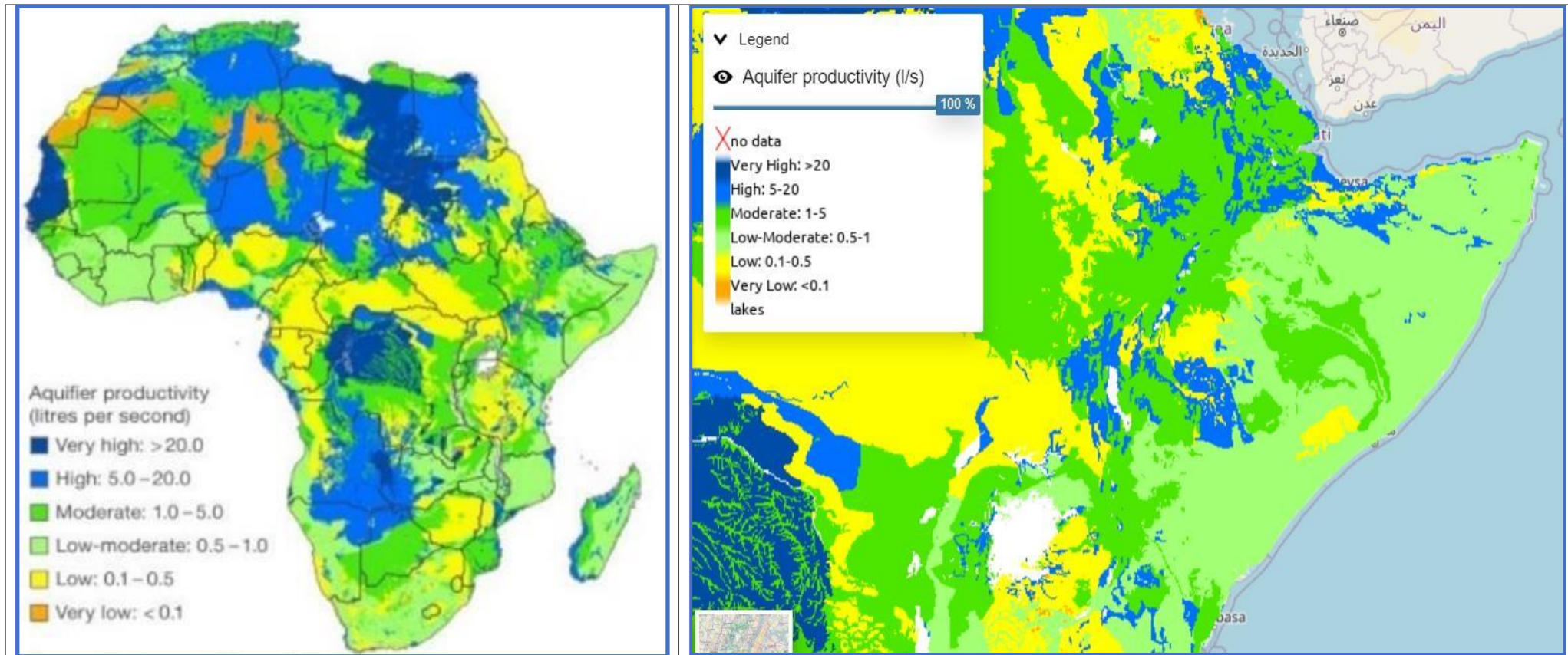


Figure-7: Aquifer Productivity Map of Africa (left) and Aquifer Productivity Map HoA GW4R Project Phase-I Member States (right) (Extracted from *Quantitative maps of groundwater resources in Africa*. *Environmental Research Letters*, 2012)

Groundwater resources of Ethiopia: 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 a wide heterogeneity of geology, topography, and environmental conditions. Actually, the geology of the country provides usable groundwater and 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. 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 rocks²¹.

A specific feature of the groundwater quality in Ethiopia is the presence of fluoride and salinity, mainly in the Rift Valley, making 30% of resources below standards for drinking. Another issue is anthropogenic groundwater pollution, which is particularly problematic in cities. Inadequate sewage systems, on-site pit latrines, animal feedlots, and other factors can result in harmful microbiological contamination, while some industries (such as those that use petroleum, chemicals, or metal manufacturing) can seriously pollute groundwater²².

Groundwater resources of Kenya: The total potential groundwater resource (storage) in Kenya is estimated to be 619 million m³. The total groundwater abstraction rate in 2012 was estimated at 7.21 million m³/year, and the total safe abstraction rate (annually recharged) in Kenya is estimated to be 193 million m³/year. Some aquifers are identified as being over-abstracted, with associated problems of water level decline and sometimes water quality deterioration, in particular the Nairobi volcanic aquifer. Some aquifers, mostly recharged by freshwater rivers, are excellent groundwater sources, e.g., the Lodwar Aquifer recharged by the river Turkwel; the Merti Aquifer recharged by the river Ewaso; the Gongoni Aquifer recharged by the Mkurumudzi River; and the Baricho Aquifer recharged by the river Galena²³.

Groundwater quality in Kenya is affected by natural influences and human activities²⁴, though groundwater quality issues are not very well understood. Saline groundwater has been detected in the northwestern Turkana region, coastal aquifers, and the Merti Aquifer. High concentrations of naturally occurring fluoride have also been detected in parts of the Nairobi Aquifer and throughout the Rift Valley. Pathogenic contamination and high nitrate levels caused by the infiltration of agricultural runoff and poor sanitation systems have been detected in shallow aquifers along the coast and near Lake Victoria²⁵. Many aquifers have groundwater quality issues. For example, the Nairobi aquifer has high fluoride concentrations, which mostly exceed WHO standards, especially in the Embakasi area. The Lotikipi Aquifer is very saline, with conductivity exceeding 8000 $\mu\text{S}/\text{cm}$. The Mombasa Island Pleistocene sands and limestones and related aquifers are impacted by pollution and saline intrusion. The Mumias granites are impacted by pollution and salinization. Various contamination problems arise due to the hydraulic continuity between surface water and shallow groundwater systems in Kenya²⁶.

²¹ FDRE-MOWE and MOIL, 2022. Environmental and Social Management Framework (ESMF) for Horn of Africa - Groundwater for Resilience Project (P174867 HoA-GW4RP)

²² Smith, 2022. Groundwater for Resilience in the IGAD Region: Facts and Figures and Future Prospects: Presentation at 2nd IGAD Water Forum at Entebbe, Uganda, 25-27, January, 2022

²³ Kenya-MOWSI, 2022. Horn of Africa Groundwater for Resilience Project Environmental and Social management Framework (ESMF) final draft).

²⁴ National Environment Management Authority (NEMA) Kenya (2021). Kenya State of Environment Report 2019-2021.

²⁵ USAID (2021). Water Resources Profile Series: Kenya Water Resources Profile Overview.

²⁶ UPGro, 2020. *African Groundwater 2020: Online Final Report of the Unlocking the Potential of Groundwater for the Poor Programme (2013-2020)*, <http://www.upgro.org>

Groundwater Resources of Somalia: The main types of aquifers in Somalia include unconsolidated, volcanic, and sedimentary-intergranular and fracture flow, sedimentary-fracture flow, sedimentary-karstic, and basement. Southern Somalia has the best hydrogeological conditions for finding groundwater, such as along the major toggas in the alluvial deposits and weathered basement. In the areas covered by the Gulf of Aden, the Darror, and the Nugal Drainage Basins, groundwater movements start in the mountainous areas and move in two directions. The first is from the south to the north, from the mountainous regions to the coastal areas of the Gulf of Aden. The second is from the north to the south, towards the Haud and Sool plateaus.

The areas of good groundwater potential are as follows: i. Baydhaba Plateau, Buur, Waajid, Damassa areas in the Juba and Shabelle basins; ii. Alluvial plains along the Juba, Shabelle and Lag Dera rivers; iii. Shallow aquifers in the sand dunes in the central coastal belt and the northern coastal regions (freshwater lenses), in the Galkayo and Dhuusamarreb Ancestral drainage systems in the Mudug-Galgaduud Plateau, along the toggas in the mountainous areas and sloping plains of Northern Somalia; iv. Deep aquifers in the Mudug-Galgaduud Plateau with wells 100 m to 250 m deep; v. Shallow aquifers in the Galkayo and Dhuusaarreb ancestral drainage and Coastal belt along the Gulf of Aden; vi. Upper catchment area of the mountainous zone in the Gulf of Aden and Darror basins where many springs and underground/surface dams and infiltration galleries could be constructed; and vii. Plateaus and valleys in northern Somalia (Sanaag region, Haud Plateau and Darror Valley) ²⁷. In Somalia, apart from areas along the Juba and Shabelle Rivers, all regions depend on groundwater for domestic water supply, livestock and small-scale irrigation and most groundwater sources have salinity levels above 2,000 $\mu\text{S}/\text{cm}$, and many shallow wells are unprotected and vulnerable to microbiological and other contamination ²⁸.

In 2008, IGRAC developed the Global Fluoride Model. It is a predictive geostatistical model of the probability of fluoride concentrations in groundwater exceeding the WHO guideline of 1.5 mg/L (Figure 8). The Fluoride Global Model (2008), downloaded from [https://ggis.un-igrac.org/catalogue/#!/search?q=Fluoride,%20Global%20Model%20\(2008\)](https://ggis.un-igrac.org/catalogue/#!/search?q=Fluoride,%20Global%20Model%20(2008))

²⁷ FRS-MEWR, 2022. Horn of Africa Groundwater for Resilience Project Environmental and Social management Framework (ESMF) final draft).

²⁸ Smith, 2022. Groundwater for Resilience in the IGAD Region: Facts and Figures and Future Prospects: Presentation at 2nd IGAD Water Forum at Entebbe, Uganda, 25-27, January, 2022

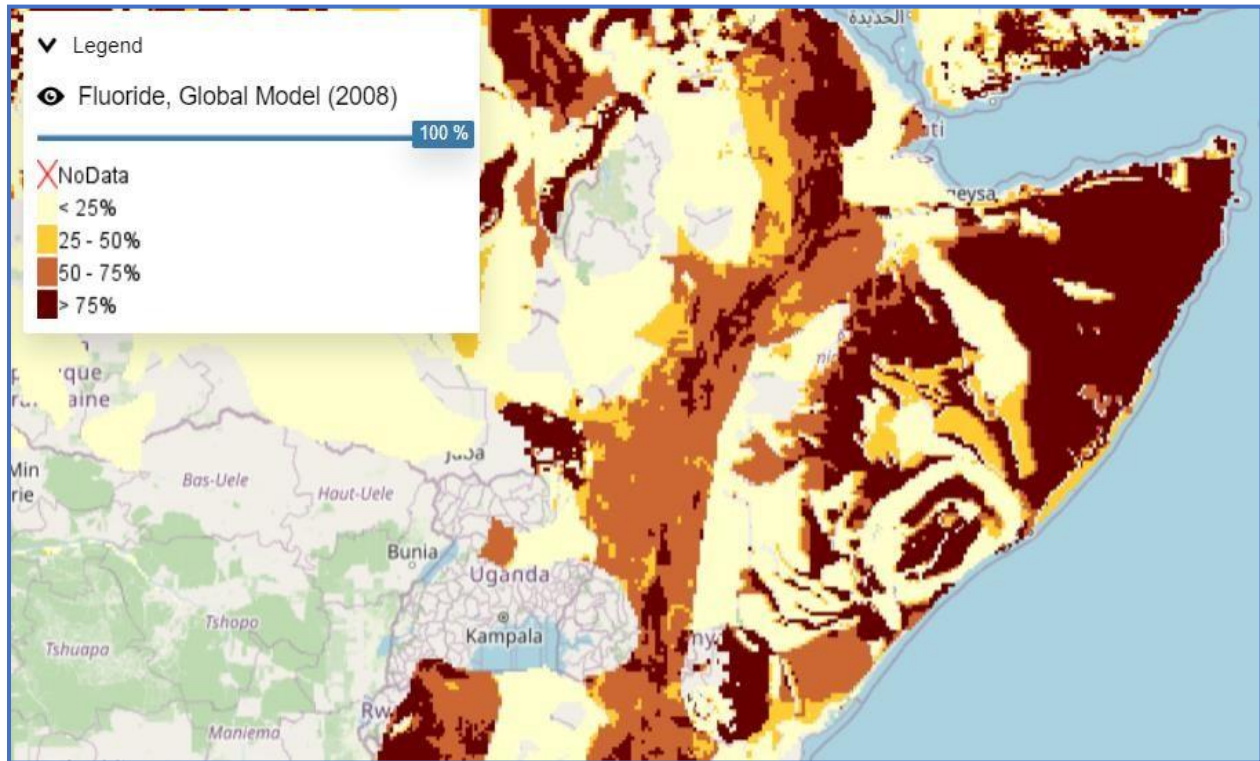


Figure-8: Fluoride concentrations in groundwater Map HoA GW4R Project Phase-I Member States (right) (Extracted from IGRAC, 2008, Fluoride Global Model).

4.1.6 Surface Water Resources

Surface water resources of Ethiopia: Ethiopia is blessed with abundant surface water resources. The country is divided into 12 basins, of which 8 are river basins, 1 is a lake basin, and the remaining 3 are dry basins with little or no drainage system outflow. The majority of the basins that the Rift Valley divides into two originate from the country's central plateau. River basins drained by rivers coming from the Eastern Highlands flow toward the east into the Republic of Somalia, while those coming from the highlands west of the Rift Valley flow toward the west into the Nile River basin system. Rivers that run north and south of the center of the Ethiopian Rift Valley's uplift originate in the nearby mountains and drain into the valley. There is a tremendous volume of surface water flowing in the river basin systems because practically all river basins come from highlands and other regions with substantial rainfall, and Ethiopia is regarded as the water tower of the Horn of Africa.

Millions of Ethiopians, like many in the region, suffer from a lack of access to clean water. In Ethiopia, 49.6 percent have access to basic water supply coverage, 8.9 percent have access to basic sanitation coverage, 60-80 percent of communicable diseases are attributed to limited access to safe water and inadequate sanitation and hygiene services, 4.8 percent have access to basic hygiene coverage, 25,000 under-five deaths per year due to diarrhea, and 17 percent of people practice improved hygiene behavior and live in healthy environments ²⁹.

²⁹UNICEF, 2023. <https://www.unicef.org/ethiopia/every-child-clean-water>

Surface water resources of Kenya: Lake Victoria and the Tana River, which is the longest in Kenya, are the two main surface water bodies. The Arid and Semi-Arid Lands of Kenya are characterized by low and erratic rainfall, periodic droughts and floods, irregular agricultural productivity and high-water scarcity. Some of the perennial Rivers include Turkwel, Kerio, Lokichar, Ol Arabel, Tana River, and the upper section of Ewaso Ng'iro. Seasonal Rivers include River Suguta and many forming open lager during dry season ³⁰. Surface water quality in Kenya is affected by both naturally occurring minerals and human activities. Deforestation and soil erosion in the country's water towers have increased turbidity, sedimentation, and flooding, and are reducing overall storage capacity in Lake Victoria and Lake Naivasha. Solid waste, sewage, and industrial effluent contribute to high levels of biological oxygen demand (BOD), heavy metals, and bacteriological contamination, particularly on the Athi River and its tributaries. Agricultural runoff and untreated industrial effluents have led to eutrophication in the Athi River and its tributaries, as well as Lake Victoria ³¹.

According to Kenya's Voluntary National Review (2020) ³², the proportion of individuals using safely managed drinking water increased from 68.8% in 2016 to 72.4% in 2019. This increase was attributed to the construction and expansion of water supply schemes in urban and rural areas by both the national and county governments. The proportion of individuals with safely managed sanitation services rose from 59.3% in 2016 to 81.5% in 2019 (Government of Kenya, 2020). Second Voluntary National Review Report on the Implementation of the Sustainable Development Goals Water and sanitation challenges in Kenya are especially evident in rural areas and urban slums, where people are often unable to connect to piped water infrastructure ³³.

Surface water resources of Somalia: Somalia has little rainfall and is often a dry, arid nation. As a result, one of the nation's most urgent issues is the lack of access to water. Only two rivers, the Jubba and the Shabelle, flow continuously through the nation; both rivers originate in the highlands of Ethiopia and move southward. More than 65% of the catchment basin for the two major rivers is thought to be outside the nation in the Ethiopian highlands. The Gulf of Aden, Darror, Tug Der/Nugal, Ogaden, Shabelle, Juba, Lag Dera, Lag Badana, and the Central Coastal Basin are its nine main water basins. The Juba and Shabelle rivers are crucial to Somalia and have been referred to as the nation's breadbasket. Due to the shortage of reliable water sources, water prices in Somalia are one of the highest in Africa (up to \$10 per cubic meter), making it difficult for the most poor and vulnerable households to access safe water. Water scarcity has also led to high mortality rates amongst livestock and failed crop production, essential elements of household survival in Somalia. Many households, usually women and girls, walk long distances to access water, increasing their exposure to risks of sexual and gender-based violence. As a result, only slightly more than 26 percent of Somalis have access to safe drinking water ³⁴.

³⁰ Kenya-MOWSI, 2022. Horn of Africa Groundwater for Resilience Project Environmental and Social management Framework (ESMF) final draft).

³¹ USAID, 2021. Water Resources Profile Series: Kenya Water Resources Profile Overview.)

³² Kenya's Voluntary National Review, 2020.

³³ Ministry of Health, Republic of Kenya (2015). Kenya Environmental Sanitation and Hygiene Policy 2016-2030.

³⁴ FRS-MEWR, 2022. Horn of Africa Groundwater for Resilience Project Environmental and Social management Framework (ESMF) final draft).

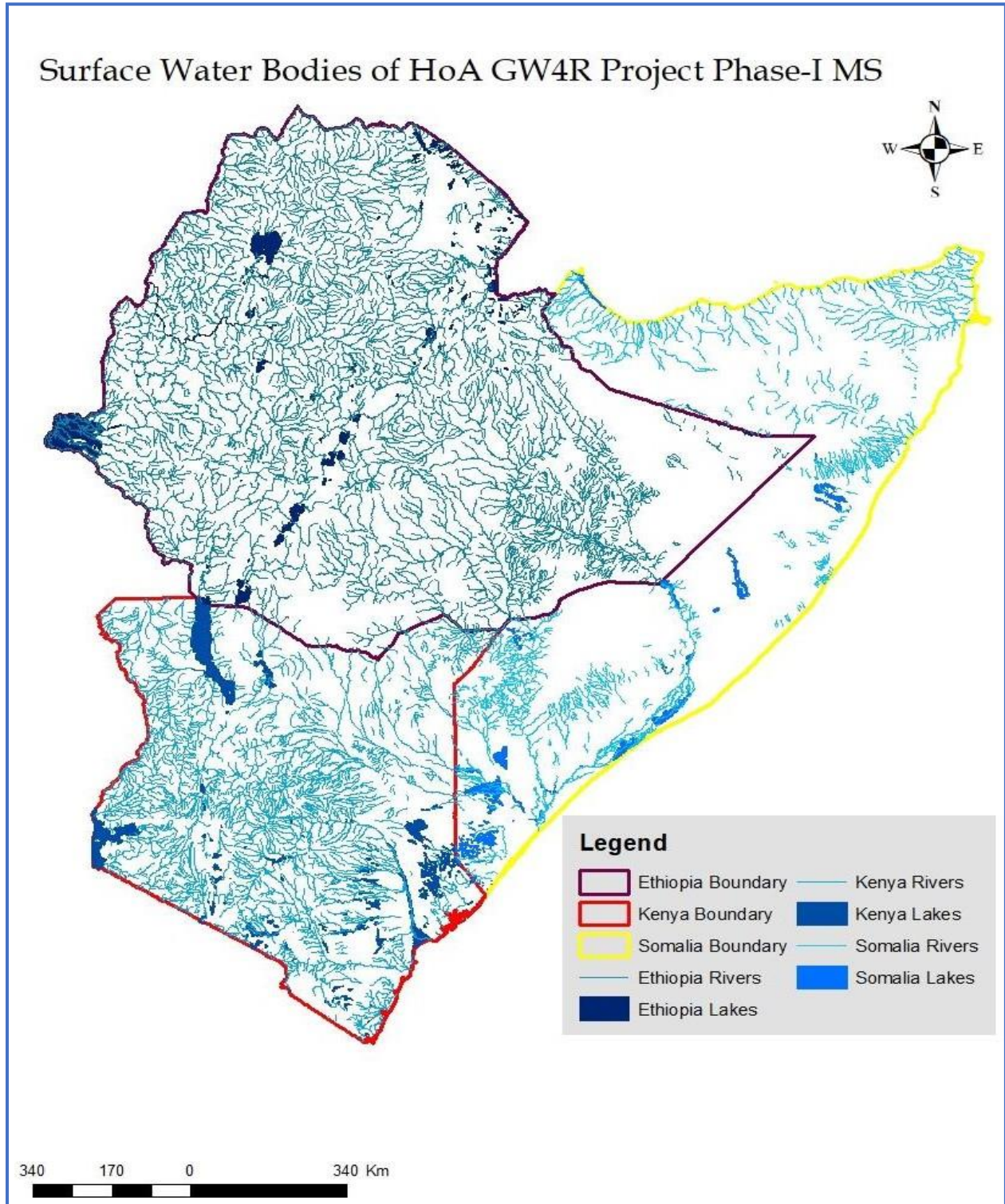


Figure-9: Surface Water Bodies of HoA GW4R Project Phase-I Member States

4.1.7 Transboundary Rivers, Lakes and Aquifers of the Region

Transboundary Rivers and Lakes: The Juba, the Shebelle, the Omo-Turkana, and the Awash are other important shared river basins in the region. The Juba River basin is made up of the Juba River itself and of three tributaries, namely the Dawa, the Genale, and Gestro that flow from Ethiopia through Somalia, meet the Juba after the border, and reach the Indian Ocean. Part of Kenya is located in the basin because the Dawa forms its boundary with Ethiopia. The Shebelle also takes its source in Ethiopia and flows into Somalia, where it turns south and follows the coast. There it reaches a depression area and disappears into the sand, feeding groundwater aquifers. Only when it rains heavily does the river join the Juba River and reach the Indian Ocean. The Omo River rises in southern Ethiopia and flows south until it empties into Turkana Lake, which is shared between Ethiopia and Kenya. The Awash River rises in the high plateau west of Addis Ababa in Ethiopia and flows along the rift valley into the Afar triangle to join Lake Abbé in Djibouti ³⁵.

Lake Victoria, Lake Turkana, Lake Abbé, Lake Jipe, Lake Chala, and Lake Magadi are *Transboundary Lakes of HoA GW4RP MS (Figure 10)* ³⁶. The Kenyan Rift valley lake basins from North to South are: Turkana, Logipi, Baringo, Bogoria, Nakuru, Elementeita, Naivasha and Magadi. Lake Logipi, L. Bogoria, L. Elementeita and L. Magadi receive a considerable part of the inflow from springs. Lake Turkana, Baringo, Nakuru are mainly fed by rivers. Only Lake Naivasha and Lake Baringo are freshwater lakes. The position of the lake with respect to topography and other lakes plays a dominant role in the regional hydrogeology. In general the lakes at the topographic high elevation are fresh through an outflow of groundwater (eg. Naivasha) and lakes in the low parts act as the final collector (e.g. Magadi). The relative position of the lakes will thus govern the regional flow patterns, where Naivasha constitutes the main recharge area and Magadi and Baring/Bogoria the main discharge areas ³⁷. By their virtue of their spatial location and hydrological connectivity, from five *Transboundary Lakes*, only *Lake Turkana* would likely to be impacted by *HoA GW4RP phase-I*.

Table-9: Transboundary Lakes of HoA GW4RP

Name of Lakes	Sharing countries	River(s) draining into Lake	Water quality
Lake Victoria	Kenya, Tanzania & Uganda	Nyando, Yala, Nzoia, Sonndu, Kibos, Kuja Mara	Fresh
Lake Turkana	Ethiopia & Kenya	Tukwel (Kenya, Kerio(Kenya), & Omo(Ethiopia)	Brackish
Lake Abbé	Djibouti & Ethiopia	Awash River	Saline
Lake Jipe	Kenya & Tanzania	Umi	Fresh
Lake Chala	Kenya & Tanzania	(Underground seepage)	Fresh
Lake Magadi	Kenya & Tanzania	Ewaso Kedong	Saline(pH 10.5)

Source: Ministry of Environment and Mineral Resources (MEMR), 2012. Kenya Wetlands Atlas

³⁵ FDRE-MOWE and MOIL, 2022. Environmental and Social Management Framework (ESMF) for Horn of Africa - Groundwater for Resilience Project (P174867 HoA-GW4RP)

³⁶ Ministry of Environment and Mineral Resources (MEMR), 2012. Kenya Wetlands Atlas).

³⁷ Odada, Eric & Olago, Daniel O. (Ed.) Proceedings of the 11th World Lakes Conference: vol. 2. p. 7-14: <http://hdl.handle.net/1834/3518>).



Figure-10: Transboundary Lakes of HoA GW4RP

Transboundary Aquifers (TBAs): Currently more than 450 TBAs have been identified globally ³⁸. A large number of TBAs have also been identified for Africa, presently about 80 TBAs, but more and smaller ones are likely to be added as more information and knowledge becomes available. IGAD region has 11 known TBAs ³⁹. Transboundary aquifers in the HoA vary in size from 10,000 to 50,000 km² and cover in total more than 200,000 km², with a population of over 5 million people ⁴⁰. In HoA GW4RP area, there are seven TBAs: namely: Merti, Jubba, Shabelle, Dawa, Sudd, Afar Rift Valley, and Gedaref (Figure 11 & Table 10). The agreement reached between Ethiopia and Kenya regarding the name of the last transboundary aquifer (TBA) of Northern Basement Aquifer that will be studied in the initial phase of the IGAD project.

³⁸ IGRAC, 2012. Transboundary Aquifers of the World, https://www.unigrac.org/sites/default/files/resources/files/TBAmapping_2015.pdf

³⁹ Nijsten, G.-J., Christelis, G., Villholth, K. G., Braune, E., and Gaye, C. B., 2018. Transboundary aquifers of Africa: Review of the current state of knowledge and progress towards sustainable development and management: Journal of Hydrology: Regional Studies, v. 20, p. 21-34.

⁴⁰ WBG, 2021. Horn of Africa Initiative: Supporting Recovery through Deepening Economic Integration and Promoting Regional Cooperation: Description of Priority Projects and Readiness

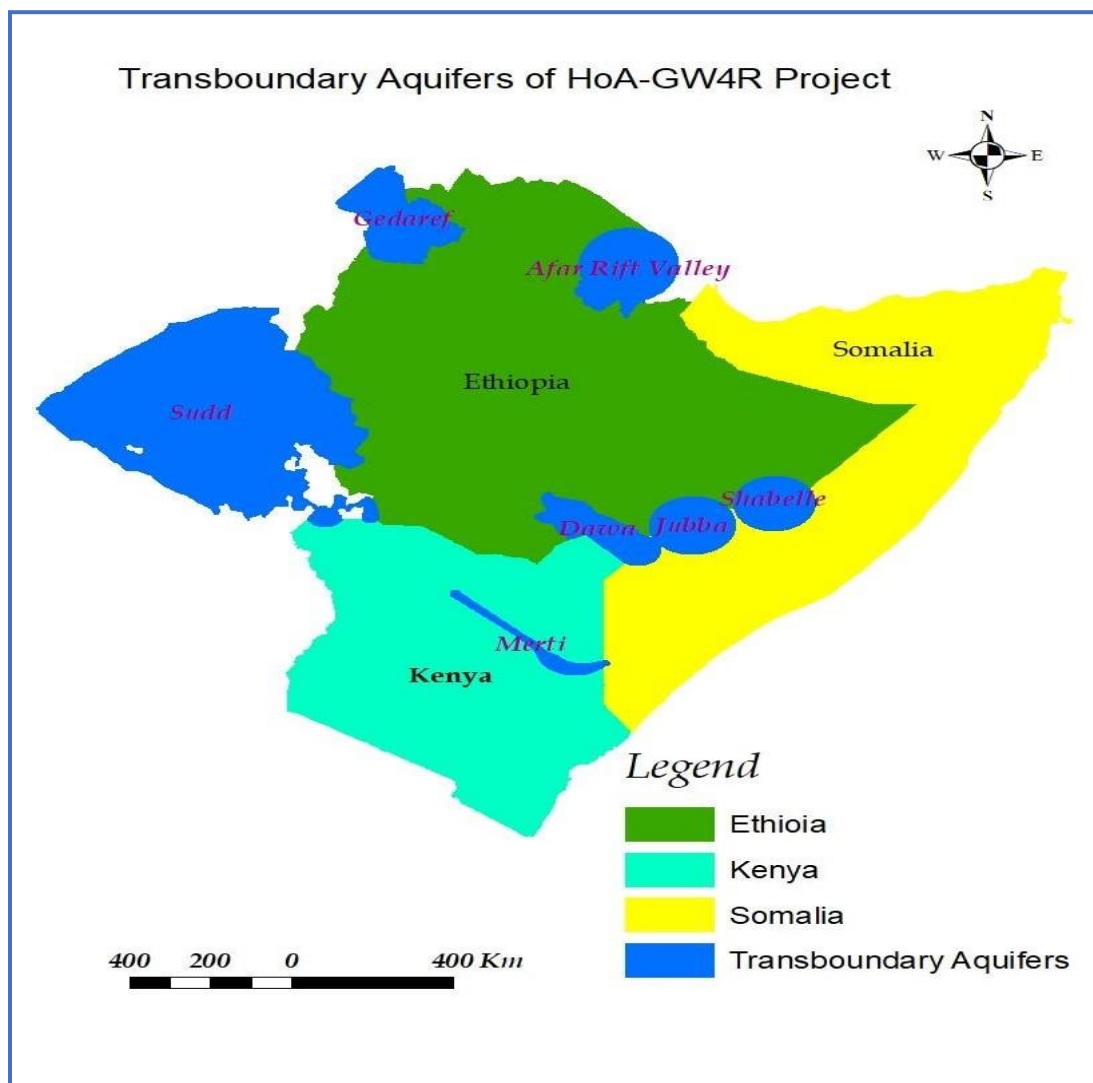


Figure-11: Transboundary Aquifers of IGAD Region

Table-10: Transboundary Aquifers of HoA GW4RP

ID	Aquifer Name	Sharing countries	Remark
AF38	Merti Aquifer	Kenya, Somalia	
AF43	Dawa	Ethiopia, Kenya and Somalia	
AF44	Jubba	Ethiopia, Somalia	
AF45	Shabelle	Ethiopia, Somalia	
AF46	Sudd	Ethiopia, South Sudan	
AF59	Afar Rift Valley	Djibouti, Ethiopia	
AF61	Gedaref	Ethiopia, Sudan	
	Northern Basement Aquifer	Ethiopia, Kenya	TBA suggested by MSs

4.1.8 Marine and Coastal Resources

With its 11,618 km of ocean shoreline, which covers Djibouti, Eritrea, Kenya, Somalia, and Sudan, the IGAD region is blessed with a wide range of coastal and marine resources. Numerous islands, lagoons, coral gardens, and mangrove swamps flank that shoreline. According to the UNCLOS, the shorelines enjoy exclusive access to a sizable Exclusive Economic Zone (EEZ) that has the potential for marine fisheries, seaweed harvesting, tourism, mining, and oil and gas development. The region's coastal and marine environment is home to a wide range of habitats made up of distinctive ecosystems that support a rich biodiversity and a priceless array of natural resources. This array of resources has supported an expansion of social and economic opportunities through enterprises such as fishing, agriculture, aquaculture, tourism and industrial expansion. The threats to achieving the potential offered by coastal and marine resources in the region are: impacts of climate change; habitat loss and degradation (e.g., tar-balls problem since it is the world's main transport route for hydrocarbons whereby oil tankers pass through the Gulf of Aden, transporting some 590 million tons of oil a year); over-fishing and fishing-related damage; silting of estuaries and coral gardens and inadequate investment in coastal zones ⁴¹.

Mangroves in the Western Indian Ocean region stretch from Somalia until Southern Africa, including Madagascar. They cover 745,518 ha in this region. Mangroves in Kenya are spread around 18 formations along the coastline, with about 74% of these forests occurring in Lamu and Tana River, where the protective influence of barrier islands off the coast is large. Lamu and Tana mangroves extent and loss (1996-2020) in the estuary have resulted in an abundance of mangroves that cover a combined total of 40,224 ha. Tens of thousands of people depend on the natural resources that are provided by this seascape, among them fishing, wood logging, and small-scale agriculture. Tourism is another important source of income. The protective influence of barrier islands off the coast of Lamu and the large estuary has resulted in an abundance of mangroves in the area. In fact, the largest area of mangroves in Kenya is found in the Lamu district where lush forests cover more than 300km². The Kwale, Kilifi, Tana River and Mombasa districts all have mangrove areas (Figure 12). The lack of protection along the remaining coast, with the exception of some stands in the far south, leaves few extensive mangroves elsewhere. Eight species of mangroves (*Rhizophora mucronata*, *Ceriops tagal*, *Bruguiera gymnorhiza*, *Avicennia marina*, *Sonneratia alba*, *Heritiera littoralis*, *Xylocarpus granatum*, and *Lumnitzera racemosa*) are found in Kenya and they follow typical East Africa zonation patterns. *Heritiera littoralis* is a rarer species and its largest concentration in East Africa is found in the Tana River Delta ⁴².

The Global Mangrove Watch is an online platform that provides remote sensing data and tools for global monitoring of mangroves in scientific collaboration with Wetlands International, Aberystwyth University, soloEO, The Nature Conservancy, Cambridge University, JAXA, NASA, and a host of partners. According to Global Mangrove Watch, the extent of Mangrove in Kenya has decreased by 5.61km² between 1996 and 2020 ⁴³.

⁴¹ IGAD, 2007. IGAD Regional Environment and Natural Resources Strategy

⁴² Taylor, M., Ravilious, C., & Green, E. P. (2003). Mangroves of East Africa V4. 0. *UNEP World Conservation Monitoring Centre (UNEP-WCMC)*. URL: <http://data.unep-wcmc.org/datasets/7>.

⁴³ Bunting, P., Rosenqvist, A., Hilarides, L., Lucas, R. M., Thomas, N., Tadono, T. & Rebelo, L. M. (2022). Global mangrove extent change 1996-2020: Global mangrove watch version 3.0. *Remote Sensing*, 14(15), 3657. https://www.globalmangrovetwatch.org/country/SOMactiveLayers=mangrove_extent&category=distribution_and_change&zoom=12.159881534523233



Figure-12: Mangrove distribution of Kenya from: Michelle Taylor, et al, 2003(left) and Global Mangrove Watch (right)

Somalia's coastline stretches along 3 025km, the longest national coastline on the East African mainland. Six species of mangroves (*Rhizophora mucronata*, *Cerriops tagal*, *Bruguiera gymnorrhiza*, *Avicennia marina*, *Sonneratia alba*, and *Lumnitzera racemosa*) are found in Somalia. What is known is that mangroves are found in three tidal estuaries between Saada Din Island and Saba Wanak in the extreme south of the country (Figure 13). The Caanoole Estuary and the Bushbush Estuary, which are tidal for approximately 30km inland, have narrow, 20m, mangrove fringes. The Bushbush Estuary runs through the Bushbush Game Reserve, Somalia's only marine protected area with mangroves. Northern areas of Somalia are subtropical and thickets of low, scattered mangroves, usually *Avicennia marina*, exist. However, an upwelling of cold water inhibits abundant mangrove development. Mangroves have also formed in the low wave energy, intertidal zones of channels along the Kisimayo coast⁴⁴. According to Global Mangrove Watch, the extent of Mangrove in Somalia has decreased by 1.65km² between 1996 and 2020⁴⁵.

⁴⁴ Taylor, M., Ravillious, C., & Green, E. P. (2003). Mangroves of East Africa V4. 0. UNEP World Conservation Monitoring Centre (UNEP-WCMC). URL: <http://data.unep-wcmc.org/datasets/7>.

⁴⁵ Bunting, P., Rosenqvist, A., Hilarides, L., Lucas, R. M., Thomas, N., Tadono, T. & Rebelo, L. M. (2022). Global mangrove extent change 1996-2020: Global mangrove watch version 3.0. *Remote Sensing*, 14(15), 3657. <https://www.globalmangrovetwatch.org/country/SOM>.

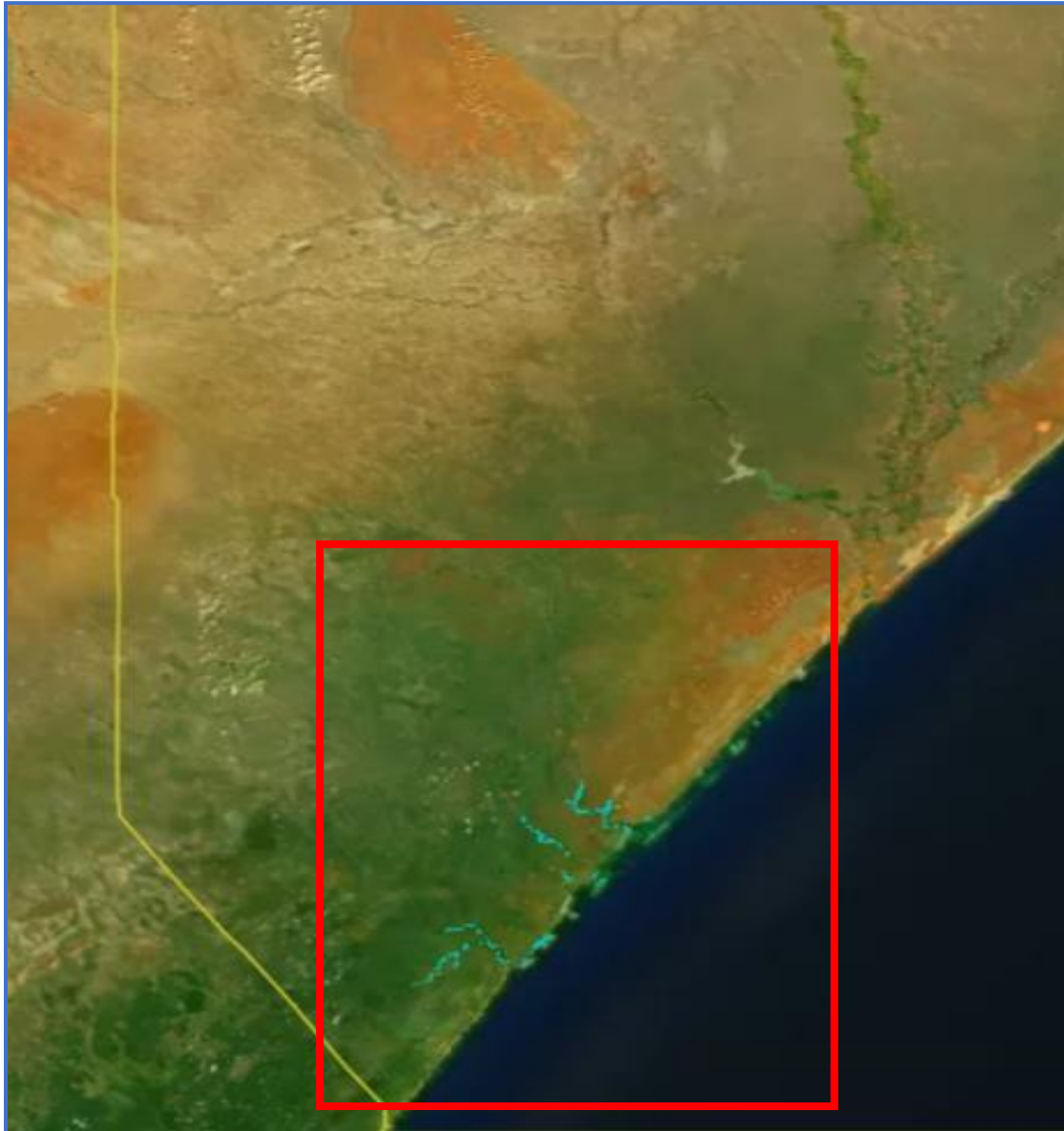


Figure-13: Mangrove at Saba Wanak in the extreme south of Somalia extracted from Global Mangrove Watch

The HoA-GW4R project activities associated with over-pumping of aquifers will affect groundwater-dependent estuarine and near-shore marine ecosystems along Somalia and Kenya's ocean shorelines. WB ESS3 (Resource Efficiency and Pollution Prevention and Management) recognizes that economic activity and urbanization often generate pollution in the air, water, and land and consume finite resources that may threaten people, ecosystem services, and the environment at the local, regional, and global levels. Thus, all the necessary mitigation measures will be considered in this SESA study.

4.2 Biological Conditions

4.2.1 Flora and Fauna ⁴⁶

Ethiopia is home to an estimated 6,000 species of higher plants 10% of which are endemic. There are 861 species of birds and 284 species of wild animals in the nation. There are now 1,225 species of arthropods, 201 species of reptiles, 200 species of fish, 63 species of amphibians, and limited information on other wild creatures. 29 wild mammals, 18 birds, 10 reptiles, 40 fish, 25 amphibians, and 7 arthropod species are indigenous to Ethiopia, including the Ethiopian Wolf (*Canis simensis*), which is one of these faunal riches. Ethiopia also has a wide diversity of microbial biodiversity, which is hardly explored. The main direct threats to Ethiopia's biodiversity include habitat loss and degradation due to expansion of agriculture and settlements and encroachment of invasive species; unsustainable utilization of biodiversity from overgrazing, overharvesting, and unregulated hunting; proliferation of invasive species; and pollution. Indirect causes of biodiversity loss in the country are demographic change, poverty, and a lack of awareness and coordination. Long-term, climate change represents challenges, particularly shifting growing seasons.

Kenya is endowed with diverse ecosystems and habitats that are home to unique and diverse flora and fauna. In Kenya, there are more than 7,000 different plant species, more than 1,000 of which are indigenous or nearly endemic. A third of the 356 plant species that have been classified as endangered by the IUCN Red List are indigenous to Kenya. Though just 2,000 have been identified, the number of fungal species in the nation is thought to be around 5,000. Eight of Kenya's 1,100 bird species are indigenous. Fish populations in Kenya's freshwater and marine habitats are both biologically diverse and significant economically. Over 60 of these species are threatened, according to the IUCN Red List. Over 35,000 invertebrate taxa have been recorded and described, with many thousands more remaining to be described. The overriding threat facing biodiversity in Kenya is habitat degradation, fragmentation, and loss, such as land use changes, physical modification of rivers or excessive withdrawal from rivers, loss of coral reefs, and damage to sea floors due to trawling. The main drivers are: human population growth, exerting pressure on biodiversity habitats and land resources; poverty leading to unsustainable use of land resources and biodiversity; and limited financial resources to support biodiversity conservation.

Although there haven't been many studies on species diversity in Somalia, it is thought to be home to more than 175 animal species and 671 bird species. There have been more than 3,000 plant species identified, 836 of which are thought to be native to the nation. Somalia is home to 29 species of amphibians and 230 distinct reptiles, 80% of which are native to the country. Unrecorded species from Somaliland include additional ones. The critical threats to biodiversity in Somalia include habitat loss and degradation, deforestation, poverty, pollution, political pressure, climate change, woodland conversion to agriculture and urbanization, unsustainable harvesting, and invasive alien species. These are underpinned by indirect drivers such as poverty, insecurity, civil conflict, and a lack of institutional capacity for conservation.

⁴⁶ IUCN ESARO (2020). The state of protected and conserved areas in Eastern and Southern Africa. State of Protected and Conserved Areas Report Series No. 1. Nairobi, Kenya: IUCN ESARO).

4.2.2 Key Biodiversity Areas

The IGAD region is endowed with rich biological diversity, which, if sustainably exploited, could literally put the region on the road to prosperity. The region's biodiversity presents a wealth of development prospects, including those for biotechnology, ecological services, biological products, trade, tourism (particularly ecotourism), and ecotourism. The biodiversity of the area is largely transboundary. Despite the potential that biodiversity resources hold for the region's sustainable development, these resources are increasingly in danger due to factors like habitat loss and degradation, foreign invasive species, and weak institutional and legal frameworks. Transboundary resources must be carefully managed, regulated, and conserved through cross-border regional agreements in order to maintain or improve ecosystem function and biodiversity conservation in large-scale natural systems. This will help to prevent further resource depletion and scarcity ⁴⁷.

Ethiopia has 104 protected areas covering 200,074 km² of land. There are 79 Key Biodiversity Areas. Ethiopia includes part of the Boma-Gambella Landscape and the Lower Awash-Lake Abbé Landscape transboundary conservation areas. Kenya has 411 protected areas covering 72,545 km² of land and 904 km² of ocean. 72 sites in Kenya are Key Biodiversity Areas. Kenya includes part of five transboundary conservation areas, namely: i) Amboseli-Kilimanjaro-Longido; ii) Mount Elgon; iii) Serengeti-Mara; iv) Tana-Kipini-Laga Badana Bushbush Land and Seascape; and v) Tanga Marine Reserves System, Tanga Coelacanth Marine Park, Diani Chale, and Kisitee-Mpunguti (Table 11). Somalia has 21 protected areas. Two of them are Key Biodiversity Areas. These are point records with no reported area, so it is not possible to provide an area for the coverage of these protected areas. Somalia includes part of the Tana-Kipini-Laga Badana Bushbush Land and Seascape transboundary conservation areas ⁴⁸.

The Environment and Social Standard (ESS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources) for the WB sets out general provisions on risks and impacts to biodiversity resources from project activities. The ESS6 recognizes that protecting and conserving biodiversity and sustainably managing living natural resources are fundamental to sustainable development. From the seven transboundary conservation areas of member states, Boma-Gambella Landscape (Ethiopia and South Sudan), Lower Awash-Lake Abbé Landscape (Djibouti and Ethiopia), and Tana-Kipini-Laga Badana Bushbush Land and Seascape (Kenya and Somalia) would likely be impacted by HoA GW4R Program activities.

⁴⁷ IGAD, 2007. IGAD Regional Environment and Natural Resources Strategy

⁴⁸ IUCN ESARO, 2020. The state of protected and conserved areas in Eastern and Southern Africa. State of Protected and Conserved Areas Report Series No. 1. Nairobi, Kenya: IUCN ESARO).

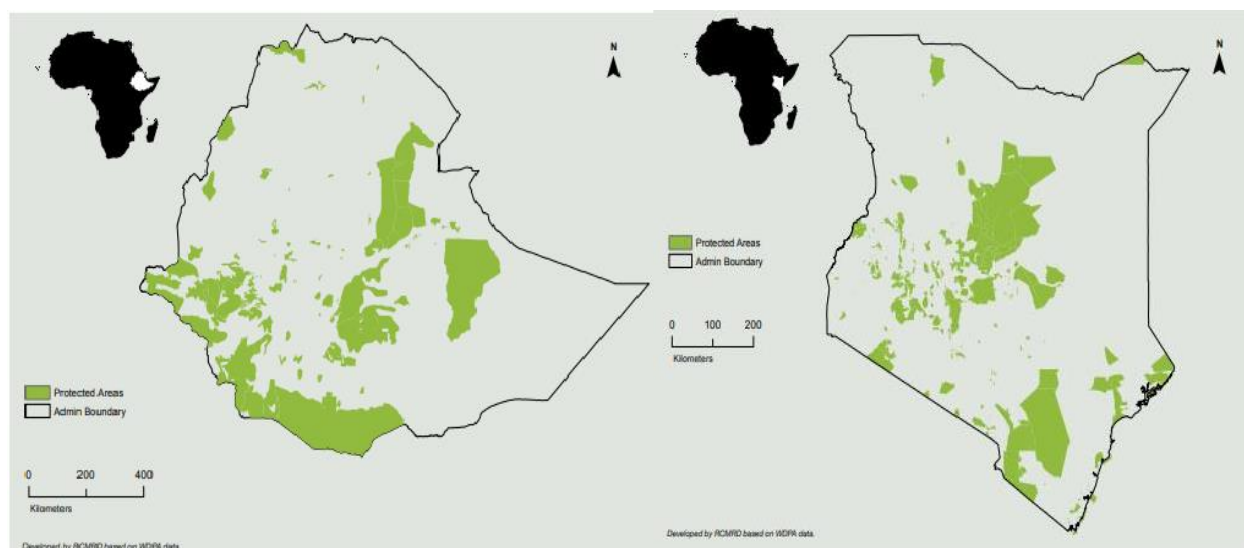


Figure-14: Protected Areas of Ethiopia and Kenya (Source: IUCN ESARO, 2020. The state of protected and conserved areas in Eastern and Southern Africa. State of Protected and Conserved Areas Report Series No. 1. Nairobi, Kenya: IUCN ESARO)

Table 11: Transboundary Conservation Areas of HoA GW4RP

No.	Name of transboundary conservation areas	Sharing Countries
1.	Lower Awash-Lake Abbé Landscape transboundary conservation areas	Djibouti & Ethiopia
2.	Boma-Gambella Landscape	Ethiopia & South Sudan
3.	Amboseli-Kilimanjaro-Longido	Kenya & Tanzania
4.	Mount Elgon	Kenya & Uganda
5.	Serengeti-Mara	Kenya & Tanzania
6.	Tana-Kipini-Laga Badana Bushbush Land and Seascape	Kenya & Somalia
7.	Tanga Marine Reserves System, Tanga Coelacanth Marine Park, Diani Chale, and Kisitee-Mpunguti	Kenya & Tanzania

In Ethiopia, there are a number of protected areas potentially affected by the project (HoA-GW4RP). These include Alataish NP, Mahiberesilasie CBCA, Godebe Proposed Park, Bagussa NP, Daubs Valley controlled hunting area (CHA), Gergeda national forest priority area (NFPA), Jikao CHA, Gambella national park (NP), Tedo CHA, Akobo CHA, Gura Ferda NFPA, Omo West CHA, Murule CHA, Chelbi wildlife reserve (WR), Borena NP, Yabello sanctuary, Arero NFPA, Mille-Serdo WR, Dengego-Melak Jabdu NFPA, Malka Mari NP, and Sibilo NP. Kenya's protected and conservation areas, such as: (a) Forest Reserve; (b) Game Sanctuary; (c) Marine National Park; (d) National Park; and (e) National Reserve, are also potentially affected by the project (HoA-GW4RP). Somalia is also part of two biodiversity hotspots. The first is the Horn of Africa biodiversity hotspot, which encompasses Somalia's northern and central regions. The East African Coastal Forest Biodiversity Hotspot is the second hotspot and is more pertinent to the current report. These biodiversity hotspots will be potentially affected by the project (HoA-GW4RP). Within some TBAs, there are National Parks and National Reserves. For instance Marsabit National Park and Marsabit National Reserves are found within Merti TBA while Marka Mari National Park is found within Dawa TBA.

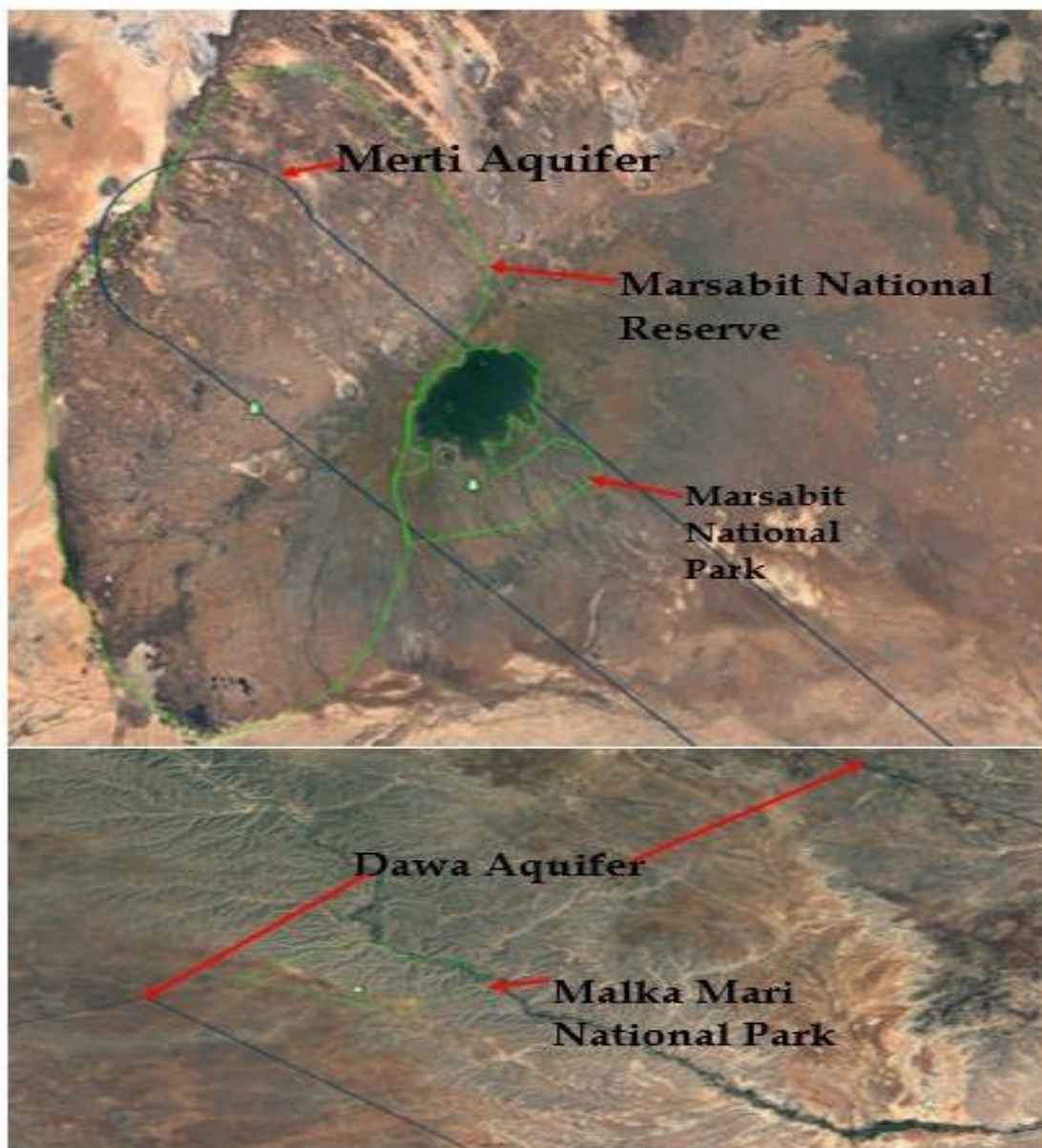


Figure-15: National Parks and National Reserves within Transboundary Aquifer of HoA GW4RP

4.3 Socio-economic Conditions

4.3.1 Population

Ethiopia is a sizable, largely rural, multicultural nation with a rapidly expanding population. In 2020, the country's population was projected to be 115 million, making it the second-largest in the region. More than 80% of the population lived in rural areas. With a roughly 9% average yearly growth rate over the last ten years. Kenya's present population

density is 94.74 persons per square kilometer, and in 2021 it will reach 54,985,698, a 2.26% rise from 2020. Kenya's rapid population growth continues against the backdrop of relatively high fertility and mortality rates. The urban population in 2020 was 15,053,275, while the rural population was 38,718,025, having increased by 4.09% and 1.59% respectively from 2019. Somalia has a population of 15 million, of which 60 percent are nomadic and semi-nomadic pastoralists, and 60 percent live in rural areas. About 70 percent of the population lives below the poverty line (US\$1.90 a day in 2011 purchasing power parity terms) ⁴⁹.

4.3.2 Traditional Underserved Community

HoA GW4RP sub-components will be implemented mainly in lowland areas of Ethiopia, Kenya, and Somalia, 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.

Pastoralist communities in Ethiopia occupy the largest percentage of the country's total land area along the borders of Somalia, Kenya, Sudan and Djibouti. 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 countries. HoA GW4R project components from the Ethiopia side 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. There are at least five Oromo and Somali sub groups over whom the Boran assumed predominance. These include Gebra (speaking Oromo), Marehan (speaking Somali), Gujji (speaking Oromo), Garri (speaking Oromo and Somali) and the Degodia (speaking Somali).

The constitution of Kenya identifies Turkana County as one whose inhabitants (Turkana People) are indigenous People, they are also found in Marsabit like the Yaaku Waata, Borana, and Gabra in Marsabit and Somali in Garissa and Mandera counties. Marginalization of minority groups and clannism and other cultural issues will be addressed in an Inclusion Plan within the SEP.

Table-12: Kenya Project County Names and Groups Needing Special Attention ⁵⁰

No	Project County Name	Groups Needing Special Attention
1.	Mandera	Waata, Warabeiyi and the Gababwein
2.	Marsabit	Dasanach, El Molo and the Rendille
3.	Wajir	Riba
4.	Turkana	El Molo and Ngibetok
5.	Garissa	Munyoyaya, Malakote and Waliwana,

⁴⁹ FDRE-MOWE and MOIL, 2022.Environmental and Social Management Framework (ESMF) for Horn of Africa - Groundwater for Resilience Project (P174867 HoA-GW4RP)

⁵⁰ Kenya-MOWSI, 2022. Horn of Africa Groundwater for Resilience Project Environmental and Social management Framework (ESMF) final draft).

In Somalia, some vulnerable and disadvantaged groups, such as the Aweer/Boni and Eyle, and possibly some Bantu/Jareer groups, could meet the requirements for ESS7. The project will give special consideration to vulnerable and disadvantaged groups. These include: i. Minority castes and groups; ii. Internally Displaced Persons; iii. Those who live in remote rural areas or areas characterized by violence that are bereft of social services and amenities; iv. Nomadic pastoralist communities; v. People Living with Disabilities; vi. Widows and Widows and female heads of households; and vii. Youth. The Bank will apply ESS7 (Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities) for this project in the same spirit as previously agreed with the member states. The SEP prepared by the IGAD-Water Unit cascades into HoA GW4RP member states how the project will include these groups in consultations throughout the project lifecycle in order that they can input into the design and not be excluded from project benefits. Vulnerable and Marginalized Groups Plans (VMGPs) shall be prepared by HoA GW4RP member states.

4.3.3 Cultural and Natural Heritage Sites

In HoA GW4RP phase-I MS, there are different relevant natural and cultural heritages. Natural heritage sites serve as vital "Sinks" for greenhouse gas emissions and *are key to the protection of biodiversity*. Cultural heritage, on the other hand, can convey traditional knowledge that builds resilience for change to come and leads us to a more sustainable future. Cultural heritage, in its many manifestations, is important as a source of valuable scientific and historical information. It is both an economic and social asset for development and an integral part of people's cultural identity and practice.

Kenya National Museums and Heritage Act Chapter 216 (revised 2012), defines "cultural heritage" as: (a) monuments; (b) architectural works, works of monumental sculpture and painting, elements or structures of an archaeological nature, inscriptions, cave dwellings and combinations of features, which are of universal value from the point of view of history, art or science; (c) groups of separate or connected buildings which, because of their architecture, their homogeneity or their place in the landscape, are of outstanding value from the point of view of history, art or science; (d) works of humanity or the combined works of nature and humanity, and areas including archaeological sites which are of outstanding value from the historical, aesthetic, ethnological or anthropological point of view, and includes objects of archaeological or paleontological interest, objects of historical interest and protected objects.

There are nine UNESCO World Heritage Sites (Aksum, Fasil Ghebbi in Gondar Region, Hara Jugol of the Fortified Historic Town, Konso Cultural Landscape, Lower Valley of the Awash, Lower Valley of the Omo, Rock-Hewn Churches, Lalibela, Simien National Park, and Tiya in Ethiopia as of 2019 (Figure 16a). There are seven world heritage sites in Kenya (Lake Turkana National Park, Mount Kenya National Park and Forest, Lamu Old Town, The Sacred Mijikenda Kaya Forests, the Kenya Lake System in the Great Rift Valley, Fort Jesus, Mombasa, and Thimlich Ohinga Archaeological Site (see Figure 16b). Somalia has never signed the UNESCO charter, making none of its historic sites currently eligible for World Heritage Status. However, Somalia has the top 10 future UNESCO World Heritage Sites (Mogadishu, Zeila, Taleh Fortress Complex, Rock Paintings of Laas Geel, Merca, Barawa, Al-Mnara Tower, Berbera, Citadel of Gondershe, and Ruins of Opone), which they can put forward as candidates for World Heritage Status. Name of Heritage Sites in each of the three MS, Types of Heritage, and Year of Inscription to the List of UNESCO are presented at Table 13. Further information about each heritage site could be retrieved from UNESCO World Heritage Sites: Lists by Country: <https://whc.unesco.org/en/statesparties/et>.

Currently, UNESCO lists 37 transboundary World Heritage sites globally. Maasai Mara National Reserve and Serengeti World Heritage Site connectivity, the geometric rock art sites in the Lake Victoria Basin, and the Omo-Turkana Basin are transboundary World Heritage sites in this program area (Table 14). From the three transboundary World Heritage sites in this program area, the Omo-Turkana Basin is potentially impacted by the program and needs the cross-border collaboration of Ethiopia and Kenya on sustainable ecosystem services in the Omo-Turkana basin. With co-funding from the European Union Trust Fund, the basin countries of Ethiopia and Kenya, working with the United Nations Environment Programme (UNEP) and with support from the UNEP-DHI Centre, implemented a three-year project concerned with sustainable development in Lake Turkana and its river basins. The project supported borderland ecosystems through environmental monitoring and promoted transboundary cooperation. To support decision-making, the project created independent data and tools for the basin countries. The UNEP-DHI Center has developed the *Lake Turkana and its River Basins portal*. This portal provides over 130 data sets covering the basin area ⁵¹.

The Environment and Social Standard (ESS8) for the WB sets out general provisions on risks and impacts to cultural heritage from project activities. ESS8 (Cultural Heritage) sets out measures designed to protect cultural heritage throughout the project life cycle. The project will need to identify and protect these items based on the provisions provided in ESS8. From nine heritage Sites of Ethiopia, only one heritage Site (Lower Valley of the Omo), and from seven Heritage Sites of Kenya, two Heritage Sites (Lake Turkana National parks, and the Kenya Lake system in the Great Rift Valley) would likely be impacted by HoA GW4R Program activities.

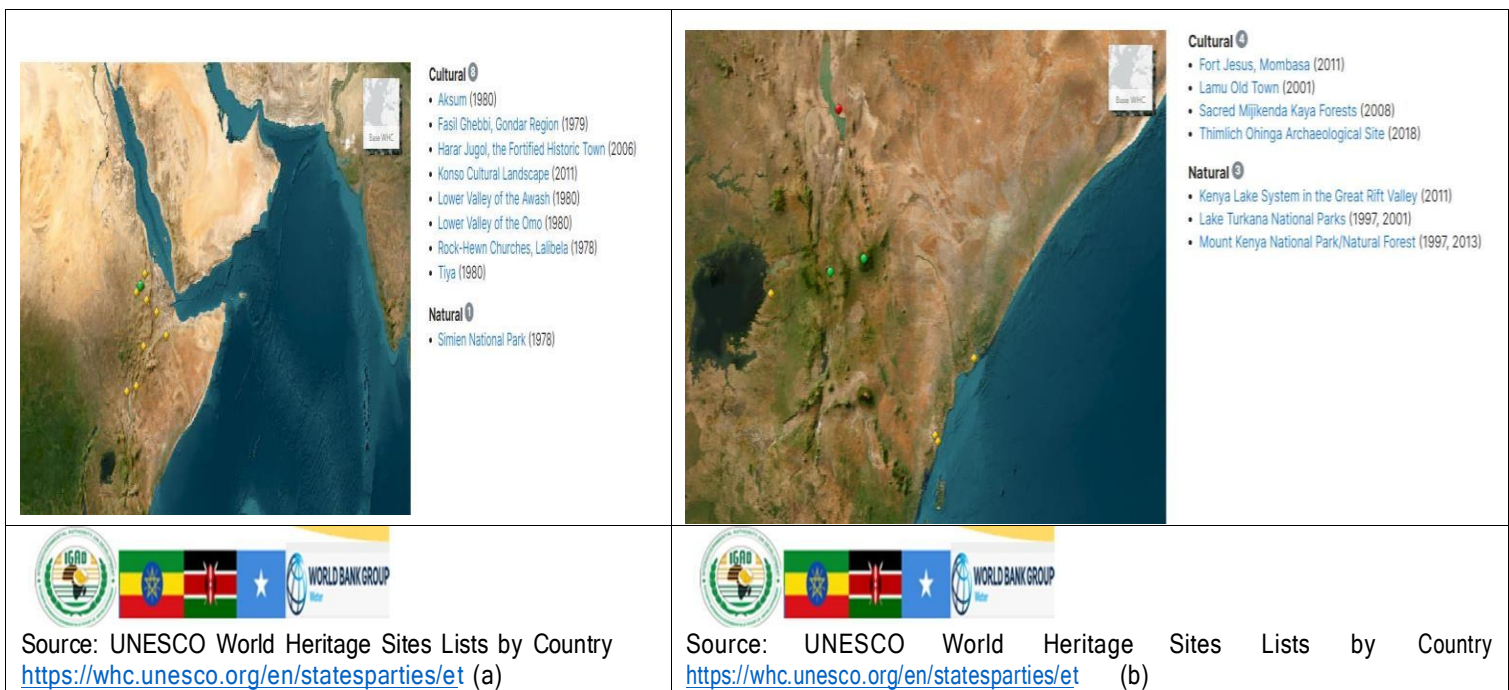


Figure-16: UNESCO World Heritage Sites of Ethiopia (left) and Kenya (right)

⁵¹ UNEP-DHI, --- -.Cross-border collaboration on sustainable ecosystems services in the Omo-Turkana basin: accessed from <https://unepdhi.org/cross-border-collaboration-on-sustainable-ecosystem-services-in-the-omo-turkana-basin/>)

Table-13: Heritage Sites of HoA GW4RP phase-I MS

No	Name of UNESCO Heritage Sites	Country	Types of Heritage	Year of inscribed to the list of UNESCO
1.	Aksum	Ethiopia	Cultural	1980
2.	Fasil Ghebbi, Gondar Region		Cultural	1979
3.	Hara Jugol, the Fortified Historic Town		Cultural	2006
4.	Konso Cultural Landscape		Cultural	2011
5.	Lower Valley of the Awash		Cultural	1980
6.	Lower Valley of the Omo		Cultural	1980
7.	Rock-Hewn Churches, Lalibela		Cultural	1978
8.	Simien National Park		Natural	1978
9.	Tiya		Cultural	1980
10.	Lake Turkana National parks	Kenya	Natural	1997
11.	Mount Kenya National Park and Forest		Natural	1997
12.	Lamu Old Town		Cultural	2001
13.	The Sacred Mijikenda Kaya Forests		Cultural	2008
14.	The Kenya Lake system in the Great Rift Valley		Natural	2011
15.	Fort Jesus, Mombasa		Cultural	2011
16.	Thimlich Ohinga archaeological site		Cultural	2018
17.	Mogadishu	Somalia	Cultural	Somalia has never signed the UNESCO charter, making none of its historic sites currently eligible for World Heritage Status. Once the Somali government signs the charter, the country has a large list of ancient and medieval sites it can put forward as candidates for World Heritage Status.
18.	Zeila		Cultural	
19.	Taleh Fortress Complex		Cultural	
20.	Rock Paintings of Laas Geel		Cultural	
21.	Merca		Cultural	
22.	Barawa		Cultural	
23.	Al-Mnara Tower		Cultural	
24.	Berbera		Cultural	
25.	Citadel of Gondershe		Cultural	
26.	Ruins of Opone		Cultural	

Table -14: Transboundary *World Heritage sites* of HoA GW4RP

No	Name of transboundary World Heritage sites	Sharing countries
1.	Masai Mara National Reserve and Serengeti World Heritage Site connectivity	Kenya & Tanzania
2.	The geometric rock art sites in the Lake Victoria Basin	Kenya, Tanzania & Uganda
3.	Omo-Turkana Basin	Ethiopia and Kenya



Figure-17: Somalia Future UNESCO World Heritage Sites (Courtesy: UNESCO World Heritage Sites Lists by Country <https://whc.unesco.org/en/statesparties/et>)

4.3.4 Conflicts Associated with Drought, Food Insecurity, and Access to Water ⁵²

The general context of conflict in the IGAD region is defined largely by the challenges of practicing pastoralism and agro-pastoralism in an arid and semi-arid landscape that extends across national borders and is so much affected by drought. There are correlations between conflict and food security, climate change (drought), displacement, and migration. Conflict shapes the opportunities and challenges of food security, climate change, displacement, and migration. At the same time, food security, climate change, displacement, and migration drive conflict. Communities living in the IGAD region have over time identified resilience factors such as diversification of livelihoods, negotiating peace agreements, and migration that enable them to survive and get on with their lives in the midst of the conflict situation. Such resilience factors constitute important entry points for programming to address conflict in the region.

⁵² IGAD- IDDRSI, 2022. Conflict Dynamics in IGAD Region: Drought and other Hazards

Ethiopia: The conflict dynamics in Ethiopia are widespread community clashes in parts of Oromia, Amhara, Wolega, Konso, Gambella, and Somali regions. Some of these regions are currently experiencing one of the most severe La Niña-induced droughts in recent decades, with more than 8 million people acutely food insecure and the deaths of 1.5 million livestock due to drought destroying people's livelihoods. Nearly 300,000 drought-affected people have migrated in search of water, pasture, or assistance. More than 8 million people are currently affected across southern and south-eastern parts of the country, including Somalia (more than 3.5 million people), Oromia (more than 3.4 million), SNNP (more than 1.1 million), and the South West (more than 200,000 people) regions.

Kenya: Three consecutive poor rainy seasons in the Arid and Semi-Arid Lands (ASAL) of Kenya have exhausted families' coping capacities and left more than 2.9 million people in urgent need of humanitarian assistance. Livestock deaths due to the drought are reported to have surpassed 5 million, including due to long trekking distances and depleted pastures. In pastoral areas, people are having to trek longer distances in search of water for themselves and forage for their livestock. As pastoralists travel further from their usual zones, several counties—including Baringo, Isiolo, Laikipia, Lamu, Marsabit, Samburu, Tana River, Turkana, and Wajir—have been affected by resource-based conflicts. In some areas, over 90 percent of open water sources have dried up, and the remaining are expected to last only between 1 and 2 months.

Somalia: Drought conditions have deteriorated in Somalia following an unprecedented fourth consecutive failed rainy season. More than 7 million people are affected, up from 6.1 million in May, and over 805,000 are displaced. Disease outbreaks have spiked, with over 5,830 suspected cholera cases reported from 24 drought-affected districts since January. Migration by pastoralists and their livestock continues to increase as people compete for limited resources, potentially stoking social tensions and violent conflicts.

WB ESS4 (Community Health and Safety) recognizes that communities that are already subjected to impacts from climate change may also experience an acceleration or intensification of impacts due to project activities. HoA GW4RP member states communities are already exposed to climate change risks and conflicts associated with drought, food insecurity, and access to natural resources. As a result, ESS4 will be triggered by the already existing impacts from climate change as well as the subproject activities and remain relevant to the HoA-GW4R project.

4.3.5 Gender Based Violence

Protracted crises in the IGAD region have created and exacerbated different forms of gender-based violence, having a devastating impact on the agriculture sector and food security by reducing the capacity and productivity of survivors as a result of illness, injury, stigma, and discrimination. Gender-based violence is the most extreme manifestation of gender inequality and constitutes a violation of fundamental human rights. Research shows that gender-based violence (GBV) is widespread 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 violence. Furthermore, 15% of women in this same age group have experienced physical violence in the last 12 months⁵³.

⁵³ FDRE-MOWE and MOIL, 2022. Environmental and Social Management Framework (ESMF) for Horn of Africa - Groundwater for Resilience Project (P174867 HoA-GW4RP)

According to UNDP Somalia, Somalia has one of the highest rates of gender inequality in the world, with a score of 0.776, placing it fourth overall. The prevalence of violence against women and girls is very high in the nation, as are the rates of rape, female genital mutilation, child marriage, and maternal death. Although this is changing, the minimal positions and participation of women in politics and decision-making still place restrictions on their potential and reinforce inequity⁵⁴.

As per the WB ESS2 (Labour and Working Conditions), borrowers can promote sound worker-management relationships and enhance the development benefits of a project by treating workers in the project fairly and providing safe and healthy working conditions. The commitments under ESS2 shall be outlined in the Labour Management Plan (LMP).

4.3.6 Unemployment

Ethiopia has a very high unemployment rate. 2 million individuals enter the workforce each year, and 25% of urban workers of working age are unemployed. 70% of Ethiopia's working population relies primarily on the agricultural sector for their income. Compared to men, women have greater unemployment rates. In 2015-2016, women made up 45% of the workforce overall, compared to 55% for men⁵⁵.

Total employment in Kenya, excluding those engaged in small-scale farming and pastoralist activities, is estimated to have increased from 17.3 million in 2018 to 18.1 million in 2019. Out of this total number, 70.5% are employed by the private sector, with the leading industries providing wage employment being manufacturing; agriculture, forestry, and fishing; and wholesale and retail trade and repair of motor vehicles. Unemployment is more acute among the youth; it stood at 10.8% compared to the non-youth at 2.5% and was high at 5.3% for males. Therefore, unemployment among youth and women is higher than the overall unemployment rate of 7.4%. In addition, significant disparities exist in urban and rural areas, where they are 11.6% in urban areas compared to 3.4% in rural areas.

In Somalia's labour sector, 47 percent of the population in South Central Somalia is unemployed. Among youth, the rate is even higher at 54 percent. The main employment is in the agricultural sector, where 72 percent of employees worked in 2019, followed by 6 percent in the industrial sector, and 21 percent in the services sector. IGAD will ensure that all Project Workers consisting of direct and contracted workers will be employed in line with relevant national legislation and the requirements of ESS2, in a manner acceptable to the Bank, including inter alia, implementing adequate occupational health and safety measures (including emergency preparedness and response measures), setting out grievance arrangements for project workers, and incorporating labor requirements into the ESHS specifications of the procurement documents and contracts with contractors. IGAD will establish, maintain, and operate a Grievance Redress Mechanism (GRM) for Project workers, as described in the SEP and consistent with ESS2.

⁵⁴ FRS-MEWR, 2022. Horn of Africa Groundwater for Resilience Project Environmental and Social management Framework (ESMF) final draft).

⁵⁵ FDRE-MOWE and MOIL, 2022. Environmental and Social Management Framework (ESMF) for Horn of Africa - Groundwater for Resilience Project (P174867 HoA-GW4RP)

4.4 Situational Analysis

In addition to the above basic environmental and social baseline conditions, a comprehensive situational analysis of the groundwater sector, environment, and social aspects in the HoA Initiative region was conducted. SESA of HoA-GW4RP is based on the analysis of a combination of the Strengths, Weaknesses, Opportunities and Threats (SWOT) of the environmental, social, political, economic, technological, and legal situation of HoA Region. Information from the existing literature and studies done in IGAD was extracted and added to each section of the SWOT analysis. It was applied as a technique to facilitate sustainable groundwater management and access to conserve and protect its quality. The results from all the SWOT analyses were combined and summarized below.

4.4.1 Strengths

Major strengths of SWOT output are: establishment of permanent IGAD Secretariate for HoA Region, the presence of technical and financial support from WBG, AfDB and EU, intensive process of dialogue to agree priorities under the identified four pillars and in managing conflicts and enhance cooperation among member states, data collection and information sharing among member states, establishment and operational of Horn of Africa Groundwater Information System (HoA-GWIS), Creation of IGAD Platform for groundwater collaboration(I-GWC and NGWC), establishment of IGAD Geoportal and GIS MAR Portal, the presence of groundwater sampling and monitoring programs, and starting modelling, mapping and studies of groundwater availability in the HoA Regional (Groundwater Mapping of Merti aquifer shared between Kenya and Somalia, and feasibility study for groundwater development and management in the Dawa transboundary aquifer (Shared between Ethiopia, Kenya, and Somalia).

In general, the HoA Initiative region has a permanent secretariat that can start and oversee initiatives and programs including transboundary groundwater management and monitoring activities. They can serve as a forum for rallying political support across the basin and elevating groundwater on the political agenda. The territory covered by the HoA Initiative offers a solid platform for securing funding for transboundary groundwater initiatives like monitoring. The AfDB, EU, and WBG were the three development partners that the HoA Initiative countries requested and received technical assistance from in order to prepare the initiative beginning in early 2019 ⁵⁶.IGAD participates actively in the HoA Initiative and acts as a resource institution, particularly in resilience-related fields. The countries have worked cooperatively over the past two years to improve regional cooperation around shared goals in peace, prosperity, and development. The HoA Initiative countries engaged in a thorough consultation process to establish priorities under the four pillars, which are anticipated to work together to address major development concerns and advance peace and security: Regional infrastructure networks, trade and economic integration, resilience, and the development of human capital are listed in that order.

⁵⁶ WBG, 2021.Horn of Africa Initiative: Supporting Recovery through Deepening Economic Integration and Promoting Regional Cooperation: Description of Priority Projects and Readiness

The HoA-GWIS is under establishment and operational in the region. It will be essential for sustainable groundwater management as it will allow countries to generate and share data on transboundary aquifers, adding value to inform decision-making and joint planning. Data collection and information sharing among member states started. Continued regional-level dialogue is imperative and forms the basis for cooperation and managing conflicts in the IGAD region. To enhance cooperation between all member states, IGAD conducted a series of inter-sectoral dialogues and systematic multi-stakeholder consultation processes. The platform is key to coordinating sustainable management of transboundary aquifers at the regional or national level by creating an enabling mechanism/environment to facilitate a trust-building process, stimulate the initiation of processes that help strengthen cooperation at the regional level, share experience and knowledge at the regional level, and improve the capacities of institutions and other stakeholders through capacity building/training workshops and study visits/exchanges. To enhance regional cooperation for the collection, analysis, dissemination, and exchange of hydrological and hydro-meteorological data and information for water-related decision-making, the IGAD Hydrological Cycle Observation System (HYCOS) project, funded by the EU, implemented⁵⁷.

IGAD developed the Spatial Web Portal (IGAD Geoportal). The IGAD Spatial Web Portal is an extension of Geo-Node. This portal is intended to provide spatial services to a larger audience with no or little GIS experience. Layers are given for further use in a GIS environment by experts. Finished and ready-to-use map products are listed in the "Documents and Maps" category. Users can also compose their maps interactively, making use of the base maps and layers provided in the portal⁵⁸. The IGAD Inland Water Resources Management Programme (IGAD-INWRMP), an EU-funded programme that aims to strengthen national and regional capacities in the field of water resources management and to develop regional dialogue and cooperation for sustainable water resources management in the Horn of Africa, has commissioned a project on Managed Aquifer Recharge (MAR) in the transboundary Merti Aquifer, shared by Kenya and Somalia. The study has demonstrated that the Merti aquifer contains both the water supplies and the characteristics of the landscape needed for MAR interventions. The MAR suitability map shows that both shallow and deep groundwater have the possibility for MAR interventions. Direct aquifer infiltration, diffuse land surface infiltration, localized land surface infiltration, surface water storage, and in-stream interventions are examples of shallow MAR interventions⁵⁹.

⁵⁷ IGAD, 2012. Hydrological Cycle Observing System (HYCOS) Project - IGAD-HYCOS/IGAD-HYCOS Project: Funded by EU-Implemented by WMO, Revised Project Document.2012)

⁵⁸ IAD, 2019. IGAD Geoportal, <https://geonode.igad.int/docs/intro/igad/igad.html>

⁵⁹ IGAD, 2014 Design and development of a management system for Managing Aquifer Recharge in the Horn of Africa, <https://isarm.org/project/design-and-development-management-system-managing-aquifer-recharge-horn-africa>

In order to establish recommendations and guidelines for future groundwater exploration, management, and protection and assess associated environmental and social risks and mitigation measures, a feasibility study on the Dawa Transboundary Aquifer System is being conducted. The objective of this work is to undertake a feasibility study on the Dawa Transboundary Aquifer System (shared between Ethiopia, Kenya, and Somalia) in order to: a) compile and complement the knowledge of the aquifer and assess key data gaps; b) assess the availability and variability of surface water and groundwater resources and their vulnerability to climate change, and evaluate the uncertainties related to these assessments; c) provide preliminary plans for developing water-related infrastructure for socio-economic development; and d) develop an Aquifer Management Plan (AMP) and Decision Support System (DSS) for the Dawa aquifer,⁶⁰ transboundary aquifer shared between Ethiopia, Kenya and Somalia.

Table-15: Summary of Strengths of SWOT analysis

No	Strengths
1.	Establishment of permanent IGAD Secretariate for HoA Region with reliable and long experience in resilience and disaster management
2.	The presence of technical and financial support from WBG, AfDB and EU
3.	Intensive process of dialogue to agree priorities under the identified four pillars and in managing conflicts and enhance cooperation among member states
4.	Data collection and information sharing among member states
5.	Establishment and operational of Horn of Africa Groundwater Information System (HoA-GWIS),
6.	Creation IGAD Platform for groundwater collaboration (I-GWC and NGWC),
7.	Establishment of IGAD Geoportal and GIS MAR Portal
8.	Starting modelling, mapping and studies of groundwater availability in the HoA Regional (Groundwater Mapping of Merti aquifer shared between Kenya and Somalia, and feasibility Study for Groundwater Development and Management in the Dawa Transboundary Aquifer (Shared between Ethiopia, Kenya, and Somalia).

4.4.2 Weakness and Challenges

Different IGAD member nations have different levels of groundwater-related information, institutions, infrastructure, and incentives (the 4I's). These are comparatively well-developed in Kenya and Ethiopia, but they still need to be improved to better withstand droughts and meet the problems of rising water demands. Country differences show the need for context-appropriate approaches that, over time, might be synchronized and complemented to enhance the transboundary advantages of groundwater resources in the HoA. They demonstrate the necessity of coordinating groundwater information, institutions, infrastructure, and incentive efforts with the successful implementation of solutions at all scales (regional, national, sub-national, and local), as well as the need to foster inclusive innovation.

⁶⁰ IGAD, 2023. Terms of Reference for Feasibility Study for Groundwater Development and Management in the Dawa

Groundwater constitutes an area of unprecedented opportunity for the Horn of Africa. However, despite its potential to help rural people better withstand and adapt to the effects of shocks and stressors, groundwater knowledge and use in the area are still lacking, and continuing efforts are insufficient to change this. The majority of the sizable, potential groundwater aquifers are transnational in scope. But the area lacks operational forums (such as transboundary commissions, basin authorities, or others) to promote communication, information sharing, cooperative governance, and monitoring. IGAD continues to work in this area, although country ability and commitment to cooperation in pursuit of shared objectives are limited. The five Is (information, institutions, infrastructure, implementation, and innovation) are still in need of improvement in many countries despite having enormous potential aquifers contained within their borders. Although there is considerable will to improve regional conversation on transboundary resources, progress on that front is nevertheless hampered by the slow development of groundwater knowledge, institutional structures, and confidence in national aquifers. Because of the disparity in capabilities between the region's nations, remedies must be both individualized and coordinated ⁶¹. The implementing institutions existing E&S risk management capacity and prior experience are weak and limited due to the lack of project implementation experience; etc. Institutional capacity and practices for implementation and sustainability risks are rated substantial. Institutional capacities vary largely among the participating countries, but across the region, rural water supply schemes and water related investments in remote areas present significant sustainability challenges. Countries like Kenya and Ethiopia have higher institutional capacity than Somalia. The later will require stronger program support in terms of reinforcing institutional implementation arrangements and building capacities for service delivery.

One of the main challenges in the region is the lack of targeted groundwater monitoring to support the management and regulation of water allocation and use ⁶². In the case of Somalia, the groundwater situation is weakened by higher aridity, while Somalia faces challenges related to lower and more sparse population density and insecurity. Despite these challenges, there is still a large potential for groundwater development in the four countries that can be achieved through increased, targeted support for the sector.

The technology to utilize groundwater resources and assure their wise use, as well as the skills and knowledge required to discover and comprehend them, are improving globally. The HoA region, however, does not gain from this development. Hydro geophysics improvements, new sensors that are smarter, smaller, and less expensive and may be used in real-time applications, among other things, are not reaching the sub-region to the required extent. A quick and reliable foundation for the siting of boreholes in shallow and deep aquifers as well as the choice and design of suitable Managed Aquifer Recharge (MAR) structures is provided by groundwater mapping using high-resolution satellite data and remote sensing/GIS analysis; however, follow-up is frequently delayed due to the lack of implementation capacity by responsible entities ⁶¹.

⁶¹ WBG, 2021. Horn of Africa Initiative: Supporting Recovery through Deepening Economic Integration and Promoting Regional Cooperation: Description of Priority Projects and Readiness

⁶² WB, 2022. Horn of Africa Groundwater for Resilience Project using the Multiphase Programmatic Approach: Project Appraisal Document

There are potentially adverse environmental and social challenges related to groundwater. Groundwater development may have detrimental social and environmental effects due to a variety of circumstances. When used in such conditions, groundwater supplies can spread disease to people and cattle and can take decades or centuries to recover from pollution. Overuse of groundwater resources can result in saline intrusion or the drying out of groundwater-dependent surface waterways, rendering water unfit for many uses. In Kenya, some aquifers are being over-abstracted with associated problems of water level decline and sometimes water quality deterioration, in particular the Nairobi volcanic aquifer. In total, groundwater abstraction is 57.2 Mm³/year, or 30% of recharge. Similar to other parts of the world, the HoA region may experience development constraints due to natural (geo-genic) and human-caused groundwater pollution. Although it does not yet pose serious problems, water pollution is on the increase in the IGAD region due to inadequate wastewater treatment, industrial activities, mining and the use of agricultural fertilizers and pesticides. Groundwater that is too salinized may not be acceptable for particular livestock or certain crops. Groundwater contamination from naturally occurring fluoride, arsenic, or other dissolved species can make it unsafe for human consumption. A specific feature of the groundwater quality in Ethiopia is the presence of fluoride and salinity, mainly in the Rift Valley, making 30% of resources below standards for drinking. Another issue is anthropogenic groundwater pollution, which is particularly problematic in cities. Inadequate sewage systems, on-site pit latrines, animal feedlots, and other factors can result in harmful microbiological contamination, while some industries (such as those that use petroleum, chemicals, or metal manufacturing) can seriously pollute groundwater. In Kenya, river pollution by industrial waste and sewage poses a great risk to groundwater quality. In the case of Somalia, apart from areas along the Juba and Shabelle Rivers, all regions depend on groundwater for domestic water supply, livestock and small-scale irrigation and most groundwater sources have salinity levels above 2,000 µS/cm, and many shallow wells are unprotected and vulnerable to microbiological and other contamination⁶³.

Table-16: Summary of Weakness and Challenges of SWOT analysis

No	Weakness and Challenges
1.	Different level of groundwater related information, institutions, infrastructure, and incentives (the 4I's) differs between the member states
2.	Lack of targeted groundwater monitoring
3.	Low levels of skills and the knowledge to explore and understand groundwater resources, as well as the technology to exploit it and ensure its rational use,
4.	Limited country capacity and a lack of commitment to cooperate towards commons goals in this area
5.	Weak five I's (information, institutions, infrastructure, implementation and innovation) in member states
6.	Uneven capacity among countries in the region requires both tailored and coordinated solutions
7.	Weak follow-up of Groundwater mapping using high resolution satellite data and remote sensing/GIS analysis
8.	Environmental and social challenges of groundwater development

⁶³ Smith, 2022. Groundwater for Resilience in the IGAD Region: Facts and Figures and Future Prospects: Presentation at 2nd IGAD Water Forum at Entebbe, Uganda, 25-27, January, 2022

4.4.3 Opportunities

Major opportunities for SWOT output are: financial opportunities for groundwater resources management, research, and activities; training opportunities to train staffs of member states as well as IGAD staffs; the presence of current and planned water projects supported by the World Bank and which are exclusively focused on groundwater; opportunities to profit from transnational pricing, knowledge and service differentials, and labour opportunities from differences across borders, or TBAs, presence of traditional institutions at the borderlands, or TBAs, and trade and mobility even in times of high conflict and in the absence of supporting investment across borders, or TBAs⁶⁴.

Focusing on opportunities using SWOT analysis, financial opportunities play a vital role in groundwater resource management, research, and activities in the HoA Initiative region. International and domestic financial resources for groundwater research will be able to transfer technology, promote best practices, and support capacity building for groundwater and infrastructure, ensuring that such infrastructure and services meet the needs. Training programs are an important element in training staffs of member states as well as IGAD staffs to share the responsibility to manage the groundwater in the region.

In the water sector, several projects have been carried out within IGAD region. The most recent are the projects supported by the World Bank and which are exclusively focused on groundwater are: Project-1: Mapping, Assessment & Management of Transboundary Water Resources in the IGAD Sub-Region Project; Project-2: Inland Water Resources Management Programme (INWRMP) in the IGAD region; Project-3: Transboundary Water Governance and Cooperation Project; Project-4: Capacity-building International Water Law; Project-5: Building River Dialogue and Governance (Bridge) Project; Project-6: Horn of Africa Groundwater Initiative; and Project-7: Horn of Africa Groundwater for Resilience Program⁶⁵.



Figure-18: Groundwater Projects of IGAD Region Supported by World Bank (Source: IGAD-Water Unit, 2023.Groundwater for Resilience Project)

⁶⁴ WBG, 2021.Horn of Africa Initiative: Supporting Recovery through Deepening Economic Integration and Promoting Regional Cooperation: Description of Priority Projects and Readiness

⁶⁵ IGAD-WU, 2023. Groundwater for Resilience Project. Power Point Presentation by IGAD-WU Project Manager

People may be able to benefit from transnational pricing, knowledge and service differentials, and employment chances due to spatial discounts, often known as differences across borders or TBAs. A chance is also presented by the existence of traditional institutions in the HoA Initiative region's boundaries. Traditional institutions continue to be legitimate and influential despite having undergone major change as a result of sociopolitical processes and conflict. They can traverse boundaries and serve important roles in promoting social stability, regulating trade, and controlling conflict. They are frequently founded on clan or ethnic affiliations. Trade and mobility are robust and resilient, mostly in livestock and consumer goods, continuing even in times of high conflict and in the absence of supporting investment across borders, or TBAs. Trade is facilitated by mobility—the primary resilience strategy—as people move in search of better livelihood opportunities or better conditions for farming and livestock ⁶⁶.

Rich biological diversity exists in the IGAD region, which, if responsibly utilized, might genuinely put the region on the path to development. The region's biodiversity has numerous development potential in the areas of ecosystem services, biological products, trade, bioprospecting, biotechnology, tourism (particularly ecotourism), and biological products. Transboundary biodiversity makes up a sizable portion of the region's biodiversity.

The IGAD region is endowed with a long ocean shoreline of approximately 11 618 km covering the countries of Djibouti, Eritrea, Kenya, Somalia and Sudan, with extensive and diverse coastal and marine resources. There are thousands of islands, lagoons, coral gardens, and mangrove swamps along that shoreline. The shorelines enjoy exclusive access to a sizable Exclusive Economic Zone (EEZ) that has the potential for marine fisheries, seaweed harvesting, tourism, mining, and oil and gas exploration, in accordance with the UN Convention Law of the Sea (UNCLOS).

The IGAD region's surface water, groundwater, and open water bodies comprise its freshwater resources. There are substantial wetlands regions in the area as well. One of the most important components of social and economic growth is the availability of freshwater. Water for drinking, sanitation, agriculture, energy production, industry, transportation, and habitat for species as sources of food and trade are just a few of the many uses that freshwater and wetland ecosystems support.

Through a variety of initiatives, the IGAD region has the ability to reduce poverty and feed its population by making use of its agricultural land resources. The land shouldn't, however, solely be viewed in relation to agriculture. The area has the opportunity to take use of additional opportunities brought about by land resources, including energy, tourism, minerals, and a large pool of people resources.

In keeping with the MDGs, all IGAD member nations have pledged to provide everyone with appropriate housing and related services. The region's population is expanding. Planned human settlements present chances for sustainable population growth management. More building activity translates into more jobs and improved building material trade.

⁶⁶ WBG, 2021. Horn of Africa Initiative: Supporting Recovery through Deepening Economic Integration and Promoting Regional Cooperation: Description of Priority Projects and Readiness

Table-17: Summary of Opportunities of SWOT analysis

No	Opportunities
1.	Financial opportunities for groundwater resources management, research and activities
2.	Training opportunities to train staffs of member states as well as IGAD staffs
3.	The presence of current and planned water projects supported by the World Bank and which are exclusively focused on groundwater
3.	Opportunities to profit from transnational pricing, knowledge and service differentials, and labor opportunities from differences across borders or TBAs
4.	Presence of traditional institutions at the border lands or TBAs
5.	Trade and mobility even in times of high conflict and in the absence of supporting investment across borders or TBAs
6.	Extensive reserve of biological resources
7.	Existence of extensive and diverse coastal and marine resources and a long coastline with a large Exclusive Economic Zone
8.	The extensive surface and groundwater resources, wetlands and the ecosystem services and resources for human use
9.	Presence of Agricultural land
10.	Human settlements

4.4.4 Threats

On the other hand, major threats to SWOT output are climate change and variability, increasingly frequent and devastating droughts, the region's growing population density, an already fragile natural resource base, water conflicts, high levels of fragility, conflict, and violence (FCV), social, political, and economic instability, and food crises. Climate change and variability constitute the main drivers of this regional program: disrupted climatic patterns, changes in the water source, and increased uncertainty have elevated the urgency for building resilience and tapping into stable groundwater resources to cope with drought, among other shocks and stressors. In addition to climate change, the region's growing population density will place additional stress on its already-fragile natural resource base, sometimes to the point of no return. Water conflicts are expected to increase, which could make insecurity and emigration worse. The Horn of Africa—which includes the three countries of Somalia, Ethiopia, and Kenya that are included in Phase I of this Regional Program—has been hit by increasingly frequent and devastating droughts. Food insecurity in the HoA is primarily driven by armed conflict and violence, economic shocks and macroeconomic challenges, climate change-induced erratic or below-average rainfall, and desert locust⁶⁷.

The threats to achieving the full potential of land resources and ensuring food security in the region are: land degradation and desertification; climate variability; hunger and disease; land tenure issues; and armed conflict. Overexploitation of water resources in some parts of the IGAD region has led to undesirable effects such as lowering of the water table and saline seawater intrusion.

⁶⁷ WB, 2022. Horn of Africa Groundwater for Resilience Project using the Multiphase Programmatic Approach: Project Appraisal Document

The main constraints to realizing the full potential of forests and woodlands include: forest loss and degradation; policy, legal, institutional, and technical constraints; and invasive alien species. Also, some of the forests are located next to wetlands and open freshwater bodies, which represent critical water catchments. The threats to achieving the potential offered by coastal and marine resources in the region are: impacts of climate change; habitat loss and degradation; over-fishing and fishing-related damage; silting of estuaries and coral gardens; and inadequate investment in coastal zones. The IGAD region has been characterized by massive population movements pushed by other groups and pulled by the search for better pasture and water resources, among others.

Table-18: Summary of Threats of SWOT analysis

No	Thematic Areas	Issues and Threats
1.	Climate change and variability	Coral reef bleaching, melting glaciers, sedimentation, rising sea levels and flooding, advantage to invasive species, a risk to delicate species unable to adapt to change, health, socio-economic.
2.	Natural disasters	Floods, droughts, storms, earth movements and sea changes, tsunamis
3.	Pastoralism	Excessive livestock numbers, water and pasture scarcities and conflicts with agricultural communities
4.	Pressure on land resources	Drought, desertification, population pressure, land pressure, land clearing and degradation, soil erosion, invasive species, sand dunes, land mines
5.	Wetlands and Water Resources	Increasing demand for domestic, irrigation, industrial, urban use, overstocking, pollution, sedimentation, invasive species
6.	Forest and Biodiversity Resource	Deforestation, woodland conversion, unsustainable harvesting, climate change, decrease in natural forests, poverty, political pressure, invasive species, pollution
7.	Coastal and Marine Ecosystems	Coastal erosion, clearing for agriculture, flooding and siltation, pollution, human activities and dumping of wastes, climate change, invasive species
8.	High levels of fragility, conflict, and violence (FCV),	General degradation of environment, overuse of natural resources by local, transient and refugee people as well as returnees after conflict.
9.	Land tenure and access	Mixed tenure, uncertain tenure, tenure preventing access, uneven access and benefit sharing
10.	Social, political, and economic instability	Incidents of violence, inter and intra-ethnic conflict, high prevalence of Sexual and Gender Based Violence (SGBV), tensions over access to resources, refugees and illegal migrants seeking shelter in neighboring countries
11.	Food crises.	Armed conflict and violence, economic shocks and macroeconomic challenges, climate change-induced erratic or below-average rainfall, and desert locust.

It is clear from the SWOT analysis output that although there are strengths and opportunities, the HoA Initiative region is also subjected to a range of threats and weaknesses, which include both regional, national, and local processes. SWOT analysis helps to find the best match between environmental trends (opportunities and threats) and internal capabilities (strengths and weaknesses). Weaknesses should be converted into strengths, whereas threats should be

converted into opportunities. To overcome threats and weaknesses, strategy management and practices are vital to converting them into strengths and opportunities. SWOT analysis output can be applied to facilitate sustainable groundwater management in the HoA Initiative region. To successfully implement the Horn of Africa Groundwater for Resilience (HoA GW4R) Program and to ensure its sustainable use and access, there is a need to ensure the most critical enabling conditions in terms of knowledge, capacity, and economic assessments are in place. The following World Bank framework or approach, built to support priority shallow and deeper groundwater development in Sub-Saharan Africa (SSA), shall also be applied for the Horn of Africa Groundwater for Resilience (HoA GW4R) Program⁶⁸. The framework was built around the "Four I's- Information, institutions, Infrastructure/Investment, and incentives—across regional, national, and local scales for sustainable development of shallow and deeper groundwater resources in SSA.

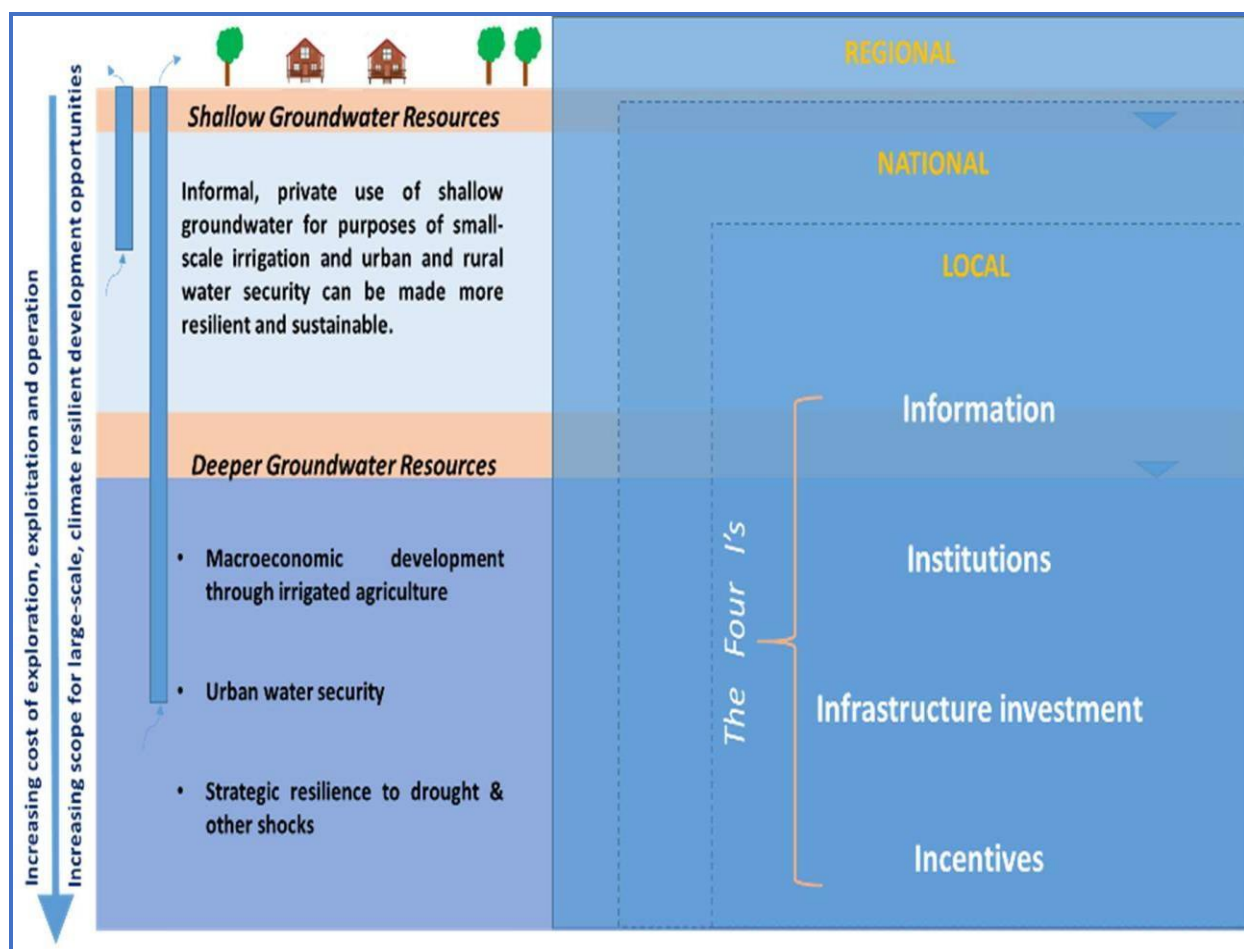


Figure-19: A framework to guide a World Bank sustainable development strategy for shallow and deeper groundwater resources in SSA (Source: *Assessment of Groundwater Challenges & Opportunities in Support of Sustainable Development in Sub-Saharan Africa* by WBG and Water Partnership Program)

⁶⁸ WB, 2018. *Assessment of Groundwater Challenges & Opportunities in Support of Sustainable Development in Sub-Saharan Africa*

5. STAKEHOLDER CONSULTATIONS

5.1 Review of Previous Regional Stakeholder Consultation Workshops Related to HoA-GW4RP

SESA consultant for HoA-GW4RP reviewed records of regional consultation workshop findings that have taken place as part of HoA-GW4RP, if available. Based on this review, a series of stakeholder workshops related to the HoA-GW4R project that were organized by IGAD revealed that key stakeholders' interests, concerns, and values with respect to the HoA-GW4RP were sufficiently reflected. However, the identification of potential environmental and social risks and impacts associated with the implementation of the HoA-GW4R project was not discussed in these stakeholder workshops. Therefore, one additional stakeholder consultation workshop on the identification and prioritization of key environmental and social issues is needed for the HoA-GW4R project.

Reviewed previous regional stakeholder consultation workshops related to HoA-GW4RP include:

- (a) The Role of Groundwater in Drought Resilience in the IGAD Region: 26-07-2017, Addis Ababa (Ethiopia),
- (b) Horn of Africa Initiative (HoAI): Resilience Pillar Workshop October 13th, 2020,
- (c) The 1st IGAD Water forum held in Nairobi, Kenya, focused on the urgent need for regional cooperation in the management of water resources,
- (d) The 2nd IGAD Water Forum held in Entebbe, Uganda, on 25-27 January, 2022, deliberated on groundwater as key to Africa's resilience,
- (e) The 1st virtual mini workshop for the Horn of Africa Groundwater for Resilience Program took place on April 7th 2021, and
- (f) The 2nd virtual mini-workshop for the Horn of Africa Groundwater for Resilience Program took place on June 30th 2021,

The outputs of 1st and 2nd virtual mini-workshops helped inform the design of the Project in particular the components that would be implemented by IGAD and early identification of potential environmental and social risks and impacts. Brief Summary of Previous Stakeholder Engagement Activities related HoA-GW4RP is presented below:

Table-19: Brief Summary of Previous Stakeholder Engagement Activities related HoA-GW4R Program

No	Name of the SHW	Place of the SHW	Date of SHW	Theme(s) of the Forum	Outputs of the Forum
1.	The Role of Groundwater in Drought Resilience in the IGAD Region	Addis Ababa, Ethiopia	July 26, 2017	The Role of Groundwater in Drought Resilience in the IGAD Region	Participants discussed on the potential solutions and ways forward to improve the status of both the groundwater knowledge base and the capacity to manage the resources in a way that optimizes the benefits of the resource in building resilience.
2.	Horn of Africa Initiative (HoAI): Resilience Pillar Workshop		October 13th, 2020	Discuss three new proposed project profiles to the HoAI Resilience Pillar (i.e. desert locust control, groundwater for	Participants confirmed the key role that the proposals on desert locust control, groundwater for resilience, and borderlands can play in building the HoA's resilience to multiple shocks.

				resilience, and borderlands)	
3.	The 1st IGAD Water forum	Nairobi, Kenya	2014	Urgent need for regional cooperation in the management of water resources	Agreed on the roles of regional cooperation for management of water resources
4.	The 2nd IGAD Water Forum	Entebbe, Uganda	25-27 January, 2022	Groundwater for Resilience	The success of the 2nd IGAD Water Forum creates a solid foundation for onward cooperation among Member States and partners in the region on shared groundwater resources and associated development issues, in order to support 'deep' resilience in the region.
5.	The 1 st virtual mini workshop for the Horn of Africa Groundwater for Resilience Program	IGAD	April 7th 2021	Groundwater for Resilience	The Groundwater for Resilience Program was recognized as a useful and relevant umbrella to address the challenges and the opportunities of groundwater in the HoA region
6.	The 2 nd virtual mini-workshop for the Horn of Africa Groundwater for Resilience Program	IGAD	June 30th 2021	Groundwater for Resilience	The IGAD's proposed components were revised and finally validated by the country delegations from Djibouti, Ethiopia, Kenya, and Somalia and Project Steering Committee (PSC) Members for the HoA-GWI Project



(a) The 2nd IGAD Water Forum held in Entebbe, Uganda, on 25-27 January, 2022



(b) The Role of Groundwater in Drought Resilience in the IGAD Region, held in Addis Ababa Ethiopia, on 26-07-2017

Figure-20: Figure Stakeholder Consultation Workshops on the roles of Groundwater in IGAD Region

5.2 Stakeholder Consultations during SESA Study

5.2.1 Stakeholder Workshop on Designing Resilient Rural Water Supply Systems in the HoA

IGAD has taken the initiative to organize a comprehensive two-part regional workshop around the Horn of Africa (HoA) Groundwater for Resilience (IGAD-GW4R) project: Designing Resilient Rural Water Supply Systems in the HoA May 8th-10th 2023 at Addis Ababa, Ethiopia. Total participants were 60. The workshop was bringing together delegates in charge of water resources from Ethiopia, Kenya, and Somalia, representatives from The World Bank, the UNDP, and the Rift valley Institute. This groundbreaking event focused on fostering dialogue and cooperation among key project stakeholders from Ethiopia, Kenya, and Somalia. The workshop aimed to enhance regional cooperation and knowledge exchange, with a focus on transboundary groundwater management and the development of resilient rural water supply systems.

The first day of the workshop was dedicated to enhancing the foundations of a dynamic regional collaboration mechanism. The central aim of this mechanism is to bring together the main players - Ethiopia, Kenya, and Somalia - and construct a robust, effective, and encompassing framework for the informed management of transboundary groundwater resources.

The second part of the workshop was focused on providing technical capacity building tailored to the GW4R participating countries' needs and priorities. Sessions addressed key aspects related to the planning and implementation of resilient rural water supply systems (RWSS) within the IGAD region. The workshop included an esteemed roster of attendees, comprising delegates, experts and researchers from the member states, the World Bank, United Nations Development Program (UNDP), and the Rift Valley Institute (RVI). The event emphasized the challenges posed by climate change, drought, and poverty, and highlighted the importance of data sharing, capacity building, and long-term financing plans. One of the workshop's significant achievements was the agreement reached between Ethiopia and Kenya regarding the name of the last transboundary aquifer (TBA) that will be studied in the initial phase of the IGAD project.

In this workshop, critical factors for sustainability and suitability for resilient Rural Water Supply Systems (RWSS) Design, which is the main aim of conducting strategic environmental and social assessment, were discussed in the first session. The following strategies were highlighted during the first session as a way to ensure the long-term sustainability of rural water supply systems: (a) the use of various storage technologies, particularly nature-based solutions; (b) joint use of water resources; (c) the use of pumping technology, with data analyzed by the UNDP generator; and (d) applying the selection process and the knowledge gained from the study to other locations, particularly in the area of sand, (e) focus on domestic and livestock water supply, with a proposed cost-sharing tariff for sustainability, (f) a flexible contract that includes geophysical and survey studies, and drilling services, with a no-water-no-payment policy, (g) the importance of engaging religious and elders' leadership in project operation, (h) community engagement, and tariff planning, and (i) creation of joint committee. They also proposed sustainability indicators such as revenue collection, sharing of benefits, technical manpower, adoption of technology (e.g., drip irrigation), concrete lining to reduce leakage, use of solar energy to reduce fuel costs, demand management to control water usage, revenue reduction, resource monitoring, and conflict resolution mechanisms.

Integrated water planning for livelihood, population, and climate change, conflict assessment and mitigation, and Inclusive community engagement and ownership were highlighted as fragility considerations in Resilient RWSS in the

second session. (1) Resource mapping and climate risk profiling; (2) Assessing existing water system availability, including potential GW harvesting sites; (3) Site selection should consider population, availability of pasture, and climate vulnerability. (4) Consultative meetings with the community, (5) Select a site, including community dynamic needs; (6) Need to identify win-win options; (7) Where are we and where are we going? (8) Multi-disciplinary approach, (9) Flood harvesting structures upstream, (10) Planting trees to reduce runoff and silt that is taken downstream, and (11) Redistribution of collecting water for pasture production, ground water regeneration, livestock consumption, human consumption, and irrigated crop farming were noted as means for Integrated water planning for livelihood, population, and climate change.

(1) community awareness to understand the basis and impact of the water development; (2) Peaceful discussions and negotiations with the stakeholders; (3) Traditional leader's take lead roles in convening meetings with the community members and stakeholders to resolve conflicts; (4) Develop steering committees with all the stakeholders to explore conflicts causes and develop possible mitigation measures; (5) Construct drought strategic borehole networks across the conflict-affected areas to be utilized during the drought season; (6) Construct boreholes in pasture grazing areas; (7) Consider alternative water sources during the rainy season and utilize the GW sources during the drought season; and (8) Develop technical committees across the different levels of government structures to take responsibility for addressing conflict issues were proposed to mitigate impacts of conflicts.

Ascertain that the community has demand or need for the water supply before any project design (donor-driven versus community-driven), involve the community in all stages of the project, provide the community with an active decision-making role, allow the construction to engage community labor and procure local supplies for the construction, have feedback mechanisms in place for the community to raise grievances or complaints, and set tariffs or pay for use were suggested as a means to ensure inclusive community engagement and a sense of ownership.

In the fourth session, applying best strategies to procure aquifer assessments, design of schemes, and drilling works in the HoA using FIDIC as a valuable resource in the context of contracting and procurement was considered a mitigation measure to avoid risks associated with the construction of water boreholes.

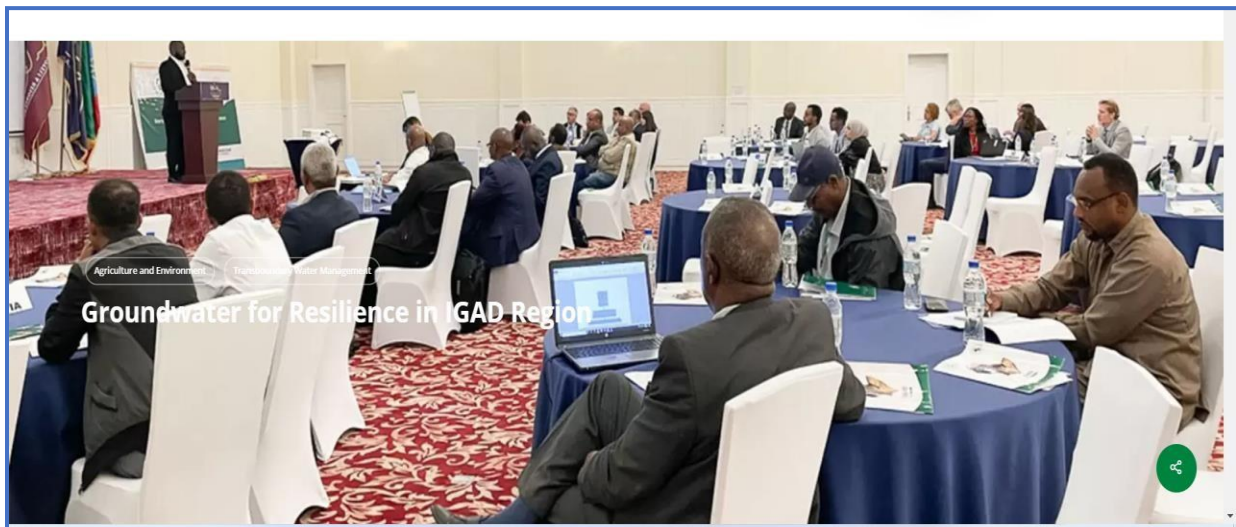


Figure-21: IGAD three-day workshop for Regional Events: Learning and Training for the Horn of Africa Groundwater for Resilience Project (HoA GW4R)

5.2.2 Stakeholder Consultation Workshop on the Identification and Prioritization of Key Environmental and Social Issues

Virtual mini workshop on the identification and prioritization of key environmental and social issues took place on 06 September, 2023. Total participants were 16 from three MSs of NFG. Questionnaire was prepared and attached to participants on 27 July, 2023 before the consultation. The questionnaire was the basis of the stakeholder consultation meeting which was held 06 September, 2023. In this virtual mini-workshop, using the focal groups of the three participating countries and IWU, key strategic environmental and social impacts in the spatial context associated with HoA GW4RP were identified and prioritized.

The overall objective of this stakeholder consultation was to identify and prioritize both beneficial and adverse transboundary environmental and social impacts likely to be associated with the implementation of the proposed HoA GW4R Program for each of the three member states and the IGAD-Water Unit. These issues will require regional collaboration to implement enhancement measures for beneficial or positive strategic environmental and social impacts and mitigation measures for negative strategic environmental and social impacts.

The specific objectives were to : (a) identify key positive and negative transboundary environmental and social impacts associated with the implementation of the proposed HoA GW4R Program;(b) prioritize identified beneficial strategic environmental and social issues that need help to focus on urgent sub-project activities and priority enhancement measures based on their level of significance in terms of climate resilience, ensuring food security, reducing conflict, creating job opportunities, and enhancing regional cooperation and linkages; and (c) prioritize identified adverse strategic environmental and social issues that need attention and priority mitigation measures on the most urgent and/or detrimental impacts based on their risk level of significance, magnitude, and spatial and temporal extent.

The outputs of this virtual mini-workshop were the following: (a) individual consultant of SESA for the GW4R Program disclosing RSESA information (transboundary environmental and social impacts associated with the implementation of GW4RP as well as the overall contents of the draft report) to the stakeholders; (b) participants discussed the potential identified beneficial as well as adverse impacts and their priorities. Participants also reflect their views, aspirations, and recommendations on RSESA, as well as recommending ways to integrate the findings of stakeholder engagement from communities at the grassroots level of the borderlands into RSESA as follows: (a) they suggested that, to be more successful and practical, consultations with the local communities should form the basis of the SESA report. Consultation at the office level using three MSs of NFG is not sufficient; (b) ESMF and RPF studies were conducted before this RSESA study. Procedurally, which is not correct. Because RSESA is recognized as a useful and relevant umbrella to conduct ESMF and RPF studies as well as ESIA and ESMP studies. Therefore, as much as possible, RSESA shall be aligned with the existing ESMF and RPF. The NFG of Ethiopia filled out and submitted the checklist before this virtual mini-workshop, while the NFG of Kenya and Somalia agreed to submit the checklist by September 8, 2023.

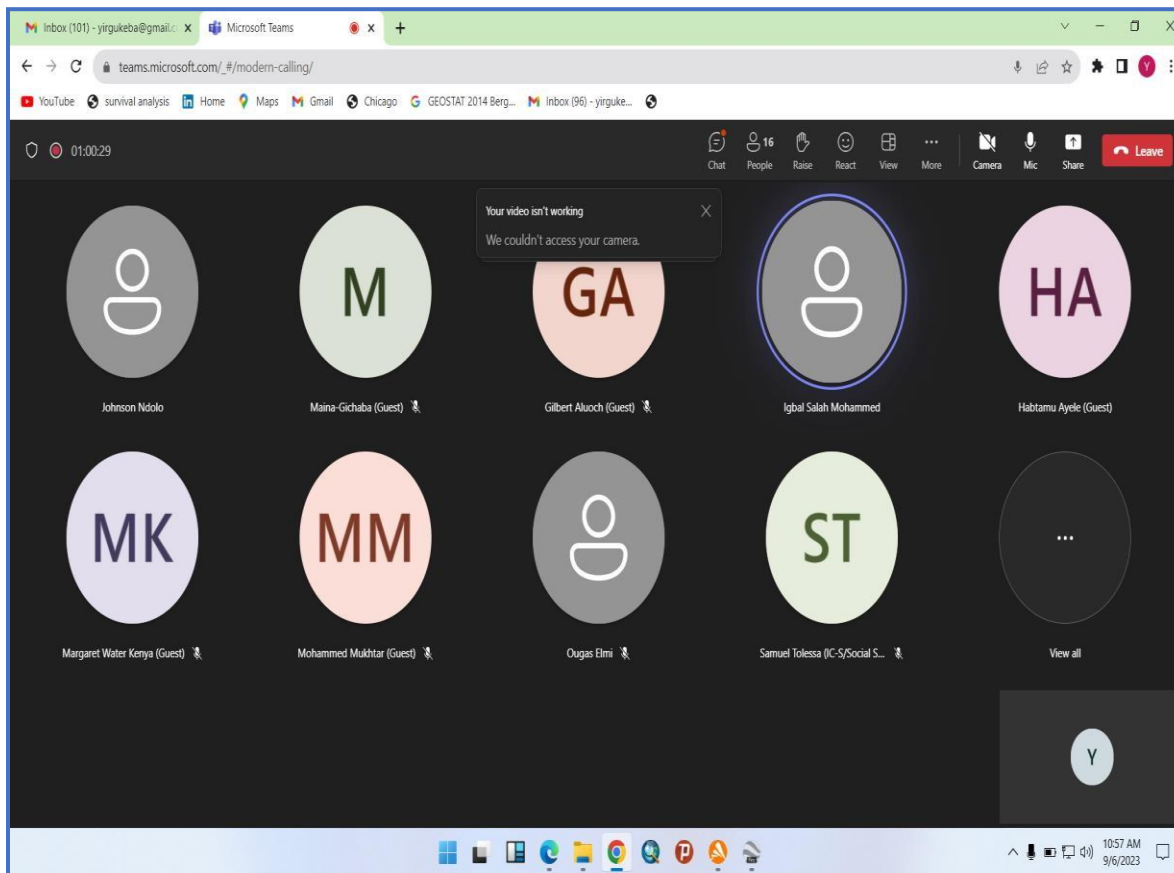


Figure-22: Virtual Mini Workshop Participants on the identification and prioritization of key environmental and social issues took place on 06 September, 2023

Ethiopian NFG suggested the following additional beneficial/positive strategic environmental and social issues likely to be associated with the implementation of the proposed HoA GW4R Program: (a) reduced death of livestock and wildlife, (b) improved health condition and reduced cost of health care, (c) improved school enrollment and reduced dropouts; and (d) reduced burden of fetching water on women. Similarly, Kenyan NFG suggested the following additional beneficial/positive strategic environmental and social issues likely to be associated with the implementation of the proposed HoA GW4R Program: (a) implementation of effective governance and legal frameworks for the management and allocation of transboundary aquifer resources; (b) establishment of comprehensive monitoring and data collection systems to assess groundwater availability, quality, and trends over time - essential for making informed decisions; (c) address the need for financial and technical support for implementing sustainable groundwater management practices (Kenya as a developing country may require assistance in terms of funding, capacity building, and technology to effectively manage their groundwater resources); and (d) apart from livestock keeping, the program will create opportunities for alternative source of livelihood.

Well interference, risk of inaccurate data generation and misinterpretation of the system may affect decision and negative impacts of urbanization (as improved water supply leads to development of urban centers) on the pastoral/traditions of communities were adverse or negative strategic environmental and social issues likely to be associated with the implementation of the proposed HoA GW4R Program added by Ethiopian NFG. Kenyan NFG

proposed efforts to address or prevent pollution and contamination of groundwater, which can have significant negative impacts on human health and the environment. Pollution survey, both point and nonpoint sources and mitigation measures should form part of the SESA report.

Table-20: Prioritized beneficial strategic environmental and social impacts

No.	MS	Identification and Prioritization of Key Environmental and Social Issues
1.	Ethiopia	Prioritized beneficial strategic environmental and social impacts
		A. Create inclusive community-level access to groundwater in the borderlands of the HoA.
		B. Reduce conflicts over water and create peace and stability in the Region.
		C. Ensure food security and bring socioeconomic developments.
		D. Improve community health by reducing stunting and diarrhea and enhancing sanitation.
		E. School dropout rate will decline as a result of easier access to potable water in the nearby area.
		F. Strengthened the women's share of leadership positions in community groundwater organizations like IWUA and WASHCOM.
		G. Enhanced regional integration and regional cooperation in the management of trans-boundary water resources.
		H. Strengthen the climate resilience of targeted communities and reduce GHG Emissions.
		I. Strengthen traditional and public water resources management entities in the project areas and experience sharing on good lessons.
		J. Creating employment opportunity for the local communities and women.
		K. Supporting Agro-pastoral and pastoral activities in the project areas.
		L. Generating groundwater information and strengthening regional and national groundwater institutions.
		M. Create strong linkages and alignment with other HoA projects.
		N. Integrating the development efforts of the program with different sectors' development interventions to tackle the interwoven socio-economic problems of the communities in the borderlands.
		O. Contribute for watershed management activities in the project areas.
2.	Kenya	Prioritized Key SESA Issues
		A. Water Security Situation: The infrastructure gap to achieve water security remains large. With unregulated water withdrawals of the renewable water resources), water for economic growth remains limited. Efforts to manage water and make it available where it is most needed are hampered by limited storage, changing climate and the shared nature of the water resources.
		B. Optimizing the use of water through better policies and incentives: While adopting policy reforms the right reforms, governments can help ensure that demands are not left vulnerable to the consequences of water-related shocks. Measures could include strengthening sector regulation as well as tariffs which could be valuable for improved water stewardship, cost recovery and promotion of private investment financing.
		C. Strengthening water use efficiency: Deployment of technologies, reduction and increasing water production. Approaches are already available, such as smart metering as well as the Technologies.
		D. Reducing the impact of climate extremes: Increasing storage capacities, investment in information systems, and water reuse systems will strengthen resilience. Strengthening transboundary water management, river systems is also key to resilience

		<p>E. Addressing Potential Conflicts: There is potential conflict and sometimes conflict in the available resources due to dependence on the aquifer. Improved techniques in the management and development of the resources is important to address the conflict. Collaboration in the management and development if also important to enhance equity among the users.</p> <p>F. Balancing Upstream and downstream use: There is also need to enhance the proper management of the resources especially in terms of upstream and downstream users and prevent any harm. Catchment management need to be enhanced to improve the recharge and quality of the resources.</p>
3.	Somalia	Prioritized beneficial strategic environmental and social impacts
		A. Create inclusive community-level access to groundwater in the borderlands of the HoA
		B. Ensure food security and bring socioeconomic developments
		C. Reduce conflicts over water and create peace and stability in the Region
		D. Generating groundwater information and strengthening regional and national groundwater institutions
		E. Create strong linkages and alignment with other HoA projects
		F. Strengthen the climate resilience of targeted communities and reduce GHG Emissions
		G. Creating employment opportunity for the local communities and women

Table-21: Prioritized adverse strategic environmental and social impacts

No	MS	Prioritized adverse strategic environmental and social impacts
1.	Ethiopia	A. The boreholes drilling of the project will cause noise and vibration and which may affects human and animals residing nearby temporarily.
		B. Temporal impact of the access road on agricultural land while reservoir and BH drilling were underway.
		C. Construction risk of daily labours due to reluctance to implement labour safety management.
		D. Likely to cause temporary effect of traffic flow on the project area during the construction phase.
		E. Trivial impacts on groundwater-dependent ecosystem of terrestrial flora and fauna.
		F. Minor impact on transboundary aquifer depletion
2.	Somalia	A. Deforestation
		B. Increasing aridity and overgrazing
		C. Risk of exacerbating existing social exclusion, conflict, illicit behavior, crime and gender-based violence of borderlands
		D. Impacts livelihoods of commercial Birkad owners
		E. Risk of exacerbating existing transboundary water use conflict
		F. Transboundary aquifer depletion
		G. Water quality deterioration
		H. Impacts on groundwater-dependent ecosystem of terrestrial flora and fauna
		I. Impacts on groundwater-dependent ecosystem of estuarine and near-shore marine ecosystems

6. ENVIRONMENTAL AND SOCIAL RISKS AND IMPACTS

Regional Strategic Environmental and Social Assessment (SESA) for the HoA GW4R Program focused on regional-level, transboundary, and cumulative impacts. The transboundary impact area could be defined at three levels: the core area, the immediate impact area, and the area of influence ⁶⁹. The core areas could be aquatic and terrestrial ecosystems, while the immediate impact area is defined to comprise catchment areas outside of the core area where HoA GW4R Program activities are likely to impact directly or be impacted on the core area. The watershed of the drainage basins of HOA GW4RP member states defines the outer limit of such areas in hydrological terms. Since surface runoff and eroded material from these watersheds subsequently find their way into lakes and the Indian Ocean, the life of the lakes and coastal areas of the Indian Ocean is very much dependent on the hydrological regime and activities taking place in these watersheds. The areas of influence could be defined to include all areas likely to have indirect relationships with and impacts on the core area.

The spatial scope of the SESA of HoA GW4RP includes the direct impact zone of the program area, which includes areas under the direct influence of the program components and their immediate environs, such as the terrestrial ecosystem areas of Ethiopia, Kenya, and Somalia. The aquatic ecosystems comprise (i) the fresh water bodies of Ethiopia, Kenya, and Somalia; (ii) the inland wetland resources of Ethiopia, Kenya, and Somalia; and (iii) the marine coastal strip of the western Indian Ocean of Kenya and Somalia. The indirect zone includes areas far away from the GW4R program site that will be influenced by the program components and/or that will have an influence on the proposed program components. The indirect impact zone of HoA-GW4RP covers areas far away from the GW4R program sites (Ethiopia, Kenya, and Somalia) and other areas along the Ethiopia-Sudan, Ethiopia-South Sudan, Ethiopia-Eritrea, and Ethiopia-Djibouti borders. In these areas, there are transboundary aquifers, namely the Sudd, Afar Rift Valley, and Gedaref. Even if Sudan, South Sudan, Eritrea, and Djibouti are not included in Phase 1 of the program, the HoA-GW4RP will affect transboundary aquifers in their territories. The temporal scope of the SESA covers construction, operation and decommissioning of phase-I and phase-II of HoA GW4R program.

6.1 Beneficial/Positive Strategic Environmental and Social Impacts

This subsection presents the general potential environmental and social benefits of the HoA-GW4RP. These beneficial impacts of the HoA-GW4R program are described below:

A. Strengthen the climate resilience of targeted communities and Reduce GHG Emissions: groundwater plays an important role in building drought resilience in the borderlands of the HoA, although, due to the complexity and lack of knowledge about the resource, it remains neglected and largely untapped. In a region where surface water is scarce due to high temperatures and evapotranspiration rates. The valuation of environmental externalities further enhances the economic justification of the Program. As estimated through the GHG accounting, the Program is estimated to reduce GHG emissions by 502,621 tCO₂-e over 20 years as a result of transitioning from fossil fuel to solar energy pumping.

⁶⁹ EAC, 2005. Draft Revised Guidelines for Transboundary Environmental Impact Assessment

When evaluating these environmental benefits using the social price of carbon estimates, the overall economic results of the Program increase to an NPV of US\$160.8 million and an EIRR of 20.6 percent (assuming the low range pricing - increasing from US\$42/tCO₂eq in 2022 to US\$64/tCO₂eq in 2041) and to an NPV of US\$175.8 million and an EIRR of 22.1 percent (assuming the high range pricing - increasing from US\$84/tCO₂eq in 2022 to US\$128/tCO₂eq in 2041)

⁷⁰.

B. Reduce conflicts over water and create peace and stability in the Region: climate shocks in the HoA's borderlands are contributing to food insecurity, to increased tensions over scarce natural resources, particularly over water and land, and to heightened risks to public health. Disputes among farmers and pastoralists or refugees and host communities are more likely to occur in borderlands with difficult access to water. Climate impacts on pasture and water availability could alter pastoral mobility, exacerbating tensions over land and water resources, and worsening cases of gender-based violence.

C. Ensure food security and bring socioeconomic developments: food insecurity in the HoA is primarily driven by armed conflict and violence, economic shocks and macroeconomic challenges, climate change-induced erratic or below-average rainfall, and desert locust. The Program will also contribute to improving food security in a region undergoing a severe drought, with South-eastern Ethiopia, Northern Kenya and Somalia being particularly affected. The Program will address food insecurity through the development of sustainable groundwater access and use of groundwater for irrigation and water supply in critical districts along the borderlands in these three countries. During the implementation of the program collected groundwater shall be redistributed for pasture production, ground water regeneration, livestock consumption, human consumption, and irrigated crop farming that helps to ensure food security and bring socioeconomic developments of MSs.

D. Create inclusive community-level access to groundwater in the borderlands of the HoA: Livelihood support involves livestock rearing; groundwater-based small-scale irrigation; peri-urban solar pumped groundwater supply schemes, sand dam pilots for community gardens, nature-based solutions for enhanced groundwater recharge; access to groundwater resources; soil and water conservation practices; conducting various studies.

E. Creating employment opportunity for the local communities and women: Temporary job opportunities shall be available during design phase (topographic and soil survey works), 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. During operation phase, there will be employment of permanent workers in the operation and maintenance, security service and billing.

⁷⁰ WB, 2022. Horn of Africa Groundwater for Resilience Project using the Multiphase Programmatic Approach: Project Appraisal Document

F. Generating groundwater information and strengthening regional and national groundwater institutions

Activities will focus on generating essential data and information needed for informed decision making on sustainable groundwater management, and at the same time, will strengthen the capacity of key regional and national entities that play a role in the management of the resource, while building trust and fostering collaboration. IGAD will be leading most of the activities under this Component through regional-level efforts that will be articulated with country activities at the national level.

G. Create strong linkages and alignment with other HoA projects: The Program's support to IGAD will be coordinated with other ongoing and planned World Bank regional projects through close collaboration across the WBG to ensure strong synergy, complementarity and use of common arrangements to optimize capacity building efforts. In addition to the Regional Groundwater Initiative, development partners, including the World Bank, are planning and carrying out a wide range of projects on water resources management, land protection, and climate smart agriculture where groundwater protection, development, and management are addressed. This proposed project will supplement these other projects and many others on water resources management, land protection, and climate-smart agriculture. The Somalia Water for Agro-pastoral Productivity and Resilience Project "Biyoole", the Kenya Water Security and Climate Resilience Project, and the series of Sustainable Land Management Projects in Ethiopia are examples.

6.2 Adverse/Negative Strategic Environmental and Social Impacts

This subsection presents the general potential environmental and social adverse impacts of the HoA-GW4RP. Though the HoA GW4R Program has various benefits and is crucial for the transformation of the socioeconomic development of member states of the program, it will have potentially some adverse effects on the biophysical and socio-economic environment of the region if not properly managed.

A. Transboundary aquifer depletion: groundwater aquifer depletion may result from the usage of groundwater for livestock consumption, residential water supply, pasture production and irrigation. Since the rate of groundwater use can occasionally be significantly higher than the rate of groundwater replenishment, uncontrolled groundwater use could result in resource depletion. Groundwater abstraction should occur at a rate that is either less than or equal to that of recharge. A decrease in groundwater level or a reduction in safe yield will occur if the pace of groundwater abstraction exceeds the rate of recharging. Long-term extraction will result in a fall in groundwater levels that makes it difficult to remove water, rendering some water management plans inoperable or continuously raising pumping expenses.

B. Water quality deterioration: Wastewater may be generated during sub-project 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 a pollution risk to water resources, thereby harming the environment and water users. Especially in borehole drilling operations, drilling foams and bentonites are applied to enhance the drilling efficiency, and drilling discharge or sludge contaminated with chemicals is 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.

During the operation of the small-scale irrigation schemes, there will be a potential risk of surface and groundwater pollution due to agricultural intensification and increased use of agrochemicals. 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.

C. Risk of exacerbating existing transboundary water use conflict: In areas where water is scarce (such as the borderlands of TBAs), 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 users, and pasture lands. All these modes require water, directly or indirectly. Conflict can also be between other groundwater source users or surface water users, as well as transboundary water users. For instance, Dawa Transboundary Aquifer is shared by Ethiopia, Somalia and Kenya, covering an area of 24 000 km. The Dawa River runs through the heart of the Mandera Triangle, a cross-border region encompassing Mandera County in Kenya, Gedo Region in Somalia and Dolo Ado District in Ethiopia. Regional dynamics have been influenced by political struggles and armed conflict over access to land and water. Decades of border conflicts in the Mandera Triangle pose a serious hindrance to transboundary basin cooperation. There are water-linked factors that triggered the dispute such as: (1) water scarcity linked to climate change, (2) diminishing water quality caused by groundwater extraction and aquifer pollution, (3) competing water development needs and unilateral development plans, and (4) lack of transboundary information sharing ⁷¹.

D. Cumulative impacts of soil erosion and degradation: This program may cause soil degradation, particularly if the irrigation operations are non-conservation-based. Acidification, organic depletion, compaction, nutrient depletion, chemical contamination, and erosion are all forms of soil degradation that can be brought about by inappropriate land use practices. As soil degradation develops, land productivity starts to decline, and in extreme cases, it can stop nearly all plant growth. These effects include depletion of soil nutrients and organic matter when topsoil is carried away, washing crop seeds down slope, exposure of plant roots, and degrading downstream water sources when run-off spills out of the command area. Surface runoff and eroded material from these watersheds subsequently find their way into lakes and the Indian Ocean.

⁷¹ Kim, K., Broek, E., Smith, E. S., Michel, D., De Nys, E., & Godoy, N. S., 2021. Water Cooperation in the Horn of Africa: Addressing Drivers of Conflict and Strengthening Resilience.

E.Impacts on groundwater-dependent ecosystem of lacustrine/palustrine/riverine wetlands, springs and

Oasis: GDEs are communities of plants, animals, and other organisms whose extent and life processes depend on groundwater^{72, 73}. GDEs could be grouped into three types based on their groundwater reliance: (a) GDEs dependent on the surface expression of groundwater; (b) GDEs dependent on the subsurface presence of groundwater; and (c) GDEs in aquifer and cave ecosystems. Lacustrine, palustrine, and riverine wetlands, springs, and Oasis are GDE that depend on the surface expression of groundwater or use groundwater after it has been discharged to the surface and have either a gaining or variable gaining or losing aquifer connectivity. This group includes all groundwater-fed surface water bodies, such as rivers, wetlands, lakes, and springs. They refer only to the aquatic component of a system and exclude any vegetation that may fringe a surface water body⁷⁴.

Wetlands that occupy depressions in the land surface (palustrine types of wetlands) have interactions with groundwater similar to lakes and rivers. The HoA-GW4RP of projects involving the development of groundwater-based water supply infrastructures and the construction of irrigation schemes that involve groundwater intensive use can result not only in aquifer depletion and water quality degradation but also in impacts on the ecological integrity of streams, oasis, and wetlands and can result in significant losses of habitat and biodiversity. 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, and potential modification of the surface water flow regime shall be considered potential risks.

Irrigation and water supply projects have the potential to alter groundwater levels and the water quality enjoyed by GDEs. GDEs are, to a significant extent, reliant on groundwater, and those that occupy a very narrow ecological range and those in arid and semi-arid areas could be completely eliminated by even relatively small changes in water regime or water quality. In dry seasons, especially in semi-arid and arid areas in the Horn of Africa Region, the base flow of rivers is maintained entirely from groundwater. This makes management of this groundwater very important for both humans and the environment, where wildlife, flora, and people depend on surface water availability. In Ethiopia, the majority of groundwater wells are situated around lower places in a catchment, or adjacent to sources of surface water. Additionally, the use of springs may have an impact on the water supply in rivers and streams downstream.

The requirement for environmental flow must also be taken into account. Environmental flows support habitats, including aquatic ones. In general, groundwater abstraction could have an influence on surface water resources, such as the removal of streams or a drop in river base flows, unless the proper measures are taken. Experience in some regions of the nation suggests that excessive groundwater abstraction may cause spring or stream flows to be curtailed or discontinued. IGRAC produced global selected wetlands, mostly groundwater related. According to global selected wetlands, mostly groundwater related, four groundwater-dependent ecosystem of wetlands are found in Baringo (Lake associated wetlands of Baringo and Bogoria) and Nakuru (Lake associated wetlands of Nakuru and Navasha) counties of Kenya. These four groundwater-dependent wetland ecosystems would likely to be adversely affected by excess groundwater abstraction from Merti TBAs.

⁷² AGW-Net, BGR, IWMI, CapNet, ANBO, & IGRAC, 2015). Integration of Groundwater Management into Transboundary Basin Organizations in Africa

⁷³ Eamus, D., B. Fu, A.E. Springer, and L.E. Stevens, 2016. Groundwater dependent ecosystems: Classification, identification techniques and threats. In: A.J. Jakeman et al. (Eds.). Integrated Groundwater Management Concepts, Approaches and Challenges. Springer International Publishing AG Switzerland. ISBN 978-3-319-23575-2.

⁷⁴ Department of Environment and Heritage Protection, 2015. Groundwater dependent ecosystems in South East Queensland, 471 pp, Queensland Wetlands Program, Queensland Government, Brisbane.

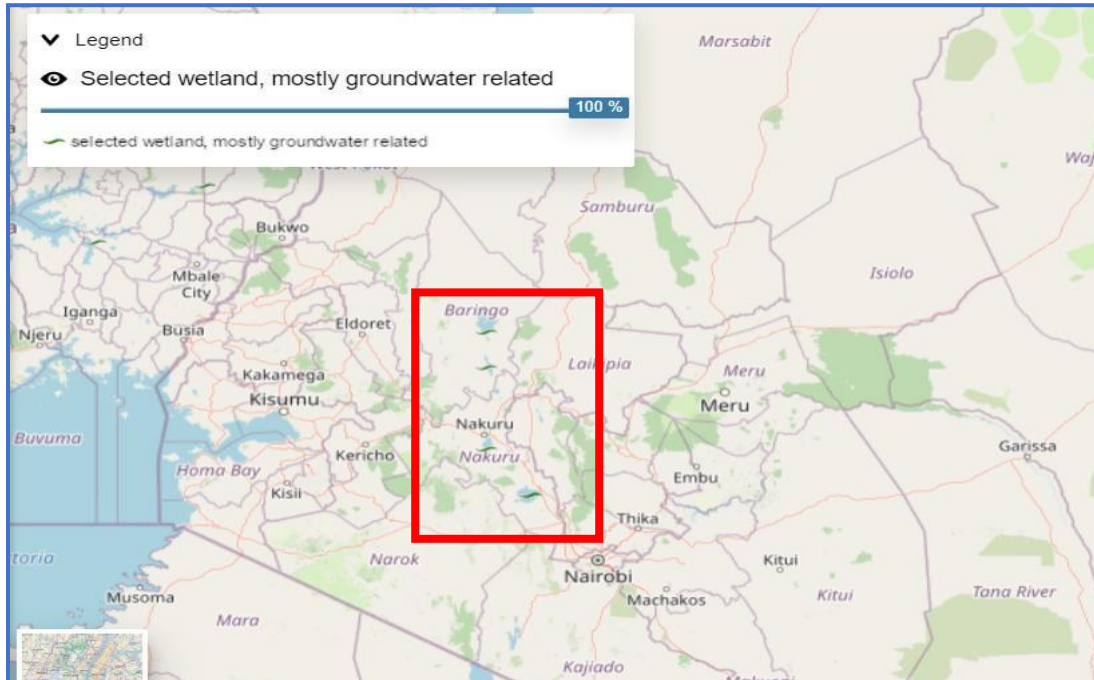


Figure-23: Four groundwater-dependent ecosystem of wetlands in Kenya extracted from IGRAC, Selected wetland, mostly groundwater related

F. Impacts on groundwater-dependent ecosystem of terrestrial flora and fauna: GDEs dependent on the subsurface presence of groundwater are GDEs that access subsurface groundwater to meet all or some of their water requirements. This includes terrestrial vegetation, subsurface fauna communities such as burrowing crayfish, and some vegetation that is associated with a surface water body. Terrestrial GDEs are terrestrial ecosystems that require access to groundwater on a permanent or intermittent basis to meet all or some of their water requirements so as to maintain their communities of plants and animals, ecological processes, and ecosystem services. Terrestrial GDEs are characterized by vegetation with access to groundwater within their rooting zone and are indicated by maintained vegetation vigor regardless of surface water availability ⁷⁵.

The biotic communities of Kenya were grouped into 19 biotic communities by the Wildlife Planning Unit of the Wildlife Conservation and Management Department as a prerequisite to the preparation of a System Plan for Kenya's National Parks and Reserves. From the 19 biotic communities, the groundwater and riverine forest biotic communities of Kenya are supported largely by groundwater seepage and thus exhibit a more luxuriant growth of vegetation than would be expected from the rainfall in the area. Examples are the Boni and Dodori forests, the Tana River Forest, and the vegetation along the Turkwel River that fed Lake Turkana ⁷⁶.

⁷⁵ Department of Environment and Heritage Protection 2015, Groundwater dependent ecosystems in South East Queensland, 471 pp, Queensland Wetlands Program, Queensland Government, Brisbane).

⁷⁶ Dean, P. B., & Trump, E. C. (1983). The biotic communities and natural regions of Kenya. *Wildlife Planning Unit, Ministry of Tourism and Wildlife and Canadian International Development Agency*).

Some groundwater-dependent terrestrial flora and fauna ecosystems are vulnerable to small groundwater decreases because of excessive use and/or a reduction in recharge in riparian zones along streams and rivers or in places with shallow water tables⁷⁷. Groundwater extraction for irrigation and water supply plans has the potential to lower restricted aquifer pressure as well as groundwater levels in unconfined aquifers. The timing, availability, and volume of groundwater flow to groundwater-dependent terrestrial ecosystems of flora and fauna may change as a result. Potential impacts to terrestrial GDE vegetation community include: (a) groundwater drawdown, (b) changes in groundwater flow, and (c) reduced surface water quality through erosion and sedimentation.

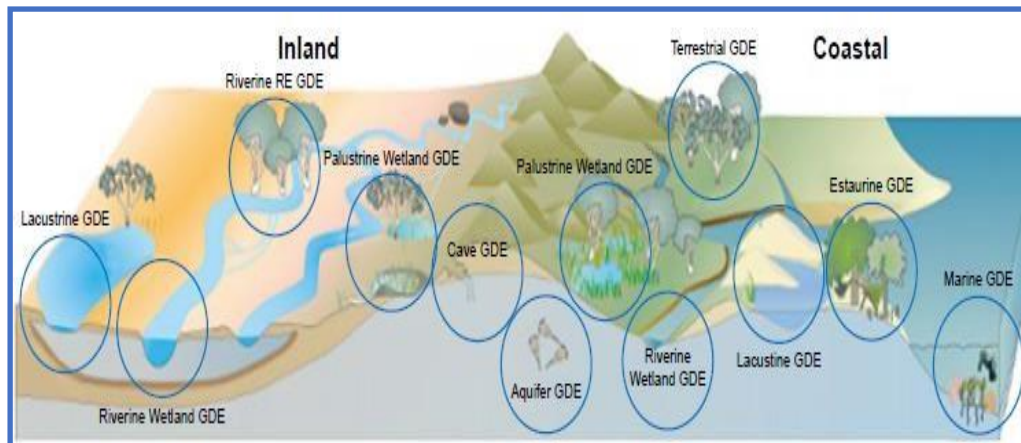


Figure-24: GDE's, where groundwater supports directly and indirectly terrestrial and aquatic ecosystems (Source: <http://wetlandinfo.ehp.qld.gov.au/wetlands/ecology/aquatic-ecosystems-natural/groundwater-dependent/>)

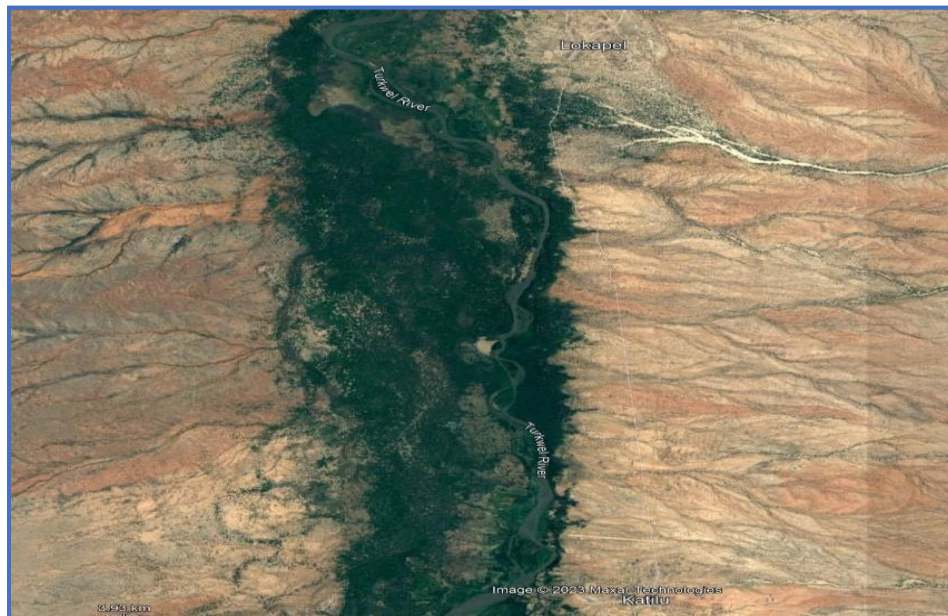


Figure-25: Groundwater and Riverine Forest Biotic Communities of the Turkwel River in Kenya

⁷⁷ AGW-Net, BGR, IWMI, CapNet, ANBO, & IGRAC, (2015). Integration of Groundwater Management into Transboundary Basin Organizations in Africa

G. Impacts on groundwater-dependent ecosystem of estuarine and near-shore marine ecosystems: Estuarine GDEs are estuarine ecosystems that require access to groundwater on a permanent or intermittent basis to meet all or some of their water requirements so as to maintain their communities of plants and animals, ecological processes, and ecosystem services. They are aquatic ecosystems dependent on the submarine discharge of groundwater. Marine GDEs are marine ecosystems that require access to groundwater on a permanent or intermittent basis to meet all or some of their water requirements so as to maintain their communities of plants and animals, ecological processes, and ecosystem services. They are aquatic ecosystems dependent on the submarine discharge of groundwater.

The HoA-GW4R program phase-1 member states of Kenya (Figure 12) and Somalia (Figure 13) are blessed with a wide range of coastal and marine resources. Numerous islands, lagoons, coral gardens, and mangrove swamps flank that shoreline. The region's coastal and marine environment is home to a wide range of habitats made up of distinctive ecosystems that support rich biodiversity and a priceless array of natural resources. Over-pumping of coastal aquifers will affect groundwater-dependent estuarine and near-shore marine ecosystems in Somalia and Kenya. The biotic communities of coastal forest and woodland, coastal evergreen bushland, coastal palm stands, marine beaches and dunes, and mangroves, which rely on the submarine discharge of groundwater would be impacted by over-pumping of coastal aquifers.

H. Impact on transboundary key biodiversity conservation areas: Ethiopia includes part of the Boma-Gambella Landscape and the Lower Awash-Lake Abbé Landscape transboundary conservation areas. Kenya includes part of five transboundary conservation areas, namely: i) Amboseli-Kilimanjaro-Longido; ii) Mount Elgon; iii) Serengeti-Mara; iv) Tana-Kipini-Laga Badana Bushbush Land and Seascape; and v) Tanga Marine Reserves System, Tanga Coelacanth Marine Park, Diani Chale, and Kisitee-Mpunguti (Table 11). Somalia includes part of the Tana-Kipini-Laga Badana Bushbush Land and Seascape transboundary conservation areas. HoA-GW4RP projects and sub-project activities will affect these transboundary key biodiversity conservation areas. From the seven transboundary conservation areas of member states, only Tana-Kipini-Laga Badana Bushbush Land and Seascape (Kenya and Somalia) would likely be impacted by HoA GW4R Program activities, whereas the rest six are spatially far from HoA GW4R Program intervention areas and thus would not likely be impacted by HoA GW4R Program activities. Within some TBAs, there are National Parks and National Reserves. For instance Marsabit National Park and Marsabit National Reserves are found within Merti TBA while Marka Mari National Park is found within Dawa TBA.

I. Impacts on traditional underserved communities of borderlands: HoA GW4RP sub-components will be implemented mainly in lowland areas of Ethiopia, Kenya, and Somalia, where large part of the population follows pastoralist and agro pastoralist livelihood systems are regarded as meeting the Bank safeguards category 'indigenous peoples', hence fell into that category. 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.

HoA GW4R project components from the Ethiopia side 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. There are at least five Oromo and Somali sub groups over whom the Boran assumed predominance. These include Gebra (speaking Oromo), Marehan (speaking Somali), Gujji (speaking Oromo), Garri (speaking Oromo and Somali) and the Degodia (speaking Somali). In Kenya, some vulnerable and disadvantaged groups, such as Waata, Warabeiyi, and the Gababwein at Mandera Project County; Dasanach, El Molo, and the Rendille at Marsabit Project County; Riba at Wajir Project County; El Molo and Ngibetok at Turkana Project County;

and Munyoyaya, Malakote, and Waliwana at Garissa project county¹⁹, will be potentially affected by the proposed project. In Somalia, some vulnerable and disadvantaged groups, such as the Aweer/Boni and Eyle, and possibly some Bantu/Jareer groups, could meet the requirements for ESS7. The project will give special consideration to vulnerable and disadvantaged groups. These include: i. Minority castes and groups; ii. Internally Displaced Persons; iii. Those who live in remote rural areas or areas characterized by violence that are bereft of social services and amenities; iv. Nomadic pastoralist communities; v. People Living with Disabilities; vi. Widows and female heads of households; and vii. Youth, who will be potentially affected by the proposed project.

J. Impact on transboundary heritage sites: There are nine UNESCO World Heritage Sites in Ethiopia as of 2019. There are seven world heritage sites in Kenya (Table 13). Somalia has never signed the UNESCO charter, making none of its historic sites currently eligible for World Heritage Status. However, Somalia has the top 10 Future UNESCO World Heritage Sites, which they can put forward as candidates for World Heritage Status (Table 13). There are nine UNESCO World Heritage Sites in Ethiopia as of 2019. There are seven world heritage sites in Kenya. Somalia has never signed the UNESCO charter, making none of its historic sites currently eligible for World Heritage Status. However, Somalia has the top 10 future UNESCO World Heritage Sites, which it can put forward as candidates for World Heritage Status. In the program of HoA GW4R, there are transboundary and transitional heritage sites that could promote regional integration, reduce poverty, and strengthen social cohesion, foster sustainable development, innovation, and peace among the peoples of the member states. Currently, UNESCO lists 37 transboundary World Heritage sites globally. Maasai Mara National Reserve and Serengeti World Heritage Site connectivity, the geometric rock art sites in the Lake Victoria Basin, and the Omo-Turkana Basin are transboundary World Heritage sites in this program area. Lake Turkana natural heritage consist of Sibiloi National Park and two islands on Lake Turkana (South Island and Central Island) (Figure 26). Reasons for the park's importance include its use as a stopping point for migratory birds and as a breeding ground for the Nile crocodile, hippopotamus, and snakes. It also contains both animal and hominid fossils in the Koobi Fora deposits, which are unique in the world.

From the three transboundary World Heritage sites in this program area, the Omo-Turkana Basin is potentially impacted by the program and needs the cross-border collaboration of Ethiopia and Kenya on sustainable ecosystem services in the Omo-Turkana basin. The impact of HoA-GW4RP sub-projects on transboundary and transnational cultural heritage sites is going to depend on the presence of such cultural, historical, religious, or archaeological sites in the sub-project's implementation areas. The potential location of sub-project sites under HoAGW4RP will cover a wider geographical area, and hence there is still a potential for certain sub-projects to affect national and transboundary cultural heritage sites valued and recognized by the local communities. The sub-project works would involve earthworks and temporary and permanent land uptake in areas with a significant level of known physical cultural heritage, 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 artefacts or change conditions so that artefacts are affected through changed hydrological conditions, improved access, and therefore the risk of vandalism and theft. Construction of temporary access roads and construction material production sites could pose the same risk of affecting unknown cultural heritages.



Figure-26: Lake Turkana natural heritage consist of Sibilo National Park and two islands on Lake Turkana (South Island and Central Island)

K. Impact on Livelihood: A significant proportion of the people in the IGAD region are pastoralists. The livelihood is practiced predominantly in arid and semi-arid lands (ASALs), where pastoralists are able to exploit land and conditions that normally cannot support rain-fed agriculture. Pastoralist livelihoods in the region will be adversely impacted due to temporary or permanent land acquisition, contamination of pastureland from testing, monitoring, and productive borehole drilling, and pastureland degradation associated with the drilling of new boreholes for livestock consumption through HoA-GW4RP.

During the construction stage, HoA-GW4RP sub-projects will probably have to occupy an average of 2 meters of pipeline corridor. Since the project is located predominantly in arid and semi-arid lands (ASALs), most of the affected properties will be pasturelands, which have traditionally been considered almost 'waste lands'. The water pipelines shall be buried at a depth of 1.5 meters to allow pastoralists to graze and agro-pastoralists to cultivate over the pipe. Therefore, this area will be temporarily impacted during the construction phase, and the land could be returned to the communal owner during the operation phase. Tree roots rarely reach more than 1.8 meters deep, so it could be possible to plant trees above the pipe; however, it seems more prudent to avoid this in order to facilitate access to the pipe during water system operation and maintenance. The footprint associated with permanent land acquisition and resettlement impacts for groundwater extraction includes the area of the wells and water extraction infrastructure and some specific spots in the area of the pipeline that connects the wells or collects water for pasture production, groundwater regeneration, livestock consumption, human consumption, and irrigated crop farming. In the well fields, boreholes will occupy the land for the project duration. The acquisition will be permanent even if a return of the land is proposed at the project closure. The water pipelines shall be buried at a depth of 1.5 meters, and groundwater testing, monitoring, and productive boreholes shall be drilled. Pasturelands would be taken for these construction activities. The nature of the direct environmental effect of pasturelands will be the removal of vegetation and topsoil. Pipeline corridors and boreholes will displace pasturelands directly within their footprint, in addition to the direct and indirect

environmental effects of quality reduction of adjacent grassland due to erosion and sediment. Pasturelands will also be affected by improper or unwise disposal of spoil disposals and sedimentation from the burring of pipeline corridors and the drilling of boreholes.

Borehole-drilling operations apply drilling foams and bentonites to enhance the drilling efficiency, and drilling discharge or sludge contaminated with chemicals is released from the drilling operation. The disposal of drilling water and sludge into pasturelands will adversely affect them. The WB EHS Guidelines provide information on techniques for wastewater management and reuse that can be applied to a wide range of activities. Pastoralist livelihood systems in the borderlands are intrinsically transnational and are oriented around mobility. Drilling of new boreholes for livestock consumption through HoA-GW4RP will be a pulling factor for unmanaged in-flux of livestock, even by crossing national boundaries, which can cause overgrazing with irreversible ecological consequences. Thus, the impact could be considered transboundary in nature.

L. Exacerbating natural and man-made disasters: The proposed HoA-GW4RP sub-projects, particularly irrigation schemes, will exacerbate natural and man-made disasters such as flooding and drought. It will trigger flood hazards during the construction phase of the project due to different reasons. Interference with rivers and streams is associated with the construction of access roads and temporary bridges. Contractors may interfere with the natural flow of rivers or streams by constructing access roads, temporary bridges, temporary diversions, and construction works for drainage crossing (DC) structures and interception drains. If construction works for drainage crossing (DC) structures as well as interception drains are not finalized before the rainy season of the upstream watershed areas, flood hazards will become a serious issue associated with the construction of irrigation schemes.

Besides triggering flood hazards, irrigation and water supply projects will have their own impact on the natural terrestrial environment and trigger drought in the region, particularly if the construction and operations of the irrigation and water supply projects are non-conservation-based. The project could construct access roads to borehole sites, and the access roads will impact vegetation and wildlife by clearing the area. Implementation of sub-projects could indirectly affect aquatic flora and fauna. Unmanaged abstraction and utilization of groundwater may have an impact on the surface water resources of a specific sub-project area. Elimination or reduction of water level or base flow in surface water resources (such as streams, rivers, wetlands, lakes, etc.) could, in turn, eliminate or restrict the aquatic habitat or ecosystem, resulting in impacts on the aquatic flora and fauna as well as triggering hydrological drought.

M. Spread of water borne diseases and public health risks: A very serious problem facing the region is also the wide-spread impact of Tsetse fly, which has rendered the agricultural resources of many countries unusable. Water logging conditions of the irrigation water in the canals and drainage systems, as well as the formation of ponds around the bore holes, ponds, and small reservoirs, with the hotter climate conditions of the project area, will create conducive conditions (breeding ground) for disease-transmitting vectors like mosquitoes. Anopheles mosquitoes from the water bodies can travel a maximum flying distance of 2 km and could cross the national borderland. Formation of stagnant water bodies around borderland, resulting from changes in environmental conditions that increase vector (i.e., Anopheles mosquito) abundance. Thus, the impact can be considered transboundary in nature.

N. Risk of exacerbating existing social exclusion, conflict, illicit behavior, crime and gender-based violence of borderlands

WB ESS4 (Community Health and Safety) recognizes that communities that are already subjected to impacts from climate change may also experience an acceleration or intensification of impacts due to project activities. HoA GW4RP member states communities are already exposed to climate change risks and conflicts associated with drought, food

insecurity, and access to natural resources. The encounter with recurrent drought, policy gaps, access to water, pasture and scarce resources has progressively exposed the vulnerability of the pastoral and agro-pastoral communities and it is eventually leading to social instability. For instance in the case of Kenya, the project area is situated in the northern and north-eastern region of the country that is prone to conflict and insecurity. Conflicts between the mostly pastoralist ethnic groups of northern Kenya take the form of battles over pasture and water sources, raiding of livestock, and banditry, and are driven by survival needs, climatic variability, culture, and ethnic politics. The northeast is particularly vulnerable to terrorism and radicalization, particularly near the Kenya-Somali border where the Somalia-based terrorist organization Al-Shabaab often dwells in close contact with communities.

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.

Female workers may be discriminated against in terms of employment but are also at higher risk of SEA/ SH. Labour Management Procedures, SEA/SH action plans and codes of conduct for workers will be prepared during implementation. Security risks to workers and communities will be addressed through the development of security risk assessments and management plans when project sites are finalized.

Construction work opportunities may be taken by "outsiders" rather than local residents. In the construction sectors of the program countries, it is common for many contractors shift with their labor force from completed construction site to another new construction site awarded for such contractor instead of recruiting from the local project resident. Arriving workers have a need for housing, food supply, merchandize, transport, health care, entertainment, social interaction, etc. If not managed appropriately this influx of workers (and followers) can lead to adverse social and environmental impacts on local communities.

Fraternization i.e., inappropriate social relations may occur (conflict, illicit, exploitative, forced) will occur due to labor influx. Workers are predominantly young, male, often single, separated from family and normal sphere of social control, and with cash income. This can lead to a spectrum of unacceptable and/or illicit behavior, ranging from unwanted aggressive advances and sexual harassment to gender-based violence against women and children. As long as the proposed project is financially supported by World Bank, labor influx is a project related impact that needs to be assessed and managed as required by the Bank Policy.

6.3 Analysis of Significance Level of Impacts

6.3.1 Analysis of Significance Level of Positive Strategic Environmental and Social Impacts

The significance level of beneficial/positive strategic environmental and social impacts was assessed based on their level of significance in terms of benefit of the project-affected area, duration of positive impact, and intensity of positive impact. Finally, the overall significance level of beneficial/positive strategic environmental and social impacts before the implementation of enhancement measures was determined by combining those three scales benefit of the project-affected area, duration of positive impact, and intensity of positive impact. Prioritization of identified beneficial strategic environmental and social issues would help to focus on urgent sub-project activities, and priority enhancement measures.

Table-22: Summary Table of beneficial/positive strategic environmental and social Significance Ratings

No	Beneficial/Positive Environmental and Social Impacts	Benefit of the project-affected area	Benefited the Grassroots level Beneficiaries	Duration of Positive Impact	Intensity of Positive Impact	Overall Significance Level
1.	Strengthen the climate resilience of targeted communities and reduce GHG Emissions	Regional	High	Long-term	High	Very High
2.	Reduce conflicts over water and create peace and stability in the Region	Regional	Medium	Long-term	Medium	High
3.	Ensure food security and bring socioeconomic developments	Regional	High	Long-term	High	Very High
4.	Create inclusive community-level access to groundwater in the borderlands of the HoA	Regional	High	Long-term	Medium	High
5.	Creating employment opportunity for the local communities and women	Regional	High	Medium-term	Medium	High
6.	Generating groundwater information and strengthening regional and national groundwater institutions	Regional	Low	Medium-term	Medium	Medium
7.	Create strong linkages and alignment with other HoA projects	Regional	Low	Medium-term	Medium	Medium

All identified beneficial or positive strategic environmental and social impacts are regional in their spatial context. Strengthen the climate resilience of targeted communities and reduce GHG Emissions, ensure food security and bring socioeconomic developments, create inclusive community-level access to groundwater in the borderlands of the HoA, and create employment opportunity for the local communities and women are beneficial or positive strategic environmental and social impacts that highly benefited grass root level beneficiaries or local communities. Strengthen the climate resilience of targeted communities and reduce GHG Emissions, ensure food security and bring socioeconomic developments, and create inclusive community-level access to groundwater in the borderlands of the HoA have long-term duration impact. From seven identified beneficial or positive strategic environmental and social impacts, strengthen the climate resilience of targeted communities and reduce GHG Emissions, and ensure food security and bring socioeconomic developments are highly beneficial environmental and social impacts.

The analysis of significance level of positive environmental and social impacts indicated that IGAD-WU and three member states of HoA GW4RP decision-makers need to focus their attention and means on the most urgent sub-

project activities, and priority enhancement measures of strengthening the climate resilience of targeted communities, reduce GHG Emissions, and ensuring food security and bring socioeconomic developments.

6.3.2 Analysis of Significance Level of Negative Strategic Environmental and Social Impacts

The significance level of the impact was assessed quantitatively or qualitatively based on the extent, duration, and intensity of the impact. Finally, the overall significance level of the impact before the implementation of mitigation measures was determined by combining those three scales: extent, duration, and intensity, as well as information provided by the stakeholder consultation workshop on the Identification and Prioritization of Key Environmental and Social Issues Associated with the HoA-GW4R project. Prioritizing negative impacts is a useful way to increase efficiency in decision-making. When determining actions to mitigate or eliminate the negative impacts of a project, and particularly when resources available to take such measures are limited, decision-makers need to focus their attention and means on the most urgent and/or detrimental impacts.

Table -23: Summary Table of Impact Significance Ratings

No	Adverse/Negative Environmental and Social Impacts	Extent	Duration	Intensity	Overall Significance Level
1.	Transboundary aquifer depletion	Regional	Long-term	Medium	High
2.	Water quality deterioration	Regional	Long-term	Medium	High
3.	Risk of exacerbating existing transboundary water use conflict	Regional	Long-term	High	Very High
4.	Cumulative impacts of soil erosion and degradation	Regional	Short-term	Medium	Low
5.	Impacts on groundwater-dependent ecosystem of lacustrine/palustrine/riverine wetlands, springs and Oasis	Regional	Long-term	Medium	High
6.	Impacts on groundwater-dependent ecosystem of terrestrial flora and fauna	Regional	Long-term	Low	Medium
7.	Impacts on groundwater-dependent ecosystem of estuarine and near-shore marine ecosystems	Regional	Long-term	Low	Medium
8.	Impact on transboundary key biodiversity conservation areas	Regional	Short-term	Medium	Low
9.	Impacts on traditional underserved communities of borderlands	Regional	Long-term	Medium	High
10.	Impact on transboundary heritage sites	Regional	Short-term	Medium	Low
11.	Impact on livelihood	Regional	Long-term	Medium	Medium
12.	Exacerbating natural and man-made disasters (flood and drought)	Regional	Long-term	High	Very High
13.	Spread of water borne diseases and public health risks	Regional	Long-term	Medium	High
14.	Risk of exacerbating existing social exclusion, conflict, illicit behavior, crime and gender-based violence of borderlands	Regional	Short-term	High	Medium

As long as this Regional Strategic Environmental and Social Assessment (SESA) for the HoA GW4R Program focused on regional-level, transboundary, and cumulative impacts, all identified impacts are regional in their spatial context. From 14 identified adverse environmental and social impacts, 5 of them are short-term impacts associated with project construction activities include: cumulative impacts of soil erosion and degradation, impact on transboundary key biodiversity conservation areas, impact on transboundary heritage sites, impact on livelihood. and risk of exacerbating existing social exclusion, conflict, illicit behavior, crime and gender-based violence of borderlands. In terms of impact intensity, except risk of exacerbating existing transboundary water use conflict and exacerbating natural and man-made disasters (flood and drought) which are rated as high intensity the rest are rated as nine of them under medium intensity (transboundary aquifer depletion, water quality deterioration, cumulative impacts of soil erosion and degradation, impacts on groundwater-dependent ecosystem of lacustrine/palustrine/riverine wetlands, springs and Oasis, impacts on traditional underserved communities of borderlands, impact on transboundary heritage sites, impact on livelihood, spread of water borne diseases and public health risks and risk of exacerbating existing social exclusion, conflict, illicit behavior, crime and gender-based violence of borderlands) and three of them (impacts on groundwater-dependent ecosystem of terrestrial flora and fauna, and impacts on groundwater-dependent ecosystem of estuarine and near-shore marine ecosystems) rated as low intensity.

From the identified and analyzed regional and transboundary environmental and social impacts, risk of exacerbating existing transboundary water use conflict and exacerbating natural and man-made disasters (flood and drought) have very high overall significance level whereas. Transboundary aquifer depletion, water quality deterioration, impacts on groundwater-dependent ecosystem of lacustrine/palustrine/riverine wetlands, springs and Oasis, impacts on traditional underserved communities of borderlands, and spread of water borne diseases and public health risks have high overall significance level. Impacts on groundwater-dependent ecosystem of terrestrial flora and fauna, impacts on groundwater-dependent ecosystem of estuarine and near-shore marine ecosystems, and impact on livelihood have medium overall significance level. Cumulative impacts of soil erosion and degradation, impact on transboundary key biodiversity conservation areas, and impact on transboundary heritage sites have low overall significance level.

The analysis of significance level of negative strategic environmental and social impacts indicated that IGAD-WU and three member states of HoA GW4RP decision-makers need to focus their attention and means on the most urgent and/or detrimental impacts and their suggested mitigation measures (very high and high overall significance level) such as: risk of exacerbating existing transboundary water use conflict, exacerbating natural and man-made disasters (flood and drought), transboundary aquifer depletion, water quality deterioration, impacts on groundwater-dependent ecosystem of lacustrine/palustrine/riverine wetlands, springs and Oasis, impacts on traditional underserved communities of borderlands, and spread of water borne diseases and public health risks.

6.4 Analysis of Alternative Scenarios of the HoA GW4R Program

6.4.1 Identification of Alternative Scenarios

During Environmental and Social Assessment (SESA and ESIA), it is crucial that assessing feasible alternatives for the program and project so as to bring environmentally sound, economically feasible and socially viable programs and projects in the area. Therefore, prior to decide the proposed program design and implementation of it in general, a number of program options were examined to select the feasible alternatives considering biophysical, social, economic and technical factors.

The following alternative scenarios were identified and further evaluated:

- **Alternative Scenario (S₀):** No action alternative scenario which considers maintaining the current status quo or business-as-usual scenario in the region without improving management and access of water resources in IGAD Region for resilience;
- **Alternative Scenario (S₁):** improving management and access of surface water for resilience in HA;
- **Alternative Scenario (S₂):** improving management and access of conjunctive use of both surface and groundwater for resilience in HA; and
- **Alternative Scenario (S₃):** improving management and access of groundwater for resilience in HA.

6.4.2 Evaluation and Selection of Preferred Alternative Scenario

4.2.1.1 Alternative Scenario (S₀): current status quo or business-as-usual scenario

A "do-nothing" alternative to the base-case form of the program or no action alternative scenario that considers maintaining the current status quo or business-as-usual scenario in the region without improving management and access to water resources in the IGAD Region for the resilience project has been considered. From a purely physical environmental viewpoint, the do-nothing alternative is preferable to the program's implementation since it would avoid any of the adverse impacts associated with the program. However, the potential environmental and socioeconomic benefits to the IGAD Region would be foregone, and quality of life would remain at a low level for many of those who live in the member states of the IGAD Region.

Across the Africa region, the World Bank's portfolio included both country-specific and regional projects with relevance to groundwater between 1997 and 2017 from member states of HoA GW4RP, the countries that have been engaged in the most projects with relevance to groundwater are Ethiopia (16), Kenya (12), and Somalia (2). Regional projects (of which 30 alone are mapped to the Africa region rather than a specific country or countries) often relate to the transboundary management of (surface) water resources. There have been no country-level World Bank projects predominantly focused on groundwater in the World Bank's Africa portfolio (1997-2017). This seems to represent a major deficiency in the World Bank's Africa project portfolio. In addition to groundwater not featuring prominently in the World Bank's Africa project portfolio, drought resilience also receives scant attention. Zooming into a known region of repetitive drought conditions—the Horn of Africa—there is not strong evidence of strategic lending to address this problem. The Horn of Africa is currently facing its third consecutive year of drought; three of the four Horn of Africa countries are situated in the Africa region (Eritrea, Ethiopia, and Somalia), and only one of those countries has had more than one project relevant to groundwater in the past 20 years ⁷⁸.

⁷⁸ WB, 2018. Assessment of Groundwater Challenges & Opportunities in Support of Sustainable Development in Sub-Saharan Africa

HoA GW4RP's long-term vision consists of three stages: the short term, the medium term, and the long term, which would be compromised and slowed down. Developing small-scale infrastructure and tapping mostly national aquifers allows for dispersed low-cost service provision (i.e., water supply for humans and livestock and small-scale irrigation) in remote, sparse communities, contributing to addressing poverty traps and climate change impacts on health and promoting cross-border dynamics. In the medium term, larger-scale infrastructure could be developed and more complex aquifers could be exploited to support the development of small towns and larger-scale irrigation. Ultimately, in the long term, countries take advantage of the regional institution's strong capacity for complex aquifer dynamics and are able to develop shared groundwater management projects with mutual benefits and economies of scale. Under the no action alternative scenario, which considers maintaining the current status quo or business-as-usual scenario in the region without improving management and access to water resources in the IGAD Region, these short-term, medium-term, and long-term visions would be compromised and slowed down, as well as the climate resilience of targeted communities, which wouldn't be strengthened using the Multiphase Programmatic Approach (MPA). Therefore, from an environmental and socio-economic point of view, the do-nothing alternative, i.e., maintaining the current status quo or business-as-usual scenario in the region without improving management and access to water resources in the IGAD Region, is not preferable to project implementation.

Business-as-usual is not an option for water and development, and the RSESA alternative evaluation suggests that IGAD should find ways to systematically support the member countries that face the most water stress. The evaluation result of this SESA supported the evaluation results of Independent Evaluation Group (IEG) 2010 evaluation of the World Bank's global water sector portfolio, with specific reference to groundwater. They also concluded that business-as-usual is not an option for water and development and they suggested that the World Bank should find ways to support systematically the countries that face the most water stress ⁷⁹.

Three alternative scenarios, namely (a) Alternative Scenario (S1)-improving management and access of surface water for resilience in HA; (b) Alternative Scenario (S2)-improving management and access of conjunctive use of both surface and groundwater for resilience in HA; and (c) Alternative Scenario (S3)-improving management and access of groundwater for resilience in HA, were further evaluated as alternatives by avoiding the Business-as-usual or "do-nothing" scenario. The evaluation of alternative scenarios was based on ten indicators, including GHG emissions, pressure on transboundary surface and groundwater resources, water use conflict due to transboundary downstream effects mainly decrease in water quantity, effects on transboundary groundwater-dependent ecosystems (GDEs), number of direct beneficiaries, upfront costs needed to confirm and characterize water resources, capital costs, operational costs, technological maturity level, and implementation timeframe.

⁷⁹ EG (Independent Evaluation Group, World Bank Group). 2010. AN EVALUATION OF WORLD BANK SUPPORT, 1997-2007 Volume 1

4.2.1.2 Evaluation of Alternative Scenarios (S1, S2 and S3) Using DEFINITE Software

Evaluation results of alternative scenarios (S1, S2 and S3) using DEFINITE Software are presented as follow:

Problem Definition: Define Alternatives and Effects: Problem definition was the first step to defining alternative scenarios and setting up an effects table (Figure 27). By avoiding the first no-project alternative or "do-nothing" alternative, three alternative scenarios, namely: (a) Alternative Scenario (S₁): improving management and access of surface water for resilience in HA; (b) Alternative Scenario (S₂): improving management and access of conjunctive use of both surface and groundwater for resilience in HA; and (c) Alternative Scenario (S₃): improving management and access of groundwater for resilience in HA, were defined in the problem definition and included under the effect table as columns. These alternatives are evaluated according to ten criteria as indicators, such as: GHG emission, pressure on both transboundary surface and groundwater resources, water use conflict due to transboundary downstream effects mainly decrease in water quantity, transboundary groundwater-dependent ecosystems (GDEs) effects, number of direct beneficiaries, up-front costs required to confirm and characterize water resources, capital costs, operational costs, and technological maturity level. For each effect (indicators), the name of the effect (indicators), type of effect (effect or groups of effects), measurement scale, Cost/benefit, and unit were determined or defined. These effects or indicators are included in the effect table as rows. The ten key effects or indicators used to inform the evaluation of alternative scenarios are summarized in the table below:

Table-24: Summary of Alternative Scenarios, Indicators (Effects) and their Units

No	Scenario Indicators	Unit	Alternative Scenarios		
			Alternative Scenario(S ₁): improving management and access of surface water for resilience in HA	Alternative Scenario(S ₂): improving management and access of conjunctive use of both surface and groundwater for resilience in HA	Alternative Scenario (S ₃): improving management and access of groundwater for resilience in HA
I Environmental Indicators					
1.1.	GHG Emissions (CO ₂ & CH ₄)	Scale	High GHG emissions. There will be Dam and Irrigation Scheme Footprint areas. There will be environmental impacts related to inundation areas resulting from the construction of new dams that will cause potential carbon biomass emissions from rotting vegetation. Irrigation scheme footprints include Canal Footprint area and Command Areas. Development of new irrigation schemes could entail clearing of natural vegetation (with carbon emission consequences).	Moderate GHG emissions	Low GHG emissions due to the absence of Dam and Irrigation Scheme Footprints areas are small mainly for solar power construction and water distribution lines.
1.2.	Pressure on both transboundary surface and groundwater resources.	Number of Transboundary Rivers (3), Lakes (1) and Aquifers (4)	High pressure on transboundary surface water resources	Avoids aquifer and surface source over-extraction and degradation	High pressure on transboundary groundwater resources
1.3.	Transboundary Groundwater-dependent ecosystems (GDEs) effects	Types of GDEs(4)	Moderate Transboundary Groundwater-dependent ecosystems (GDEs) effects	Induced natural recharge of the aquifer(s) and reduces Transboundary Groundwater-dependent ecosystems (GDEs) effects	High Transboundary Groundwater-dependent ecosystems (GDEs) effects
II. Socioeconomic and Technological Indicators					
2.1	Number of Direct Beneficiaries	Number	High	Moderate	Low
2.2	Water use conflicts due to transboundary downstream effects	Number of Transboundary Rivers (3) and Lakes(1)	High Water Use Conflict due to Transboundary Downstream effects	Moderate Water Use Conflict due to Transboundary Downstream effects	Reduces water use conflict by avoiding damming of transboundary Rivers and over abstraction of transboundary Lakes.
2.3	^a Up-front costs required to confirm and characterize water resources	Scale	Low	Moderate	Compared to surface water development, groundwater can have higher up-front costs for resource confirmation and characterization prior to development.
2.4	^b Capital Costs	Scale	Equivalent-sized surface water development. has higher capital expenditures than groundwater development (both small and large-scale)	Moderate capital costs	Groundwater development (both small and large-scale) has lower capital expenditures than equivalent-sized surface water development. Variability in cost for fresh groundwater shall correspond to the average depth of groundwater
2.5	^c Operational Costs	Scale	Equivalent sized surface water development has lower ongoing operational expenditures than	Moderate	Groundwater development (both small and large-scale) has lower ongoing operational

			groundwater development (both small and large-scale)		expenditures than equivalent sized surface water development. Operational costs contribute the main part of the costs over the life cycle of the pumps and account for more than 80 % of the initial installation cost over the life of the pumps.
2.5	^d Technological Maturity Level	Scale	Highly mature and widely used	In early stages of research and development	Moderately mature and used.
2.6	^e Implementation timeframe	Scale	To date, surface water time investments have predominated over groundwater investments. Long time investments needed to establish and/or reach full capacity.	Moderate implementation timeframe.	Quick to implement and reach desired capacity.

Note: It represents an indicative assessment scale of 1-5 as follows: ^a Up-front costs required to confirm and characterize water resources: 1 – very low cost, to 5 – very high up-front costs required to confirm and characterize water resources, ^bInitial investment: 1 – very low cost, to 5 – very high cost investment needed to implement technology, ^cOperational costs: 1 – very low/no cost, to 5 – very high costs of operation and maintenance, ^dTechnological maturity: 1 - in early stages of research and development, to 5 – fully mature and widely used, and ^eImplementation timeframe: 1 - very quick to implement and reach desired capacity, to 5 - significant time investments needed to establish and/or reach full capacity

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File View Module Problem definition Settings Help

Problem definition Start Alternatives Effects Close

	C/B	Unit	*Alternative Scenario (S1)	*Alternative Scenario (S2)	*Alternative Scenario (S3)
GHG Emissions	●	Scale	4.00	2.00	1.00
Pressure on both transboundary SW and GW	●	Number	8.00	0.00	4.00
Water use conflicts	●	Number	4.00	2.00	0.00
Transboundary GDEs effects	●	Types	1.00	3.00	4.00
Number of Direct Beneficiaries	+	Number	4000000.00	3700000.00	3300000.00
Up-front costs	●	Scale	2.00	3.00	4.00
Capital Costs	●	Scale	4.00	3.00	2.00
Operational Costs	●	Scale	4.00	3.00	2.00
Technological Maturity Level	+	Scale	4.00	2.00	3.00
Implementation timeframe	●	Scale	4.00	3.00	2.00

Figure-27: Problem definition: the effects table of improving management and access of water for resilience in HA

Multicriteria Analysis: Standardizing, Weighting, and Ranking of Alternative Scenarios

Standardizing and Weighting: Multicriteria analysis is the second step in this evaluation procedure. The purpose of this step is to derive a ranking of the alternatives. To do this, the scores must first be standardized to make them comparable, and the relative importance, or weight, of each score must be established. Figure 28-30 show the three steps of multicriteria analysis: 1. Standardize, 2. Weights, and 3. Rank. In this scenario evaluation, all criteria were standardized using the maximum standardization method. The columns minimum and maximum range show the lowest and highest score for each criterion, respectively. Weights were assigned using the expected value or Ranking Method.

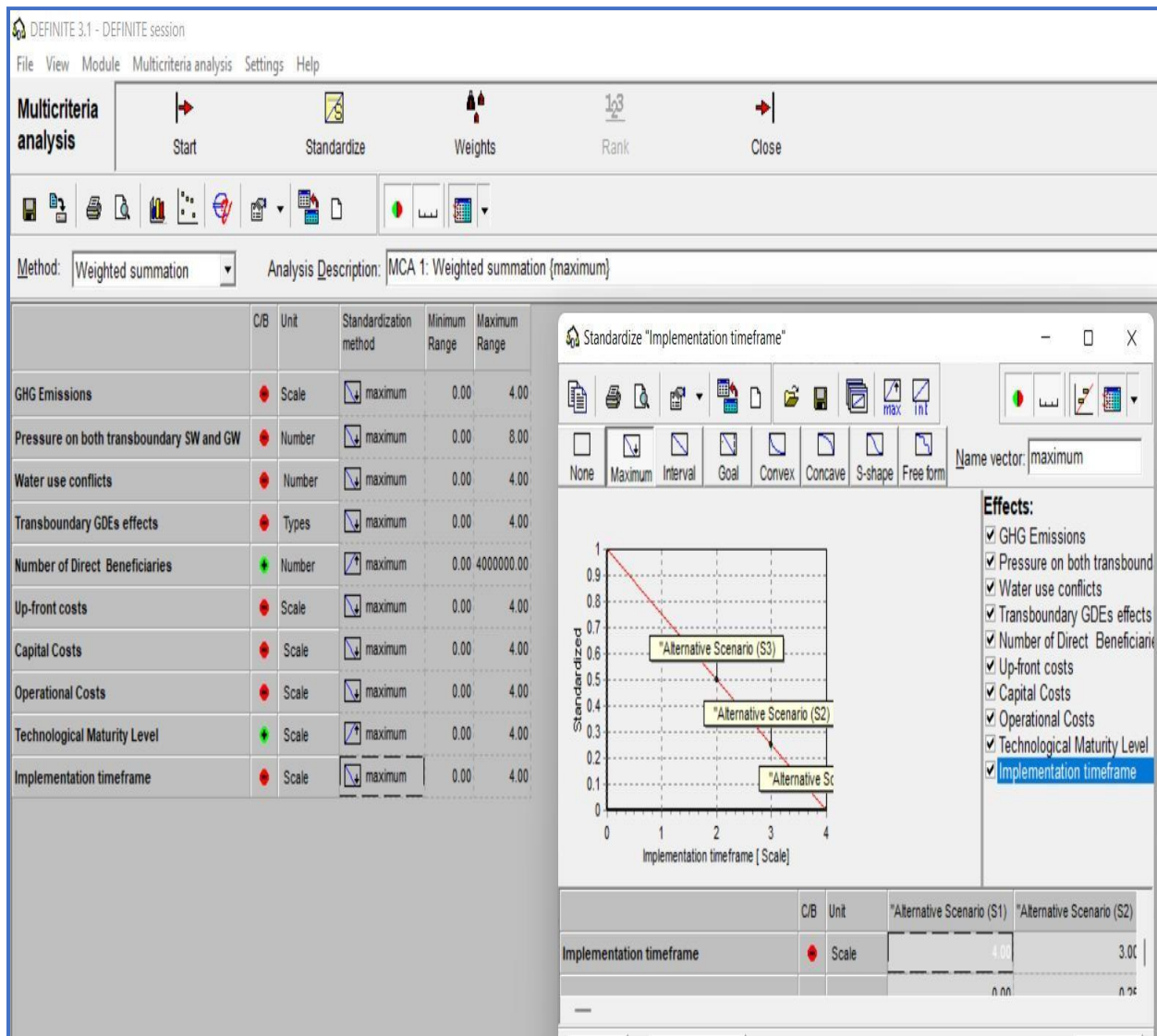


Figure-28: Standardizing Using Maximum Method

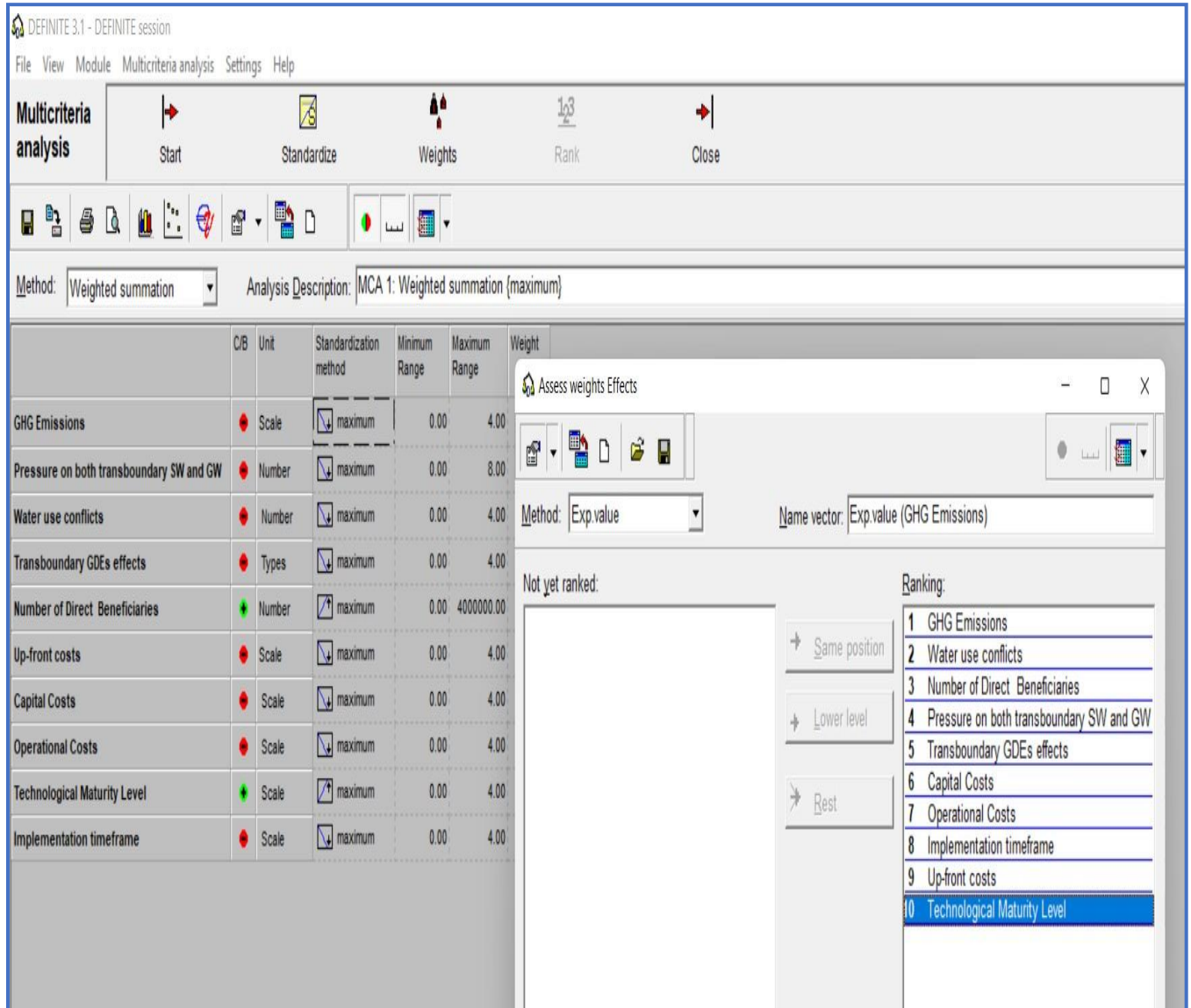


Figure-29: Weighting Using Expected Value or Ranking Method

DEFINITE 3.1 - DEFINITE session

File View Module Multicriteria analysis Settings Help

Multicriteria analysis Start Standardize Weights Rank

Method: Weighted summation Analysis Description: MCA 1: Weighted summation (maximum; Exp.value

	C/B	Unit	Standardization method	Minimum Range	Maximum Range	Weight
GHG Emissions	●	Scale	maximum	0.00	4.00	0.293
Pressure on both transboundary SW and GW	●	Number	maximum	0.00	8.00	0.110
Water use conflicts	●	Number	maximum	0.00	4.00	0.193
Transboundary GDEs effects	●	Types	maximum	0.00	4.00	0.085
Number of Direct Beneficiaries	●	Number	maximum	0.00	4000000.00	0.143
Up-front costs	●	Scale	maximum	0.00	4.00	0.021
Capital Costs	●	Scale	maximum	0.00	4.00	0.065
Operational Costs	●	Scale	maximum	0.00	4.00	0.048
Technological Maturity Level	●	Scale	maximum	0.00	4.00	0.010
Implementation timeframe	●	Scale	maximum	0.00	4.00	0.034

Figure-30: Weight Values for each Indicators (Effects) Using Expected Value or Ranking Method

Ranking of Alternative Scenarios

- A. GHG Emissions:** High GHG emissions for alternative scenario (S1) surface water resources. There will be dam and irrigation scheme footprints. There will be environmental impacts related to inundation areas resulting from the construction of new dams that will cause potential carbon biomass emissions from rotting vegetation. Irrigation scheme footprints include the Canal Footprint Area and Command Areas. The development of new irrigation schemes could entail the clearing of natural vegetation (with carbon emission consequences). Low GHG emissions for alternative scenario 3 (groundwater development) are due to the absence of dam and irrigation scheme footprints, except for small footprints for power house construction and water distribution lines.
- B. Pressure on both transboundary surface and groundwater resources:** Alternative Scenario (S₁), i.e., improving management and access of surface water for resilience in HA, will cause high pressure on

transboundary surface water resources, while Alternative Scenario (S3), i.e., improving management and access of groundwater for resilience in HA, will cause high pressure on transboundary groundwater resources. Therefore, in terms of pressure on both transboundary surface and groundwater resources, the alternative scenario (S2) of improving management and access to conjunctive use of both surface and groundwater for resilience in HA is the preferred alternative scenario because it reduces aquifer and surface source over-extraction and degradation and supports a more natural water balance where both groundwater recharge and surface water recovery are possible. This scenario will improve the sustainability of surface and groundwater management while still meeting water demands. It will also reduce the risks of waterlogging and salinization.

- C. **Water use conflict due to transboundary downstream effects:** The Juba, the Shebelle, and the Omo-Turkana are important shared river basins in the program area of HoA GW4RP-phase-I. There will be high water use conflict due to transboundary downstream effects if dams on TBRs and water abstraction from TBLs implemented in alternative scenario 1 (surface water development), whereas water use conflict is reduced by avoiding damming of transboundary rivers and over-absorption of transboundary lakes in alternative scenario 3 (groundwater development).
- D. **Transboundary groundwater-dependent ecosystems (GDEs):** GDEs are communities of plants, animals, and other organisms whose extent and life processes depend on groundwater. Different types of GDEs, such as GDEs of wetlands, springs, and oasis, GDEs of terrestrial flora and fauna, and GDEs of estuarine and near-shore marine ecosystems, will be affected by groundwater as well as the conjunctive use of surface water and groundwater resources. Transboundary groundwater-dependent ecosystems (GDEs) effects will be high at the Alternative Scenario (S3) level, improving management and access to groundwater for resilience in HA. In terms of transboundary groundwater-dependent ecosystems (GDEs) effects, the Alternative Scenario (S1) of improving management and access to surface water for resilience in HA is the preferred alternative scenario because it reduces transboundary groundwater-dependent ecosystems (GDEs) effects.
- E. **Number of direct beneficiaries:** To date, surface water investments have predominated over groundwater investments. Surface water projects (such as watershed management, dams and hydropower, rivers, and lakes) have received the greatest investment focus in the Bank's water portfolio, with the number of direct project beneficiaries much higher than groundwater investments. There are also many labor-intensive activities that are groundwater-related. The project will identify and analyze opportunities for responsibly exploiting groundwater in terms of job creation and entrepreneurship.
- F. **Up-front costs required to confirm and characterize water resources:** Compared to surface water development, groundwater can have higher up-front costs for resource confirmation and characterization prior to development; this can prove a major barrier. Significant and enduring up-front costs are required to confirm and characterize groundwater resources. For example, groundwater systems may require both physical monitoring bores and computer modeling for characterization, both of which can be expensive to establish. However, once established, ongoing monitoring costs for both groundwater and surface waters may be similar. WB, 2018. Assessment of Groundwater Challenges & Opportunities in Support of Sustainable Development in Sub-Saharan Africa).

- G. Capital costs:** While dependent on site-specific conditions and other secondary factors, groundwater development (both small and large-scale) has lower capital expenditures and ongoing operational expenditures than equivalent-sized surface water development ⁸⁰. Initial investment: 1 (very low cost) to 5 (very high cost investment needed to implement technology) ⁸¹. In the case of Ethiopia, pump installation costs for machine-drilled bore well in US \$/m gathered from literature is about 142 ⁸². While in the case of Kenya, pump installation costs for machine-drilled bore well in US \$/m gathered from literature is about 97 ⁸².
- H. Operational costs:** Groundwater development (both small and large-scale) has lower ongoing operational expenditures than equivalent-sized surface water development. The operational costs of groundwater contribute the main part of the costs over the life cycle of the pumps and account for more than 80% of the initial installation cost over the life of the pumps ⁸³. Operational costs: 1 - very low/no cost, to 5 - very high costs of operation and maintenance.
- I. Technological maturity level:** The main challenge of conjunctive use of surface water and groundwater is that it is not fully mature and widely used. Technological maturity ranges from 1 (in the early stages of research and development) to 5 (fully mature and widely used).
- J. Implementation timeframe:** To date, surface water time investments have predominated over groundwater investments. Long time investments needed to establish and/or reach full capacity. Implementation timeframe: 1-very quick to implement and reach desired capacity, to 5- significant time investments needed to establish and/or reach full capacity.

⁸⁰ WB, 2018. Assessment of Groundwater Challenges & Opportunities in Support of Sustainable Development in Sub-Saharan Africa)

⁸¹ Climate Change Adaptation Technologies for Water. *UN Climate Technology Centre and Network, Report. Available online: <http://sdg.iisd.org/news/publications-provide-tap-guidance-highlight-adaptation-technologies-for-water>*

⁸² Xenarios & Pavelic, 2013. Assessing and forecasting groundwater development costs in Sub-Saharan Africa. <http://dx.doi.org/10.4314/wsa.v39i4.12>

⁸³ Grundfos. (2004). Pump Handbook. Grundfos

Ranking of Alternative Scenarios Using Multicriteria Analysis of DEFINITE Software entailed the evaluation of the overall scores of all proposed alternative scenarios in terms of environmental, social, economic, and technical indicators. Weight Values for each Indicators (Effects) Using Expected Value or Ranking Method (Figure 30) and the Contributions of each Indicators in each Scenario (Figure 32) showed that 29.30% of the weight was assigned to GHG Emissions reduction followed by 19.3% and 14.3 % to water use conflict due to transboundary downstream effects and number of direct beneficiaries respectively whereas, up-front costs required to confirm and characterize water resources, and technological maturity level were assigned the least weights of 2.1% and 1.0% respectively. Using these weights, alternative scenario (S₃) is the preferred alternative(0.67) followed by alternative scenario (S₂) which scores 0.55 whereas alternative scenario (S₁) is the least preferred alternative(0.23) .Ranks of Scenario (Figure 31) shows that alternative scenario (S₃) of improving management and access of groundwater for resilience in HA scores highest from all indicators except pressure on both transboundary surface and groundwater resources, transboundary groundwater-dependent ecosystems (GDEs), number of direct beneficiaries, and up-front costs and is thus the preferred one, whereas alternative scenario (S₁) is the worst case or the least preferred scenario in terms of all selected key indicators (lowest score) except impact on transboundary groundwater-dependent ecosystems (GDEs), number of direct beneficiaries, and technological maturity level (see details total scores of the alternatives using various perspectives on group weights at Figure 33). In the case of various perspectives on group weights, rankings are linked to perspectives, each emphasizing a particular interest in the decision. Perspectives are linked to groups of effects.

However, the alternative scenario (S₁) of improving management and access to surface water for resilience in HA is highly preferred in terms of the number of direct beneficiaries, reducing impacts on transboundary groundwater-dependent ecosystems (GDEs), and technological maturity level. To date, surface water investments have predominated over groundwater investments. Surface water projects (such as watershed management, dams and hydropower, rivers, and lakes) have received the greatest investment focus in the Bank's water portfolio, with the number of direct project beneficiaries much higher than groundwater investments. There are also many labor-intensive activities that are groundwater-related. Surface water storage, because of the large investments involved, is often preferred because it offers much higher political visibility and because high construction costs give an opportunity for private profit and corruption, opening the way for improper influence on decision-making.

Alternative Scenario (S₂) of improving management and access of conjunctive use of both surface and groundwater for resilience in HA is the second preferred scenario. Alternative Scenario (S₂) has an intermediate position. Even though the alternative scenario (S₃) of improving management and access to groundwater for resilience in HA scores highest, sub-project activities of conjunctive use of surface and groundwater shall be considered in the HoA GW4R Program. The HoA GW4RP shall foster the more effective utilization and protection of selected shared aquifers in the selected sub-basin in the IGAD region through further improving the understanding of available groundwater resources and demonstrating 'conjunctive management that optimizes the joint use of surface and groundwater. The program shall also contribute to aiding the national achievements and reporting of water-related sustainable development goals and will be supportive of environmental protection while enhancing the socio-economic development of the Region. Conjunctive use of surface and groundwater consists of harmoniously combining the use of both sources of water in order to minimize the undesirable physical, environmental, and economic effects of each solution and to optimize the water demand/supply balance. Usually, conjunctive use of surface and groundwater shall be considered within the HoA GW4R program, i.e., both the river and the aquifer belong to the same basin.

Therefore, besides Alternative Scenario (S₃), Alternative Scenario (S₂) of improving management and access to conjunctive use of both surface and groundwater for resilience in HA shall be also implemented for the following advantages⁸⁴.

1. **Controls waterlogging and salinization:** Continuous and excessive use of surface water in canal command areas without proper surface drainage and/or adequate groundwater development results in an alarming rise of the water table, creating problems of waterlogging and salinization. Therefore, the simultaneous development of groundwater, especially through dug wells and shallow tube wells, lowers the water table, provides vertical drainage, and thus can prevent waterlogging and salinization. Areas that are already waterlogged can also be reclaimed.
2. **Remedies for the problem of salinity ingress:** in coastal areas, excessive pumping of groundwater has been responsible for causing the gradual movement of seawater into inland aquifers. This saltwater intrusion makes fresh groundwater saline, rendering it unfit for many purposes. Such a condition can also occur in inland areas due to the lowering of water levels as a result of excessive withdrawal of fresh water in the vicinity of a saline water zone. This situation can be controlled by increasing the application of surface waters and encouraging conjunctive use.
3. **Control of over-pumping of groundwater reservoirs:** Continuously increased withdrawals from a groundwater reservoir in excess of replenishable recharge have resulted in the regular lowering of the water table, leading to mining of the groundwater. In such a situation, a serious problem is created, resulting in the drying of shallow wells and an increase in pluming head for deeper wells and tube wells. The remedy lies in providing more surface water irrigation with the help of storage reservoirs, inter-basin transfer, etc., and
4. **It makes the use of saline water possible.** In certain areas, the surface water is not able to meet the full demand for irrigation water. At the same time, because groundwater is saline, direct application is not possible. In such cases, conjunctive use can be made by the construction of augmentation tube wells and mixing the saline water with canal water to the extent that the quality of the mixed water remains within the tolerable limits of crops.

⁸⁴ Darghouth, M. Salah; Dinar, Ariel; Shah, Tushar. *Conjunctive use of groundwater and surface water (English)*. Agricultural and Rural Development notes; no. 6 Washington, D.C.: World Bank Group. <http://documents.worldbank.org/curated/en/387941468041438440/Conjunctive-use-of-groundwater-and-surface-water>

The technological maturity level of Alternative Scenario (S₂) of improving management and access to conjunctive use of both surface and groundwater for resilience in HA is low compared to Alternative Scenario (S₁) and Alternative Scenario (S₃). However, in Africa, efforts have been made to implement conjunctive water management in at least two basins. In the Lake Chad Basin (Algeria, Cameroon, Chad, Central African Republic, Libya, Niger, Nigeria, and Sudan), implementation of groundwater recharge assessments and hydrological monitoring in order to improve water supply in the South Chad Irrigation Project began around 2000 (Isiorho et al., 2000). In the Orange-Senqu Basin (Botswana, Namibia, and South Africa), the management of the transboundary Stampriet Aquifer together with the basin's surface water is being attempted through the Orange-Senqu River Commission (ORASCOM) and the Southern Africa Development Community (SADC), but specific institutions to facilitate conjunctive management are still to be developed⁸⁵.

Implementation challenges and barriers associated with conjunctive use of surface and groundwater include: (a) a high degree of coordination between water users is required to ensure benefits are maintained and overexploitation is avoided; (b) a sufficient level of data on both water sources is required; (c) it can be challenging to monitor illegal or unregistered groundwater use on private grounds (for example, private wells) that may impact groundwater availability, regardless of management plans; and (d) responsibility for surface and groundwater resources may lie with different authorities or even in different administrative boundaries⁸⁶.

⁸⁵ Lautze, J., Holmatov, B., Saruchera, D., & Villholth, K. G. (2018). Conjunctive management of surface and groundwater in transboundary watercourses: A first assessment. *Water policy*, 20(1), 1-20).

⁸⁶ Climate Change Adaptation Technologies for Water. *UN Climate Technology Centre and Network, Report*. Available online: <http://sdg.iisd.org/news/publications-provide-tap-guidance-highlight-adaptation-technologiesfor-water>

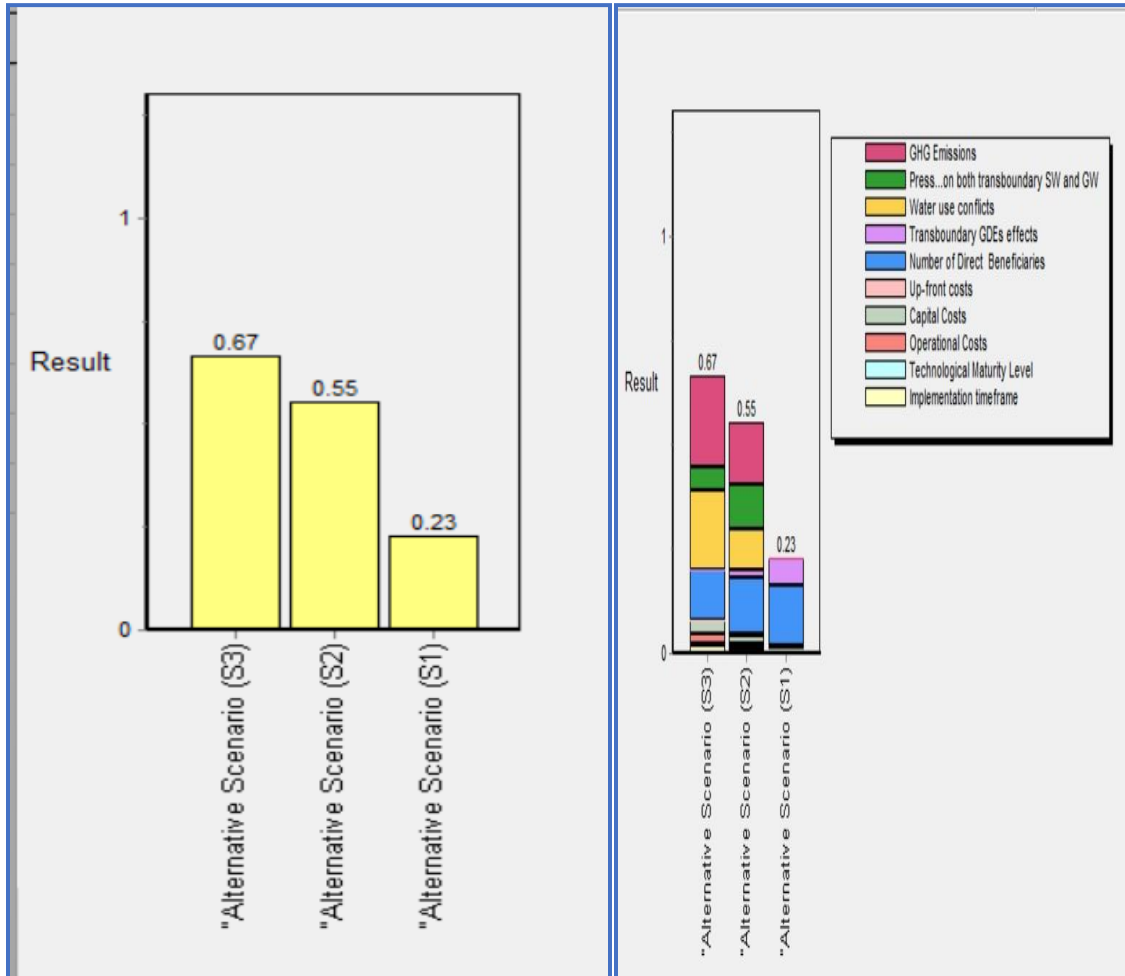


Figure-31: Ranks of Scenario Normal Bar Charts (left) and Stacked Bars (Right)

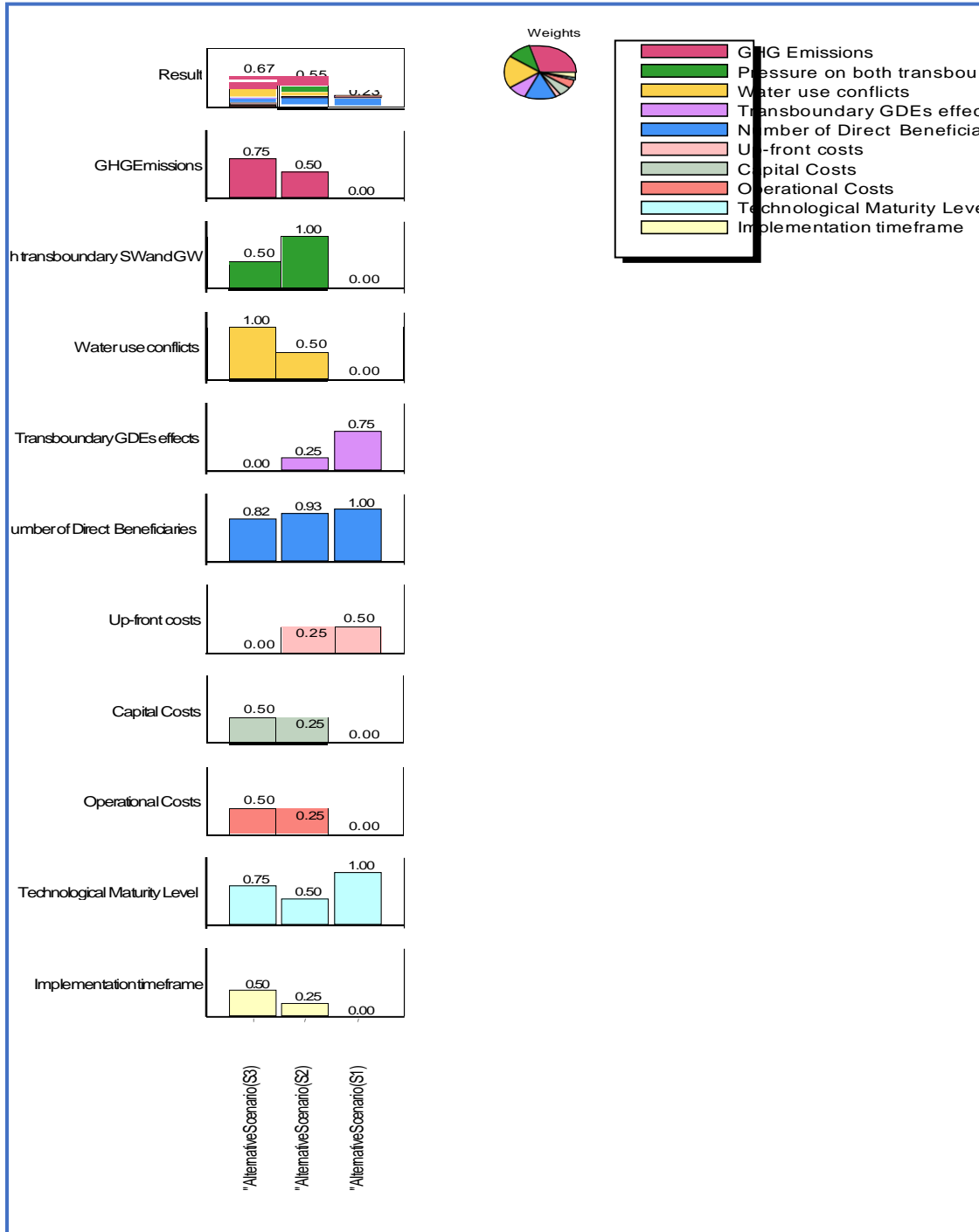


Figure-32: Contributions of each Indicators in each Scenario

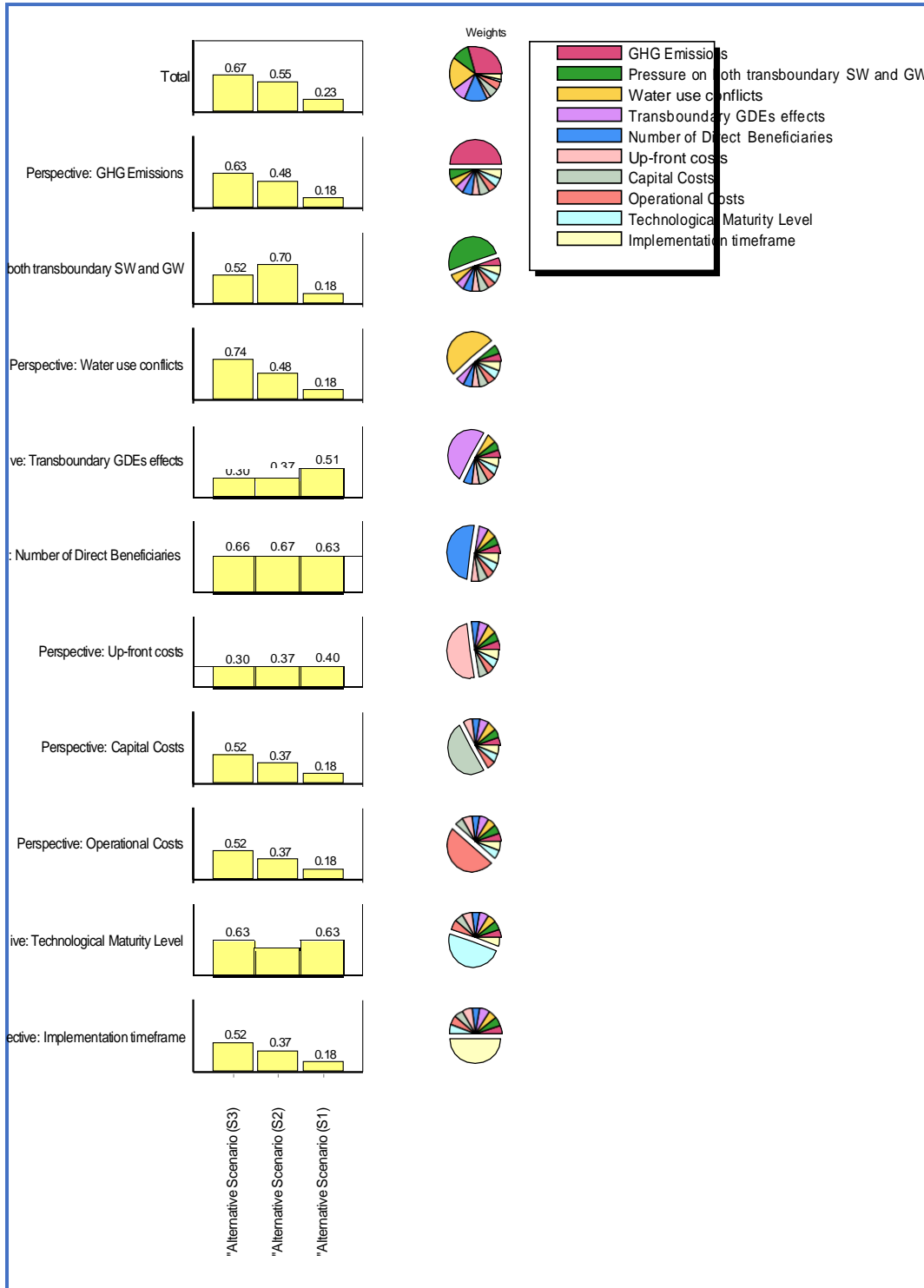


Figure-33: Total scores of the alternatives using various perspectives on group weights

6.4.3 Project Level Alternatives

During the Environmental and Social Impact Assessment, it is crucial to assess feasible alternatives for the project so as to bring environmentally sound, economically feasible, and socially viable groundwater-based water supply infrastructures and the construction of irrigation schemes that shall be implemented by three MSs of HoA GW4R. Therefore, prior to deciding on the proposed groundwater-based water supply infrastructures and construction of irrigation schemes and the implementation of the project in general, a number of project options shall be examined to select the feasible alternatives considering biophysical, social, economic, and technical factors.

During the Environmental and Social Impact Assessment studies for groundwater-based water supply infrastructures and the construction of irrigation schemes implemented by three MSs of HoA GW4R, the following project alternatives shall be considered: A detailed project alternative analysis shall be done by using different environmental, social, economic, and technological indicators:

- No action Alternative that considers maintaining the current status quo or business as usual in the region in the management of environmental and social aspects;
- Alternative Water Sources (Surface water, Conjunctive Use of Surface and Groundwater, and Groundwater);
- Alternative Sites for Production Test Well Sites;
- Alternative Canal alignment of irrigation schemes;
- Alternative distribution routes for groundwater-based water supply infrastructures;
- Alternative Sites of Booster Stations for Water Supply Infrastructures;
- Alternative Power for pumping (solar power, diesel, or Manual);
- Alternative Aquifer Types (Only Shallow Aquifer, Only Deep Aquifer, and Both Shallow and Deep Aquifer);
- Alternative Borehole Drilling Techniques (Cable Tool Drilling, Rotary Drilling, Auger Drilling, Hand Driving, Jetting and Hollow Road);and
- Alternative Technologies for Groundwater Remediation (pump-and-treat, in-situ air sparging, in-situ flushing, and permeable reactive barriers)

6.5 Environmental and Social Sustainability Appraisal of the HoA-GW4R Program

Following an extensive examination of the subprojects put forth by the WBG for HoA GW4RP for the IGAD and MSs, subprojects have been organized according to specific criteria in order to facilitate an integrated knowledge of their relationships with one another. This knowledge also aids in the analysis of the relationships between project groups with various justifications and the degree of integration of various institutions' overall approaches to various service areas. The relevance of the subprojects and the region of intervention with the environmental and social issues that were given priority in the IGAD and MSs were both evaluated using rationale categorizations. As per the results of analysis of alternative scenarios of the HoA GW4R Program (Sub-section 6.4), apart from projects and sub-project activities that were included under the WBG Project Appraisal Report, additional projects and sub-project activities (conjunctive use of groundwater with surface water, and conservation and protection activities that ensures the sustainability of the program included in this SESA Study). HoA GW4RP Program project and sub-project activities categorized into four groups.

- **Category-1:** Creating inclusive groundwater services to priority areas;
- **Category-2:** Supporting conservation and protection activities;
- **Category-3:** Generating groundwater information and strengthening institutions, Infrastructure/Investment, and incentives—across regional, national, and local scales for sustainable development of groundwater resources in HoA; and
- **Category-4:** Strengthening the implementation of HoA GW4R Program

Sub-project activities included in each the above four categories were evaluated in terms of the sustainability objectives. Setting/establishing sustainability objectives were used to assess whether or not the HoA GW4R Program projects and sub-project activities are not sustainable.

Table-25: Sustainability Objectives and Indicators

No	Sustainability objectives
1.	Strengthen the climate resilience of targeted communities
2.	Ensure food security and bring socioeconomic developments
3.	Reducing conflicts over water and create peace and stability in the region
4.	Improve access to irrigation schemes
5.	Improve access to water supply for human and livestock consumption and production,
6.	Enhance regional integration and regional cooperation in the management of trans-boundary water resources
7.	Generate groundwater information and strengthening regional and national groundwater institutions
8.	Improve already-fragile natural resource base areas and food insecurity
9.	Reduce flood hazards
10.	Enhance Aquifer Recharge

Based on the information from scoping, identification and analysis of significant environmental and impacts of HoA-GW4R Program, it is possible to assess the likely environmental and social impacts of the proposed program activities and compare them against the sustainability objectives. The following matrix appraise proposed program, project activities and sub-project activities in the HoA-GW4R Program against the SESA objectives listed at table 25.

By cross-linking sustainable objectives with impact factors of proposed program, project activities and sub-project activities, the levels of effect or significant of a given program in relation to sustainable objectives were determined. This allows us to determine whether or not the planned aspects, project activities and features in the HoA -GW4R Program are sustainable. The rating criterion is given in the table below.

Table-26: Rating Criteria for Appraisal of the HoA-GW4R Program

Score	Rating Description	Rating Value
+	Highly important to this sustainable Objectives	4
+/-	Moderately important to this sustainable Objectives	3
0	No Significant Effect on this sustainable Objectives	2
-	Not important to this sustainable Objectives	1

Table-27: Environmental and Social Appraisal of the HoA-GW4R Program

Projects and Sub-project Activities in HoA GW4R Program	Sustainability objectives										Total Score Out of 40
	Strengthen the climate resilience of targeted communities	Ensure food security	Reducing conflicts over water	Improve access to irrigation schemes	Improve water supply access for human and livestock	Enhance regional integration and regional cooperation	Generate GW information and strengthening Institutions	Improve already-fragile natural resource base areas	Reduce flood hazards	Enhance aquifer recharge	
1.Creating inclusive groundwater services to priority areas											
1.1. Rehabilitation and Construction of new, climate resilient groundwater infrastructure for human consumption and livestock.	4	4	4	1	4	2	2	1	1	1	24
1.2. Small-scale irrigation infrastructure to promote CSA practices	4	4	4	4	1	2	2	1	1	1	24
1.3 Climate resilient conjunctive use of surface and groundwater resources for human consumption and livestock	4	4	4	1	4	2	2	1	1	1	24
1.3 Climate resilient conjunctive use of surface and groundwater resources for small-scale irrigation infrastructure to promote CSA practices	4	4	4	4	1	2	2	1	1	1	24
1.4 Develop Alternative Sources(Sand Dams, Rainwater Harvesting, and other non-conventional water sources - such as desalination and reuse of treated wastewater)	3	3	3	3	3	2	2	2	3	2	26
2.Supporting Conservation and Protection Activities											
2.1. Infrastructure to support aquifer sustainability (recharge)	3	1	3	3	3	1	1	3	1	4	23
2.2. Infrastructure to support flood mitigation	3	1	2	2	2	1	1	3	4	3	22
2.3 Nature-based solutions for enhanced groundwater recharge such as Connecting Rivers with Flood Plains, Reforestation, Maintaining good soil structure and vegetation cover,	4	3	3	3	3	2	2	4	4	4	32

Development of Riparian Buffer, and Wetland restoration and creation.											
3. Generating groundwater information and strengthening institutions, Infrastructure/Investment, and incentives—across regional, national, and local scales for sustainable development of groundwater resources in HoA.											
3.1. Regional Groundwater Center (IGAD-GWC)	3	2	2	2	2	4	4	2	2	2	25
3.2. Network of National Groundwater Centers (NGWC).	3	2	2	2	2	4	4	2	2	2	25
3.3. IGAD Platform for Groundwater Collaboration (I-PGWC)	3	2	2	2	2	4	4	2	2	2	25
3.4. Feasibility Studies for joint planning in three TBAs of the HoA	3	2	2	2	2	4	4	2	2	2	25
3.5. Support the development of policy instruments for sustainable groundwater exploration and management in the HoA.	3	2	2	2	2	4	4	2	2	2	25
3.6 Intensive capacity building at the national and regional levels on sustainable groundwater management	3	2	2	2	2	4	4	2	2	2	25
4.Strengthening the implementation of HoA GW4R Program											
4.1. Finance the operational costs of the Project Implementing Units (PIUs) in participating countries	3	4	4	4	4	2	2	3	3	3	32
4.2. Strengthen the capacity of IGAD's Water Unit	3	3	3	3	3	4	4	3	3	3	32
4.3. Strengthen project's' Monitoring and Evaluation (M&E), knowledge management and learning, and evidence-based policy input	3	3	3	3	3	4	4	3	3	3	32
4.4. Third-Party Monitoring (TPM) for the entire program	3	3	3	3	3	4	4	3	3	3	32

From the above appraisal result, the rating score varies from 22-32 out of 40. This show that the underlying planned Projects and Sub-project Activities in HoA GW4R Program remains sound but certain aspects of the program should be given more emphasis from environmental and social sustainability perspective particularly activities planned under conservation and protection activities particularly nature-based solutions for enhanced groundwater recharge such as connecting rivers with flood plains, reforestation, maintaining good soil structure and vegetation cover, development of riparian buffer, and wetland restoration and creation are vital conservation measures for the sustainability of HoA GW4R Program in general and achieving the sustainable objectives stated in this SESA in particular. These low-cost nature-based solutions, can improve the efficiency and effectiveness of groundwater development. This RSESA recommends ensuring that projects pay adequate attention to conserving groundwater and ensuring that the quantity extracted is sustainable.

Different IGAD member nations have different levels of groundwater-related information, institutions, infrastructure, and incentives (the 4I's). They demonstrate the necessity of coordinating groundwater information, institutions, infrastructure, and incentive efforts with the successful implementation of solutions at all scales (regional, national, sub-national, and local), as well as the need to foster inclusive innovation. Therefore, activities planned under generating groundwater information and strengthening institutions, infrastructure/investment, and incentives—across regional, national, and local scales shall be successfully implemented so as to ensure for sustainable development of groundwater resources in HoA.

Similarly, planned under strengthening implementation of HoA GW4R Program such as finance the operational costs of the project implementing units (PIUs) in participating countries, strengthen the capacity of IGAD's Water Unit, strengthen project's Monitoring and Evaluation (M&E), knowledge management and learning, and evidence-based policy input, and Third-Party Monitoring (TPM) for the entire program are also vital tools for the sustainability of HoA GW4R Program in general and achieving the sustainable objectives stated in this SESA in particular.

Generally, the above environmental appraisal result indicates that the environmental and socio-economic benefits of the HoA GW4R Program outweigh negative impacts. Therefore, all the above planned Projects and Sub-project Activities in HoA GW4R Program are environmentally and socio-economic acceptable by forwarding alternative mitigation measures for planned issues having adverse impacts.

7. ENVIRONMENTAL AND SOCIAL MITIGATION, MANAGEMENT AND MONITORING MEASURES

7.1 Environmental and Social Enhancement/Mitigation Measures

7.1.1 Environmental and Social Enhancement Measures for Beneficial/Positive Impacts

A. Enhancement measures to strengthen the climate resilience of targeted communities and GHG emissions reduction

1. Minimize greenhouse gas emissions associated with HoA-GW4R Program and projects, and enhance and maintain carbon sinks. IGAD shall seek to prioritize measures to reduce greenhouse gas emissions associated with its programs and projects, especially those that are also intended to deliver adaptation benefits. These measures may include, but are not limited to, a shift to alternative use of renewable and low-carbon energy sources (solar energy pumping; increased energy efficiency);
2. Implement climate smart or low-carbon agriculture and improved livestock management practices;
3. Implement sustainable soil and soil organic carbon sequestration management practices that are in line with the Voluntary Guidelines for Sustainable Soil Management; integrated soil fertility management and the reduction of nitrogen fertilizer use; nature-based solutions for enhanced groundwater recharge and wetland restoration and creation;
4. Conduct climate risk screening for groundwater-based water supply infrastructures and the construction of irrigation schemes, ensure that all HoA-GW4R projects, integrate climate change and disaster risk considerations and implement climate change and disaster risk screening. The screening process will rate the risks associated with climate change and disasters. Based on the risk rating, subsequent steps shall be identified to comprehensively incorporate appropriate risk-reduction measures into the formulation of HoA GW4R sub-projects. It ensures the integration of appropriate measures for disaster risk reduction, and climate change adaptation and mitigation into programs and projects based on the hazards, risks (i.e. vulnerabilities, exposure, and coping/adaptive capacities), and the mitigation potential identified;
5. Climate-proof HoA-GW4R program and projects by promoting climate-resilient measures, climate change mitigation, adaptation and disaster risk reduction, to reduce the exposure and vulnerability of communities and their livelihood systems to the impacts of climate change and disaster risks. Incorporating the perspectives of women and men, including marginalized, vulnerable and disadvantaged groups and individuals into inclusive and participatory risk analysis, and the design, planning, implementation, monitoring and evaluation of programs and projects; and
6. Identify and appraise climate resilient development options of groundwater-based water supply infrastructures and the construction of irrigation schemes.

B. Enhancement measures to reduce conflicts over water and create peace and stability in the region

1. Local communities in the border region of Ethiopia, Kenya, and Somalia shall sign a water-sharing agreement to alleviate tensions around growing water scarcity;
2. Engaging religious and elder leadership in project operation, community engagement, and tariff planning;
3. Conflicts should be addressed by peace leaders at the clan level, with recognition from government structures. Cross-border movements do not involve legal processes;

4. Creation of joint committees, where the utility serves as the service provider and regulatory authorities from each country are involved;
5. Community awareness to understand the basis and impact of the water development. Peaceful discussions and negotiations with the stakeholders. Traditional leaders take lead roles in convening meetings with community members and stakeholders to resolve conflicts;
6. Construct drought-smart borehole networks across the conflict-affected areas to be utilized during the drought season and construct boreholes in pasture grazing areas;
7. Consider alternative water sources during the rainy season and utilize the GW sources during the drought season. Consider alternative sources that can promote conservation of GW sources, such as water pans, which can be used to help with groundwater recharge and conserve surface runoff. Implement community-based and nature-based solutions to improve water supply to the local farmers;
8. Giving the opportunity for cross-border communities to solve the conflicts at the local level using community or religious leaders and, during the escalation loop, the national level to intervene. Because they have their own systems of resource sharing at the borders. For instance, in Ethiopia, the regional states prioritize conflict resolution at the local level, with the federal government rarely involved; and
9. Develop cross-country steering committees with all the stakeholders to explore conflict causes, develop possible mitigation measures, and manage cross-border conflicts. e.g., Kenya has steering committees for regional border conflict management.

C. Enhancement measures to ensure food security and bring socioeconomic developments

1. Implement fair and equitable groundwater allocation for pasture production, ground water regeneration, livestock consumption, human consumption, and irrigated crop farming that helps to ensure food security and bring socioeconomic developments of MSs;
2. Lifting agricultural productivity through agricultural research and development;
3. Implement groundwater-based small-scale irrigation; sand dam pilots for community gardens, nature-based solutions for enhanced groundwater recharge; nature-based solutions for wetland restoration and creation; and soil and water conservation practices;
4. Improving rural livelihoods by strengthening markets and market access;
5. Building community resilience by supporting the establishment and improvement of social protection programs; and
6. Improving sustainable financial services.

D. Enhancement measures to create inclusive community-level access to groundwater in the borderlands of the HoA

1. **Rehabilitation or construction of new, climate resilient groundwater infrastructure for human consumption and livestock.** After the corresponding aquifer sustainability assessments are conducted, the program will invest in the drilling of new boreholes or rehabilitation of existing ones, as well as in the development or retrofitting of water systems for human consumption and for livestock. Groundwater extraction will use, when feasible, solar pumping with the purpose of substituting unsustainable and expensive fuel and contributing to reduction in greenhouse gas (GHG) emissions. Investments and O&M arrangements will focus on enhancing the system's robustness to climate shocks by ensuring that service delivery is resilient to climate impacts (e.g., drought, floods), and/or to increased water demand.

2. **Small-scale irrigation infrastructure to promote CSA practices, contributing to soil conservation and aquifer recharge.** These investments are currently being considered in the area of Borena, Ethiopia, in the border with Kenya. This activity will help farmers switch from rain-fed agriculture to irrigated agriculture, enabling adaptation to changing rainfall patterns and drought events in the lowlands. Irrigation schemes will be fitted with pressurized systems that will utilize renewable energy for water lifting and distribution.
3. **Promoting resilience and conflict resolution through groundwater development.** Through integrated water planning for livelihood/population and climate change, conflict assessment and mitigation, and inclusive community engagement and ownership. Two key factors that determine the resilience of a water supply system: the length of the pipeline and the water storage capacity, with greater storage capacity contributing to increased resilience.
4. **Implement Infrastructure to support aquifer sustainability (recharge) and flood mitigation.** This type of infrastructure will also contribute to enhance water supply during extreme drought (e.g., sand dams, a cost-efficient storage mechanism constructed in dried riverbeds that contributes to retain soil moisture and concentrate water in the dry months), and to mitigate the peaks of high runoff during heavy rains. Other nature-based solutions that will be implemented for enhanced groundwater recharge are ecosystem-based approaches, rainwater harvesting, afforestation, and soil and water conservation measures to avoid erosion and land degradation. The Program will also promote embedding these interventions in river basin plans, as part of broader water resources management strategies.
5. **Minimize risks associated with borehole siting, geological factors, design, and construction.** Best design and construction practices shall be effectively implementing. FIDIC (International Federation of Consulting Engineers) shall be considered as a valuable resource in the context of contracting and procurement.
6. **Establish Digital Information and Decision Management Systems.** The Program will also develop capacity to monitor relevant information on local service delivery using digital technologies to enhance transparency and accountability. This includes the geo-localization of each water point (including information on groundwater depth and quality of the resource), as well as other indicators related to the quality-of-service delivery in terms of O&M. This will serve to inform decisions to improve service delivery, and/or to enhance local preparedness and response to climate shocks (e.g., floods and drought).

E. Enhancement measures to create employment opportunity for the local communities and women

1. During the HOA GW4R program and sub-projects cycle, IGAD and member countries shall consider and apply principles, practices and techniques that are best suited to avoid the violation of core international labour standards, and WB ESS2 (Labor and Working Conditions) and other international labour standards that are applicable to HOA GW4R program and sub-projects, and national employment and labour laws; and promote the application of these standards.
2. HOA GW4R program and projects shall actively contribute to the realization of the right to work, especially for those who are severely affected by unemployment and underemployment, such as women and youth.
3. HOA GW4R program and projects will ensure that no forced labour shall be used in connection with their activities.
4. The employment of workers shall be based on the principle of equality of opportunity and treatment. There shall be no discrimination in any aspect of the employment relationship, such as recruitment and hiring; compensation, including wages and benefits; working conditions and terms of employment; access to training;

job assignments and promotion; termination of employment or retirement; or disciplinary practices. Women and men shall receive equal remuneration for work of equal value.

5. Priority will be given to the creation of more and better employment opportunities, especially for disadvantaged, marginalized and vulnerable workers.
6. As much as possible, workforce during project implementation and operation shall be from the local community.
7. As much as possible, encourage the local labor force to work on skilled labor categories in addition to the unskilled job opportunities

F. Enhancement measures to generate groundwater information and strengthening regional and national groundwater institutions

1. **Establish Regional Groundwater Center (IGAD-GWC) and network of National Groundwater Centers (NGWC).** The creation and operationalization of the IGAD-GWC is central to the achievement of the Program's objectives. This Center aims to fill key gaps in the region related to the lack of valuable information on transboundary aquifers, and to the low capacity of countries to develop legally binding bilateral and/or regional agreements and arrangements on joint groundwater management. The proposed IGAD-GWC will support MS to enhance sustainable management and utilization of groundwater through resource mobilization, data sharing, and capacity building through a network of NGWC, located in MS, to be established and operationalized by the Program.
2. **Establish IGAD Platform for Groundwater Collaboration (I-PGWC).** Regional knowledge generation and capacity building activities, joint studies and transboundary case studies will be implemented through the I-PGWC, for which IWU will fulfill the role of secretariat. The Platform will serve as a key mechanism for IGAD and MS to agree on and prioritize joint groundwater activities, scope, and modalities, and support the implementation of regional actions. IGAD will also facilitate the establishment and operationalization of Groundwater National Focal Groups (GW-NFGs) in the MS, established as a governmentally convened working groups to serve and augment existing groundwater management structures in the countries.
3. **Develop joint Regional Studies and Assessments.** Under IGAD's leadership and in close collaboration with participating countries, the Program will contribute to the generation of new knowledge at a regional scale. In coordination with the IWU and the NGWCs, the IGAD-GWC will identify priority topics for a regional study or assessment. Examples of topics include 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, and socioeconomics of groundwater.
4. **Intensive capacity building at the national and regional levels on a wide range of topics related to sustainable groundwater management.** Examples include the integration of groundwater management into river basin organizations (RBOs), climate informed groundwater management, groundwater data collection, analysis and management, and principles of data sharing and data compatibility across countries, RBOs, Non-Governmental Organizations (NGOs), and other interested parties. Women's representation in decision-making positions in groundwater management institutions will be supported through leadership and technical training for female agency staff, and gender awareness training for groundwater agency staff to support female employment, among others.

5. **Support the development of policy instruments for sustainable groundwater exploration and management in the HoA.** These include national strategies, policies, guidelines, standards and/or regulations, depending on the case, for sustainable groundwater management. At the regional level, IGAD will contribute by providing guidance on the establishment of borehole drilling and testing guidelines and professional standards, water point O&M guidelines, establishment of groundwater protection zones, pollution impact and economic assessment, flood and drought cost impacts, among other key topics.

G. Enhancement measures to create strong linkages and alignment with other HoA projects

1. Other donors/government projects in the HoA region should be mapped to avoid overlapping interventions by donors and waste of resources, and management and access of groundwater resources should be coordinated with such projects within a specific TBAs approach. The Nile Basin Initiative (NBI), with the financial support of the Global Environment Facility (GEF) through United Nations Development Program (UNDP) is being implementing groundwater resources management and access in selected trans-boundary aquifers of IGAD member states and in the meantime members of NBI Nile Basin. Therefore, both should be mapped and coordinated to avoid overlapping interventions by donors and waste of resources.
2. Establish Horn Africa Groundwater Initiative Alliance or Consortium (Alliance of IGAD with NBI). The Alliance or Consortium shall have their own plan, evaluate and monitor their agreed plan. In the water sector, several projects have been carried out within IGAD region.
3. Identify cross-cutting measures that, once implemented, would help support the implementation of HoA GW4RP

7.1.2 Environmental and Social Mitigation Measures for Adverse/Negative Impacts

A.Mitigation measures for transboundary aquifer depletion

To avoid or reduce impact due to transboundary aquifer depletion, the following mitigation measures shall be considered:

1. The rationally exploited groundwater resources in TBAs by comprehensively considering the following factors: (1) the natural properties of aquifer systems, (2) the formation and sources of recharge of aquifer systems, (3) the existing and potential uses of aquifer systems, (4) the actual and potential consequences of the development and utilization of aquifer systems, (5) the protection and development of aquifer systems, and (6) the ecological environment under the influence of aquifer systems;
2. Undertake a Shared Aquifer Diagnostic Analysis (SADA) for each TBAs. TBAs need to be characterized in terms of extent (horizontal and vertical), recharge (areas, mechanisms, rates), storage capacity, as well as flow patterns, relationship with surface water systems, vulnerability, current exploitation levels, potential for further development, and existing threats;
3. Conducting aquifer sustainability assessments prior to development as a prerequisite for proposed infrastructure investments;
4. Regulate groundwater abstraction and issuance of water use rights or permits. Regulation of groundwater abstraction through issuance of groundwater abstraction/use permits serves as the basis for charging abstraction fees;

5. Conduct well pump testing to characterize the capacity of recharge and discharge (to determine the safe yield and recovery rate);
6. Determine sustainable amount of groundwater to be extracted without causing appreciable reduction in groundwater level ;
7. Assess/model groundwater recharge and discharge rates for the specific catchment or sub-basin;
8. 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);
9. Modify or control the groundwater abstraction rate depending on the outcome of groundwater monitoring; and
10. If possible, consider artificial recharge of groundwater using stored runoff water or other practical means.

B. Mitigation measures for water quality deterioration

1. **Regulation of groundwater pollution and issuance of wastewater discharge permits.** To protect groundwater from pollution, licensing for the disposal of wastewater underground stipulates the manner of disposal and the degree of treatment necessary. In the regulatory system, where fees are based on the pollutant load discharged to the ground, the "polluter-pays-principle" is typically embedded.
2. **Implement the following measures to improve groundwater management at the national and transboundary levels include the following:** (a) improving information exchange and coordination between ministries and departments;(b) the unification of networks for monitoring surface and ground waters; (c) the development of special agreements and joint programs for groundwater monitoring; and(d) improving public awareness of groundwater-related issues
3. **Conduct joint monitoring of the water levels and water quality of TBA systems and exchange monitoring data on a regular basis.** This information should be used to build a numerical model of groundwater flow and quality in TBAs, make predictions and assessments on changes in water quantity and quality in aquifer systems, and evaluate potential future change scenarios.
4. **Strengthen IGAD Regional dialogue and cooperation regarding the use of groundwater resources in TBAs, including:** (1) developing and implementing appropriate TBA management plans and creating collaborative management mechanisms; (2) strengthening exchanges and cooperation in terms of water-saving technologies; (3) establishing mechanisms for protecting the ecological environment of transboundary waters, reducing the pollution of water bodies in the basin, and controlling and preventing further deterioration of the ecological environment and declines in water quality.

C. Mitigation measures for transboundary water use conflict

1. **Highlight the concrete mutual benefits of water cooperation and resilience**-as mentioned earlier, one of the major constraints for building resilience is weak bottom-up drivers of cooperation at the local level. Strengthening local drivers of cooperation, can be aided by national, transboundary and external actors;
2. **Support institutional frameworks and processes**-weak institutional arrangements for transboundary water management at basin and regional levels are important constraints that need to be overcome. In 2015, IGAD drafted a regional policy on water resources and it is currently facilitating negotiation of a regional transboundary water protocol based on the IGAD Regional Water Policy. Such a water protocol might be

particularly useful for resolving disputes in transboundary water basins that currently lack cooperative frameworks;

3. **Assist research on groundwater**-Development of accessible information tools and open platforms could be useful for the local communities to jointly monitor and manage their resources;
4. **Strengthen local capacities for dispute resolution**-both top-down and bottom-up approaches are necessary in the promotion of cooperation. Local agreements can be as important as or better than basin-wide agreements for responding to water scarcities and climate change-related water pressures;
5. **Construct drought-smart borehole networks across the conflict-affected areas and pasture grazing areas**. Drought-smart borehole networks shall be constructed across the conflict-affected areas to be utilized during the drought season and construct boreholes in pasture grazing areas;
6. **Consider alternative water sources during the rainy season and utilize the GW sources during the drought season**. Consider alternative sources that can promote conservation of GW sources, such as water pans, which can be used to help with groundwater recharge and conserve surface runoff. Implement community-based and nature-based solutions to improve water supply to the local farmers;
7. **Giving the opportunity for cross-border communities to solve the conflicts at the local level using community or religious leaders and, during the escalation loop, the national level to intervene**. Because they have their own systems of resource sharing at the borders. For instance, in Ethiopia, the regional states prioritize conflict resolution at the local level, with the federal government rarely involved; and
8. **Develop cross-country steering committees with all the stakeholders**. These cross-country steering committees shall explore conflict causes, develop possible mitigation measures, and manage cross-border conflicts. e.g., Kenya has steering committees for regional border conflict management.

D.Mitigation measures for cumulative impacts of soil erosion and degradation

1. As much as possible, reduce unnecessary soil disturbance during the various construction activities;
2. As much as possible, retain the vegetation cover of the sub-project area to reduce exposed land and ultimately soil erosion;
3. Re-vegetate exposed areas as a result of construction activities;
4. Rehabilitate soil/land compacted due to the construction activities;
5. Stockpile and reuse top soil from excavation work; and
6. Provide runoff protection or interception structures such as bunds, terraces, and berms in areas that are susceptible to erosion.

E.Mitigation measures for impacts on groundwater-dependent ecosystem of lacustrine/ palustrine/ riverine wetlands, springs and Oasis

1. **Development of a conceptual model of groundwater-wetland interactions for wetlands in IGAD Region**- The first step in developing a conceptual model should be to specify the water transfer mechanisms that allow water to enter and exit each wetland. Quantifying the contributions of water from diverse sources and any groundwater recharge to aquifers can be done by calculating a water balance. Calculating the water balance under wet and dry conditions is necessary for different seasons. This information is required to quantify the dependence of a wetland on groundwater and, conversely, the potential dependence of an aquifer

on associated wetlands, in order to quantify the groundwater requirements of associated wetlands and, conversely, the water requirements of wetlands for groundwater recharge.

2. **Development of Groundwater Dependent Ecosystems Atlas (GDE Atlas) as a national dataset of member states of Ethiopia, Kenya and Somalia GDEs to inform groundwater planning and management.** A comprehensive inventory of GDE locations at an appropriate management scale is a necessary first step for sustainable management of supporting aquifers; however, this information is unavailable for most areas of IGAD Region. Several parameters and/or methods using indicator spatial datasets could be combined such as land use/land cover, lithology, soil and vegetation type, depth to groundwater, flow accumulation, slope, drainage density, elevation, etc., tailored for specific eco-hydrological zones, for a more comprehensive multiple-lines-of-evidence or rule-set-based GDE identification approach.
3. **Situation assessment of combined impacts, status and trends of groundwater-dependent ecosystem of wetlands, springs and oasis in IGAD Region-** It is vital that any assessment of the current status of groundwater-associated wetlands also include assessment of the separate and combined impacts of both abstraction from and discharge to groundwater and surface water bodies in the basin. Wider scenarios of climate or land use change for the catchment or aquifer unit should be used to assess how groundwater-wetland interactions may change in the future.
4. **Determination of groundwater requirements of wetlands-** The hydrological component of evaluating the interactions between wetlands and groundwater is provided by quantifying water transfer processes. In general, the wetland ecosystem will be adapted to the hydrological regime, including the magnitude, frequency, duration, and timing of water transfer mechanisms, as well as its constituents, such as its soils, plants, and animals, functions, such as groundwater recharge or nutrient cycling, and attributes, such as biodiversity. Minor hydrological changes may not have an impact on the ecology, even if considerable alterations to wetland hydrology typically result in these changes.
5. **Setting of groundwater allocations for wetlands-** wetlands' specific groundwater needs should be identified so that they can be taken into account when calculating the aquifer's sustainable yield and subsequently allocating the available water resources to various purposes. Water managers and the general public may see the effects of various groundwater allocation options on the health of wetlands in this way, and basin water allocation plans can take these effects into account. In order to preserve the intended biological character, sufficient water should be given for surface or underground wetlands that are dependent on the aquifer.
6. **Inclusion of groundwater-related management actions and strategies in the land and water management plan for the basin, in order to minimize the impacts of groundwater exploitation on associated wetlands-such as:**(a) groundwater may be the most important water source for a wetland at particular times of the year, such as the dry season or during periods of drought, so higher abstraction may be permitted during wet periods when the wetland is not at risk, in order to offset reduced abstraction when the wetland is in critical need;(b) boreholes should not be located close to the wetland where the cone of depression would reduce water levels in the wetland and cause degradation of ecological character; and(c)where wetlands are fed jointly by surface and groundwater, potential exists for meeting water needs in different seasons from different sources (i.e., conjunctive management).
7. **Borehole siting should be outside heads of lacustrine/ palustrine/ riverine wetlands, springs and Oasis.** Borehole siting should be outside heads of lacustrine/ palustrine/ riverine wetlands, springs and Oasis

and sufficient buffer zones shall be maintained between Boreholes and heads of lacustrine/ palustrine/ riverine wetlands, springs and Oasis.

F.Mitigation measures for impacts on groundwater-dependent ecosystem of terrestrial flora and fauna

1. **Modeling or predicting drawdown impacts to GDEs.** Modeling or predicting elements of drawdown impacts to GDEs shall include: current depth to groundwater, modelled drawdown extent, predicted depth to groundwater, potential impacts to likely GDE, and potential impacts to possible GDE).
2. **Reduced surface water quality through erosion and sedimentation.** To manage the potential for decreased water quality during construction and operation, the following mitigation measures shall be implemented: (a) appropriate erosion and sediment control measures will be established as required to reduce the amount of runoff from disturbed areas; (b) as soon as practical, disturbed areas will be rehabilitated to reduce the amount of exposed soils; (c) sediment dams, pit water storage and other water management structures (e.g. bunds and drains) will be designed and operated; (d) construction of the haul road crossing will occur over the dry season to minimize soil disturbance on adjacent waterways;(e) bunding and appropriate storage of fuels and other hazardous and flammable materials, where practical, will be located away from any waterbodies;(f) 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; and (g) and conduct regular monitoring of the terrestrial flora and fauna species and changes due to project implementation and operation.
3. **Minimize potential impacts on groundwater quality.** Mitigation measures to be implemented, including: implement annual monitoring of groundwater quality to identify trends and changes over time; and fuel, dangerous goods and, hazardous chemicals shall be managed as outlined by current standards, guidelines and in compliance with statutory requirements.
4. **Borehole siting should be outside of groundwater-dependent ecosystem of terrestrial flora and fauna.** Borehole siting should be outside of the groundwater and riverine forest biotic communities of Kenya that are supported largely by groundwater seepage. Sufficient buffer zones shall be maintained between Boreholes and groundwater and riverine forest biotic communities of Kenya.

G.Mitigation measures for impacts groundwater-dependent ecosystem of estuarine and near-shore marine ecosystems

1. **Strengthened knowledge of the marine environment:** In Africa, as in across the world, information on coastal biodiversity and marine ecosystems is lacking. Knowledge on the status of species that are important for a Blue Economy and sustainable marine management needs to be strengthened.
2. **Protect and restore threatened estuarine and near-shore marine habitats.** With the World Bank's support, Kenya launched the Kenya-Marine Fisheries and Socio-Economic Development project, which aims to, among other objectives, restore mangroves in the counties of Lamu, Kilifi, and Kwale. Mangroves provide critical habitats for fish, mollusks, and crustaceans, yet their trees are harvested for poles, firewood, and charcoal or transformed with the increase urbanization of coastal areas. Protection and restoration activities of threatened habitats of coastal and marine biodiversity and ecosystem shall be strengthen and supported by IGAD.

3. **Draw on nature-based solutions to increase coastal resilience** such as restore mangroves for enhancing coastal defence and restoring fisheries, living seawalls and other habitat creation measures to improve the biodiversity of existing and new structures, native intertidal vegetation as an alternative to conventional engineered solutions for shoreline erosion protection, and protective gabions to facilitate natural establishment of mangroves on riverbanks.
4. **Strengthen and effectively implement priority activities identified in the Convention, and Protocol of Nairobi for the Protection, Management and Development of Coastal and Marine Environment of the Western Indian Ocean (WIO) region.** The Convention aimed at increasing the capacity of the Western Indian Ocean nations to protect, manage, and develop their coastal and marine environment.
5. **Reducing impacts from land-based sources and activities and sustainably managing critical coastal-riverine ecosystems:** The Project entitled 'Implementation of the Strategic Action Programme for the Protection of the Western Indian Ocean from Land-Based Sources and Activities (WIOLAB SAP) is intended 'to reduce impacts from land-based sources and activities and sustainably manage critical coastal-riverine ecosystems through the implementation of the WIO-SAP priorities with the support of partnerships at national and regional levels'. Kenya and Somalia are participating countries in WIO-SAP. The WIOLAB SAP identified four critical priority areas when it came to reducing land-based sources and activities: (a) protecting, restoring, and managing critical coastal habitats; (b) ensuring water quality; (c) managing river flows wisely; and (d) strengthening governance and awareness.
6. **Establishment of a transnational network between Kenya and Somalia for mangrove protection.** Not only the exchange and communication on a local level were important for the project's success, but also the regular, cross-border exchange of the project partners. By combining knowledge and expertise from Kenya and Somalia, they will form a transnational network for mangrove protection. The framework of the network shall allow regular exchange of lessons learned and challenges encountered during implementation.
7. **Enhance natural regeneration processes of impacted mangrove wetlands of Kenya and Somalia by restoring the underlying hydrology like the mixture of saltwater and fresh water.**

H. Mitigation measures for impacts on transboundary key biodiversity conservation areas

1. **Depending on the location of the subprojects and pertinent impacts, Biodiversity Management and Action Plans shall be annexed to the ESIA/ESMP.** Indicative Content of a Biodiversity Management Plan (BMP) shall include: (a) objectives based on the findings of the biodiversity baseline and recommendations of the environmental and social assessment or similar document(s). These might include, for example, No Net Loss or Net Gain, (b) Activities to be carried out, along with any specific project requirements needed to achieve the intended BMP objectives, (c) Project requirement that the implementing entities follow to achieve BMP objectives, such as biodiversity-related prohibitions or specific restrictions for civil works contractors and project workers, (d) An implementation schedule for the key BMP activities, taking into account the planned timing of construction and other project activities, (e) Institutional for BMP implementation, and (f) Cost estimates for BMP implementation, including up-front investment costs and long-term recurrent costs. The BMP also specifies the funding sources for plan implementation as well as recurrent operating costs.
2. **Avoid adverse impacts on biodiversity and habitats.** When avoidance of adverse impacts is not possible, project implementer of MSs will implement measures to minimize adverse impacts and restore biodiversity in accordance with the mitigation hierarchy provided in ESS1 and with the requirements of this ESS.
3. **Sub-projects which have significant impacts in terms of biodiversity will be considered as ineligible.**

4. **Borehole Siting should be outside of National Parks and National Reserves.** Borehole siting should be outside of Marsabit National Park and Marsabit National Reserve in the case of Merti TBA and Marka Mari National Park in the case of Dawa TBA.

I.Mitigation measures for impacts on traditional underserved communities of borderlands

1. **The application of ESS 7 requirement for IP/SSAHUTLC Plan is advisable when appropriate.** The IP/SSAHUTLC Plan shall include the following elements, as needed: (a) a summary of the Targeted Social Assessment, including the applicable legal and institutional framework and baseline data; (b) a summary of the results of the meaningful consultation tailored to IP/SSAHUTLC, and if the project involves the three circumstances specified in paragraph 24 of ESS7, then the outcome of the process of FPIC carried out with the affected IP/SSAHUTLC during project preparation; (c) a framework for meaningful consultation tailored to IP/SSAHUTLC during project implementation; (d) measures for ensuring IP/SSAHUTLC receive social and economic benefits that are culturally appropriate and gender sensitive and steps for implementing;(e) Measures to avoid, minimize, mitigate, or compensate IP/SSAHUTLC for any potential adverse impacts that were identified in the social assessment, and steps for implementing them; (f) the cost estimates, financing plan, schedule, and roles and responsibilities for implementing the IP/SSAHUTLC Plan; (g) accessible procedures appropriate to the project to address grievances by the affected IP/SSAHUTLC arising from project implementation, as described in paragraph 35 of ESS7 and in ESS10; (h) mechanisms and benchmarks appropriate to the project for monitoring, evaluating, and reporting on the implementation of the IP/SSAHUTLC Plan, including ways to consider input from project-affected IP/SSAHUTLC in such mechanisms.
2. **Meaningful consultation shall be tailored to Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities.** To promote effective project design, to build local project support or ownership, and to reduce the risk of project-related delays or controversies, IGAD and member states shall undertake an engagement process with affected Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities, as required in ESS10.
3. **Affected Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities may themselves seek support for various initiatives, and these should be taken into consideration by IGAD and WBG.** They include: (a) support for the development priorities of Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities through programs (such as community-driven development programs and locally managed social funds) developed by governments in cooperation with Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities; (b) preparation of participatory profiles of Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities to document their culture, demographic structure, gender, and intergenerational relations and social organization, institutions, production systems, religious beliefs, and resource use patterns; (c) facilitating partnerships among the government, Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities Organizations, Civil Society Organizations, and the private sector to promote Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities' development programs.
4. **IGAD and member states shall ensure that a grievance mechanism is established for the project, as described in ESS10.**This shall be culturally appropriate and accessible to affected Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities, and takes into account the availability

of judicial recourse and customary dispute settlement mechanisms among Indigenous Peoples/ Sub-Saharan African Historically Underserved Traditional Local Communities.

J.Mitigation measures for impacts on transboundary cultural heritage sites

1. **IGAD and member states shall avoid impacts on cultural heritage.** When avoidance of impacts is not possible, and where appropriate, IGAD and member states shall develop a Cultural Heritage Management Plan. The CHMP shall address the following as relevant to the project: (a) a review of the legal and institutional framework applicable to cultural heritage; (b) roles and responsibilities of the different project and other interested parties, for example, the Borrower, contractors, project-affected people, and cultural heritage authorities; (c) steps to identify and manage cultural heritage throughout the project life cycle; (d) proposed mitigation measures to be undertaken; (e) steps for incorporating relevant requirements relating to cultural heritage into project procurement documents, including chance find procedures; (f) implementation schedule and budget; and (g) monitoring and reporting requirements.
2. **IGAD and member states shall carry out meaningful consultations with stakeholders in accordance with ESS10.** Using consultations with stakeholders identify cultural heritage that may be affected by the potential project; consider the significance of the cultural heritage affected by the project; assess the potential risks and impacts; and explore avoidance and mitigation options.
3. **IGAD and member states shall implement globally recognized practices for field-based surveys using qualified specialists, documentation, and protection of cultural heritage in connection with the project, including by contractors and other third parties.** Methods for documenting and protecting cultural heritage typically include field surveys to identify cultural heritage likely to be affected by the project.
4. **A chance find is any unanticipated discovery or recognition of cultural heritage.** Most often, chance finds occur during the construction phase of a project. A chance finds procedure covers the identification, notification, documentation, and management of chance finds in accordance with national laws and, where applicable, internationally accepted practice and local customs. Components of a chance finds procedure shall include: (a) an advance survey and monitoring of ground-disturbing activities, especially in locations with a high likelihood of cultural heritage; (b) steps for temporary work stoppages in the event of a potentially significant discovery; (c) Steps to protect chance finds from the impacts of any further project activities; (d) a contractor code of conduct with rules and guidance on how to address chance finds and training of contracted workers; (e) steps for appropriate intervention where chance finds have been discovered; (f) a monitoring system for the implementation of the chance finds procedure; (g) arrangements with relevant government authorities; and (h) arrangements with relevant indigenous authorities, where appropriate.
5. **Chance-finding issues shall be incorporated into construction contract agreement documents.**

K.Mitigation measures for impact on livelihood

1. No construction should be undertaken until the Project Affected Persons (PAP) are compensated for their losses and have received their resettlement rights;
2. On the completion of the work, the Contractor shall reinstate all the pastureland temporarily taken for various activities of construction and left in a tidy condition and protected against soil erosion;

3. No tree or shrub outside the area of the works shall be felled, topped, cut or pruned until it has been clearly marked for this purpose by the Engineer;
4. Ensure that any disturbance of flora is limited to the sub-project area and avoid spillover effects on neighboring areas. Along with that, there will be strict monitoring of construction vehicles to ensure they only work in the area to be disturbed;
5. The Contractor shall abstain from dumping any spoil from construction activities into pasturelands and wetlands;
6. The proposed site for spoil waste disposal site should be free from environmentally sensitive areas such as: wetlands, grass lands, natural habitat;
7. To minimize such impacts introducing a mechanism for proper handling of chemicals, drilling discharges, bentonite sludge and other contaminant spillages is essential; and
8. Careful consideration and selection of areas proposed for livestock projects, and siting of project facilities, to avoid occupation of areas which are inhabited or regarded as having high value by communities where possible.

L. Mitigation measures to reduce natural and man-made disasters

1. When diversion of Rivers and Streams are necessary during construction, Rivers and Streams should be diverted within a short distance and join with the natural flow and maintain surface water flow for downstream riparian users;
2. On completion of the works, all diversion shall be removed and disposed of or shall be levelled in a manner to give a slightly appearance, and so as not to interfere in any way with the operation or usefulness of the work;
3. When construction of temporary Bridges for access road across rivers and streams are necessary, it should be constructed with boulders or rock fragment that allow to pass water between them and be removed before the rainy season of season of the upstream watershed areas;
4. Rivers and streams should not be diverted to minimize the number of crossings;
5. Constructions of Diversion Weir and Flume should be finalized before the rainy season of the upstream watershed areas and after construction, Rivers should flow using the natural bank without any interference;
6. No tree or shrub outside the area of the works shall be felled, topped, cut or pruned until it has been clearly marked for this purpose by the Engineer;
7. Ensure that any disturbance of flora is limited to the sub-project area and avoid spillover effects on neighboring areas. Along with that, there will be strict monitoring of construction vehicles to ensure they only work in the area to be disturbed;
8. Maintain environmental flows in surface water resources at all times; and
9. Delineate important aquatic habitats and ecosystems so that appropriate attention and protection can be provided.

M. Mitigation options for health risks associated with water borne diseases

1. Environmental manipulation: malarial mosquitoes breed in stagnant water; therefore, steps should be taken to minimize stagnant water: ((a) implement Sprinkler Irrigation Method;(b) avoid excess application of water

particularly in the initial years when the command area is not fully developed; and(c) lining of canals places where exposed for the risk of seepage, to control seepage losses is an important control measure.

2. Reduction of the Anopheles population by repeated house spraying with residual insecticides is not realistic;
3. Reduction of contacts between humans and Anopheles by the use of impregnated bed nets. This has been proved to result in a reduction of the incidence of malaria. Together with efficient health facilities and health education, the general result of mass use of bed nets, preferably impregnated with a long lasting insecticide, is a dramatic decrease in malaria morbidity and mortality; and

N. Mitigation measures for risk of exacerbating existing social exclusion, conflict, illicit behavior, crime and gender-based violence of borderlands

1. The project should assess SEA/SH risks, identify and implement prevention and mitigation measures to address these risks. The risk assessment would include: (i) project-related SEAH Risk Assessment: assessment of the risk of exacerbation/introduction of SEA or SH at the community level; and (ii) Capacity Assessment: assessment of the local capacity to prevent and respond to SEA/SH including other forms of GBV, and the availability of safe and ethical service provision for survivors.
2. The Labour Management Procedures (LMP) shall be developed to manage risks under HoA GW4RP implemented by IGAD-WU and three member states, and funded by the World Bank. The LMP sets out the Program's approach to meeting three member states requirements as well as the objectives of the World Bank's Environmental and Social Framework, specific objectives of Environmental and Social Standard 2: Labour and Working Conditions (ESS2) and Standard 4: Community Health and Safety (ESS4). Indicative content of LMP shall include but not limited 1.Introduction (Background, Project Components or Activities, and Objectives of the LMP), 2. Assessment of key potential labour risks, 3. Brief overview of labour legislation (Terms and Conditions, Occupational Health and Safety), 4.Responsible Staff, 5.Policies and Procedures, 6. Grievance Redress Mechanism, 7.Resources for the Implementation of the LMP (Coordination of the SRM Activities, Resources for the Implementation of the LMP), and Annexes (Code of Conduct Template and Public Service Grievance Form).
3. Implement Grievance Redress Mechanism (GRM). Indicative content of Grievance Redress Mechanism (GRM) shall include but not limited: 1. Introduction (Background and Objectives), 2. Laws and Regulations Framework (International Guidelines, National Regulations), 3.Social Context of the Project Area (Social Baseline Conditions, Indigenous Peoples, Land Tenure Aspect, Overview of Water or Grazing Conflict, Community Livelihood), 4.Current Practices on Water or Grazing Conflict resolution (Traditional/Cultural Laws and Formal Laws),5. Proposed GRM for GW4RP, 6. Operationalization of GRM (Roles of Stakeholders in the GRM, Institutional Arrangement of the GRM, Monitoring and Evaluation Requirement, & Communication and Coordination, and 7.Conclusions and Recommendations.
4. Implement Gender Based Violence Action Plan. 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.
5. Develop and implement a stand-alone SEAH Prevention and Response Plan. The project shall develop and implement a stand-alone SEAH Prevention and Response Plan that will guide the PCU, PIUs and contractors on how to plan for and management the GBV/SEAH risks.

6. Ensuring that locally available labour force is given priority during recruitment.
7. Monitor change in labor influx throughout the life cycle of a sub-project and effectiveness of mitigation measures
8. Clearly define the SEAH prevention and response measures for contractors in the bid documents
9. Use oversight of an independent Third Party Monitor (TPM) organization with experienced GBV staff for monitoring the implementation of the SEAH Prevention and Response Action Plan and ensuring all parties are meeting their responsibilities.
10. Educate all workers and nearby communities on preventing and responding to GBV.
11. Impose zero tolerance on gender-based violence and discrimination.

7.2 Environmental and Social Management Plan

An environmental and social management plan is very important to undertake the operation of HoA-GW4RP, which involves the development of groundwater-based water supply infrastructures and the construction of irrigation schemes in an environmentally sound and socially acceptable manner. It describes the possible actions that are required to be taken to ensure that the adverse impacts that have been identified are mitigated to the extent feasible or acceptable. Where adverse impacts cannot be mitigated, if any, compensatory programs will be designed, as will any environmental enhancement activities required to offset or minimize those impacts. This ESMP is an indicative plan to manage regional-level, transboundary, and cumulative impacts.

All concerned regional and national institutions and parties should work in collaboration, and integration with different environmental and social management responsibilities is very essential so as to manage the plan effectively and efficiently. The consultant supervision team, construction contractor, and all project employees are also among the main actors, especially during the construction phase when they are required to act as agreed on the contract document. The ESMP summarizes how the environment will be managed during different phases of the proposed HoA-GW4R Program.

The environmental and social management plan covers the following contents: potential environmental and social benefits and impacts resulting from project implementation; recommended enhancement measures for the beneficial or positive impacts; recommended mitigation measures for the adverse impacts to enable the sustainable development and management of groundwater resources; regional and national institutional responsibility for the implementation of the enhancement or mitigation measures; capacity building recommendations for the regional and national institutes; implementation timeframes; and an estimate of the implementation budget in USD.

Table-28: Environmental and Social Management Plan (ESMP)

No	Environmental and Social Impact	Enhancement/Mitigation Measures	Implementation Timeframe	Responsible Institution	Estimated Budget in USD
Positive Environmental and Social Impact					
1.	Strengthen the climate resilience of targeted communities and Reduce GHG Emissions	<ul style="list-style-type: none"> Shift to alternative use of renewable and low-carbon energy sources (solar energy pumping); Implement low-carbon agriculture and improved livestock management practices; Implement sustainable soil and soil organic carbon sequestration management practices; Conduct climate risk screening for groundwater-based water supply infrastructures and the construction of irrigation schemes; and Identify and appraise climate resilient development options of groundwater-based water supply infrastructures and the construction of irrigation schemes; 	2023-2027	IGAD-WU, IGAD-Rural Livelihood's Adaptation to Climate Change in the Horn of Africa-Phase-II (RLACC-II) Programme, MSs, & WB	Part of the Program's cost items
2.	Reduce conflicts over water and create peace and stability in the region	<ul style="list-style-type: none"> Local communities in the border region of three MS shall sign a water-sharing agreement to alleviate tensions around growing water scarcity; Conflicts should be addressed by peace leaders at the clan level; Construct drought-smart borehole networks across the conflict-affected areas to be utilized during the drought season and construct boreholes in pasture grazing areas; Consider alternative water sources during the rainy season and utilize the GW sources during the drought season; Giving the opportunity for cross-border communities to solve the conflicts at the local level using community or religious leaders and, during the escalation loop, the national level to intervene; and Develop cross-country steering committees with all the stakeholders to explore conflict causes, develop possible mitigation measures, and manage cross-border conflicts. 	2023-2027	IGAD-WU, IGAD-Conflict Early Warning and Response Mechanism (CEWARN), MSs, & WB	Part of the Program's cost items
3.	Ensure food security and bring socioeconomic developments	<ul style="list-style-type: none"> Implement fair and equitable groundwater allocation for pasture production, ground water regeneration, livestock consumption, human consumption, and irrigated crop farming; Lifting agricultural productivity through agricultural research and development; Implement groundwater-based small-scale irrigation; sand dam pilots for community gardens, nature-based solutions for enhanced groundwater recharge; nature-based solutions for wetland restoration and creation; and soil and water conservation practices; Improving rural livelihoods by strengthening markets and market access; Building community resilience by supporting the establishment and improvement of social protection programs; and Improving sustainable financial services. 	2024-2027	IGAD-WU, IFRAH, IGAD Dryland Research Forum, IGAD-Comprehensive Africa Agriculture Development Programme (CAADP), MSs & WB	Part of the Program's cost items
4.	Create inclusive community-level access to groundwater in the borderlands of the HoA	<ul style="list-style-type: none"> Rehabilitation or construction of new, climate resilient groundwater infrastructure for human consumption and livestock; Small-scale irrigation infrastructure to promote CSA practices, contributing to soil conservation and aquifer recharge; Promoting resilience and conflict resolution through groundwater development; Implement Infrastructure to support aquifer sustainability (recharge) and flood mitigation; Minimize risks associated with borehole siting, geological factors, design, and construction; and 	2024-2027	IGAD-WU, MSs & WB	Part of the Program's cost items

No	Environmental and Social Impact	Enhancement/Mitigation Measures	Implementation Timeframe	Responsible Institution	Estimated Budget in USD
		<ul style="list-style-type: none"> Establish Digital Information and Decision Management Systems. 			
5.	Creating employment opportunity for the local communities and women	<ul style="list-style-type: none"> IGAD and member countries shall consider and apply principles, practices and techniques that are best suited to avoid the violation of core international labour standards, and WB ESS2 (Labor and Working Conditions) HOA GW4R program and projects will ensure that no forced labour shall be used in connection with their activities. The employment of workers shall be based on the principle of equality of opportunity and treatment. Priority will be given to the creation of more and better employment opportunities, especially for disadvantaged, marginalized and vulnerable workers. 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 	2024-2027	IGAD-WU, MSs & WB	Part of the Program's cost items
6.	Generating groundwater information and strengthening regional and national groundwater institutions	<ul style="list-style-type: none"> Establish Regional Groundwater Center (IGAD-GWC) and network of National Groundwater Centers (NGWC); Establish IGAD Platform for Groundwater Collaboration (I-PGWC); Develop joint Regional Studies and Assessments; Intensive capacity building at the national and regional levels on a wide range of topics related to sustainable groundwater management; Support the development of policy instruments for sustainable groundwater exploration and management in the HoA 	2023-2027	IGAD-WU, MSs, & WB	Part of the Program's cost items
7.	Create strong linkages and alignment with other HoA projects	<ul style="list-style-type: none"> Other donors/government projects in the HoA region should be mapped and coordinated to avoid overlapping interventions by donors and waste of resources; Establish Horn Africa Groundwater Initiative Alliance or Consortium (Alliance of IGAD with NBI). 4. Identify cross-cutting measures that, once implemented, would help support the implementation of HoA GW4RP 	2022-2027	IGAD-WU, MSs, & WB	Part of the Program's cost items
Negative Environmental and Social Impact					
1.	Groundwater aquifer depletion	<ul style="list-style-type: none"> Undertake a Shared Aquifer Diagnostic Analysis (SADA) for each TBAs; Conducting aquifer sustainability assessments prior to development; Regulate groundwater abstraction and issuance of water use rights or permits; 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; and 	2024-2027	IGAD-WU, MSs, WB, IGRAC, & GEF	140,000

No	Environmental and Social Impact	Enhancement/Mitigation Measures	Implementation Timeframe	Responsible Institution	Estimated Budget in USD
		<ul style="list-style-type: none"> Modify or control the groundwater abstraction rate depending on the outcome of groundwater monitoring. 			
2.	Water quality deterioration	<ul style="list-style-type: none"> Regulation of groundwater pollution and issuance of wastewater discharge permits; Conduct joint monitoring of the water levels and water quality of TBA systems and exchange monitoring data on a regular basis; and Strengthen IGAD Regional dialogue and cooperation regarding the use of groundwater resources in TBAs, including: (1) developing and implementing appropriate TBA management plans and creating collaborative management mechanisms; (2) strengthening exchanges and cooperation in terms of water-saving technologies; (3) establishing mechanisms for protecting the ecological environment of transboundary waters. 	2024-2027	IGAD-WU& MSs	Included Under Monitoring Plan
3.	Transboundary water use conflict	<ul style="list-style-type: none"> Highlight the concrete mutual benefits of water cooperation and resilience; Support institutional frameworks and processes; Strengthen local capacities for dispute resolution; Construct drought-smart borehole networks across the conflict-affected areas and pasture grazing areas; Consider alternative water sources during the rainy season and utilize the GW sources during the drought season; Giving the opportunity for cross-border communities to solve the conflicts at the local level using community or religious leaders and, during the escalation loop, the national level to intervene; and Develop cross-country steering committees with all the stakeholders. 	2024-2027	IGAD-WU, IGAD-Conflict Early Warning and Response Mechanism (CEWARN), & MSs	Part of routine or usual activities of PIU
4.	Cumulative Impacts of soil erosion and degradation	<ul style="list-style-type: none"> 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; and Provide runoff protection or interception structures such as bunds, terraces, and berms in areas that are susceptible to erosion. 	2024-2027	IGAD-WU & MSs	Part of routine or usual activities of PIU
5.	Impacts on groundwater-dependent ecosystem of lacustrine/palustrine/riverine wetlands, springs and Oasis	<ul style="list-style-type: none"> Development of a conceptual model of groundwater-wetland interactions for wetlands in IGAD Region; Development of Groundwater Dependent Ecosystems Atlas (GDE Atlas) as a national dataset of member states of Ethiopia, Kenya and Somalia GDEs to inform groundwater planning and management; Situation assessment of combined impacts, status and trends of groundwater-dependent ecosystem of wetlands, springs and oasis in IGAD Region; Determination of groundwater requirements of wetlands; Setting of groundwater allocations for wetlands; 	2024-2027	IGAD-WU, IGAD-NRMU, WB, IGRAC, Wetlands International (Source to Sea Initiative (S2S) project),	250,000

No	Environmental and Social Impact	Enhancement/Mitigation Measures	Implementation Timeframe	Responsible Institution	Estimated Budget in USD
		<ul style="list-style-type: none"> Inclusion of groundwater-related management actions and strategies in the land and water management plan for the basin, in order to minimize the impacts of groundwater exploitation on associated wetlands; and Borehole siting should be outside of heads of lacustrine/ palustrine/ riverine wetlands, springs and Oasis. 			
6.	Impacts on groundwater-dependent ecosystem of terrestrial flora and fauna	<ul style="list-style-type: none"> Modeling or predicting drawdown impacts to GDEs; Reduced surface water quality through erosion and sedimentation; Minimize potential impacts on groundwater quality; and Borehole siting should be outside of the groundwater and riverine forest biotic communities of Kenya 	2024-2027	IGAD-WU, MSs, WB, IGRAC	Included Under 5.
7.	Impacts on groundwater-dependent ecosystem of mangrove, estuarine and near-shore marine ecosystems	<ul style="list-style-type: none"> Strengthened knowledge of the marine environment; Protect and restore threatened estuarine and near-shore marine habitats; Draw on nature-based solutions to increase coastal resilience; Strengthen and effectively implement priority activities identified in the Convention, and Protocol of Nairobi for the Protection, Management and Development of Coastal and Marine Environment of the Western Indian Ocean (WIO) region; and Reducing impacts from land-based sources and activities and sustainably managing critical coastal-riverine ecosystems. Establishment of a transnational network between Kenya and Somalia for mangrove protection. Enhance natural regeneration processes of impacted mangrove wetlands of Kenya and Somalia by restoring the underlying hydrology like the mixture of saltwater and fresh water. 	2024-2027	IGAD-WU, MSs, Nairobi Convention Secretariat, Wetlands International (Source to Sea Initiative (S2S) project), Global Mangrove Alliance	75,000
8.	Impact on transboundary key biodiversity conservation areas	<ul style="list-style-type: none"> Depending on the location of the subprojects and pertinent impacts, Biodiversity Management and Action Plans shall be annexed to the ESIA/ESMP; Avoid adverse impacts on biodiversity and habitats; and Sub-projects, which have significant impacts in terms of biodiversity, shall be considered as ineligible. Borehole siting should be outside of National Parks and National Reserves. 	2024-2027	IGAD-WU, IGAD Biodiversity Management in the Horn of Africa Programme Unit & MSs	53,000
9.	Impacts on traditional underserved communities of borderlands	<ul style="list-style-type: none"> The application of ESS 7 requirement for IP/SSAHUTLC Plan is advisable when appropriate; Meaningful consultation shall be tailored to Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities; Affected Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities may themselves seek support for various initiatives, and these should be taken into consideration by IGAD and WBG; and IGAD and member states shall ensure that a grievance mechanism is established for the project, as described in ESS 10. 	2024-2027	IGAD-WU, MSs	75,000
10.	Impact on transboundary heritage sites	<ul style="list-style-type: none"> When avoidance of impacts is not possible, and where appropriate, IGAD and member states shall develop a Cultural Heritage Management Plan; IGAD and member states shall carry out meaningful consultations with stakeholders in accordance with ESS 10; 	2024-2027	IGAD-WU, MSs, WB, UNESCO	75,000

No	Environmental and Social Impact	Enhancement/Mitigation Measures	Implementation Timeframe	Responsible Institution	Estimated Budget in USD
		<ul style="list-style-type: none"> IGAD and member states shall implement globally recognized practices for field-based surveys using qualified specialists, documentation, and protection of cultural heritage in connection with the project, including by contractors and other third parties; and A chance find is any unanticipated discovery or recognition of cultural heritage 			
11.	Impact on livelihood	<ul style="list-style-type: none"> No construction should be undertaken until PAP are compensated; Contractor shall reinstate all the pastureland temporarily taken for various activities of construction and left in a tidy condition No tree or shrub outside the area of the works shall be felled, topped, cut or pruned Ensure that any disturbance of flora is limited to the sub-project area and avoid spillover effects on neighboring areas The Contractor shall abstain from dumping any spoil from construction activities into pasturelands and wetlands Proper handling of chemicals, drilling discharges, bentonite sludge and other contaminant spillages is essential; and Careful consideration and selection of areas proposed for livestock projects, and siting of project facilities 	2023-2027	MSs PIU & Contractors	Nil-standard best construction practices
12.	Exacerbating natural and man-made disasters(flood and drought)	<ul style="list-style-type: none"> When diversion of Rivers and Streams are necessary during construction, Rivers and Streams should be diverted within a short distance and join with the natural flow and maintain surface water flow for downstream riparian users; On completion of the works, all diversion shall be removed; Ensure that any disturbance of flora is limited to the sub-project area and avoid spillover effects on neighboring areas; Maintain environmental flows in surface water resources at all times; and Delineate important aquatic habitats and ecosystems 	2023-2027	MSs PIU & Contractors	Nil-standard best construction practices
13.	Spread of water borne diseases and public health risks	<ul style="list-style-type: none"> Environmental manipulation: malarial mosquitoes breed in stagnant water; therefore, steps should be taken to minimize stagnant water: ((a) implement Sprinkler Irrigation Method;(b) avoid excess application of water particularly in the initial years when the command area is not fully developed; and(c) lining of canals places where exposed for the risk of seepage, to control seepage losses is an important control measure. Reduction of the Anopheles population by repeated house spraying with residual insecticides is not realistic; Reduction of contacts between humans and Anopheles by the use of impregnated bed nets. 	2023-2027	MSs PIU & Woreda/County Health offices	Part of routine or usual activities of Woreda/County Health offices
14.	Risk of exacerbating existing social exclusion, conflict, illicit behavior, crime and gender-based violence of borderlands	<ul style="list-style-type: none"> The project should assess SEA/SH risks, identify and implement prevention and mitigation measures to address these risks; The Labour Management Procedures (LMP) shall be developed to manage risks under HoA GW4RP implemented by IGAD-WU and three member states, and funded by the World Bank; Implement Grievance Redress Mechanism (GRM); Develop and implement a stand-alone SEAH Prevention and Response Plan; 	2023-2027	IGAD-WU, MSs, WB, TPM	90,000

No	Environmental and Social Impact	Enhancement/Mitigation Measures	Implementation Timeframe	Responsible Institution	Estimated Budget in USD
		<ul style="list-style-type: none"> • Ensuring that locally available labour force is given priority during recruitment; • Monitor change in labor influx throughout the life cycle of a sub-project and effectiveness of mitigation measure; • Clearly define the SEAH prevention and response measures for contractors in the bid documents; • Use oversight of an independent Third Party Monitor (TPM) organization with experienced GBV staff for monitoring the implementation of the SEAH Prevention and Response Action Plan; • Educate all workers and nearby communities on preventing and responding to GBV; and • Impose zero tolerance on gender-based violence and discrimination. 			
Grant Total Estimated Budget in USD for Environmental and Social Management Plan (ESMP)					758,000 USD

7.3 Environmental and Social Monitoring Plan

The primary purpose of this environmental and social monitoring is to cross-check significant environmental effects that arise during the implementation stage against those predicted during the plan preparation stage, as well as to identify any unforeseen adverse effects. Monitoring contributes to determining whether SESA is, as it is meant to, leading to a high level of protection of the environment and the promotion of sustainable development. SESA monitoring typically entails measuring established indicators on a regular basis. Changes in indicator values can be compared against the documented baseline environment for the plan area to evaluate their trends. This is then used as a basis for identifying beneficial or adverse effects. It also serves as the basis for establishing changes in the baseline environment to better inform future plans. The main components of the monitoring plan are: key project parameters or aspects to monitor; specific and measurable indicators; frequency of monitoring; responsible regional and national institutions or parties for monitoring; and a monitoring budget.

Table-29: Environmental and Social Monitoring Plan

No	Environmental and Social aspect to be monitored	Indicators/ Parameters	Monitoring Means (Methods)	Location of monitoring	Frequency	Responsibility	Estimated Budget in USD
1.	Groundwater aquifer depletion	Borehole water levels, Borehole yields, Static water level, dynamic water level, drawdown, and safe yield, Number of Shared Aquifer Diagnostic Analysis (SADA) conducted for TBAs, Groundwater abstraction/use permits prepared and implemented, and practices of artificial recharge of groundwater using stored runoff water or other practical means.	Survey, and collect samples and analysis	TBAs, Boreholes	Biannually (during dry periods & wet periods)	IGAD-WU, MS Water Sector Offices/ Bureaus & MSs Environmental Agency MSs PIU & MSs ESSs	150,000
2.	Water quality deterioration	Water quality tests of selected parameters (surface water and groundwater) & Wastewater quality tests.	Survey, and collect samples and analysis	TBAs, TBLs, TBRs & Boreholes	Biannually (during dry periods & wet periods)	IGAD-WU, MS Water Sector Offices /Bureaus, MSs Environmental Agency, MSs PIU & MSs ESSs	250,000
3.	Transboundary water use conflict	Number of records of water resource related conflicts/disputes, Number of Water conflicts resolved, Number of drought-smart borehole networks constructed across the conflict-affected areas and pasture grazing areas, Supports provided to strengthen local capacities for dispute resolution, Opportunities given for cross-border communities to solve the conflicts at the local level using community or religious leaders.	Dialogue within and among the cross-border communities and water resource related conflicts/disputes cases recorded	TBAs, Boreholes & Pasture Grazing Areas	Annually (during dry periods)	IGAD-WU, MS Water Sector Offices/ Bureaus, MSs Environmental Agency, MSs PIU, MSs ESSs & Cross-country Steering Committees	Part of routine or usual monitoring activities of PIU
4.	Cumulative Impacts of soil erosion and degradation	Re-vegetation areas, Number of plantation seedlings, Soil and water conservation activities, Gullies, Water turbidity, & Siltation of the canals.	Before and after Visual Inspection & Photographic Records	Watersheds of GWB water supply infrastructures and irrigation scheme.	Quarterly	IGAD-WU, MS Water Sector Offices & Bureaus, MS Agricultural Sector Offices/Bureaus, MSs Environmental Agency MSs PIU, & MSs ESSs	Part of routine or usual monitoring activities of PIU

No	Environmental and Social aspect to be monitored	Indicators/ Parameters	Monitoring Means (Methods)	Location of monitoring	Frequency	Responsibility	Estimated Budget in USD
5.	Impacts on groundwater-dependent ecosystem of lacustrine/ palustrine/ riverine wetlands, springs and Oasis	Number of impacted GDE lacustrine wetlands, palustrine wetlands, riverine wetlands, springs and Oasis due to groundwater drawdown. Area coverage in ha of impacted GDE lacustrine wetlands, palustrine wetlands, riverine wetlands, springs and Oasis due to groundwater drawdown.	Long-term tracking of specific wetland biodiversity values and threat of groundwater drawdown using Remote Sensing Techniques	Groundwater-dependent ecosystem of lacustrine/ palustrine/ riverine wetlands, springs and Oasis	Biannually (during dry periods & wet periods)	IGAD-WU, MS Water Sector Offices/ Bureaus, MSs Environmental Agency, MSs PIU, MSs ESSs & WI	35,000
6.	Impacts on groundwater-dependent ecosystem of terrestrial flora and fauna	Number of impacted GDEs of groundwater and riverine forest biotic communities due to groundwater drawdown, changes in groundwater quality, and reduced surface water quality, Area coverage in ha of impacted GDEs of groundwater and riverine forest biotic communities due to groundwater drawdown, changes in groundwater quality, and reduced surface water quality	Long-term tracking of specific GDEs of groundwater and riverine forest biotic communities status using Remote Sensing Techniques	GDEs of groundwater and riverine forest biotic communities	Biannually (during dry periods & wet periods)	IGAD-WU, MS Water Sector Offices/ Bureaus, MSs Environmental Agency, MSs PIU, MSs ESSs & WI	Included Under 5.
7.	Impacts on groundwater-dependent ecosystem of mangrove, estuarine and near-shore marine ecosystems	Number of GDE Atlases as a national dataset of member states of Ethiopia, Kenya and Somalia, Number of impacted GDEs of estuarine and mangrove ecosystems due to over-pumping of coastal aquifers, Area coverage in ha of impacted GDEs of estuarine and mangrove ecosystems due to over-pumping of coastal aquifers	Tracking of mangrove habitat changes using 'Mangrove Restoration Tracker Tool' (MRTT) launched by GMA	Mangrove habitats, estuaries and near-shore marine ecosystems	Biannually (during dry periods & wet periods)	IGAD-WU, MS Water Sector Offices/ Bureaus, MSs Environmental Agency, MSs PIU, MSs ESSs & WI	Included Under 5.
8.	Impact on transboundary key biodiversity conservation areas	Area coverage in ha of impacted part of transboundary key biodiversity conservation areas of Tana-Kipini-Laga Badana Bushbush Land and Seascape, and Number of Biodiversity Management and Action Plans annexed to the ESIA/ESMP	Tracking of changes of Tana-Kipini-Laga Badana Bushbush Land and Seascape, Follow up the implementation of Biodiversity Management and Action Plans	Transboundary key biodiversity conservation areas of Tana-Kipini-Laga Badana Bushbush Land and Seascape.	Biannually (during dry periods & wet periods)	IGAD-WU, MS Water Sector Offices/ Bureaus, MSs Environmental Agency, MSs PIU, MSs ESSs & Cross-country Steering Committees & Contractors	Included Under 5.
9.	Impacts on traditional underserved communities of borderlands	Number of traditional underserved vulnerable and disadvantaged community groups impacted by the Project, Number of IP/SSAHUTLC Plans Prepared & implemented, Supports for the development priorities of IP/SSAHUTLC, Number of participatory profiles prepared for IP/SSAHUTLC, Number of meaningful	Dialogue within and among the traditional underserved vulnerable and disadvantaged community groups and traditional	Settlement Areas of traditional underserved vulnerable and disadvantaged community groups	Quarterly	IGAD-WU, MS Water Sector Offices/ Bureaus, MSs Environmental	Part of routine or usual monitoring activities of PIU

No	Environmental and Social aspect to be monitored	Indicators/ Parameters	Monitoring Means (Methods)	Location of monitoring	Frequency	Responsibility	Estimated Budget in USD
		consultation held with IP/SSAHUTLC, and Number of established grievance mechanism that culturally appropriate and accessible to IP/SSAHUTLC	underserved vulnerable and disadvantaged community groups Grievance cases recorded			Agency, MSs PIU, MSs ESSSSs & Cross-country Steering Committees	
10.	Impact on transboundary heritage sites	Number of meaningful consultations with stakeholders to identify cultural heritage that may be affected by the project, Number of CHMP prepared and implemented, Number of field-based surveys using qualified specialists, documentation, and protection of cultural heritage in connection with the project, including by contractors and other third parties, and Implementation practices of chance finds procedures.	Survey & Visual inspection of Heritage Sites	Both physical and Cultural Heritage Sites	Quarterly	IGAD-WU, MS Water Sector Offices/ Bureaus, MSs Environmental Agency, MSs PIU, MSs ESSSSs, Cross-country Steering Committees & Contractors	Part of routine or usual monitoring activities of PIU
11.	Impact on livelihood	Lands temporarily acquired for Pipeline Corridor, Lands permanently acquired for Drilling Wells, Area coverage of vegetation cover cleared for Pipeline Corridor and Borehole Locations, Number of PAP complain about compensation, and Number of new Boreholes with unmanaged in-flux of livestock and exposed for the risk of pastureland degradation.	Survey, Observation & Interview	Pipeline Corridor Well Fields	Three times for first one year, annually thereafter.	IGAD-WU, MS Water Sector Offices/ Bureaus, MSs Environmental Agency, MSs PIU, MSs ESSSSs, Cross-country Steering & Contractors	Part of routine or usual monitoring activities of PIU
12.	Exacerbating natural and man-made disasters (flood and drought)	Number of tree and shrub outside the area of the works cleared, felled, topped, cut or pruned, Areas of grazing lands outside the area of the works cleared, Number of streams and Rivers interfered by the construction works, Areas exposed for flood hazards, Properties damaged by flood risk, and Trends and occurrences of drought after project construction	Visual inspection & Photographic record	Potential flood hazard exposed parts of the PCA	Bi-annually	IGAD-WU, MS Water Sector Offices/ Bureaus, MSs Environmental Agency, MSs PIU, MSs ESSSSs & Contractors	Part of routine or usual monitoring activities of PIU
13.	Spread of water borne diseases and public health risks	Check the implementation of sprinkler irrigation methods and lining of canals particularly at seepage areas and Cases of malaria	Review of health records at the woreda or county level health centres	Water logged areas with & adjacent PCA	Bi-annually	IGAD-WU, MS Water Sector Offices/ Bureaus,	Part of routine or usual monitoring activities of PIU

No	Environmental and Social aspect to be monitored	Indicators/ Parameters	Monitoring Means (Methods)	Location of monitoring	Frequency	Responsibility	Estimated Budget in USD
						MSs Environmental Agency, MSs PIU, MSs ESSSS & Contractors	
14.	Risk of exacerbating existing social exclusion, conflict, illicit behavior, crime and gender-based violence of borderlands	Number of Labour Management Procedures (LMP) prepared and implemented, Number of Grievance Redress Mechanism (GRM) prepared and implemented, Number of Gender Based Violence Action Plan prepared and implemented, Number of stand-alone SEAH Prevention and Response Plan prepared and implemented, Changes in labor influx throughout the life cycle of a sub-project, and Implementation practices of zero tolerance on gender-based violence and discrimination, Record of GBV grievances, No. of local population recruited.	Inspection of Grievance Records, check preparation and implementation of LMP, GRM, Gender Based Violence Action Plan, and stand-alone SEAH Prevention and Response Plan, & Inspection of Employee records,	Construction sites of GWB water supply infrastructures and irrigation schemes.	At the beginning of project construction works activities and regular checks of quarterly.	IGAD-WU, MS Water Sector Offices/ Bureaus, MSs Environmental Agency, MSs PIU, MSs ESSSSs, Cross-country Steering Committees & Contractors	Part of routine or usual monitoring activities of PIU
Grant Total Estimated Budget in USD for Environmental and Social Monitoring Plan (ESMP)							435,000 USD

7.4 Capacity Building Plan for the Regional and National Institutes

The IGAD-WU, MSs implementing sectors, environmental agents, partner and beneficiary institutions, sub-project construction contractors, and other institutions in charge of overseeing HoA-GW4RP activities, such as line ministries and departments and sub-project operators, will all need technical capacity to implement SESA effectively. The numerous lead, partner, and beneficiary institutions as well as the major players involved in the implementation of HoA-GW4RP activities would require a thorough grasp of the operationalization method for SESA. In order to help the teams understand their duties in providing supervision, monitoring, evaluation, and environmental reporting on the project activities, capacity building will be crucial. In order to assist implementation of the HoA-GW4RP with regard to transboundary social and environmental implications, a particular initiative is required to build the capacity of the project-implementing unit, personnel from partner institutions, and staff from beneficiary institutions.

Priority shall be to build capacity within regional and national institutes:

- IGAD-WU Staff. The overall objective of IWU is to promote peace and stability and support the socio-economic development of the region through efficient and effective water management and governance. IGAD will be the Implementing Agency for the Project and will mobilize in-house capacity for the Project Activities. The IGAD Water Unit (IWU) shall be strengthened to actively manage and implement the project activities including SESA.
- HoA-GW4RP MS Water Sector Offices and Bureaus. One of the key principles of good SEA practice is that these assessments should be the direct responsibility of the 'owners' of the programs for which the SEA is carried out. These institutions should therefore have sufficient knowledge, skills, and capacity to conduct the SEA process and carry out assessments. One way of building such capacity is to create PIU units in the key departments and train the staff of these units.
- The environment agency is responsible for the design and implementation of SEA regulations. Capacity should be created within this agency to: (i) prepare regulations; (ii) act as helpdesk, both in general (manuals and guidance) and as reviewer of specific SEAs; and (iii) act as watchdog, making sure SEAs of sufficient quality and relevance are actually carried out.

Funding will always be a significant issue. The effectiveness of SEAs depends on the ability to pay the necessary employees, provide adequate funding for consultants to provide thorough assessments, cover the costs of stakeholder involvement, and track the actual effects of the HoA-GW4R program's implementation. Any initiative to enhance capacity should include financial arrangements. Practice in the SEA has shown that on-the-job instruction, ideally during SEA pilot training, will result in the greatest effectiveness. These teams should receive special attention during training so they may share their knowledge inside their own organizations. A precondition for effective SEA capacity development is high-level support. For this reason, a number of high-level sensitizing meetings should be part of any capacity development plan to garner both political and bureaucratic support. Other stakeholders may also be instrumental in generating support for SEAs. Detailed suggested capacity building areas, including implementation timelines, that would need to be covered by the training presented in the table below:

Table-30: Capacity Development Plan for SESA of HoA GW4RP

No	Suggested Capacity Building Areas	Implementation Timeline				Budget in USD
		2023	2024	2025	2026	
1.	Deploy and capacitate IGAD-WU Environmental and Social Safeguard Specialist					180,000
2.	Training on WBG and MSs Legal Frameworks					
2.1	WBG Environmental and Social Standards Applicable for HoA GW4RP					
2.2	HoA GW4RP MSs Legislative Frameworks					
2.3	WBG Environmental, Health and Safety(EHS) Guidelines					
2.4	Legislative Gaps Between WBG and HoA GW4RP MSs Legislative Frameworks (based on gaps identified in this SESA Document)					
2.5	Groundwater Policy and Governance					
	Sub-total Budget in USD					150,000
3.	Training on RSESA,ESMF and RPF					
3.1	RSESA for IGAD-WU Staff					100,000
3.2	ESMF and RPF for HoA GW4RP MSs Staff & Environment Agency Staff					300,000
	Sub-total Budget in USD					400,000
4.	Training on different Environmental and Social Management Plans that help to achieve compliance with WB ESSs and ESCP (LMP, GBV/SEAH,GRM, IP/SSAHUTLC Plan, CHMP, and SEP) for HoA GW4RP MSs Staff & Environment Agency Staff					150,000
5.	Training on Incorporating Environmental and Social Issues, ESMP, and ESHS into Tender, Bidding, and Construction Contract Documents using International Federation of Consulting Engineers (FIDIC) Resource Guidelines and International Design and Construction Best Practices for Contractors, Procurement Specialists, and ESSs for HoA GW4RP MSs					
5.1	Incorporating Environmental and Social Issues, ESMP, and ESHS into Tender and Bidding Documents					
5.2	Incorporating Environmental and Social Issues (ESMP and ESHS) into Contracts					
5.2.1	World Bank Contracting Modalities					
5.2.2	Managing ESHS Risks in Work Contacts (Contract Taking Over ESHS Aspects and Defect Liability Period of ESHS Aspect)					
	Sub-total Budget in USD					150,000
6.	Training on Construction Supervision of Groundwater-Based Water Supply Infrastructures and Irrigation Schemes using Cases of Best and Bad Construction Practices of Water Supply and Irrigation Schemes for HoA GW4RP MSs & Environment Agency Staff					150,000
7.	Training on Integration of Groundwater Management and Access into the Transboundary Basin Organization of IGAD for IGAD-WU staff					

7.1	Aquifer Systems Characterizations for Groundwater Management and Access of HoA				
7.2	Management of Transboundary Aquifers of IGAD Region				
7.3	Groundwater Monitoring and Information Management				
7.4	Groundwater Regulations, Licensing, Allocations, Tariffs and Institutions				
7.5	Groundwater and Environment/Climate Change				
7.6	Nature Based Solutions for Water Security Enabling Conditions of IGAD Region				
	Sub-total Budget in USD				100,000
8.	Training on the State-of-the-Art of GIS and Remote Sensing Techniques for Transboundary Aquifer Management				
8.1	Training on the development of a conceptual model of groundwater-wetland interactions for wetlands in the IGAD Region				
8.2	Training on the Development of <i>Groundwater Dependent Ecosystems Atlas (GDE Atlas)</i> as a national dataset of member states of Ethiopia, Kenya, and Somalia GDEs to inform groundwater planning and management using State-of-the-art GIS and Remote Sensing Techniques				
8.3	Training on the use of Satellite Imagery, Computer Vision, Geospatial modeling, and Machine Learning, combined with In-situ measurement, Existing Datasets, and Qualitative Socioeconomic Information to measure and project Groundwater supply, demand, quality, and access of HoA GW4R Project Phase-I MSs				
Sub-total Budget in USD					100,000
Grand Total Budget in USD					1,380,000

7.5 Monitoring, Evaluation and Reporting System of SESA

The effective implementation of RSESA in HoA-GW4RP's enhancement and mitigation measures shall be monitored by IGAD-WU, particularly the Environmental and Social Safeguard Specialist. As a result, the Environmental and Social Safeguard Specialist will monitor the application of the enhancement and mitigation measures, either alone or in collaboration with other IGAD-WU professionals. The experts will keep an eye on how the HoA-GW4RP operations are being screened and how the mitigation measures are being put into place at the project site.

Safeguards performance monitoring in HoA-GW4RP will involve monitoring the compliance and effectiveness of the Environmental and Social Commitment Plan (ESCP) and the Stakeholder Engagement Plan (SEP) already prepared by the IGAD-Water Unit. Monitoring, Evaluation, reporting, and Continuous Improvement systems suggested for SESA of HoA-GW4RP include:

- Establish a robust monitoring and evaluation system for the implementation of the ESMF, RPF, OHS, ESCP, LMP, and SEP, including systems for timely data collection and reporting for each HoA GW4R Project implementer in member countries;

- Closely monitor the implementation of environmental and social risk management instruments (ESMPS, RAPS, LMP, GRM, SEPS, and OHS);
- Compiles and synthesizes quarterly, biannual, and annual safeguard compliance monitoring reports of HoA GW4R Project implementers in member countries and sends or shares them with the IGAD-WU and the World Bank;
- Liaise with the IGAD-WU and World Bank to ensure the Project's compliance with the ESMF, RPF, OHS, ESCP, LMP, SEP, and RPF and all resettlement aspects of the Project;
- Provide overall project safeguard coordination and assistance in the implementation of the ESMF, LMP, ESCP, SEP, and RPF for the HoA GW4R Project; and
- Facilitate cross-learning and exchange among the HoA GW4R Project implementers in member countries and develop other ways to improve environmental and social risk management in regions and cities.

8. CONCLUSION AND RECOMMENDATIONS

8.1 Conclusion

The following conclusions could be drawn from the key findings of the draft report of SESA for HoA GW4RP:

1. The IGAD regional policy and legal framework review work of SESA for HoA GW4RP concluded that there is no regionally specific coordinated policy on groundwater in the IGAD region. Instead, groundwater has occupied a cross-sectoral position in different IGAD regional policies and strategies. The review work on applicable international conventions and agreements ratified by the member states revealed that IGAD member states have not yet ratified the UN Watercourses Convention of 1997, which is instrumental to the development of transboundary water resources in the interest of all the river basin or aquifer states concerned as well as maintaining their peaceful coexistence. According to the World Bank's Environmental and Social Standards (ESSs), projects supported by the bank through investment project financing are required to meet the ESSs. Accordingly, it was noted that all except ESS 9 were potentially applicable to the HoA-GW4RP. The member states environmental management legislation is compared with the World Bank's Environmental and Social Standards. In the comparison, gaps were identified between existing member state laws and regulations and the World Bank's Environmental and Social Standards. Country-specific ESMFs and measures were suggested to fill the identified gaps.
2. In this SESA work, sufficient environmental and social baseline conditions and situational analysis were done through a desk study of existing secondary baseline data from the IGAD website and Google searches using key words such as Horn of Africa, groundwater, resilience, strategic environmental and social assessment, IGAD Region, and individual project member states. It is clear from the SWOT analysis output that although there are strengths and opportunities, the HoA Initiative region is also subjected to a range of threats and weaknesses, which include both regional, national, and local processes. SWOT analysis helps to find the best match between environmental trends (opportunities and threats) and internal capabilities (strengths and weaknesses).
3. On the basis of this RSESA study, the HoA GW4R Program will have a number of significant beneficial or positive socio-economic and environmental impacts that justify the implementation of the program. The potential socio-economic and environmental benefits that are identified in this RSESA study are: strengthening the climate resilience of targeted communities and reduction of GHG Emissions; reducing conflicts over water and creating peace and stability in the region; ensuring food security and bringing socioeconomic developments; creating inclusive community-level access to groundwater in the borderlands of the HoA; creating employment opportunities for the local communities and women; generating groundwater information and strengthening regional and national groundwater institutions; and creating strong linkages and alignment with other HoA projects.
4. Although the implementation of the HoA GW4R Program has many benefits, it will also have a number of adverse or negative impacts. The potential socio-economic and environmental adverse or negative impacts that are identified in this RSESA study are: transboundary aquifer depletion, water quality deterioration, risk of exacerbating existing transboundary water use conflict, cumulative impacts of soil erosion and degradation,

impacts on groundwater-dependent ecosystem of lacustrine/palustrine/riverine wetlands, springs and Oasis, impacts on groundwater-dependent ecosystem of terrestrial flora and fauna, impacts on groundwater-dependent ecosystem of estuarine and near-shore marine ecosystems, impact on transboundary key biodiversity conservation areas, impacts on traditional underserved communities of borderlands, impact on transboundary heritage sites, impact on livelihood, exacerbating natural and man-made disasters (flood and drought), spread of water borne diseases and public health risks and risk of exacerbating existing social exclusion, conflict, illicit behavior, crime and gender-based violence of borderlands.

5. The SESA consultant of the HoA GW4R Program recognizes that all negative impacts are possible to mitigate. To protect the environment and promote development, a monitoring plan has been prepared to control and regulate the adverse impacts for sustainable operation of the project.
6. HoA GW4R Program needs about 758,000 USD for environmental and social management, 435,000 USD for environmental and social monitoring activities, and 1,380,000 USD for capacity building and institutional strengthening

8.2 Recommendations

In light of the key findings of the draft report of SESA for HoA GW4RP, the following key recommendations are forwarded:

1. IGAD-WU shall promote regional integration and collaboration to enhance significant beneficial or positive socio-economic and environmental impacts and mitigate transboundary adverse or negative environmental and social impacts of HoA-GW4RP;
2. WBG, AfDB, and the EU shall be committed to supporting IGAD and member states in the development of regional and national groundwater policies. Groundwater regulation, licensing, and allocation shall be implemented in the IGAD Region with the support of WBG, AfDB, and the EU;
3. Each of the three MS of Phase I of the HoA GW4R Program shall be committed to implementing country-specific ESMFs and measures suggested in this SESA study to fill the identified gaps between existing member state laws and regulations and the World Bank's Environmental and Social Standards;
4. IGAD-WU in coordination with other IGAD units such as IGAD-NRMU, and WBG shall support IGAD member states in ratifying the UN Watercourses Convention through the implementation of IGAD projects that deal with natural resource management particular emphasis on water and wetland resources (lead by IGAD-NRMU). Similar to states members of the Economic Commission for Europe who ratified the convention and protocol on Strategic Environmental Assessment in a transboundary context, member states of IGAD shall adopt a convention on Strategic Environmental Assessment in a transboundary context to handle the transboundary environmental and social impacts of the HoA GW4R Program and other similar Programs;
5. In SWOT analysis output, weaknesses should be converted into strengths, whereas threats should be converted into opportunities. To overcome threats and weaknesses, strategy management and practices are

vital to converting them into strengths and opportunities. SWOT analysis output can be applied to facilitate sustainable groundwater management in the HoA Initiative region;

6. IGAD-WU as well as each of the three MS of Phase I HoA GW4R Program should allocate an adequate budget to implement the mitigation and management measures and environmental monitoring activities as outlined in the environmental management and monitoring plan;
7. To successfully implement the Horn of Africa Groundwater for Resilience (HoA GW4R) Program and to ensure its sustainable use and access, there is a need to ensure the most critical enabling conditions in terms of knowledge, capacity, and economic assessments are in place;
8. The stakeholder involvement process should be continuous and maintain a regular means of communication with area residents to keep them informed of the status of the program and project activities, as well as what the stakeholders expect from the project proponent and the government;
9. The environmental competent agency of each of the three MSs shall undertake environmental monitoring, external environmental auditing, and inspection to evaluate the effective implementation of mitigation measures based on the planned environmental management plan and take the necessary measures accordingly; and
10. SESA regional dissemination, disclosure, and public consultation shall be done based on the World Bank Policy on Disclosure of Information. These activities shall include the following: (a) When the Draft SESA is considered ready for disclosure by the World Bank, it shall be submitted to the three participating countries; (b) each country follows its own regulations for public consultation when these are in place and enforced, as well as the World Bank policy; in parallel, the draft SESA shall be posted on Infoshop; (c) after the disclosure period in each country takes place, at least one debate shall be concluded with a Minute containing recommendations and general comments; this Minute shall be sent to the Bank; (d) the SESA consultant of the HoA GW4R Program shall receive all the comments and recommendations from countries and prepares a point of view regarding those possible to be considered in the final SESA; this will be submitted to the Bank representative; (e) after the approval of this point of view, the consultant shall incorporate the recommendations and submit to IGAD-WU and the Bank the final SESA Report.

ANNEXES

Annex-1: Terms of Reference (ToR) for Strategic Environmental Assessment for HoA-GW4R (P174867) Project



PEACE, PROSPERITY AND
REGIONAL INTEGRATION

HORN OF AFRICA - GROUNDWATER FOR RESILIENCE PROJECT

TERM OF REFERENCE(TOR) FOR STRATEGIC ENVIRONMENTAL AND SOCIAL ASSESSMENT

September, 2022

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1. PROJECT DESCRIPTION

The Horn of Africa Groundwater for Resilience (HoA GW4R) Program aims to increase sustainable access and management of groundwater (GW) in the Horn of Africa as a key contribution to strengthen the climate resilience of targeted communities, using the Multiphase Programmatic Approach (MPA). Three countries, the Federal Democratic Republic of Ethiopia, the Republic of Kenya, the Federal Republic of Somalia, and the Intergovernmental Authority on Development (IGAD), are included in phase I of this Regional Program. The Program has one overarching development objective and a common structure for the connected projects. The Project Development Objective (PDO) is to increase groundwater's sustainable access and management in the Horn of Africa's borderlands.

IGAD's project aims to increase the sustainable use and management of groundwater in the Horn of Africa through the strengthening of regional information, capacity and collaboration. The progress to the PDO will be measured by the following outcome indicator: regional groundwater institutions with increased access to improved information critical for sustainable GW management. Intermediate indicators include, among others: (a) New policies, bylaws, regulations, guidelines or regional agreements prepared or adapted for sustainable groundwater management and use in participating countries, (b) Horn of Africa Groundwater Information System (HoA-GWIS) established and operational, and (c) Regional Platform for Groundwater Collaboration (PGWC) functioning among participating countries. The HoA-GWIS will be essential for sustainable GW management as it will allow countries to generate and share data on transboundary aquifers, adding value to inform decision-making and joint planning. The PGWC will serve as a key collaborative mechanism among IGAD and Member States (MS) to agree on and prioritize joint groundwater activities, decide on their scope and modalities, and support the implementation and validation of regional outputs.

The primary project beneficiaries will be decision-makers, civil servants, and groundwater management professionals of regional and national institutions involved in the planning, development and management of groundwater resources in the IGAD region, through strengthened capacity, increased availability of relevant information, improved policies and strengthened regional collaboration. The project will also benefit scientists and experts of universities, professional institutions and companies in the region that work on groundwater at the transboundary, national, and sub-national levels and indirectly also the inhabitants of the IGAD region that will benefit from more sustainable groundwater management and increased resilience to climate shocks.

The project is implemented by IGAD's Water Unit, and has a duration of 6 and half years. It's structured around the three following components:

Component 1. Strengthening Regional Capacity & Information for Sustainable Groundwater Management

Component 2. Promoting Regional Integration and Collaboration

Component 3. Regional Program Coordination, Monitoring & Evaluation

1.1. PROJECT COMPONENTS

The Horn of Africa (HoA) – Groundwater for Resilience Project has the following components. More detailed information on the Project components and environmental and social risks and instruments can be found at <https://projects.worldbank.org/en/projects-operations/document-detail/P174867?type=projects>

Component 1. Strengthening Regional Capacity & Information for Sustainable Groundwater Management

The project will strengthen the ability of Government institutions in the Member States (MSs), and of IGAD's Water Unit (IWU), to sustainably develop the region's groundwater resources. Under this Component and building on the achievements of earlier and ongoing projects, IWU will coordinate the setting up of the IGAD Platform for Groundwater Collaboration (I-PGWC), under which umbrella the activities of Components 1 and 2 will be implemented. This component involves three sub-components:

Sub-component 1.1. Creating a Framework for Regional Collaboration. This involves:

- a) Setting-up the IGAD regional Groundwater Center (IGAD-GWC). The regional GWC will help in expanding and sharing groundwater information in the region as it will be linked to a network of National Groundwater Centers (NGWC).
- b) Setting-up a network of National Groundwater Centers (NGWC). Data collection and transmission, as well as data analysis for shared watercourses, are invariably carried out at national level. A NGWC is defined as the center established within an existing institution involved in groundwater research or management in the Recipient's territory, whose objectives include: (a) leading groundwater data collection, compilation, processing, and dissemination, including data quality control; (b) participating in joint assessments, planning, and programming of transboundary aquifers; (c) contributing to the development and management of regional groundwater resources
- c) Setting-up the IGAD Platform for Groundwater Collaboration (I-PGWC). Regional knowledge generation and capacity building activities, joint studies and transboundary case studies will be implemented through the I-PGWC, for which I-WU will fulfill the role of Secretariat.
- d) IGAD will also facilitate the establishment and operationalization of Groundwater National Focal Groups (GW-NFGs) in the MSs. A GW-NFG is defined as the working group (comprising of among others relevant government's ministries, departments, and agencies at different levels; academic and research institutions; private sector; non-governmental organizations and community-based organizations) convened by a participating country to serve (and augment) its existing groundwater management

structures and to provide advisory services to the IGAD platform for groundwater collaboration.

Sub-Component 1.2. Strengthening & Harmonizing Regional Capacity.

Design and implementation of a regional capacity building program to strengthen research technical and management skills, professional skills, and professional development.

Sub-Component 1.3. Building a Regional Information Base on Groundwater. This involves:

- a) Building regional data sets through the compilation of relevant groundwater information from a wide range of sources, including open sources, public reports, datasets and maps, scientific research and information shared by MSs, and
- b) Add value to the GW information compiled and updated, by contributing to the generation of new knowledge at a regional scale through the financing of joint studies and assessments by MSs.

Component 2. Promoting Regional Integration & Collaboration

This Component complements the efforts in building regional institutional capacity and a regional information base strengthening the sustainable management of groundwater resources in the HoA through the active promotion of regional integration of policies, guidelines and standards governing groundwater development and management and through supporting collaboration in the study, planning and management of shared groundwater resources in the HoA. The Activities under this Component will build on and complement the achievements of past and ongoing efforts in the region, supported by a range of regional and international institutions and programs, and will specifically support efforts that promote gender equality in access to water, in decision making on water resources allocation and in sharing economic opportunities.

Sub-Component 2.1. Strengthening Regional Integration through harmonization of policies & guidelines

a) Development of Guidelines and Tools for Groundwater Management

The aim of this activity is to support the development of guidelines and tools for sustainable groundwater exploration and management in the HoA. Guided by the results of Gap Analyses conducted under the ongoing HoA-GWI priority topics will be identified in consultation with MS. Topics include, but are not limited to, the establishment of borehole drilling and testing guidelines and professional standards, water point O&M guidelines, establishment of groundwater protection zones, pollution impact and economic assessment, flood and drought cost impacts, EISA methodology and cost related, tracking of SDG6 indicators and project M&E systems. The guidelines will also incorporate gender/women's empowerment and citizen engagement measures. This activity will coordinate and support through targeted consultancies initiatives by MSs on development of policies, standards and guidelines for sustainable groundwater development.

b) Working towards a regional policy on groundwater management

The aim of this activity is the development and Ministerial level endorsement of a regional groundwater policy and strategy and consolidate a sustainable institutional and policy framework for Trans-Boundary Aquifers. This activity will also address the lack of institutional, legal and policy mechanisms in relation to trans-boundary aquifers through the support of gender aware Transboundary Diagnostic Analyses (TDAs) and the development of Strategic Action Plans.

Sub-Component 2.2. Supporting Transboundary Dialogue

This sub-component supports activities promoting trans-boundary dialogue and collaboration on groundwater issues among IGAD MS. This activity will support the organization of the 3rd IGAD Water Dialogue on Groundwater for Resilience. The activity will also support one study tour focused on sharing experiences of groundwater management in dryland regions.

Sub-Component 2.3. Support to Transboundary Case Studies

- a) **Cross-boundary groundwater development can provide unique opportunities for the building of resilient livelihoods in borderland regions of the HoA.** To accelerate the sustainable development of the region's groundwater potential, IGAD will facilitate and support initiatives by MSs to develop shared groundwater resources through tailored Technical Advisory services. Building on the achievements of HOA-GWI, the Water Unit will support selected IGAD MS in characterizing the complexity of two or three TBAs, as well as preparing joint cooperation mechanisms, such as bilateral/regional agreements and arrangements, including aquifer development and management plans. Under HOA-GWI, the Water Unit is implementing the Feasibility Study for the Merti Aquifer, which includes a complete aquifer mapping, a socio-economic assessment, and a bankable investment project, as well as the ESIA. The FS in consultation with the government of Kenya and Somalia is expected to provide options either for joint or bilateral developments and to identify potential sources of financing for development. IGAD will use the results of the Merti study to develop, in consultation with MSs, model ToR for Feasibility Studies for the sustainable development of TB aquifers. The steps and approaches used to prepare the phased development of a TB aquifer could also be applied to national aquifers in MSs. In general, the feasibility study is expected to generate a pathway for the joint monitoring, modeling, governance and eventually development of the shared aquifer. The development of a joint model for the aquifer will contribute to a common understanding of the dynamics and potential of the TB groundwater resource that will facilitate the dialogue among the riparian countries to develop a shared vision and support decision-making on the future development and management of the aquifer. IGAD will facilitate joint meetings of the participating countries to agree on joint monitoring framework on groundwater use, groundwater levels as well as the groundwater quality. Also, IGAD will facilitate establishment of monitoring stations installed with monitoring facilities and data sharing procedures. IGAD will coordinate in consultation with MS the selection process for the TB aquifers that will be supported through this Activity.
- b) This Sub-Component will also provide ad-hoc support to nascent and ongoing initiatives by MSs that wish to engage in a dialogue or collaborative activities with neighbouring countries on the development of shared TB groundwater resources. The development of

transboundary groundwater resources is a process that includes the establishment of trust among riparian countries, working towards a common understanding of the status and potential of the shared aquifer and developing a shared vision of its economic opportunities and development. IGAD will facilitate TB dialogue and collaborative initiatives by MSs through tailored support that, depending on the status of current collaboration, can include trust building initiatives, fact finding missions, support to joint studies or monitoring initiatives, and support for the establishment a joint transboundary working groups or committees.

Component 3. Regional Program Coordination, Monitoring & Evaluation

Sub-Component 3.1 Third Party Monitoring.

Entails contracting a Third-Party Monitoring (TPM) entity to independently monitor the entire regional program, thus covering the TPM of the Somalia, Kenya and Ethiopia projects, as well as of the IGAD Project. The TPM will have the following responsibilities:

- To monitor procurement and financial management transactions, including physical verification of works/construction sites, beneficiaries and assets acquired under each project;
- To report to the World Bank, IGAD and country implementing agencies on the status of project implementation and contract administration, and compliance with procurement, environmental and social risk management and financial management procedures in support of its mandatory reviews, verification and audits;
- To help ascertain whether the projects are reaching their intended results based on the view and evidence from the ground and in compliance with World Bank Environmental and Social Framework and relevant safeguards policies;
- To report on challenges faced by the implementing entity and field consultants involved in implementation and supervision;
- To support institutional capacity building initiatives to strengthen the procurement, financial management, environmental and social risk management, and project implementation capabilities of the implementing agencies;
- To compile lessons from activity verification and output monitoring to generate reports on lessons learned and recommendations for improving monitored projects.

Sub-Component 3.2 Regional Program Planning and Coordination and support to IWU capacity.

Support the required planning, implementation, coordination, and validation of the regional activities by IGAD and MSs through the project's Steering Committee, the Technical Advisory Committee (TAC) Members, and the IGAD Platform for Groundwater Collaboration (I-PGWC), including the management and supervision of the TPM contract. Support the hiring and training of key IGAD-Water Unit (IWU) and IGAD-Groundwater Centre (IGAD-GWC) staff in charge of the management and coordination of the IGAD regional project, including procurement and administration of project activities, financial management and Environmental and Social Framework (ESF) implementation.

Sub-Component 3.3 Operational Costs, Travel and Communication. This Sub-Component will support office, operational and logistical costs related to program implementation and management, travel of project staff as part of the implementation of regional project activities and fees for audits and other consultancies supporting IGAD in fulfilling its fiduciary obligations.

1.2. ENVIRONMENTAL AND SOCIAL RISK RATINGS

Environmental Risk Rating

At the current stage of the project, the direct environmental risks of the project are expected to be predictable, reversible, site-specific and are not that likely to be highly significant. The proposed project's environmental risk rating is currently considered to be **Substantial**. This rating is mainly due to the nature, scale, and type of the proposed project activities under component one and two. As Component one is mainly to build resilience through technical assistance, capacity building, and institutional strengthening activities that will help enhance ability of selected entities and communities to prepare for, respond and adapt to climate shocks, there is no as such an environment risk associated with this component, except waste management from office data collection facilities. Component two activities include drilling of test and production wells, and the provision of small-scale irrigation activities that may potentially result in an impact on the nearby biophysical environment. The project will reach remote areas and vulnerable groups through installation of solar pumped groundwater supply schemes that may present environmental risks. The project small scale irrigation activities may use pesticides that potentially generate dispersed waste situations, affecting access to project subproject implementation locations, making monitoring difficult. The implementing institutions' existing E&S risk management capacity and prior experience are weak and limited due to the lack of project implementation experience.

The anticipated environmental risks and impacts are associated with project activities, particularly under component one and two, which will involve construction, operation and maintenance of groundwater for data gathering and for human consumption and livelihood support. This livelihood support is for livestock rearing; groundwater-based small-scale irrigation; peri-urban solar pumped groundwater supply schemes, sand dam pilots for community gardens, nature-based solutions for enhanced groundwater recharge; access to groundwater resources; soil and water conservation practices; and conducting various studies. The components will support climate-informed feasibility studies and infrastructure development,

community engagement activities promoting the efficient use of groundwater resources, sustainable water management practices, and environmental and social studies for these activities. The project activities implementation will have potential environmental risks such as air and noise quality, visual/aesthetic intrusion, heat/light reflection, resources depletion, safety risks, other public and occupational health and safety risks, traffic safety, water, and soil pollution due to spillage of chemicals, pesticides, fuel from project activities, and hazard toxicity from improper use and disposal of batteries from the installation of solar pumped groundwater supply schemes.

Management and mitigation measures will be stipulated properly in the project Environmental and Social Assessment (ESA) instruments such as the Environmental and Social Management Framework (ESMF) and subproject specific Environmental and Social Impact Assessments (ESIAs) and Environmental and Social Management Plans (ESMPs), and the project Environmental and Social Commitment Plan (ESCP). Environmental and Social Instruments will be disclosed as they are prepared on the World Bank Website: <https://projects.worldbank.org/en/projects-operations/document-detail/P174867?type=projects>. In addition, the project will also be required to develop and implement other management strategies and implementation plans like protocols on storage, handling, and disposal of hazardous materials; Waste Management Plan, with a focus on hazardous wastes; traffic management plan; and public and occupational health and safety management plan. As most of country-level ESA instruments will deal with local risks and impacts, it is vital to prepare regional a Strategic Environmental and Social Assessment (SESA) to consider regional level impacts, transboundary and cumulative impacts.

The activities to be financed by IGAD mainly focus on capacity development activities. The technical assistance and capacity building activities will be undertaken in compliance with Bank Advisory Note on Technical Assistance and the ESF. For any technical activities involving detailed design and feasibility, an environmental and social assessment will be conducted proportionate to the anticipated risks of the technical assistance, including indirect risks and impacts. This ToR for E&S assessment for such strategic documents has been prepared. The requirements set out in paragraphs 14-18 of ESS1 will be applied to technical assistance activities as relevant and appropriate to the nature of the risks and impacts. The terms of reference, work plans or other documents defining the scope and outputs of technical assistance activities will be

drafted so that the advice and other support provided is consistent with ESSs 1-10. Activities implemented by the Borrower following the completion of the project that are not financed by the Bank, or activities that are not directly related to the technical assistance, are not subject to the World Bank Environmental and Social Policy for Investment Project Financing. Furthermore, IGAD will conduct a Strategic Environmental and Social Assessment during the implementation stage based on the ToR that has been cleared by the Bank during appraisal. IGAD have prepared an ESCP which details their commitment to undertake the capacity building activities in compliance with the ESF.

Social Risk Rating

The social risk rating is **high**, due to the contextual risks within the participating countries including the evolving security situation. Activities under Component 1, which focus on groundwater infrastructure and small-scale irrigation development, for people and to support livelihoods, could lead to a range of social risks and impacts. The use of Community Driven Development (CDD) approaches will help mitigate the risk, by promoting community buy-in. There is the potential for exclusion of disadvantaged and vulnerable groups. For example, women and youth are often excluded from decision making structures and persons with disabilities may be excluded from engagement. Internally Displaced People and refugees who are present in the countries due to conflict are also at risk of exclusion from decision making and project benefits (with associated elite capture).

The project will require land, in locations where it is likely to be subject to communal ownership and usage rights, which commonly occurs amongst pastoral communities. Developing agreements over rights to use such land may be challenging but possible given the need for water. RPFs have been developed to outline the approaches that will be used in each country. Lack of access to an adequate network of water structures for both livestock and domestic purposes has often been a cause of conflict between pastoralists and with settled communities will need to be managed through consultation. Access to land and water may contribute an increased risk of social tension within and between communities associated with rights to access water, irrigated land and benefit sharing, siting of facilities and costs. Engagement on these issues as detailed in the SEPs will be key to addressing these risks.

There are a range of contextual risks of operating in conflict zones with complex social contexts where inclusive community consultations and meaningful engagement is challenging. This is

especially true given the evolving instability currently facing countries in the HOA. The ESMFs require security risk assessments and management plans to be developed. Furthermore, developing effective grievance mechanisms will be complex due to the rural locations, traditional decision-making structures and existing social tensions which can result in lack of trust. Labor influx is expected to varying degrees depending on subproject type and location. The presence of even relatively small numbers of external workers can result in social tensions, risk of disease transmission and the risk of sexual exploitation and abuse/ sexual harassment (SEA/SH). 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 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 SEA/SH. LMPs will be prepared during implementation to address these risks. Covid-19 may continue to play a role notably around stakeholder engagement. Virtual options for meetings will be limited due to poor connectivity and lack of familiarity with such forums. During implementation CDD approaches require communities to come together to plan, any risks of exclusion may be exacerbated if face to face interactions are limited. The evolving nature of the pandemic and vaccine delivery make it difficult to determine longer-term implications.

Activities under Component 2 involve technical assistance, capacity building and institutional strengthening and enhanced information sharing, data collection and analysis within countries and regionally. Given that this component is mainly associated with institutional strengthening and capacity building the direct social risks are considered to be low. Indirect impacts may occur as a result of the outcomes of feasibility studies.

2. OBJECTIVES OF THE CONSULTANCY SERVICE

The technical services of an independent environmental and social consultant (“consultant”) are required to perform a **Strategic Environmental and Social Assessment (SESA)** for the **IGAD components** of the *Horn of Africa (HoA) – Groundwater for Resilience Project, P174867* (“project”) as presented in Section 1.3. The main objectives of the strategic environmental and social assessment are:

1. Understand and quantify the spatial distribution of groundwater quantity and quality in the HoA and synthesis best available existing data.
2. Assess environmental and social challenges and opportunities for sustainable groundwater development and management in the HoA.
3. Prevent significant environmental and social impacts through analysis of existing and proposed sector policies as outlined in Section 1.3 and investment strategies upstream in the planning process, before major decisions are made.
4. Identify gaps in the current region-wide strategies, policies, regulatory and institutional frameworks applicable and responsible for implementation of environmental and social measures identified and prioritized for the project.
5. Identify, prioritize, and validate beneficial/adverse and direct/indirect environmental and social issues both short and long term of the project at a regional level.
6. Identify and validate potential cumulative environmental and social impacts of multiple ongoing and planned investments within the sector, as well as impacts from existing policies and proposed policy changes.
7. Provide opportunities for consideration of alternative policies, plans, strategies or project types, taking into account their costs and benefits, particularly the environmental and social costs that are often ignored in least-cost project planning.
8. Propose measures to narrow and streamline the gaps in region-wide strategies, policies, regulatory and institutional frameworks for management of beneficial and adverse issues identified and prioritized for the project.

3. SCOPE OF WORK AND EXPECTED OUTPUT

3.1 GENERAL

In general, the Consultant will perform the following key tasks as part of the Strategic Environmental and Social Assessment (SESA) of the IGAD components of the HoA-GW4R project:

1. Describe the current situation related to the water resources sector in the three countries of the project, the analysis should include consideration of surface water (as it relates to resilience, alternative water source and reliance) but the focus should be on the groundwater resource, and associated environmental and social conditions; the strategies, policies, regulations, institutions, and international standards; anticipated effects (positive/negative) of the sector; key stakeholders; and current management practices.
2. Develop a spatial distribution of the groundwater resource in the HoA.
3. Define environmental and social challenges and opportunities for sustainable groundwater development and management.
4. Conduct stakeholder and public consultations at regional and national levels to identify and prioritize the strategic environmental and social concerns in relation to the IGAD components of the project. Update the implementing agencies, through further consultations, the gaps in the current strategies, policies, regulatory, and institutional frameworks for effective management of the identified and prioritized environmental and social concerns resulting from implementation of the specific project components, subcomponents, and activities.
5. Collate and analyze the findings of the assessment and recommend strategy, policy, regulatory, and institutional adjustments required for effective management of the identified and prioritized environmental and social concerns resulting from implementation of the specific project components, subcomponents, and activities.
6. Recommend specific timelines, indicators, and targets for monitoring of proposed measures, recommend institutional responsibilities, and capacity building requirements. Further, recommend environmental and social instruments to be used during the project implementation to manage and monitor the concerns identified and prioritized.

Further, the details of the various activities and outputs of the SESA are described in the below sections.

3.2 INCEPTION

At the onset of the consultancy service, the consultants shall produce an inception report covering the following key aspects of the project, with the focus on the IGAD components, defining in detail.

- The project background/context
- Rationale for the project
- The objectives of the SESA
- The scope of the SESA
- Approach/methodology of the SESA (including timelines), and
- The structure of the required deliverables.

3.3. SESA REPORT

The Consultant shall prepare the SESA report which shall include the following elements/ activities

3.4 PROJECT DESCRIPTION

Based on the information provided by IGAD (Project Appraisal Document) , the consultant shall describe *The Horn of Africa (HoA) – Groundwater for Resilience Project* to inform and facilitate the development of the SESA by the consultant including:

- The project development objectives
- The project components and sub-components covered by the SESA
- The IGAD project components, subcomponents, and activities
- The project beneficiaries
- Implementation responsibilities

The project description, that will be shared by IGAD , will form a basis for undertaking the SESA including informing the scope of the situational analysis and identification and prioritization of key environmental and social issues based on the activities being proposed and the institutional arrangements in place.

3.5 REGIONAL LEGAL AND INSTITUTIONAL FRAMEWORKS

A detailed review of relevant region-wide regulatory frameworks shall be made to establish the regulatory setting against which the project will be implemented. The review shall include (but not limited to):

- Applicable IGAD member states national policies and strategies for the groundwater sector with a focus on groundwater, environmental, and social management
- Applicable member states national legislation (proclamations, acts, bills, regulations, directives, procedural guidelines) for the water sector, with a focus on groundwater, environmental and social management
- Applicable relevant international conventions and protocols (ratified by the member states) related to the water sector, with a focus on groundwater and environmental and social management as relevant.
- Applicable regional agreements, cooperative frameworks, guidelines, etc., including on water/groundwater availability in the HoA region, water extraction in transboundary aquifers.
- The World Bank's Environmental and Social Framework (ESF).
- Applicable aspects from the World Bank Group's Environmental, Health, and Safety (EHS) Guidelines.

Analysis of the compatibility of the World Bank's environmental and social requirements, as described in the ESFM, with the regulatory frameworks of the participating countries should be included in the SESA in order to identify any gaps between the two that will be reflected during project implementation and operation. To inform this analysis, the consultant will draw on the country-specific ESMFs that have been prepared and consolidate the available information. In addition, recommendations should be given to reduce or close identified gaps.

The member states institutional framework under which the IGAD components of project will be implemented shall be identified and assessed as part of the SESA. Relevant member states institutions, their mandates, institutional structure, and capacities related to environmental and social risk management, shall be identified. Potential gaps in the institutional frameworks to address environmental and social issues related to IGAD components, that need action shall be identified and described in the SESA.

The organizational structure of IGAD—including its policy organs, divisions, and units—shall be described in detail. Their relationships, roles, and responsibilities with the HoA-Groundwater for the Resilience project shall be identified.

Other relevant regional organizations and institutions, relevant to the IGAD components, shall be identified and their structures, relationships, roles, responsibilities, and capacities shall be assessed and described.

3.6 ENVIRONMENTAL AND SOCIAL BASELINE CONDITIONS & SITUATIONAL ANALYSIS

Environmental and social baseline conditions against which the IGAD components, subcomponents, and activities will be implemented shall be described in detail, as described in the ESMFs instrument (SEP,ESCP) prepared for the overall program. The basic environmental and social baseline conditions of the region shall include:

- The regional physical environment (Groundwater, climate, topography, geology/geomorphology, soils, land use, land cover, etc.)
- The regional biological environment (flora, fauna, Key Biodiversity Areas – KBAs, natural, critical and modified habitats)
- The regional socio-economic environment (demography, ethnic composition, traditionally underserved communities, religions, settlement patterns, land uses, livelihood strategies, household income and employment, food security, access to social services and utilities, water needs and use (domestic and livelihoods) of communities, conflict /social tensions focusing on issues associated with access to water etc.).

In addition to the above basic environmental and social baseline conditions, a comprehensive situational analysis of the water sector, environment and social aspects in the HoA Initiative region shall be done including:

- The available water resources in the HoA region particularly in the three participating countries (Ethiopia, Kenya, Somalia) with emphasis on the quantity and quality of groundwater resource including:

- The physical and geological settings of surface water, groundwater, geothermal activities, etc.
- Groundwater occurrence including groundwater characterization, recharge, discharge, renewable/non-renewable groundwater, shallow/deeper groundwater systems, etc.
- Trends on groundwater characters including groundwater depletion.
- Groundwater quality (physical, chemical and bacteriological parameters).
- Current and predicted water resources, particularly groundwater, utilization status in the in the t including available shallow and deep wells and their functionality status
- The transboundary water resources and existing and planned cooperation in utilization of the resources
- Current water resources management practices and any planned changes
- Current water resources development projects in the region
- Planned water resources development projects in the region
- Current and planned relevant IGAD studies, projects, activities, etc.
- Current and predicted key sectoral issues, opportunities, challenges, resilience and vulnerability factors including:
 - Clean water supply as a social and economic good and increased access to potable water
 - Economic opportunities and food security through irrigated agricultural production
 - New technologies and innovative management of the groundwater resource
 - Exploring artificial groundwater recharge opportunities
 - Conjunctive use of surface water and groundwater, particularly in urban centers
 - Resilience to drought and other shocks
 - Opportunity to secure livelihoods of small-holder farmers and pastoralist communities through shallow well development
 - Opportunities to address social tensions and conflict over access to groundwater
 - Opportunities for non-conventional water sources such as rainwater harvesting
 - Challenges due to groundwater quality deterioration
 - Lack of groundwater information and knowledge
 - Groundwater governance and institutional challenges
 - economic and financial challenges to develop groundwater resources

- technological and infrastructure challenges to develop groundwater
- Current and future sectoral development trends
- The significant current and predicted environmental and social issues, related to groundwater, in the region including, but not limited to:
 - Over-exploitation of groundwater resources
 - Drying-up of surface water resources
 - Saline intrusion
 - Ground subsidence
 - Groundwater quality
 - Pollution of groundwater resources
 - Access to water by communities including seminomadic and pastoralist communities, disadvantaged and vulnerable communities, and communities meeting the criteria of ESS7
 - Communities need to access natural resources including pasturelands
 - Community conflict/ social tension focusing on access to water for domestic and livelihood purposes
- Current and planned environmental and social management practices including:
 - Database/data management
 - GIS models developed
 - Modelling assessment of groundwater availability in the HoA
 - Groundwater sampling and monitoring programs
 - Use of water management associations
- Environmental and social trends, opportunities, challenges, and constraints for sustainable groundwater development and management in the context of the proposed IGAD components of the HoA-Groundwater for Resilience project.

The environmental and social baseline conditions and situational analysis shall be done through desk study of existing baseline data / ground water features. Recommendations on baseline data that should be confirmed or validated shall be provided as part of the assessment.

3.7 STAKEHOLDER IDENTIFICATION AND CONSULTATIONS AT REGIONAL LEVEL

In addition to the already identified stakeholder in the IGAD stakeholder engagement plan, Region-wide stakeholder identification and analysis shall be done as part of the strategic environmental and social assessment of the IGAD project components with the objective of involving the stakeholders in informing the work of IGAD and the decision-making processes.

The main tasks include:

- Identify the regional project stakeholders including government bodies/authorities, potential beneficiary communities, community leaders, civil society organizations, non-governmental organizations, groups representing the interests of ESS7 communities, women groups, youth groups, academia, etc.
- Disclose project information to the stakeholders
- Consult on stakeholders' understanding, views, aspirations and recommendations on IGAD components
- Recommend ways to integrate the findings of the stakeholder engagement into the IGAD components.

3.8 ENVIRONMENTAL AND SOCIAL RISKS & IMPACTS

The SESA shall identify potential environmental and social impacts and risks that may result from the proposed studies, policies and plans being developed by IGAD. The environmental and social risks and impacts to be identified shall focus on those issues which particularly have region-wide effects in relation to the IGAD components of the project. Further, the SESA shall focus on environmental and social impacts or risks that are predicted to be significant in their likelihood and consequences.

The impacts identified shall be both beneficial/positive and adverse/negative impacts. The nature of the impacts shall be described such as temporary/long-term and direct/indirect/cumulative. The environmental and social risks and impacts to be identified shall consider the following key aspects:

- The significant beneficial and adverse impacts shall be separately identified for each project components and subcomponents under the IGAD part of the project.
- In addition to the direct and/or indirect impacts, the cumulative impacts (aggregate, incremental, and synergistic impacts) of project implementation in the project area of

influence shall be comprehensively identified. The cumulative project impacts shall be distinguished between their regional, national and local effects.

- The environmental and social impacts shall consider identified challenges to develop and manage the groundwater resources.
- The identified environmental and social impacts shall be prioritized based on their risk significance, magnitude, spatial and temporal extent.

3.9 IDENTIFYING AND ANALYSIS OF ALTERNATIVES

The SESA shall identify various project components and subcomponents implementation alternatives including:

- The 'no-action' option which considers maintaining the current status quo in the region in management of environmental and social aspects
- The 'proposed project' option as defined by the components, subcomponents, and activities included under the IGAD part of the HOA - Groundwater for Resilience project

A multi-criteria approach shall be used for analysis in the SESA of any project alternatives provided to the consultant.

3.10 ENVIRONMENTAL AND SOCIAL MITIGATION, MANAGEMENT AND MONITORING MEASURES

Potential environmental and social risks/impacts that will result from project implementation shall be provided with recommendations on impact mitigation measures for negative impacts and enhancement for benefits. The recommended measures shall provide information on:

- Potential environmental and social benefits and impacts resulting from project implementation (identified in the earlier exercise)
- Recommended enhancement measures for the beneficial/positive impacts
- Recommended mitigation measures for the adverse impacts to enable the sustainable development and management of groundwater resources
- Regional institutional responsibility for implementation of the enhancement or mitigation measures
- Capacity building recommendations for the regional and national institutes

- Enhancement and mitigation measures implementation timeframe
- Estimate of implementation budget.

An Environmental and social risks and impact for the impacts/ risks and associated enhancement or mitigation measures identified in the SESA shall be prepared. The main components of the monitoring plan are:

- Key project parameters or aspects to monitor
- Specific and measurable indicators
- Frequency of monitoring
- Responsible regional and national institutions/parties for monitoring
- Monitoring budget.

3.11 CONCLUSIONS AND RECOMMENDATIONS

Conclusions shall be drawn from the key findings of the SESA. Further, the SESA shall provide recommendations based on the findings of the assessment. The recommendations shall, among other points, include:

- Promoting regional integration and collaboration on environmental and social management of the sustainable development and management of the groundwater resources in the HoA
- Strengthening regional institutions responsible for implementation and management of environmental and social issue to develop and manage the groundwater resources
- Capacity building needs for regional institutions responsible for environmental and social management
- Regional dissemination and disclosure of environmental and social information
- Recommendations on other key environmental and social management issues.

4. DELIVERABLES

The five documents to be prepared as part of the Strategic Environmental and Social Assessment (SESA) are an *Inception Report*, , a *Preliminary Findings Report*, and Draft and Final *Strategic Environmental and Social Assessment (SESA) Reports*. Detailed description and contents of the reports are presented in the below sections.

4.1 Inception Report

An Inception Report which presents the consultant's specific work plan, proposed consultation plan to fully complete the assignment; a proposal for how the data collection and assessment will be coordinated with IGAD; and the availability of agreed experts for the duration of the assignment, within two weeks of commencement of the assignment.

4.2 Preliminary Findings Report

The *Preliminary Findings Report* should be a short (e.g., 2 to 3 pages) summary of the Consultant's preliminary findings (e.g., major issues, significant data gaps, conclusions, recommendations, etc.) based upon the initial information review and meetings with stakeholders.

and engagement on the draft SESA and disclosure of the final SESA.

4.3 Strategic Environmental and Social Assessment (SESA) Report

Draft and final *Strategic Environmental and Social Assessment (SESA)* Reports shall be prepared consisting of a detailed summary of the information collected (see *Appendix A* for suggested SESA report outline). The SESA reports shall consist of:

- The project background, rationale and objectives
- The objectives, scope, approach, and structure of the SESA
- Description of the project components, subcomponents, and activities
- Regional legal and institutional frameworks
- Environmental and social baseline conditions
- Situational analysis
- Environmental and social risks and impacts
- Analysis of alternatives
- Environmental mitigation, management, and monitoring measures
- Conclusions and recommendations.

Both documents are to be written in English and the documents shall be electronically submitted in *MS Word* and *PDF* file formats.

5. SCHEDULE OF THE DELIVERABLES (6 MONTHS)

The table below summarizes the timeline of the consultancy service.

	Deliverable	Timeline*
1	Inception Report	2 weeks from the signing of the contract
2	Preliminary Findings Report	8 weeks from the signing of the contract
4	Draft Strategic Environmental and Social Assessment Report	12 weeks from the signing of the contract
5	Final Strategic Environmental and Social Assessment Report	2 weeks after receiving comments on the Draft SESA Report

*From contract effective date

6. CONSULTANT'S TEAM AND QUALIFICATIONS

The SESA expert should have the following qualifications:

- Master's (or above) in a field relevant to environment studies such as environmental science, environmental engineering, etc.
- At least 10 years of experience in environmental assessment, management, monitoring, and audit
- Experience in preparation of Strategic Environmental and Social Assessment (SESA), Environmental and Social Impact Assessment (ESIA), Environmental and Social Management Plan (ESMP), Environmental and Social Monitoring Plan, Environmental and Social Management Framework (ESMF), Environmental Audit, and other related documents, preferably for large-scale development partner funded infrastructure projects
- Basic knowledge on GIS
- Basic knowledge on aquifer and transboundary aquifer's project
- Knowledge on country legal and institutional framework
- Work experience in/with World Bank funded projects and knowledge of the World Bank safeguard instruments and requirements

- Fluency in English, particularly in written and spoken English

7. IGAD SUPPORT TO THE CONSULTANT

7.1 relevant materials and documents

The Client will support the Consultant in the following matters:

- Access to relevant technical study reports and other documents
- Support (whenever possible) the Consultant's field visit coordination and liaison with the concerned authorities in the project influence area to gather information relevant to the Project
- Support (whenever possible) the Consultant in coordinating stakeholders' consultation and liaison with some of the stakeholders
- Support (whenever possible) the Consultant in logistics such as travel, meeting facilities, amenities, etc.

7.2 Additional informations

- The consultant may seek additional information on the assignment from the undersigned
Dr Ibrahim Mohamed
Senior Water expert
Email . ibrahim.mohamed@igad.int

With a copy to

Mr. Daher Elmi

Programme Manager, Natural Resources Management and Renewable Energy

Email Daher.Elmi@igad.int

8 . CONSULTANT'S PROPOSAL

The Consultant's proposal for the Strategic Environmental and Social Assessment (SESA) should contain the sections (information) listed below and the proposal (i.e., main sections excluding appendices) should not exceed 15 pages.

1. **Work Approach/Methodology** - The scope of work should include a description of the specific activities that will be performed in order to accomplish the required tasks identified in this Terms of Reference. This should include any proposed site visits/reconnaissance, documents to be reviewed, interviews, etc. If the Consultant feels that additional tasks or components within a required task are suggested or warranted, these should be stated and delineated as "Optional Tasks".
2. **Project Team and Qualifications** - This should include the name of the principal staff members. Qualifications of staff should include relevant technical capabilities, previous relevant project experience, specific in-country and regional experience and knowledge, and specific language skills.
3. **Schedule** - A proposed schedule for performance of the SESA must be presented with breakdown of specific tasks and activities. The schedule must indicate the proposed start and completion dates for each activity listed in the "Scope of Work and Expected Output" section of this Terms of Reference and any important or specific project milestones (e.g., report submittal, etc.).
4. **Estimated Costs** - A total cost of the consultancy service must be provided. Breakdown of the estimated costs by tasks/activities must also be presented (e.g., tabular format) and should include Direct Labor Costs (number of hours or days per staff and their associated unit costs) and Indirect Labor Costs (e.g., travel, per diem, etc.). Any assumptions related to the estimated costs must be clearly stated. If any additional Optional Tasks are recommended, then a separate cost estimate must be provided.

9. APPENDIX A : SUGGESTED OUTLINE FOR THE STRATEGIC ENVIRONMENTAL AND SOCIAL ASSESSMENT (SESA)

EXECUTIVE SUMMARY

1. INTRODUCTION

- 1.1 Project Background/Context
- 1.2 Rationale of the Project
- 1.3 Objectives of the SESA
- 1.4 Scope of the SESA
- 1.5 Approach/Methodology of the SESA
- 1.6 Structure of the SESA

2. PROJECT DESCRIPTION

- 2.1 Project Development Objectives
- 2.2 Project Components and Subcomponents
- 2.3 The IGAD Project Components, Subcomponents, and Activities
- 2.4 The Project Beneficiaries
- 2.5 Project Implementation Arrangement
- 2.6 Project Environmental and Social Risk Ratings

3. REGIONAL LEGAL AND INSTITUTIONAL FRAMEWORKS

- 3.1 Policies and Strategies
- 3.2 Legal Framework
- 3.3 International Conventions and Protocols
- 3.4 Regional Agreement and Cooperative Frameworks
- 3.5 World Bank Environmental and Social Framework (ESF)
- 3.6 Institutional Framework, Structure and Capacity

4. ENVIRONMENTAL AND SOCIAL BASELINE CONDITIONS AND SITUATIONAL ANALYSIS

- 4.1 Physical Conditions
- 4.2 Biological Conditions

4.3 Socio-economic Conditions

4.4 Situational Analysis

5. STAKEHOLDERS CONSULTATIONS

6. ENVIRONMENTAL AND SOCIAL RISKS AND IMPACTS

6.1 Beneficial/Positive Environmental and Social Impacts

6.2 Adverse/Negative Environmental and Social Impacts

7. ENVIRONMENTAL AND SOCIAL MITIGATION, MANAGEMENT AND MONITORING MEASURES

7.1 Environmental and Social Enhancement/Mitigation Measures

7.2 Environmental and Social Management

7.3 Environmental and Social Monitoring

8. CONCLUSIONS AND RECOMMENDATIONS

8.1 Conclusions

8.2 Recommendations

Annex-2: Data Sources for Strategic Environmental Assessment for HoA-GW4R (P174867) Project

- i. Administrative unit data for the IGAD Member Countries; <http://ww.diva-gis.org/ datadown>
- ii. DEM; <http://glcfapp.glcg.umd.edu:8080/esdi/index.jsp>
- iii. The water stream and Lakes data in Digital Chart of the world: <http://www-sul.stanford.edu/depts/gis/DCW.html>.
<http://www.maproom.psu.edu/dcw/>
- iv. ESRI Latest Land Cover Data 10 m Resolution, 2022
<https://livingatlas.arcgis.com/landcoverexplorer/#mapCenter=45.258%2C4.676%2C5&mode=step&timeExtent=2017%2C2022&year=2022&downloadMode=tre>
- v. ESRI Latest Land Cover Data 10 m Resolution Released on 24 June 2021 - YouTube
<https://www.esri.com/about/newsroom/announcements/esri-releases-new-2020-global-land-cover-map/>
- vi. Transboundary aquifer information from International Groundwater Resources Assessment Centre (IGRAC):<https://ggis.un-igrac.org/view/tba/>
- vii. Global Mangrove Watch:
https://www.globalmangrovetwatch.org/country/SOM?activeLayers=mangrove_extent&category=distribution_and_change&zoom=2.635177398716337

Annex-3: Impact Significance Evaluation Criteria

No	Core Criteria	Rating	Description
1.	Extent	Local	Site specific or confined to project footprint.
		Regional	Extending beyond the boundaries of the project site and its buffer zone, affecting neighbor, town, local authority, district and even province.
		National	Affecting areas beyond the province, and country.
		International	Affecting areas beyond the country's borders.
2.	Duration	Short term	0-5 years
		Medium term	5-15 years
		Long term	Long Term / Life of the facility but will be mitigated directly or by natural processes, or more than 15 years.
		Permanent	Beyond facility's lifespan and/or no form of mitigation can result in the impact to be considered transient.
3.	Intensity/ magnitude	Zero to very low	Where the impact affects the environment in such a way that natural, cultural and social functions and processes are not affected.
		Low	Where the impact affects the environment in such a way that natural, cultural and social functions and processes continue, albeit in a slightly modified way.
		Medium	Where the affected environment is altered, but natural, cultural and social functions and processes continue, albeit in a modified way.
		High	Where natural, cultural and social functions or processes are altered to the extent that it will temporarily or permanently cease.

Annex-4: Overall Significance Level Rating Criteria by Combining Extent, Duration and Intensity

Rating	Description
VERY HIGH	Impacts could be EITHER: of high intensity at a regional level and endure in the long term ; OR of high intensity at a national level in the medium term ; OR of medium intensity at a national level in the long term .
HIGH	Impacts could be EITHER: of high intensity at a regional level and endure in the medium term ; OR of high intensity at a national level in the short term ; OR of medium intensity at a national level in the medium term ; OR of low intensity at a national level in the long term ; OR of high intensity at a local level in the long term ; OR Of medium intensity at a regional level in the long term .
MEDIUM	Impacts could be EITHER: of high intensity at a local level and endure in the medium term ; OR of medium intensity at a regional level in the medium term ; OR of high intensity at a regional level in the short term ; OR of medium intensity at a national level in the short term ; OR of medium intensity at a local level in the long term ; OR of low intensity at a national level in the medium term ; OR Of low intensity at a regional level in the long term .
LOW	Impacts could be EITHER intensity at a regional level and endure in the medium term ; OR of low intensity at a national level in the short term ; OR of high intensity at a local level and endure in the short term ; OR of medium intensity at a regional level in the short term ; OR of low intensity at a local level in the long term ; OR of medium intensity at a local level and endure in the medium term .
VERY LOW	Impacts could be EITHER of low intensity at a local level and endure in the medium term ; OR of low intensity at a regional level and endure in the short term ; OR of low to medium intensity at a local level and endure in the short term .
INSIGNIFICANT	Impacts with: Zero to very low intensity with any combination of extent and duration.
UNKNOWN	In certain cases, it may not be possible to determine the significance of an impact.

Annex-5: Quarterly and annual ESHS Monitoring Report Template

The IGAD-Water Unit and each three-member states will develop brief quarterly and annual ESHS monitoring reports. The report's contents shall include the following:

1. Project Background and Context
2. Design, Consultancy and Construction Overview
3. Health and Safety
4. Groundwater Based Water Supply Projects Environmental and Social Performances
 - 4.1 Significant Activities
 - 4.2 Environmental and Social Assurances
 - 4.3 Status of Different Environmental and Social Management Plans
5. Groundwater Based Irrigation Projects Environmental and Social Performances
 - 5.1 Significant Activities
 - 5.2 Environmental and Social Assurances
 - 5.3 Status of Different Environmental and Social Management Plans
6. Off-site Construction Sites (Camping Sites, Quarries and Borrow Sites) Environmental and Social Performances
 - 6.1 Significant Activities
 - 6.2 Environmental and Social Assurances
 - 6.3 Status of Different Environmental and Social Management Plans
7. Other Relevant Areas of ESHS Management
 - 7.1 ESHS Trainings
 - 7.2 Claims, Grievances and Stoppages
 - 7.3 Permit Status
 - 7.4 Compliance with :
 - *Member States E&S Legislation*
 - WB Environmental and Social Commitment Plan (ESCP),WB ESS and WB ESHS Guideline
 - Conventions, Protocols and Standards ratified by Member States
 - Construction Contract Agreement Documents of Water Supply and Irrigation Projects
8. Non-compliance Issues and their Corrective Actions

Annex-6: Monthly and Annual Monitoring Report Template for On-site Environmental and Social Compliance Assessment of Construction Activities particularly Implemented by HoA GW4R Project member states

Monthly and Annual Monitoring Report for On-site Environmental and Social Compliance Assessment of Construction Activities particularly Implemented by HoA GW4R Project member states:

1. Background Information and Context
2. Methods
3. Analysis of Environmental Compliance
 - 3.1 Compliance Analysis with Construction Contract Document

Compliance Analysis with Construction Contract Document

Construction Contract Conditions	Monitoring : Month/year (Complies, Partially complies, Does not comply or Not-applicable)
3.1.1 Conditions of Contract- Specific Provisions	
3.1.2 Conditions of Contract-General Conditions (GC)	Complies
3.1.3 Conditions of Contract, Specifications-General Requirements (GRQ)	
3.1.4 Conditions of Contract, Specifications-Technical Specification (TSP)	Complies

Note: Construction Contract Conditions shall be filled from construction Contract Agreement Documents of Water Supply and Irrigation Projects

3.2 Key Findings of Field Supervision Works of Construction Activities

4. Non-compliance Issues and their Corrective Actions
5. Conclusion and Recommendations

Annex-7: Checklist of stakeholder consultation on the identification and prioritization of key environmental and social issues



PEACE, PROSPERITY AND
REGIONAL INTEGRATION

Agenda of Virtual Mini-workshop Using bi-weekly meeting of the NFG 07 August 2023

The Horn of Africa Groundwater for Resilience (HoA GW4R) Program aims to increase sustainable access and management of groundwater (GW) in the Horn of Africa as a key contribution to strengthen the climate resilience of targeted communities, using the Multiphase Programmatic Approach (MPA). Three countries, the Federal Democratic Republic of Ethiopia, the Republic of Kenya, the Federal Republic of Somalia, and the Intergovernmental Authority on Development (IGAD), are included in phase-I of this Regional Program.

As most country-level ESA instruments will deal with local risks and impacts, it is vital to prepare a regional Strategic Environmental and Social Assessment (SESA) to consider regional-level impacts, transboundary impacts, and cumulative impacts. Considering regional-level impacts, transboundary impacts, and cumulative impacts through Regional Strategic Environmental and Social Assessment (RSESA) before implementing the HoA GW4R Program ensures sustainable groundwater management and access. Prior to the implementation of the proposed Program, it is very essential to strategically identify environmental and social issues to provide information for decision-making and integrate environmental and social considerations into higher levels of decision-making. According to ESS-1: Assessment and Management of Environmental and Social Risks and Impacts, conducting a Regional Strategic Environmental and Social Assessment (RSESA) in accordance with terms of reference acceptable to the association is one of the agreed activities included under the Environmental and Social Commitment Plan (ESCP). Taking this fact into account, HoA's GW4R Program will be passed through RSESA processes. In this virtual mini-workshop, using focal groups for three participating countries, key strategic environmental and social impacts in the spatial context associated with HoA GW4RP shall be identified and prioritized. For this virtual mini-workshop, the following points will be discussed:

1. Add beneficial/positive strategic environmental and social issues associated with the implementation of the proposed HoA GW4R Program that are not included in the list below?
 - A. Strengthen the climate resilience of targeted communities and Reduce GHG Emissions
 - B. Reduce conflicts over water and create peace and stability in the Region
 - C. Ensure food security and bring socioeconomic developments:
 - D. Create inclusive community-level access to groundwater in the borderlands of the HoA
 - E. Creating employment opportunity for the local communities and women

- F. Generating groundwater information and strengthening regional and national groundwater institutions
 - G. Create strong linkages and alignment with other HoA projects
 - H. -----
 - I. -----
 - J. -----
2. Add adverse or negative strategic environmental and social issues associated with the implementation of the proposed HoA GW4R Program that are not included in the list below?
- A. Transboundary aquifer depletion
 - B. Water quality deterioration
 - C. Risk of exacerbating existing transboundary water use conflict
 - D. Cumulative impacts of soil erosion and degradation
 - E. Impacts on groundwater-dependent ecosystem of lacustrine/palustrine/riverine wetlands, springs and Oasis
 - F. Impacts on groundwater-dependent ecosystem of terrestrial flora and fauna
 - G. Impacts on groundwater-dependent ecosystem of estuarine and near-shore marine ecosystems:
 - H. Impact on transboundary key biodiversity conservation areas
 - I. Impacts on traditional underserved communities of borderlands
 - J. Impact on transboundary heritage sites
 - K. Risk of exacerbating existing social exclusion, conflict, illicit behavior, crime and gender-based violence of borderlands
 - L. -----
 - M. -----
 - N. -----
3. Prioritize identified beneficial strategic environmental and social issues associated with the implementation of the proposed HoA GW4R Program based on their level of significance in terms of climate resilience, ensuring food security, reducing conflict, creating job opportunities, and enhancing regional cooperation and linkages? (Fill only your member country)

No.	MS/IGAD	Prioritize identified beneficial strategic environmental and social impacts
1.	Ethiopia	
2.	Kenya	
3.	Somalia	

4. Prioritize Identified adverse strategic environmental and social issues associated with the implementation of the proposed HoA GW4R Program based on their risk level of significance, magnitude, and spatial and temporal extent? (Fill only at your member country)

No.	MS/IGAD	Prioritize identified adverse strategic environmental and social impacts
1.	Ethiopia	
2.	Kenya	
3.	Somalia	
4.	IGAD	

5. If you have additional comments, please suggest?-----
