NILE BASIN INITIATIVE
INITIATIVE DU BASSIN DU NIL

NILE BASIN INITIATIVE REGIONAL HYDROMET PROJECT

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP) FOR HYDROMET STATIONS UNDER NILE BASIN INITIATIVE REGIONAL HYDROMET PROJECT

January 2023

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1. INTRODUCTION

1.1 Project Overview

The Nile Basin Initiative (NBI) is an inter-governmental organization initiated and led by the Nile riparian countries to promote joint development, protection and management of the common Nile River Basin water resources. NBI was established on 22nd February 1999 by riparian countries and continues to be led by 10 Member States namely Burundi, DR Congo, Egypt, Ethiopia, Kenya, Rwanda, South Sudan, The Sudan, Tanzania and Uganda. Eritrea participates as an observer. NBI has a Shared Vision Objective: '**to promote sustainable socio-economic development through the equitable utilization of, and benefit from, the common Nile Basin water resources**. A wide range of programs and projects are currently under varying stages of identification, preparation and implementation under NBI, designed to contribute towards the realization of the NBI shared Vision.

The NBI provides a unique forum for the countries of the Nile Basin to move towards a cooperative process to realize tangible benefits in the basin and build a solid foundation of trust and confidence. The Nile Council of Ministers [Nile-COM] serves as the highest decision-making body of the NBI. The Nile-COM is supported by the NBI Technical Advisory Committee [Nile-TAC], which is composed of two senior officials from each member country.

NBI is managed from three centers. The first Centre at Entebbe, Uganda, forms the NBI Secretariat (Nile-SEC) and was launched in September 1999. It has a coordinating role across the Basin, supports the platform for Basin-wide dialogue, and provides and manages an interactive, intelligent, basin knowledge base and promotes Water Resources Management. Another Centre at Addis Ababa, Ethiopia, Eastern Nile Technical Regional Office (ENTRO) and a third Centre at Kigali, Rwanda, Nile Equatorial Lakes Subsidiary Action Program Coordination Unit (NELSAP-CU) both manage the facilitation of Cooperative Water Resources Development in their respective sub-regions.

The NBI performs three core functions:

i. **Facilitating Cooperation.** The NBI's main objective is to facilitate, support and nurture cooperation amongst the Nile Basin countries to promote timely and efficient joint actions required for securing benefit from the common Nile Basin water resources.

ii. **Water Resources Management.** The NBI provides member countries with analytic tools and a shared information system that will enable monitoring and the sustainable management of the basin.

iii. **Water Resource Development.** The NBI assists member countries to identify development opportunities and prepare projects and seek investments. Development programs are focused on power trade and generation, agriculture and watershed management.

The River Nile has one of the most complex networks of freshwater subsystems of the world including other ecosystems, biodiversity and associated ecosystem goods and services. This is augmented by rich and diverse culture, livelihoods and aspirations of Nile peoples living and depending on the Nile basin resource base. This necessitates need for striking a delicate balance in facilitating socio-economic development, thus why Nile Basin Initiative in its journey of enabling socio-economic development in Nile Basin region has endeavoured to ensure environmental and social safeguards in its river basin planning and development actions. This is evident in a number of responsive instruments geared towards enabling environmental and social sustainability; Environmental and Social Policy, Climate Change Strategy, Environmental Flows Strategy, Wetland Management Strategy including 10 Year Strategy (2017-2027) which vouches for environmental and social sustainability in projects and programs.

1.2. Environmental and Social Management Framework

The project support is organized around two main focus areas: (i) climate-resilient water resources management; and (ii) cooperative development. Against that background, a framework approach was adopted for environmental and social management across the 9 Riparian countries. Based on this approach, Environmental and Social Management Framework (ESMF) was prepared to identify all potential but generic negative environmental and social impacts of project activities and propose mitigation measures.

The ESMF provides basic screening criteria for selecting sub-projects and lists the instruments to be developed for each NCCR project. Institutional arrangements, Grievance Redress Mechanism (GRM), reporting and documentation requirements regarding environmental and social safeguards are addressed in detail in the ESMF. As per World Bank ESF standards on Environmental Assessment and available information regarding the planned Nile Cooperation for Climate Resilience Project and its envisaged installation of specialized hydromet equipment, the proposed Project is classified as Moderate Risk for environmental issues and Moderate for social issues of the Project for which mitigation measures can be readily designed.

1.3. Preliminary Environmental and Social Impact Screening

Environmental and Social Impacts screening checklist provided in the ESMF and approved by the World Bank and NBI, was used for preliminary screening of the Nile Cooperation for Climate Resilience hydromet project to help in identification of impacts. Checklists were filled through field visits and email correspondences by the environment, social safeguards experts. The environmental and social assessment/screening checklist is attached as Annex 1. The checklist identifies the proposed project as a peri-urban and rural area infrastructure development and established that:

- There is no land acquisition required for construction and rehabilitation work of proposed hydromets
- The associated environmental and social impacts of the proposed hydromets are confined to construction phase and are of temporary nature
- The residing population especially within the Nile Basin will get benefits in terms of temporary job opportunities during the construction and improved weather forecast thus reducing the impacts of future floods and decreasing threats to their assets and lives.

Environmental and other social concerns associated with the construction, rehabilitation and installation of specialized hydromet equipment will be minimized and mitigated by

adapting best practices for environmental protection proposed in this Environmental and Social Management Plan (ESMP).

1.4. Scope of the ESMP

This Environmental and Social Management Plan (ESMP) is being prepared to manage the environmental and social impacts through and specific mitigation actions required to implement the project in accordance with the requirements of ESMF and applicable national laws and policies as well as the World Bank Environmental and Social Framework (ESF) Standards and the GIZ Safeguards and Gender Management System, and international best practices. It provides an overview of the environmental and social baseline conditions of the 9 riparian countries, summarizes the potential impacts associated with the proposed construction and rehabilitation of hydromet stations in the nine riparian countries and sets out the management measures required to mitigate any potential risk/impacts in a series of discipline specific Environmental & Social Management Plan (ESMP). This ESMP is to be implemented by the contractor to be commissioned by NBI and other implementing partners. However, this ESMP is limited to the activities of Component 1 concerning enhancing availability and use of water quality data and hydromet stations related activities of the thematic area 5" Water quality investment planning and prioritization". Therefore, other EHS issues related to the full project are not considered or included in this ESMP.

1.5. Purpose and Objective of ESMP

The ESMP is a project-specific source document detailing the environmental and social protection requirements to mitigate and minimize the potential risks and impacts. The ESMP's primary purpose is to ensure that the environmental requirements and social commitments associated with the project are carried forward into implementation and operational phases of the project and are effectively managed. The specific objectives of this ESMP are as hereunder:

- Identify the potential environmental and social impact of the project activities

- Propose site specific measures to mitigate environmental and social impacts and facilitate the implementation of the identified mitigation measures
- Conducting all project activities in accordance with the relevant country specific Laws of the riparian countries as well as the World Bank ESF Standards and the GIZ Safeguards.
- Enhance positive environmental and social outcomes
- Ensure that the ESMP is feasible and cost-efficient
- To act as an Action Plan in order to ensure that the project impact mitigation measures are properly implemented and monitored
- Ensure that all stakeholders concerns are addressed
- Propose an institutional structure and define responsibilities of the project proponents, contractor, and other members of the project team.

2. PROJECT DESCRIPTION

The Nile Basin Initiative is implementing a regional hydromet project funded by European Development Fund (EDF) that aims at advancing NBI Nile River Basin Monitoring Strategy and provides comprehensive suite of river basin monitoring for informed decision making and river basin planning. Additionally, CIWA facility of World Bank through Nile Cooperation for Climate Resilience Project is funding installation of water quality equipment on the hydromet stations for comprehensive collection of information. The stations that comprise the regional hydromet network have been carefully selected based on identified strategic objectives and practical considerations, in combination with extensive national and regional consultations. The work will be delivered through regional processes where the platform for dialogue, trust building, capacity building of member states and stakeholder engagement are the long-term objective of the program. The project support is organized around two main focus areas: (i) climate-resilient water resources management; and (ii) cooperative development. The work will be delivered through regional processes where the platform for dialogue, trust building, capacity building of member states and stakeholder engagement are the long-term objective of the project. The support envisioned in the proposed project includes rehabilitation of hydromet stations, investment identification, and analysis of water allocation trade-offs.

2.1. Project Components

The project support is organized around five main thematic areas:

- Thematic Area 1: Platform for cooperation
- Thematic Area 2: Flood and drought risk mitigation
- Thematic Area 3: Dam safety capacity building
- Thematic Area 4: Innovative information services for climate-resilient investment planning
- Thematic Area 5: Water quality investment planning and prioritization

These thematic areas are considered to contribute to building resilience which for purposes of this project, refers to ability to adapt and respond to climate change and weather extremes and/or the ability to overcome or reduce fragility and conflict. Resilience is inherent to (i) reducing and managing the risks of flood and droughts, (ii) improving safety and efficiency of dams, (iii) providing water-related information services that consider climate change, (iv) platforms for cooperation and capacity building actions that engage representatives from fragile and conflict affected situation; and (v) regional activities that satisfactorily support network building, joint decision making, or a shared understanding and planning for regionally relevant investments.

Support for these thematic areas is organized into five project components that are organized according to five implementing agencies to simplify fiduciary and operational elements of the project. The proposed activities implemented by each center are prioritized based on the agencies' mandates and strengths as well as anticipated opportunities for cooperation to facilitate water resources management and development in the basin or designated sub-basin. The Thematic Areas covered by each component (implementing agency) is summarized in Box 1.

Box 1. Component Alignment with Major Thematic Areas

Thematic areas	Component 1 NBI- SEC	Component 2 NELSAP	Component 3 ENTRO	Component 4 LVBC	Component 5 NBD
Platform for cooperation	✓	✓	✓	✓	✓
Flood and drought risk mitigation		✓	✓		✓

Dam safety capacity building		✓	✓		
Innovative information services for climate-resilient investment planning	✓				
Water quality investment planning and prioritization	✓	✓	✓	✓	

Component 1: Advancing Nile Basin-Wide Cooperation (US$9.5 Million).

This Component will be implemented by Nile-SEC given its two core functions of facilitating cooperation and information services to support regional water resources management. Under this component, the Nile-SEC will provide targeted technical assistance and operational support to the Nile Basin stakeholders, including tools, knowledge products, analysis, cooperative processes and opportunity for dialogue. It has three main areas of focus:

a) **Strengthening the platform for Basin-wide cooperation.** This support will advance transboundary dialogue and trust-building among relevant Nile Basin stakeholders to mitigate risks and harness opportunities associated with cooperation. Activities supported will: (1) build the capacity of stakeholders for enhanced transboundary cooperation; (2) provide a range of platforms for facilitating stakeholder dialogue; and (3) communicate benefits of cooperation and risks of non-cooperation for increased understanding among stakeholders. Multiple activities are envisioned to achieve these sub-objectives and are detailed in Annex 2. Activities supported in Component 5 complement this Component, supporting Nile-SEC and NBD to carry out specific activities as outlined in their MOU.

b) **Basin-wide information services for climate-resilient investment planning**. This support will modernize the NBI's data and information services provided to member states to enhance the management of water and natural resources and strengthen the knowledge base of optimal water resource utilization. The proposed activities will include: (i) developing a regional cloud-based Nile Basin Data and Analytic Services Platform (NB-DAS) with modern data services to include an Earth Observation (EO) Toolkit, online analytics and visualization, and e-packaging of

data, analytical and interactive dashboards to improve data quality and utilization for supporting climate-resilient water and natural resources management, including irrigation water management, at regional and national levels; (ii) modernizing technical skillsets and capacity building of key NBI stakeholders (NBI offices, key government and other institutions in member states) on NB-DAS and effective use of data analytics to inform better decision making, through e-packaging of learning and knowledge products into mobile applications, interactive knowledge learning, Virtual Learning Campus and webinars; and (iii) improving NBI's institutional information infrastructure such as computer hardware and software, information technology (IT) equipment, connectivity, and IT support for activities under the project. This support will serve as the data and analytical backbone for the entire project and thus will contribute to, and support, all the thematic areas of the project.

c) **Enhancing availability and use of water quality data.** Led by Nile-SEC, this sub-component will focus on improving the collection and use of water quality data for cooperative, evidence-based water quality investment planning across the Basin. Sub-activities will include: (i) upgrading water quality monitoring capacity in the nine active Member States including procurement, installation, and commissioning of field equipment; (ii) upgrading the Integrated Knowledge Portal (IKP) to include a water quality information dashboard with capacity to compile and analyze data from the field and from earth observation; (iii) preparation of water quality maps and models to inform investment prioritization in water pollution hotspots; (iv) capacity building for water quality monitoring and analysis; and (v) awareness raising on the importance of regional cooperation in water quality monitoring and investment planning. This work will build on the ongoing European Union – Gesellschaft fur International Zusammenarbeit (EU-GIZ) Regional HydroMet Project, and water quality monitoring equipment will be installed at about 80 hydromet stations which will be rehabilitated under the EU-BMZ project in nine countries around the Basin.

Component 2: Improving Mechanisms for Cooperation in the Nile Equatorial Lakes (NEL) Region (US$9.5 million).

This component will support NELSAP to consolidate its leadership in advancing cooperative water management and development actions related to flood risk mitigation, water quality investment identification, dam safety capacity building and the platform for cooperation in the NEL region.

a) **Platform for cooperation.** This support will advance the platform for cooperation mechanisms, including regional dialogues between governments and inclusive forums
b) **Flood and drought mitigation in the NEL region and capacity building.** This support will advance joint development of basin-wide flood and drought forecast models, information dissemination platforms and capacity building for flood risk mitigation investment planning (coordinated with Component 3). The work will include: (i) development of a new flash flood early warning system and capacity building in flood emergency response planning; and (ii) identification of areas with high flood risk and investment options for flood risk mitigation. The tools developed will utilize the EO data obtained through satellite remote sensing and other innovative technologies. The information services developed will be made publicly accessible through NBI's IKP.
c) **Dam safety capacity building.** This support will advance development of a dam safety capacity building program in the NEL region focused on strengthening the institutional environment for dam safety and improving the information base that is essential for the development and management of dams in the Basin. Specifically, NELSAP will: (i) support interested Member States in establishing national dam safety units, which will serve a regulatory function with regards to dam safety; (ii) strengthen national dam safety units through hands-on training; (iii) develop a geo-referenced inventory of dams in the Basin that describes their key characteristics (including size, purpose, ownership, etc.); and (iv) support the development of a

tiered risk management framework for dams in the Basin. The development of the tiered risk management approach will be an opportunity to identify information gaps on the safety condition of dams in the Basin and inform a program of dam safety assessments, enabling member countries to make informed decisions on prioritization of risk reduction measures.

d) **Water quality investment identification and prioritization.** NELSAP will work with member states in the NEL region to identify water quality hotspots and identify and prioritize investments using multi-criteria decision analysis models. Support will include: (i) pre-screening of high-pollution areas and baseline water quality modeling for hotspots identified by member states; (ii) facilitating a collaborative process with member states to develop a multi-criteria analysis (MCA) for each hot-spot which integrates technical evaluation criteria with values or weights based on policy priorities to identify water-quality investment goals and examine alternative options which address these goals; and (iii) support for water quality investment planning and prioritization based on the MCA. Activities will be pursued on a two-track process: a fast-track which uses existing data for hotspot selection; and a second track which uses the water quality data compiled and analyzed under the project. Work undertaken will build on objectives, processes, and experiences of working with member states on the broader NEL Investment Program (NEL-IP).

Component 3: Improving Mechanisms for Cooperation in the Eastern Nile (US$9.5 million).

This component will support ENTRO in promoting cooperation among EN riparian countries in a challenging hydro-political environment by focusing primarily on providing flood and drought risk services, strengthening dam safety, and continuing to strengthen the network of youth and professionals in the sub-basin. It builds on ENTRO's achievements in flood forecasting and dam safety capacity building and seeks to deepen activities where information tools are regionally relevant.

a) **Platform for Cooperation.** This support will advance regional dialogues between governments, inclusive forums and capacity building and will provide continued support for the internship and young professional (YP) programs that help professionals build a network across the EN region and to enhance technical skills and understanding.

b) **Flood and drought risk mitigation.** This support will enhance of flood forecast models for the EN region, joint development of Basin-wide drought forecast models, information dissemination platforms and capacity building for flood risk mitigation investment planning (coordinated with Component 2). The work implemented by ENTRO and supported under this component will include: (i) enhancement of riverine Flood Forecast and Early Warning (FFEW) System for the EN region; and (ii) development and operationalization of a Basin-wide drought monitor. These tools will be developed with the aim of enhancing the robustness of existing models and expanding the geographical coverage. The drought forecast model will leverage the prototype seasonal drought forecast tool developed under NCORE with the aim of scaling up the model to establish a Basin-wide drought monitor. ENTRO will work with NBD to conduct a stakeholder mapping exercise and formulate a stakeholder engagement strategy for these products to enhance the usability of the flood and drought risk mitigation tools.

c) **Dam safety capacity building.** Building on ENTRO's achievements in dam safety capacity building, this support will scale successful interventions to inform a more coordinated approach to dam safety across the whole Basin. This support will focus on: (i) an assessment of the legal and institutional frameworks for dam safety in the Basin; (ii) development of a model national regulatory framework, which will cover standards for new dam development and safety of existing dams; and (iii) establishment of a regional dam safety training center to strengthen national dam safety units and build up a cadre of dam safety professionals in the region. The framework will include development of Basin-wide technical guidelines based on good practices examples and development of new guidelines on key topics such as the safety of small dams.

d) **Water Quality Investment Planning and Prioritization.** ENTRO will lead water quality investment planning and prioritization using MCA for the EN sub-region. This will mirror work led by NELSAP (Component 2) and include pre-screening of high-pollution areas, baseline modeling for identified hotspots, and collaborative MCAs with country counterparts for identified hotspots, culminating in the development of an investment plan identifying prioritized water quality investments in the sub-region. This work will aim to build complementarities with past and ongoing work on watershed management and multi-sector investment options analysis for the EN.

Component 4. Water Quality in the Lake Victoria Sub-Basin ($0.75 million)

Building on policy related work undertaken under the Second LVEMP Project, the LVBC will work with partner states of the EAC and NELSAP to clarify opportunities to harmonize policies related to water quality management in the NEL region. Activities will include an assessment of extant policies to identify opportunities for harmonization, and preparation of a strategy and action plan in consultation with the NEL countries on implementation and uptake of coordinated water quality management practices in the Basin. Available capacity and needs of countries with regards to data collection and information sharing will be diagnosed as part of this work and will inform Nile-SEC's development of a water quality database and associated user interface in the IKP.

Component 5. Enhancing stakeholder engagement in the Nile Basin ($0.75 million)

This component will support NBD in enhancing stakeholder engagement to improve cooperation and shared understanding of water-related issues in the Nile Basin. NBD will harness their broad membership to engage stakeholders in support of various thematic areas of the proposed project. NBD will support the flood and drought risk mitigation thematic area led by ENTRO and NELSAP for their stakeholder mapping exercise and development of an information dissemination strategy to incorporate the needs of the civil society end-users of the flood and drought early warning tools developed through the project. NBD will also raise awareness and enhance capacity of CSOs and women and men in communities on water and climate resilience issues and may support community

engagement on the other thematic areas as needed. Community engagement will incorporate a focus on planning for full participation by both women and men.

The project shall be funded by the World Bank through the Bank's CIWA facility. In order to improve the project development outcomes, specific instruments developed by the project proponent (NBI) are required under the World Bank's Environmental and Social Framework (ESF). The ESF includes assessment and management of environmental and social risks and impacts; labor and working conditions; resource efficiency and pollution prevention and management; community health and safety; land acquisition, restrictions on land-use and involuntary resettlement; biodiversity conservation and sustainable management of living natural resources; indigenous people's/sub-Saharan African historically undeserved traditional local communities; cultural heritage; financial intermediaries; and stakeholder engagement and information disclosure.

The development of the Environmental and Social Standards instruments under this assignment shall follow the ten standards (Environmental and Social Standards 1-10) of the World Bank's ESF to be implemented throughout the project cycle. The consultants shall also be guided by and utilize the available information of NBI's Nile Cooperation for Climate Resilience Project (under preparation) activities that will likely have positive or negative social and environmental impacts for preparation of the ESF instruments. The ESF instruments that will be prepared by the consultants are Environmental and Social Management Framework (ESMF), Labor Management Procedures (LMP), Stakeholder Engagement Plan (SEP) and Environmental and Social Commitment Plan (ESCP). ESMPs may be required to be prepared for subprojects following the screening of environment and social impacts at the specific site during project implementation before the activities may commence.

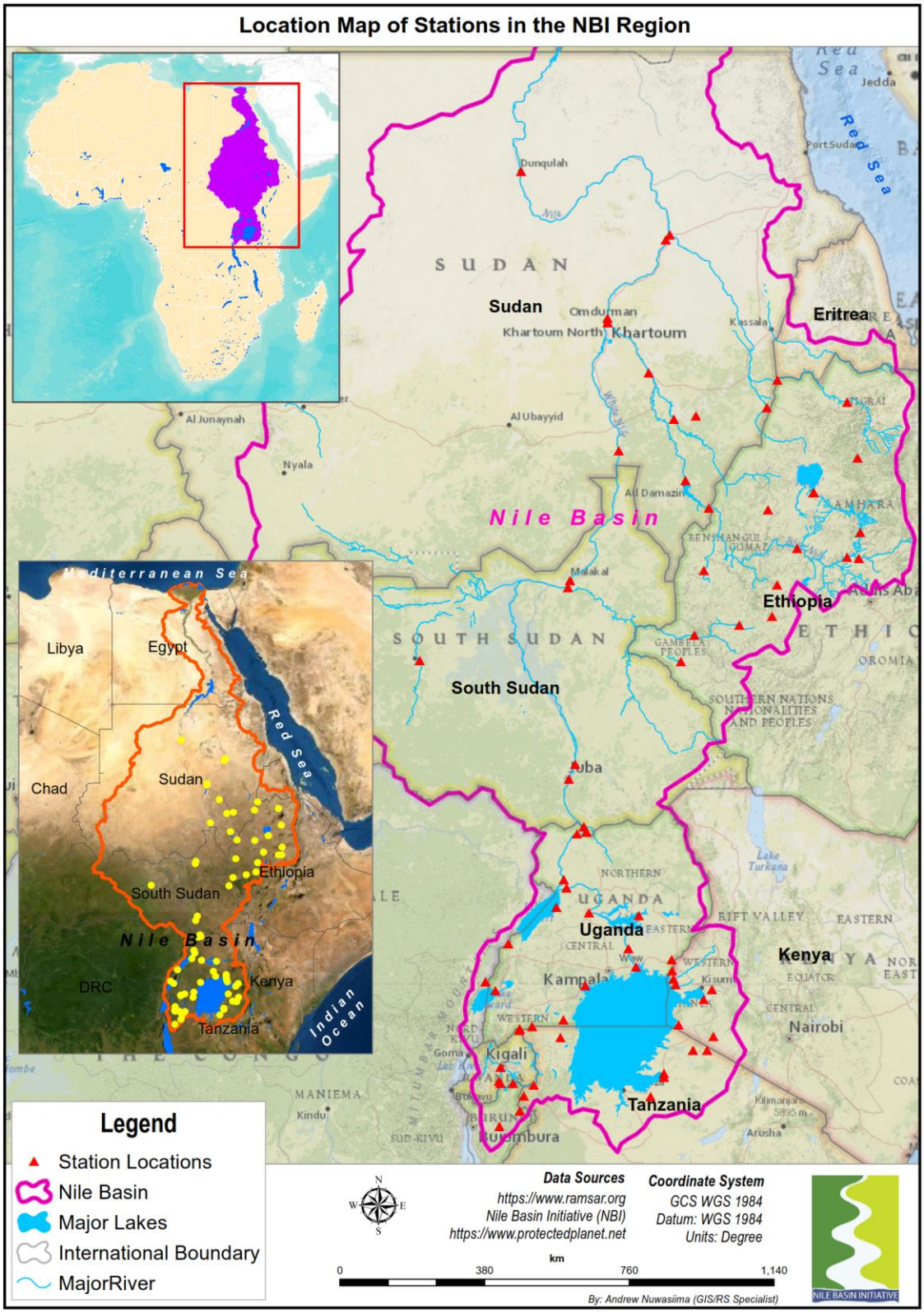


Figure 2-1: Location map of Hydromet stations earmarked for rehabilitation

2.2. Project activities where Environmental and Social Standards are relevant

The main project activity or component under the Nile Cooperation Climate Resilience project that will trigger the World Bank Environmental and Social Framework (ESF) and the GIZ Safeguards System is the flood and drought risk component which involves procurement and installation of specialized water quality monitoring equipment for 73 hydromet stations by the World Bank (new and existing) across 9 of the 11 Nile Basin countries (Table 2-1) and training for the staff that will be operating it. GIZ will fund the NBI to construct 4 new hydromet stations; 1 in Democratic Republic of Congo, 2 in South Sudan, and 1 in Rwanda. Table 2-1 below indicates that there are 73 existing hydromet stations across the Riparian countries that will need construction, rehabilitation and installation of specialized equipment.

Table 2-1: Number of Hydromet stations (existing and new) per Country

Country	No. of stations	Locations of New Hydromets	Station Name	New Coordinates (verified)	
				Latitude	Longitude
Burundi	1		Ruvubu at Muyinga	-2.988360	30.464700
	2		Ruvubu at Gitega	-3.355000	29.981700
DRC	1	1	Ishango at Ferry Crossing	0.065224	29.646700
Ethiopia	1		Geba near Supi	8.482040	35.646250
	2		Lake Tana at Bahir Dar	11.600150	37.394530
	3		Didessa near Arjo	8.683000	36.417000
	4		Angar near Nekemte	9.433528	36.541841
	5		Dabus near Bambasi	9.763140	34.808890
	6		Tekeze near Embamadre	13.736850	38.197550
	7		Abay near Bure	10.292400	37.013100
	8		Abbay near Pedagogi	11.603000	37.409700
	9		Jemma at Abay Confluence (Jema Near Ejere)	10.055457	38.465712
	10		Abay at Kessi Bridge	10.075200	38.189600
	11		Abay at Mekane Selam-Gundewein Br.	10.664100	38.503000
	12		Main Bele at Bridge DS of Bagusta	11.199293	36.326513
	13		Gilo near Pugnido	7.618042	34.268220
	14		Tekeze near Amdework (u/s TK5)	12.422400	38.437700
	15		Baro at Gambela	8.246673	34.586816
Kenya	1		1EF01_Nzoia Ruambwa	0.123300	34.090800

Country	No. of stations	Locations of New Hydromets	Station Name	New Coordinates (verified)	
				Latitude	Longitude
	2		1FG03_Yala Kadenge	0.093335*	34.16380*
	3		1GD03_Nyando (Ogilo)	-0.152345*	34.982870*
	4		1JG04_Miriu Sondu	-0.354410	34.805490
	5		1KB05_Gucha Migori	-0.950030	34.209680
	6		1LA04_Mara	-1.224300	35.035960
Rwanda	1		Gakindo	-2.343659	30.301499
	2		Gihinga	-2.286426	29.966969
	3		Kigaitumba	-1.052328	30.459597
	4		Ruliba	-1.962214	30.003646
	5		Shell	-2.341587	30.002195
	6	1	Akagera Outlet	-1.092222	30.451670
South Sudan	1		Shobat at Doleib Hill	9.355840	31.599510
	2		Bahr el Jebel at Malakal	9.533290	31.647200
	3		Bahr el Jebel at Mongalla	5.199805	31.764986
	4		Assua River/Nimule Road Bridge	3.722907	31.972233
	5		Wau	7.641933	28.093224
	6	1	Bahr el Jebel at Juba	4.848500	31.620610
	7	1	Bahr el Jebel at Nimule	3.592730	32.038870
Sudan	1		Eldeim	11.239739	34.926540
	2		Roseries	11.890596	34.376200
	3		Madani	14.427455	33.506649
	4		Khartoum	15.611626	32.532823
	5		Gewesi	13.337722	34.102308
	6		Hawata	13.415088	34.621703
	7		Atbara Kilo 3	17.679755	34.003685
	8		El Hudeiba (Hassanab relocated)	17.560862	33.910570
	9		Dongola	19.181106	30.493183
	10		Al Asira	13.612042	36.298598
	11		Hamdait	14.255584	36.544274
	12		El Jebelein (Res u/s Khartoum)	12.588912	32.800045
	13		Halfaya Bridge (Tamanyat replacement)	15.713938	32.531806
Tanzania	1		Mara River at Mara Mine	-1.548530	34.554400
	2		Grumeti river at M Bridge	-2.098440	33.869500
	3		Mbalgeti	-2.195990	33.868000
	4		Kagera at Kyaka Ferry	-1.250640	31.418600

Country	No. of stations	Locations of New Hydromets	Station Name	New Coordinates (verified)	
				Latitude	Longitude
	5		Ruvuvu at Mumwendo Ferry	-2.630590	30.558700
	6		Simiyu River at Lumeji	-2.646460	33.546600
	7		Kogatende Ranger Post	-1.561170	34.884000
	8		Rusumo Falls	-2.378080	30.788270
Uganda	1		Lake Victoria at Jinja Pier	0.414423	33.207500
	2		River Katonga at Kampala-Masaka	-0.034301	32.007394
	3		River Sio at Luhalali near Bunadet	0.321928	34.057100
	4		River Bukora at Mulukula-Kyotera	-0.842583	31.488585
	5		Lake Kyoga at Bugondo Pier	1.620000	33.273670
	6		River Victoria Nile at Mbulamuti	0.835347	33.028100
	7		River Malaba on Jinja-Tororo Road	0.585434	34.052000
	8		River Kyoga Nile at Masindi Port	1.695000	32.093000
	9		River Kyoga Nile at Paraa	2.283000	31.564000
	10		Lake Edward at Katwe	-0.148400	29.882500
	11		Lake Albert at Butiaba	1.819700	31.327500
	12		River Semliki at Bweramule	0.955800	30.186100
	13		River Albert Nile at Laropi	3.552120	31.813200
	14		River Albert Nile at Panyango	2.470000	31.500000
	15		River Kagera at Nsongezi	-0.989459	30.756175
Total	**73**	**4**			

Source: Nile Basin Regional Hydrological Monitoring Network Design Report, 2020

**Note the change in geographical co-ordinates after field visits*

2.3. The Hydromet system context in relation to the Nile Basin

The Nile is one of the world's longest and most iconic rivers, crossing 11 countries, with a drainage basin that covers almost 10 percent of the land-area of Africa. The Nile Basin is shared by Burundi, Democratic Republic of Congo (DRC), Egypt, Eritrea, Ethiopia, Kenya, Rwanda, South Sudan, Sudan, Tanzania, and Uganda. It covers contrasting hydro-climatic, ecological and socio-economic systems that span from tropical regions (the Nile Equatorial Lakes region) to desert/semi desert downstream parts. Each Nile Basin country has its own

national hydro-meteorological monitoring system designed to serve a variety of purposes in the respective countries. Studies conducted by the Nile Basin Initiative indicate substantial gaps in the current Hydromet monitoring infrastructure. There are hydrologically important areas of the basin that are poorly monitored due to inadequate monitoring network; many monitoring stations are poorly equipped – some not operational for quite substantial periods of their history since establishment; many stations are not equipped with modern instruments that ensure more precise data collection and continuous and timely transmission of data.

According to the survey conducted by NBI in 2014, there were approximately 949 meteorological and 427 hydrological stations in the Nile Basin. Over 70 percent of the meteorological stations measure either daily rainfall totals or rainfall and temperature. Most hydrological stations measure river or lake water levels. Monitoring of water quality, sediment transport in rivers, and groundwater are at their early stages in most countries. Data transmission from the stations to central data repository in most countries is manual. Further, being designed to serve purposes within the country where they are installed, many stations need water resources management. For example, flood preparedness for communities in low lying areas where most of the flood disaster causing high flow is generated from an upstream country require real-time data collection and transmission to enable timely forecast of flood early warning and, thereby, save lives. This requires a monitoring system that is optimised to serve flood disaster preparedness across country boundaries.

There are many examples that demonstrate the need for a regionally optimised HydroMet monitoring system in the Nile Basin. In a nutshell, there are two complementary arguments for the Nile Basin Regional HydroMet monitoring system. First, improved HydroMet monitoring infrastructure yields more precise and timely decision relevant data. Second, a regionally optimised HydroMet system greatly helps in joint management of the shared Nile Basin water resources, improved cooperative disaster management, more optimal water utilisation among many other benefits to the riparian countries. The Nile Basin

riparian countries recognised the need for improved joint Hydro-meteorological monitoring system early in their cooperation endeavour.

2.4. Technical description of Hydromet system

The hydromet system includes the following components:

- Field Monitoring Network comprised of station locations and measurement parameters for collecting the required ongoing field data. This includes the specification of field monitoring equipment and station telemetry at each site.
- Water Quality Labs and Standards to be used in developing consistent approaches for water quality monitoring at sites identified in the field monitoring network.
- Data and Information products that can be generated, organized and applied at a regional level and disseminated to countries for further analysis and application.
- National and regional data Centers: Data Management Systems, consisting of data acquisition management systems for collecting data from the field monitoring network, national data management systems, a regional data management system, and tools for communications between national and regional systems. Specific regional products are identified as part of these systems as a focal point for the overall system development and operation.
- Trainings and capacity development for National staff: Institutional Design and Development, outlining the factors, staffing, and training requirements for long term system implementation and operation.

A regional network requires river gauges placed at key locations upstream and/or downstream of channel confluences in order to monitor the flow contributions from various sub-basins. In general, a hydrometric site will be equipped with a five-meter tower; weatherproof NEMA 6 (IP67) rated instrument enclosure for housing the data logger, batteries, and solar regulator; a water level sensor being either a radar, pressure transducer, or shaft encoder; and a solar power supply system. Water temperature will be observed if an in-situ water level pressure transducer is used. A shaft encoder will only be installed if the existing stilling well infrastructure is functional. The data logger **Figure 2-2: A** will have a display enabling the on-site observer to record manually the parameters

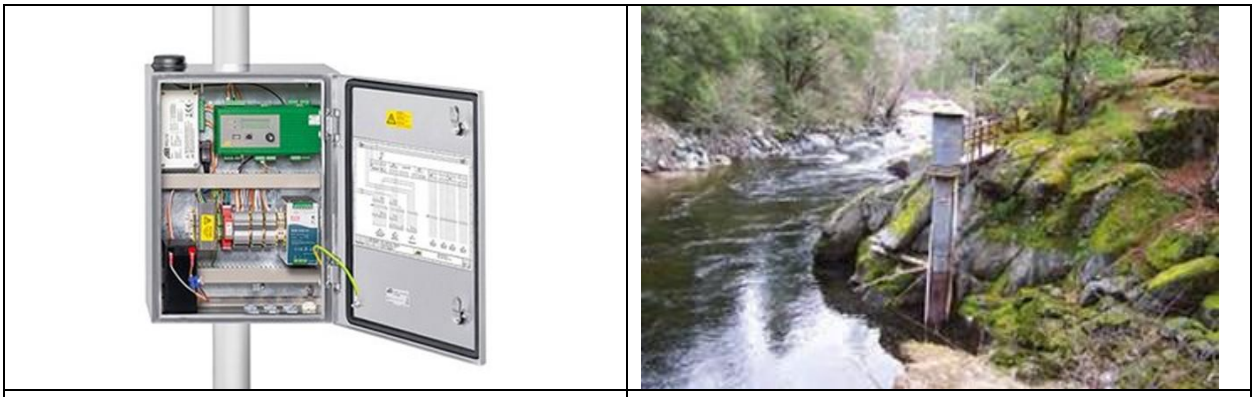
measured using auto-sensors. This functionality will ensure that the auto observations reflect the conditions at the site. The frequency of the observations by the auto-sensors will be every 15 minutes. A series of staff gauges will be installed for the manual observation of water level as well as three benchmarks tied to the local datum. Periodic streamflow measurement is required for hydrometric sites. Hydro acoustic streamflow measurement profilers will be used by trained mobile monitoring teams to conduct streamflow measurements for all other hydrometric sites. Infrastructure to support the use of hydro acoustic Doppler profilers may consist of a bank-operated cableway or boat, if a suitable measurement platform does not exist at the site. Sediment measurements for selected hydrometric sites will be conducted using standard manual methods and mechanical sediment samplers. Figures below show typical layout of hydromet station and equipment.

The types of equipment to be provided for the seventy-three (73) hydromet stations are shown in table below.

Item	Description
1	Data logger
2	Instrument Enclosure
3	Solar Power Supply
4	Telemetry communication system
5	Water level sensor - Vented pressure transducer with water temperature
6	Water level sensor - Radar
7	Rain gauge - Tipping Bucket with cable and connectors
8	Ruggedized field laptops or tablet
9	Land Surveyors Level
10	Water Quality field kits
11	Sediment Sampling field kits
12	Field tools kits to service supplied instrumentation
13	Data Acquisition Software
14	Integration, Configuration and FAT – lump sum
15	Technical Support during installation (20 days) – lump sum
16	Return to Factory Warranty for two years

A hydromet station will be equipped with either a concrete shelter or a five-metre tower; weatherproof NEMA 6 (IP66) rated instrument enclosure for housing the data logger,

batteries, and solar regulator; a water level sensor being either a radar or pressure transducer, and a solar power supply system. The data logger and power supply must support an auto water quality sensor using SDI-12 protocol. The power requirement of the auto water quality sensor has been considered in the selection of the 10-watt solar panel and 28 to 30 Amp-hr rechargeable batteries. Water temperature will be observed if an in-situ water level pressure transducer is used. A tipping bucket rain gauge will be a standard instrument at a hydrometric station, if the site exposure is suitable. The data logger will have a display or be Wi-Fi enabled for access via a smartphone; enabling the on-site observer to record manually the parameters measured using auto-sensors. The frequency of the observations by the auto-sensors will be every 15 minutes.



A-Data logger | B-Typical gauging station

Figure 2-2: Data logger and gauging station

2.4.1. Technical requirements and specifications for Hydromet civil works

There are two preparatory activities to be undertaken before starting the actual constructions, these activities might have negative effects on the site:

Site clearing and Levelling: Upon approval of the final design, the Contractor will clear and level the site as required by the site survey report. As agreed to during the site visit, the Contractor will demolish and dispose of existing structures, materials, and vegetation.

Soil Excavation: The Contractor will excavate the required footings and trenches for the concrete Walk-in shelter or 5m Mast, fence posts, rain gauge, staff posts, conduit runs,

benchmarks, and for the placement of the grounding rods. The bottom of each excavation will be level with aggregate and tamped.

2.4.2. Concrete Walk-in Shelter

The concrete walk-in shelter is to be constructed according to the supplied standard component drawings. In general, the concrete walk-in shelter is to be constructed on four pillars to ensure the floor is above the flood line. The typical floor height is one meter from the ground surface.

Conduit (50mm OD PE pipe) is precast in one of the pillars to enable the placement of cable for the running of the water level sensor and grounding cables to the interior of the shelter. The placement of the cable in conduit conceals and protects the cabling.

The concrete walk-in shelter will have Sch 30 70mm steel pipe cast in the roof slab. The steel pipe will support the satellite antenna and enable cabling for the satellite antenna, solar panel, and TB rain gauge to securely enter the walk-in shelter. An 70mm electrical service cap will be placed at the top of the steel pipe to prevent rain for entering the shelter. As well, the enter point of the steel pipe through the roof will be sealed with grout to prevent water from entering the shelter around the embedded pipe.

Concrete shall be composed of Portland cement, fine aggregate, coarse aggregate, water as specified and shall be mixed at the site of the construction, except as otherwise authorized in writing by the Employer. Reinforced concrete and workmanship shall conform to ACI 314, Building Code Requirements for Reinforced Concrete. All testing and inspection services required, will be performed by the Contractor at his expense unless otherwise specified herein. Methods of testing will comply in detail with the applicable ASTM.

Cement shall be Portland Cement, TIS 15, Type I, ''Specification of Portland Cement'' or ASTM C150, Type I, ''Specification of Portland Cement''. Cement brands shall be subjected to approval of the Employer. Water for use with cement in mortar or concrete shall be clean and free from salts, oil, acid, vegetable or other substance injurious to the finished product.

Coarse aggregate for all types of concrete except mass concrete shall consist of hard, durable stones or crushed rock and conform to the requirements of ASTM C33. It shall be

furnished with separate grading. Coarse aggregate shall meet a maximum size of 25 mm, except for mass concrete where a maximum size of 40mm may be approved by the Employer. Fine aggregate shall consist of natural sand and conform to the requirement of ASTM C33.

All material in the mix shall be proportioned wholly by weight unless other means are approved by the Employer. The slump measured by ASTM C143 shall be as shown in the following table.

Type of Construction	**Slump, in (cm)**	
	Max. in (cm)	Min. in (cm)
Footings (Reinforced concrete)	12.5	5.0
Footing (Concrete without reinforcement)	10.0	2.5
Slab-Beams-Columns and Walls	15.0	7.5
Mass concrete	7.5	2.5

The Contractor shall assume the full responsibility that the quality of the concrete conforms to specifications and this responsibility shall not be relieved by the fact that the testing has been carried out. The Contractor shall supply in sufficient quantity slump apparatus and test cylinders molds necessary for the control test described below.

Form work shall include all temporary or permanent molds for forming the concrete. Form work shall be of wood or steel and shall be rigid enough to maintain the concrete in position during placing, compacting, setting and hardening. Form work shall be so constructed that easy cleaning out of any extraneous material inside the form work can be achieved without disturbing form work already checked and approved.

Before placing any concrete, all shavings, loose binding wires, soil, rubbish and all foreign matter shall be removed from the form work and the form work shall be carefully washed with water.

Contractor is responsible for determining in advance of making any concrete pours, all requirements for perforation of concrete sections or embedment therein of fittings, such as conduits, pipes, electric boxes, weep holes, drainage pipes etc. Any concrete poured

without prior provision having been made, will be subject to correction at the Contractor's expense.

Concrete shall be placed so as to avoid segregation of the materials and the displacement of the reinforcement.

Concrete in beam or deck girder spans and columns shall be placed in one continuous operation.

All concrete surfaces shall be kept thoroughly wet for at least 7 days after placing to ensure proper curing.

The Contractor is required to supply lightning arrestors, copper ground wire, and copper ground rods according to country's earthing requirements for lightning protection.

2.4.3. Titling and Non-Titling Mast

The equipment mast for the hydrometric stations is to be 5 metres in height and constructed of heavy gauge thick wall steel pipe 80mm in diameter that is hot dip galvanized steel. The masts are to be self-supporting and are to be supplied with base plate and grounding kit.

The foundation is to be a column stump of 500mm by 500mm by 800mm of reinforced concrete. A 90-degree 60mm I.D. Schedule 40 heavy wall Rigid PVC non-metallic conduit cast with the foundation for the cable run.

Anchor bolts are to be cast with the column stump to a depth of 350mm. The anchor bolts are to be of mild steel with a 12mm dia. and 500mm in length.

The equipment mast is to be supplied with lightning arrestors, copper ground wire, and copper ground rods according to country's earthing requirements for lightning protection.

2.4.4. Staff Gauge Footings and Posts

The staff gauge footings are to be 300mm by 300mm by 1000mm deep reinforce concrete block. A staff post will be built with a wooden Skelton for the post together with the footing and mix cement with water and then pour the concrete, once rigid the structure is installed. The reinforce bars need to be placed 80 mm from the surface of the post. The concrete staff post is to be 300mm by 300mm.

The concrete staff post is to be 1200 up to 2200mm in height above grade. The top of the staff post is to be slightly sloped at the top to shed water.

Will be built with a wooden Skelton for the post together with the footing and mix cement with water and then pour the concrete, once rigid the structure is installed.

2.4.5. Rain Gauge Foundation

The foundation for the rain gauge is to be 200mm by 200mm by 600mm deep mass concrete block with a 90-degree 60mm I.D. Schedule 40 heavy wall Rigid PVC non-metallic conduit cast with the foundation for the cable run.

A 75mm O.D. medium duty hot dipped galvanized pipe stands for mounting of the rain gauge is to be cast with the foundation.

The pipe stand is to be 900mm in length with 300mm of its length embedded in the concrete foundation.

The top of the foundation is to be 50mm above ground level and sloped at the top to shed water.

2.4.6. Fence

If the hydromet station is to be enclosed by a fence, the typical arrangement will be a fenced 3m by 3m compound. The fence will be fabricated with metal mesh screen between concrete posts. The compound enclosure is to have a gate. The fence is to be two metres in height.

The posts are to be placed at 1.5m spacing for the 3m by 3m compound. The posts are to be constructed of concrete and be of 150mm by 150mm in dimension.

The footings for the fence posts are to be 300mm by 300mm and 500mm deep and slightly sloped at the top to shed water. The concrete post is to be embedded to a depth of 300mm in the concrete footing. The top of the footings is to be at ground level.

The metal wire mesh between the posts is to be constructed on heavy gauge wire mesh with a metal frame. The wire mesh and metal frame are to be either painted or be hot dipped galvanized.

The gate opening is to be 1.0m wide. The gate is to be hinged with a self-locking latch. The gate is to be constructed of heavy gauge galvanized steel mesh placed within a metal frame.

2.4.7. Inspection Pits

An inspection pit or manhole is to be installed within one metre from the base of the tower. The inspection pit is to be of precast reinforce concrete form, square in shape with an outside dimension of 600mm by 600mm by 600mm deep. The wall thickness will be 100mm.

The cover will be precast reinforce concrete 75mm in thickness and have an inside lip to hold the cover in place. The cover will have two u-shaped handles for easy of removal of the cover.

An enter point for the underground conduit will be at the base of the inspection pit and have an insert of 60 mm O.D. Schedule 40 heavy wall Rigid PVC Non-metallic Conduit of 250 mm in length cast in place. The Schedule 40 heavy wall Rigid PVC Non-metallic conduit will extend 25 mm inside the wall of the inspection pit.

The inspection pits will be buried at a level to place the top of the pit, without the cover, at ground level.

2.4.8. Underground and Above-ground Conduit

The underground conduit from the equipment mast to the inspection pit and from the inspection pit to the rain gauge is to be 50mm PE pipe suitable for underground use.

The underground conduit from the equipment shelter to the location of the sensor in the water body is to be 50mm PE pipe suitable for underground use. A standard in-water sensor mount is to be supplied.

There may be a requirement to install an in-water sensor mount for an in-situ water quality sensor.

The conduit is to be resistant to sunlight and suitable for exposed and outdoor use as well as underground use.

The conduit will be buried at a minimum depth of 400 mm, on a level bed, and backfilled with available soil, sand, and small sized gravel. Rock size in the back fill should not exceed 25 mm.

The above-ground conduit used to protect the cabling for the radar sensor is to be 20mm I.D.

A cable pull wire will be installed in the conduit.

2.4.9. Benchmarks

Three benchmarks will be installed at a hydrometric site.

The benchmark is to be a precast concrete column 100mm by 100mm by 900mm in length. The precast concrete column is to have a brass stud, 100mm in length, placed at the top of the column and extending 5mm above the top of the column.

The precast concrete column is placed vertically into a predrill hole, and a concrete collar is to be poured in place around the column. The collar is to be 300mm in diameter by 100mm thick. The top of the concrete collar is to be at ground level and sloped to shed water. The concrete column is to extend 50mm above the top of the collar.

A precast concrete column is not required if a brass stud or BM cap can be grouted into solid rock formations or nearby existing concrete structures.

2.4.10. Grounding

The concrete walk-in shelters and 5m masts are to be provided with a grounding cable and ground rod.

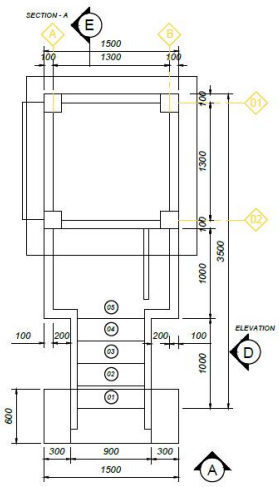
The grounding cable is to a 6 AWG solid bare copper wire of four to five metres in length and shall be connected to the ground rod using a with cast bronze or brass clamps listed for direct soil burial. The grounding cable may be insulated or bare, and shall be installed in one continuous length without a splice or joint.

The grounding cable wire shall be connected to the electronic equipment ground lug during the installation of the instrumentation enclosure. A suitable length of spare grounding

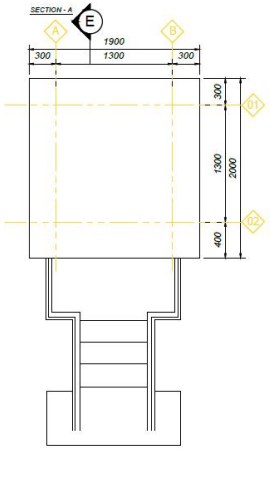
cable must be available to complete this connection, which will be typical 1.5 to 1.7 metres for a concrete walk-in shelter and 2.5 to 3 metres for a mast installation.
Ground rods are to be a copper clad steel rod and have a minimum diameter of 15mm and a minimum length of 2 metres. These are to be driven into the ground in a vertical position or an oblique angle not to exceed 45 degrees within one metre of the structure.

2.4.11. Site Completion

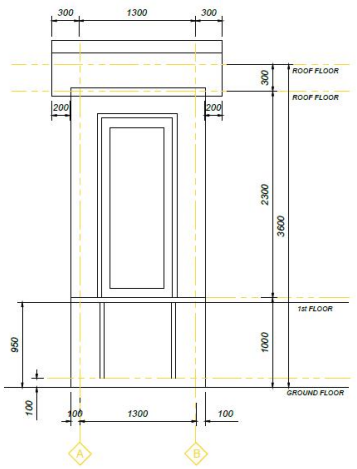
Once the civil works constructions are completed, the Contractor shall remove all unused construction materials from the site, level the site, and sow with good quality grass seed as required.



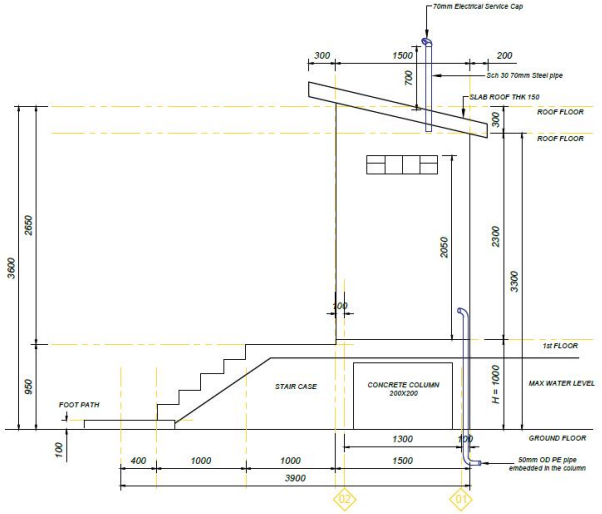
A:PLAN



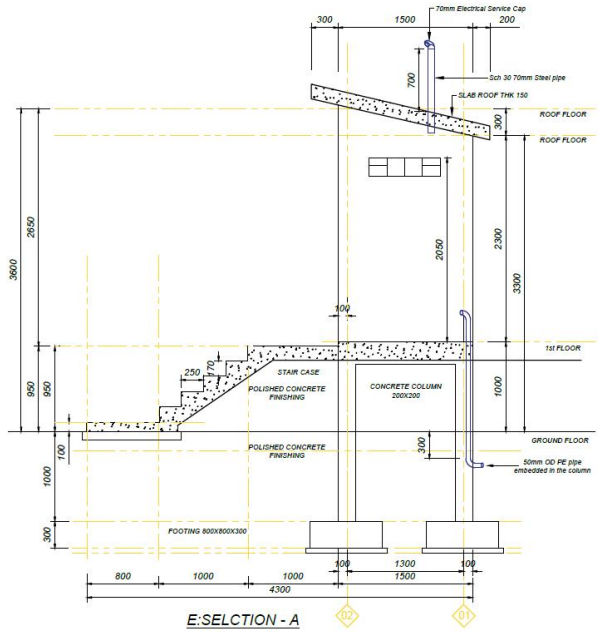
B:ROOF



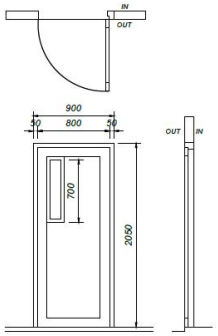
C:FRONT ELEVATION



D:LEFT ELEVATION



E:SELCTION - A

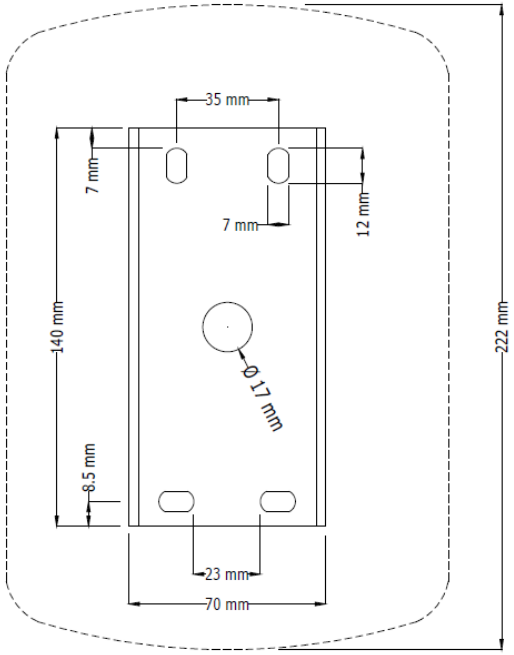


E:STEEL DOOR DETAIL D1

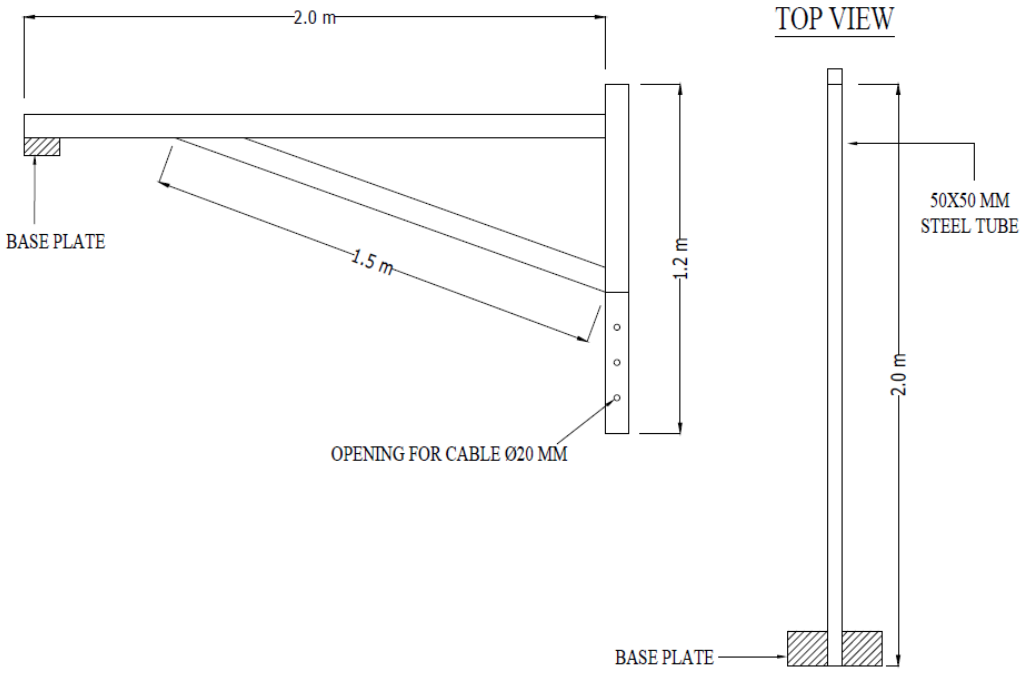
CONCRETE WALK-IN SHELTER

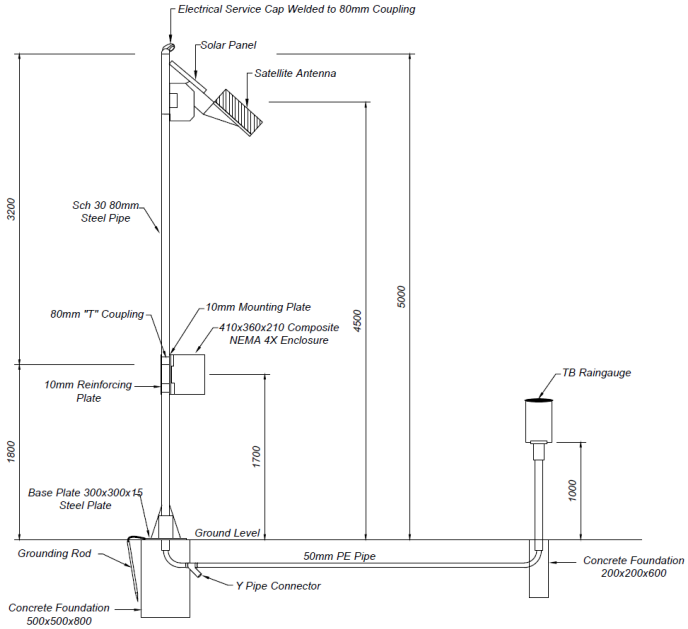
SCALE - 1:50

Base Plate -Radar

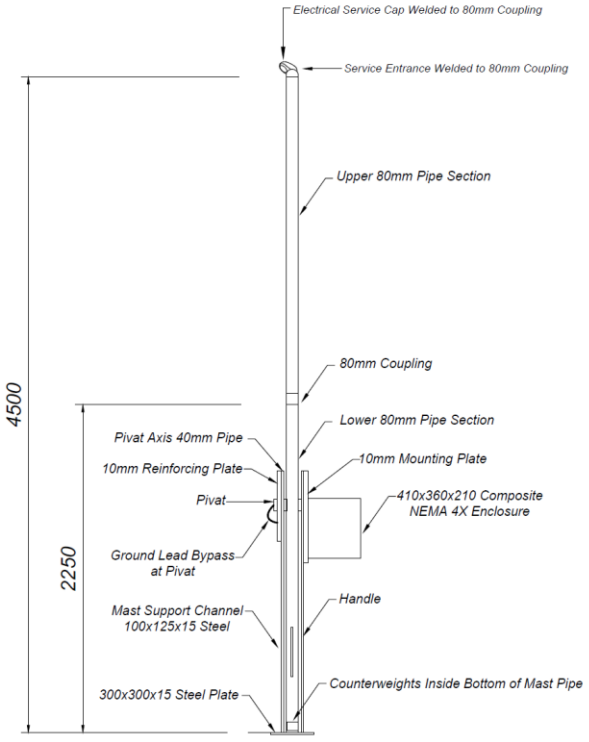


Bridge Mount -Radar





SKETCH OF ASSEMBLED NON-TILTING MAST



2.5. Purpose of hydromet systems

To address the data scarcity in the Nile Basin, support the NBI Member States in understanding the biophysical phenomena, informed planning, evidence-based decision making, improved cooperative water resources management and development; NBI is establishing the first Regional HydroMet System for the Nile Basin. The stations cover all locations of transboundary significance in nine countries of Burundi, Rwanda, Kenya, Tanzania, Sudan, South Sudan, the Democratic Republic of the Congo, Ethiopia and Uganda. The project is being implemented by NBI with full involvement of the NBI Governance (Nile-TAC) and National Hydrological Agencies/Departments. Post-project sustainability will be consistently ensured though capacity building for experts operating the system and awareness raising to the local communities

2.6. Rationale of installing hydromet systems

The critical gap in data in the Nile Basin was recognised during the preparation of the first set of cooperative projects under NBI. Data collected from the operational stations often exhibit breaks in the records, which makes the data unsuitable for many purposes. Measurements of water quality and sediment transport are rare. Basin wide, the degree of automation of the hydrometric networks is still very low, and telemetry is not used in most countries. Most recorders are out of order, and real time data are not available. Incomplete understanding and insufficient knowledge of bio-physical conditions, setbacks in strategic assessment and water resources planning, suboptimal water management decisions, and delays in national as well as regional planning and execution of investment projects; and thus, suspension of realising basin growth targets.

3. BASELINE ENVIRONMENTAL AND SOCIAL INFORMATION

An attempt has been made to document baseline environmental and social settings on regional basis as summarized herein.

3.1. Baseline Environmental Information

The Nile Basin is uniquely endowed with environmental and water resources which perform critical functions and provide essential goods and services. For eons, the River Nile has nourished an array of ecosystem services, livelihoods and diverse cultures. The Arid and semi-arid downstream countries of the Nile Basin have a high dependence on the Nile River flow owing to their large irrigation schemes while the upstream countries still depend on rain-fed agriculture at subsistence level. The water resources of the Nile Basin are also used for hydropower, inland transportation, environmental functions, fisheries and aquaculture and tourism because of the rich history of the Nile and the diverse natural resources attached. Although River Nile is shared among the 10 countries, the degree for dependence varies from country to country. For some of the countries, like the Democratic Republic of Congo, the waters of the Nile only contribute a small portion of their water resources. Other countries like Rwanda, Sudan, Burundi, and Egypt are heavily dependent on the River Nile for their water resources. Despite this variation, all these countries offer different contributions to the basin and have different needs for the water and the associated environmental resources.

The basin continues to face a number of challenges which are heavily hindering the sustainable utilization and management of the Nile waters so as to meet the needs of all the riparian countries. These challenges include high dependence on services provided by rivers, lakes, wetlands and other water-related ecosystems; location of the river in the poorest of the world's regions; low infrastructural development (hydropower development is only at 25% while only 15% of the entire basin population have access to electricity). Developments being undertaken by individual countries show a lack of mature regional mechanism for coordinated planning and management. This is coupled with insufficient water storage capacity and poor efficiencies in water use in agriculture.

3.1.1. Environmental Threats

Environmental threats in the Nile Basin include declining water quality, degradation of agricultural and grazing land, loss of forests and wetlands, and continued overexploitation of natural resources. Others include increased pollution from industrial, agricultural and urban sources, proliferating waterborne diseases, and intensifying impacts of droughts and floods. All these threats are common to all the Nile Basin countries with the only difference being their degrees of intensity. Climate change is also a reality which has had significant stress on the River Nile. The critically affected sectors include agriculture and food security, water resources, distribution and prevalence of human diseases, pests, ecosystem and biodiversity, and rise in sea levels. The impacts of climate change on water resources in the Nile have been dire and threaten livelihoods and life supporting systems. Each country within the Nile Basin faces its own environmental and water resources threats (**Table 3-1**). Most of the threats are common but there are others which are unique to specific countries. The table below summarizes the principle environmental threats per country.

Table 3-1: Summary of environmental threats per Country

Country	Major Environmental Threats
Kenya	Point and non-point pollution from farms, desertification, deforestation, sedimentation, soil erosion, water pollution, and wetlands and lakesides encroachment.
Uganda	Soil erosion, encroachment into lakeshore and riverine ecosystems, draining of wetlands, deforestation, protected areas non-point and point pollution and water pollution
Tanzania	Deforestation, desertification, soil degradation, water pollution, shortage of portable water, and poaching
The Sudan	Desertification, soil erosion, shortage of portable water and hunting of wildlife
South Sudan	Conflicts over natural resources with no natural regeneration capacity and deforestation or indiscriminate cutting of trees , desertification, environmental pollution from oil exploration and production activities
Burundi	Soil erosion, deforestation, farming on marginal lands and habitat loss.
Democratic Republic of Congo	Deforestation, wildlife poaching, water pollution, and soil erosion
Ethiopia	Overgrazing, desertification, deforestation and soil erosion
Rwanda	Land use and land scarcity, soil degradation and soil erosion, climate change, loss of biodiversity, water pollution and access, urban pollution and pressure on natural resources, generation of hazardous and solid waste and natural resources depletion

3.1.2. Nile River Morphology

River Nile is the longest river in the world with a catchment area of 3.20 million square kilometers. The hydrological and morphological characteristics of the river are affected by changes in the environment such as sedimentation and erosion. Over the past decades, River Nile has experienced major morphological changes as a result of topographical, geological, climatological conditions and human impacts including high and low flow discharge, changes in suspended sediment concentration and human interventions.

3.1.3. Hydrology

The variability of the Nile is one of its main characteristics as a result of its length and size. The topography of the river includes forested uplands, lakes, an area of swamps which are filled with seasonal grasslands and papyrus reeds and a single channel which flows through arid deserts. Mountainous tributaries are characterized with variety of climate that undergoes varying seasons of wet and dry rainfall. Half of the course of the River Nile flows through countries which have no effective rainfall. Approximately all the water which is in the Nile is generated on 20% area coverage of the entire basin. The remaining portion is in arid and semi-arid regions which offer minimal water supply but very high losses from evaporation and seepage.

The River has two tributaries, the White Nile and the Blue Nile. The basin's water resources include groundwater, wetlands, lake and rainfall. The rainfall pattern within the basin is highly uneven seasonal and spatial distribution. Most regions in the basin receive only one rainy season while the equatorial zones normally receive two rainy seasons. The Northern regions of the Sudan and arid areas of Egypt have reduced reliability and insignificant annual rainfall. The regions of the basin which produce runoff include the Ethiopian highlands, western South Sudan and the Equatorial Lake Plateau with large parts of the Nile watershed not producing any runoff. The rainfall variability (Table 3-2) coupled with over-reliability on raid fed water supply and high evaporation values in the basin has made it highly prone to drought events. Northern Sudan loses 3000 mm/year, the Ethiopian highlands 1400 mm/year and hills in

Burundi and Rwanda 1100 mm/year. The Nile Basin is divided into three sub-systems. The Eastern Nile Sub basin's runoff contributes 85 – 90 % of the total annual Nile flow. The Equatorial Nile Sub basin which only contributes 10 – 15% of the annual Nile discharge, and the main Nile Zone which generates relatively no runoff and the instream evaporation which occurs, creates a net loss.

Table 3-2: Average rainfall by country in the Nile Basin (*Source: FAO, 2011*)

Country	Period	Average Precipitation	All time High (Year)	All time Low (Year)	Reference
Burundi	1901-2015	100.01	327.19 (1961)	0.02 (1935)	https://tradingeconomics.com/burundi/precipitation
DR Congo	1901-2015	134.21	285.84 (1993)	12.84 (1958)	https://tradingeconomics.com/DRC/precipitation
Ethiopia	1901-2015	68.03	419.92 (1950)	0.05 (1923)	https://tradingeconomics.com/ethiopia/precipitation
Kenya	1901-2015	55.84	318.33 (1961)	0.99 (1997)	https://tradingeconomics.com/kenya/precipitation
Rwanda	1901-2016	1170.16	-	-	WBG Climate Change Knowledge Portal
South Sudan	1901-2016	993.63	-	-	WBG Climate Change Knowledge Portal
Sudan	1901-2015	36.65	163.74 (1946)	0.25 (1945)	https://tradingeconomics.com/sudan/precipitation
Tanzania	1901-2016	998.19	-	-	WBG Climate Change Knowledge Portal
Uganda	1901-2015	99.76	282.6 (1961)	7.35 (1934)	https://tradingeconomics.com/uganda/precipitation

The ground water resources of the Nile Basin countries are extensive. Ground water is an essential resource in advancing economic and social empowerment within the Nile Basin countries. It makes a significant contribution to food and water security in the region. The main aquifers include the Victoria artesian aquifer which is highly abundant in surface water and is present in many swamps, lakes and rivers. Others include the Congo hydrogeological artesian aquifer, the Upper Nile artesian aquifer, the volcanic rock aquifers, Nubian sandstone aquifer systems, the Nile valley aquifer and the Nile Delta aquifer. The ground water recharge is highly variable because of the distribution and amount differences across the Nile basin.

3.1.4. Water Quality

The chemical quality of the Nile water is relatively good but the bacteriological and physical qualities are generally poor. This is due to both natural and human influence on the water. The quality issues ranging from colour, turbidity and suspended solids in the head waters are as a result of poor agricultural practices, land use change, torrential rains and hilly terrains. Environmental sanitation across the basin is poor which results into nutrient enrichment and bacteriological contamination of the Nile waters. As such, most of the water in the Nile, is not safe for consumption when in its raw form. The changes which occur in the water quality upstream to downstream do not occur in a linear manner because of influence by equatorial lakes and reservoirs in Egypt and the Sudan.

3.1.5. Land Cover

There are different land cover types in the different Nile Basin countries. Over the past decades the impacts of human activities within the Nile have increased as a result of poverty, climatic conditions and population increase. This has resulted into modifications with adverse impacts on the biological, physical and functional aspects of the land resources of the Nile Basin. When there is a change in Land cover, the economy, human health and environmental attributes and functions are also affected. The different land cover types in all the countries in the Nile Basin include Cropland, Mosaic Vegetation, Forests, Grassland, Shrubland, Wetlands, and Water with varying percentage coverage.

3.1.6. Biodiversity

The Nile Basin has a very rich diversity of fauna and flora. The basin lies within several major biogeographical biomes and areas. It also has a wide range of critical fauna, flora and transboundary ecosystems. The Nile River system of wetlands and water courses is a major flyway for migratory birds which are in transit between Europe and the Mediterranean to the north and the equatorial district of Lake Victoria and the Rift valley lakes to the South. The arid areas of the basin are home to a unique variety of flora and fauna especially saline and drought sensitive species. On a worldwide scale, the most important areas for plant species diversity in the Basin are the high-altitude areas of Ethiopia and the Lake Victoria Basin. This is followed by the rest of the Lake

Victoria Basin, which has low endemism of about 3 percent of species; however, the diversity of plant species is relatively higher. A part of the White Nile region is in an area where species endemism is at 35 percent, but the diversity is a bit low. In the remaining regions, the Sahel and Sahara zones, endemism and diversity are both low. In these areas, most animal and plant species are associated with the river channel. The species endemism in the respective Nile Basin riparian countries is listed in Annex 12.

The rich biodiversity (flora and fauna) of the Nile Basin is under environmental stress as a result of reduced water quality and quantity, weak environmental and economic policies, and poor land use practices. The root causes of the continued loss in biodiversity can be attributed to poverty and a heavy reliance on natural resources. In addition to these, inadequate capacity for management of the resources in the countries from the grassroots to the highest levels and lack of sufficient monitoring are continuing to threaten the state of biodiversity in the Nile Basin. At the local and community levels in rural and riparian areas, there is also a lack of total appreciation of the importance of biodiversity and capacity to maintain critical habitats and ecosystems. As such, the degradation of the habitats and biodiversity continues. A total of 15 hydromet stations are located in sensitive areas (**Table 3-3**). Out of these, four are in Uganda, three each in Ethiopia and Tanzania, two in Rwanda, and one each in Burundi, DR Congo and Kenya as follows: seven are located in National Parks, two each in forest reserves/wildlife sanctuary and Protected Landscape, two in Controlled Hunting Areas, and one each in a National Reserve and Natural Forest Priority Area.

Table 3-3**:** Location of hydromet stations with respect to sensitive areas within the Nile Basin riparian countries

Hydromet Station	**Hydromet ID**	**Latitude/ Longitude**	**Country**	**Name of sensitive area**	**Type of sensitivity**	**Reference to National legal/policy**
Gakindo	RWA 001 Hyd	-2.343659 30.301499	Rwanda	Lacs du Nord	Protected Landscape	National Forest Law (2010), Organic Law on Environment No4/2005, Biodiversity policy (2011), Land policy (2004)
Shell	RWA 006 Hyd	-2.341587 30.002195	Rwanda	Lacs du Nord	Protected Landscape	National Forest Law (2010), Organic Law on Environment No4/2005,

Hydromet Station	Hydromet ID	Latitude/ Longitude	Country	Name of sensitive area	Type of sensitivity	Reference to National legal/policy
						Biodiversity policy (2011), Land policy (2004)
Ruvubu at Muyinga	BUR_001_Hyd	-2.98836 30.4647	Burundi	Ruvubu NP	National Park	Law no.102 of 25th March, 1985, National Forestry Policy, Burundi National Development Plan (2018-2027)
Lake Edward at Katwe	UGA_011_Hyd	-0.1484 29.8825	Uganda	Queen Elizabeth NP	National Park	The National Environment Act (2019), Wildlife Act (2019), The National Environment Management Policy (1994)
Ishango at Ferry Crossing	DRC_001_Hyd	0.065224 29.6467	DRC	Virunga NP	National Park	Law No. 11/009 (2011)
River Nile at Paraa	UGA_010_Hyd	2.283 31.564	Uganda	Murchison Falls	National Park	The National Environment Act (2019), Wildlife Act (2019), The National Environment Management Policy (1994)
River Nile at Panyango	UGA_015_Hyd	2.47 31.5	Uganda	Pakwach	Forest Reserve	The National Environment Act (2019), The National Environment Management Policy (1994)
Lake Victoria at Jinja Pier	UGA_001_Hyd	0.414423 33.2075	Uganda	Jinja (Kimaka)	Forest Reserve (Wildlife Sanctuary)	The National Environment Act (2019), Wildlife Act (2019), The National Environment Management Policy (1994)
Grumeti river at M Bridge	TAN_002_Hyd	-2.09844 33.8695	Tanzania	Serengeti National Park	National Park	Environmental Management Act (2004), National Environment Policy (1997), The Wildlife Conservation Act (2009), Wildlife Policy (1998), National Forest

Hydromet Station	Hydromet ID	Latitude/ Longitude	Country	Name of sensitive area	Type of sensitivity	Reference to National legal/policy
						Policy (1998)
Mbalgeti	TAN_003_Hyd	-2.19599 33.868	Tanzania	Serengeti National Park	National Park	Environmental Management Act (2004), The Wildlife Conservation Act (2009), National Environment Policy, (1997), Wildlife Policy (1998), National Forest Policy (1998)
Kogatende Ranger Post	TAN_008_Hyd	-1.56117 34.884	Tanzania	Serengeti National Park	National Park	Environmental Management Act (2004), The Wildlife Conservation Act (2009), National Environment Policy (1997), Wildlife Policy (1998), National Forest Policy (1998)
1LA04 Mara	KEN_006_Hyd	-1.2243 35.03596	Kenya	Masai Mara	National Reserve	Environment Management and Coordination Act (1999), Wildlife Conservation and Management Act, (2013), National Environment Policy (2013)
Geba near Supi	ETH_001_Hyd	8.48204 35.64625	Ethiopia	Yayu	National Forest Priority Area	Proclamation 94/1994 on Forest Conservation, Environmental Policy of Ethiopia (1997), Biodiversity Conservation and Research Policy (1998)
Gilo near Pugnido	ETH_021_Hyd	7.618042 34.26822	Ethiopia	Tedo	Controlled Hunting Area	Proclamation 94/1994 on Forest Conservation, Environmental Policy of Ethiopia (1997), Biodiversity Conservation and Research Policy (1998)

Hydromet Station	Hydromet ID	Latitude/ Longitude	Country	Name of sensitive area	Type of sensitivity	Reference to National legal/policy
Baro at Gambela	ETH_023_Hyd	8.246673 34.586816	Ethiopia	Jikao	Controlled Hunting Area	Proclamation 94/1994 on Forest Conservation, Environmental Policy of Ethiopia (1997), Biodiversity Conservation and Research Policy (1998)

The sensitivity of the areas where the above 15 hydromet stations are established requires mitigation measures that would reduce the potential risks and impacts related to biodiversity including vegetation and wildlife resources. Some of the mitigation measures include the following:

- Perimeter fencing of hydromet stations within protected areas, where applicable, to guard the hydromet equipment from human/wildlife interference and potential physical damage by wildlife.
- Rehabilitation of existing and/or construction of new concrete walk in shelters within which the hydromet equipment will be installed to protect the equipment from unwanted access and potential damage.
- The contractor should choose and use appropriate or camouflaging colours to paint the concrete walk-in shelters to avoid scaring wild animals that are likely to use the areas around the hydromet stations for grazing, browsing or drinking water. 'Shouting' colours (e.g. red) may be scary to most animals.
- Seek permission from respective local wildlife or protected area authorities/agencies prior to conducting any activity in the protected or sensitive areas.
- Conduct construction/refurbishment activities in the company of wildlife or forestry personnel to provide security against the risk of wildlife attacks.
- The NBI should conduct trainings and create awareness among staff managing protected areas on the role of hydromet stations, monitoring activities and reporting of suspicious activities around the sites.
- The contractor should ensure that appropriate billboards indicating on-going civil works and locations of hydromet stations are placed at strategic places

within the protected or sensitive areas and in consistency with the laid down procedures of the respective environment or wildlife agency in each country.

- The contractor should develop and ensure that all personnel sign a Code of Conduct (CoC) particularly for workers who will be engaged in civil works within protected or sensitive areas to minimize unwanted clearing of land/vegetation, poaching/illegal harvesting or killing of wildlife.
- At the end of construction or civil works at the new hydromet sites, the contractor should undertake measures to restore the affected vegetation through landscaping including planting of trees and grasses to cover unpaved areas.

The tender document for civil works to be advertised in those countries should take into consideration these specific mitigation measures to enable the local contractors to prepare their technical and financial proposals accordingly.

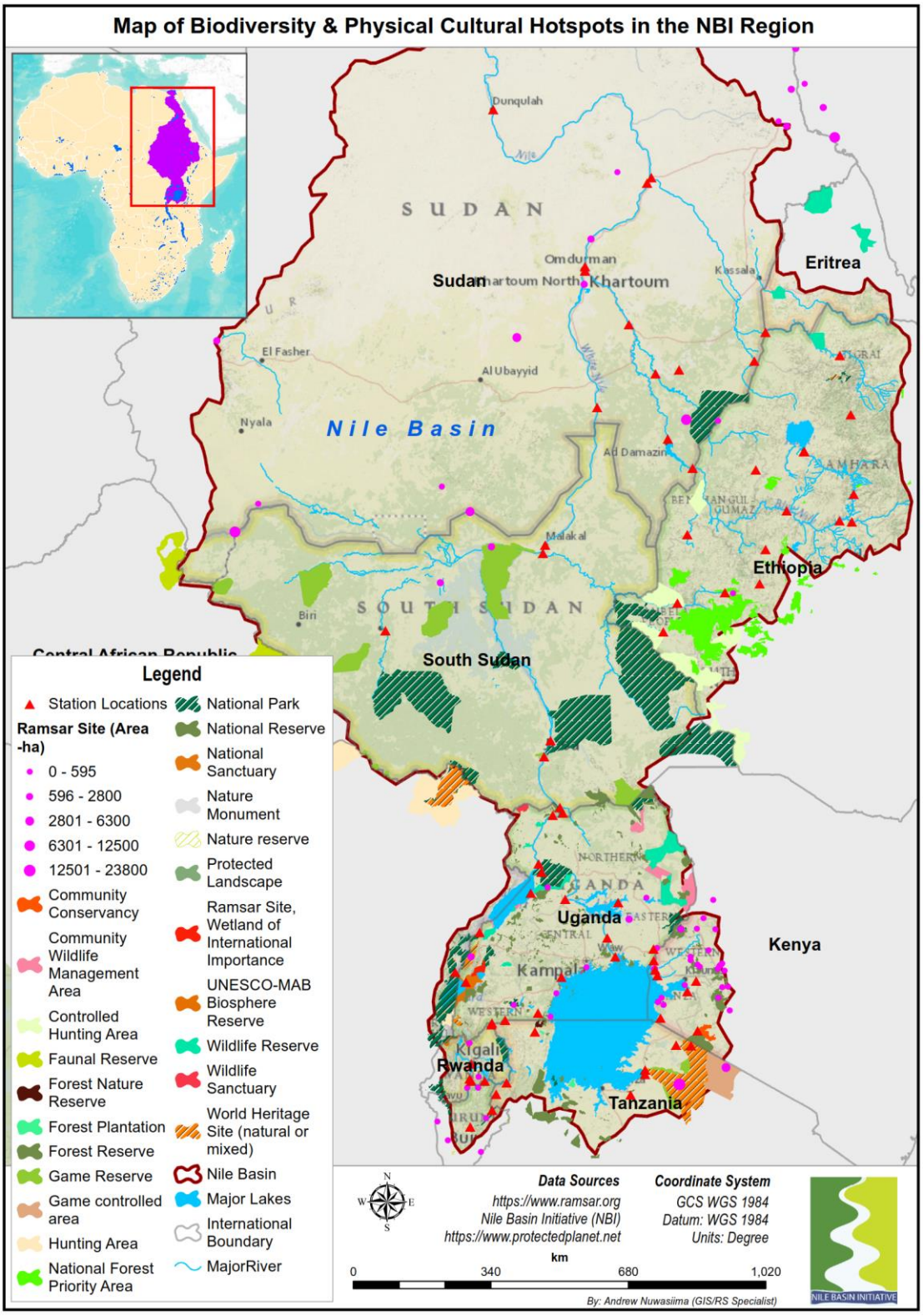


Figure 3-1: Biodiversity and physical cultural Hot Spots

3.2. Baseline Socio-Economic Information

3.2.1. Socio-Economic profile of Riparian countries

The Nile Basin, having the world's longest river (6,700 km) is shared among 11 countries. The catchment area of the basin is about 3.3 million km2. It stretches over different geographical, climatological, topographical and socio-economic regions. The climate and vegetation cover in the basin are closely correlated with the amount of precipitation, which decreases from above 1,000 mm/yr in the southern part to virtually zero in the northern part crossing the Sahara Desert. Cooperative management of the Nile River Basin is one of the greatest challenges of the global international waters agenda. The Nile has enormous potential to foster regional social and economic development through advances in food production, transportation, power production, industrial development, environmental conservation and other related activities. To realize this potential, the riparian countries have come to recognize that they must take concrete steps to address current challenges and that cooperative, sustainable development holds the greatest prospect of delivering mutual benefits to the region. And as such, development projects need to clearly analyze the socio-economic environment to ensure that any impact and risks emanating from development projects are mitigated inline within the socio-economic environment within the basin area.

3.2.2. Human Population in the Nile basin

The combined population living within the Nile Basin is estimated at 257 million (or 53% of the total population of Nile Basin countries). Egypt has the highest population living within the Nile Basin (85.8 million), followed by Ethiopia (37.6 million), Uganda (33.6 million), and Sudan (31.4 million). Eritrea (2.2 million) and DR Congo (2.9 million) have the smallest populations within the Nile Basin. The proportion of urban population is expected to rise in all Nile Basin countries. By 2050, the percentage of urban population is expected to reach above 50 percent of the total population in four of the 11 Nile Basin riparian states. In seven countries the urban population makes up more than 40 percent of the total population. In contrast, the rural population is expected to

rapidly shrink in all countries. With increasing urban population, urbanization rate will increase.

The average annual human population growth rates between 2010/2015 were 3.2% in Burundi, 2.7% in DRC, 1.6% in Egypt, 2.6% in Ethiopia, 2.7% in Kenya, 2.7% in Rwanda, 2.1% in Sudan and 3.0% in the United Republic of Tanzania. Uganda has the highest population growth rate 3.3% in the basin (HDR Statistics 2015). This, in turn, will result in increased demands for better water supply, sanitation, electricity, communication and other services. Urbanization is expected to increase the pressure on natural resources and the environment as expansion of cities occurs generally at expense of destruction of forests; there is risk of increasing pollution of water resources[1].

3.2.3. Access to Potable Water and Sanitation

Nile Basin countries have made significant progress in providing safe drinking water to their urban population. However, the proportion of rural population with access to safe drinking water is low by international standards. Egypt is an exception where 99 percent of its rural population has access to safe drinking water. There have been noticeable improvements in providing access to improved sanitation facilities in urban areas. However, still in seven of the basin countries, only less than 50 percent of the urban population has access to improved sanitation services. Nile Basin countries have made progress in improving access to improved sanitation facilities in rural areas as well. Even so, in seven of the basin countries, only less than 30 percent of the rural population has access to improved sanitation services.

3.2.4. Agriculture

Agriculture is the mainstay of most of the countries in the Nile Basin. The agricultural sector (the broader production sector that includes animal husbandry and fisheries) is of immense value to all Nile Basin countries in terms of contribution to Gross Domestic Product which falls between 12% and 43%, and provides employment to about 32%

[1] Nile Basin Water Resources Atlas, 2016

and 94% of the labor force, and food production. Over 60 per cent of the region's poor households derive their livelihood primarily from agriculture. For these households, increasing agricultural productivity and trade offer the best means of raising income, ensuring adequate food consumption, and accumulating the assets necessary to survive periodic shocks such as droughts and flood.

Table 3-4: Typically grown crops in the riparian countries

Country	Typically grown crops
Burundi	Bananas, potatoes, cassava and vegetables
Ethiopia	oil seeds, vegetables, fruits, potatoes, sorghum, maize and teff,
DRC	Sorghum, rice, maize and millet
Rwanda	Coffee, tea, flowers, beans, cassava, banana, Irish potatoes, rice, wheat, sugarcane
Sudan	Sorghum, Maize, Rice, Sunflower, Cotton, Sesame, Cassava, Beans, Peanuts
South Sudan	Sorghum, Maize, Rice, Sunflower, Cotton, Sesame, Cassava, Beans, Peanuts
Uganda	Bananas, cassava, sweet potatoes, maize, sorghum, coffee, tea
Tanzania	Maize, sorghum, millet, rice, wheat, beans, cassava, potatoes, and bananas
Kenya	Maize. Wheat, banana, wheat, beans peas, potatoes

3.2.5. Land Use

Agriculture is by far the single most important economic activity in Africa. It provides employment for about two-thirds of the continent's working population and for each country contributes an average of 30 to 60 percent of gross domestic product and about 30 percent of the value of exports. This is consistent with the riparian countries where most of the land is used for agricultural production for both crops and livestock. See table below for agricultural land use in riparian countries.

Table 3-5: Land use in riparian countries

Country	Agricultural Land use
Burundi	77%
Ethiopia	32%
Kenya	47%
Democratic republic of Congo	50%
Uganda	58%
Rwanda	76%
Tanzania	37%
Sudan	-
South Sudan	-

Source: FAOSTAT-2020

3.2.6. Transport in the Nile Basin

The main transport systems of the Nile region comprise road, rail, air, maritime, and inland water. The transport infrastructure of the region is generally poorly maintained. The Nile countries are linked to one another mainly by road and air, and to a lesser extent by rail, inland water, and maritime services. Half of the Nile countries are landlocked. Trade with global markets is conducted through transport corridors to and from seaports via neighbouring states.

Road transport is the fastest surface mode of transport in the region, and is most suited for short- to medium-distance hauls and is predominantly used for the movement of mainly agricultural products and locally manufactured goods. The products include maize and other cereals, flours, sugar, rice, beer, coffee, tea, tobacco, salt, gypsum, limestone, cement, petroleum oils, silicates, and rolled iron. International traffic comprises of exports to global markets of commodities such as coffee, hides and skins, fish, tobacco, cotton, oil seeds, cereal flour, minerals, and vegetable products. Imports from abroad include petroleum oils, cement, wheat, palm oil, iron/steel, clothing, sugar, ceramic tiles, and motor vehicles. Haulage is mostly by trailer trucks and road tankers (fuel trucks).

Railway transport is also used within the Nile Basin region and is predominantly used for ferrying bulk commodities for long distances over land, are cost-effective and are well suited to container traffic between ports and capitals. It mostly handles export traffic relating to coffee, cotton, tobacco, tea, and cereals; and import traffic related to machinery, electronic equipment, cement, iron and steel, and containers (containerized traffic). Maritime transport is also another mode of transport and is the most dominant mode of transport for moving freight between the Nile countries and the global market. Sea transport has a significant cost advantage over surface transport for dry and liquid bulk cargoes or containerized cargo. As previously discussed, further development of the bulk transport system across in the Nile Basin could have far reaching social and environmental negative impacts which need to be highlighted and possible mitigations prescribed for them to reduce the impact.

3.2.7. HIV/AIDs Prevalence

HIV prevalence varies markedly across the Nile Basin countries. The highest HIV prevalence rates are concentrated among the youth between the age of 15-49 years. According to the World health organization, the high-risk ages for women and men are between 15 and 24 years, and between 25 and 34 years, in their respective orders. The two most important risk factors are heterosexual contact and having sexually transmitted infections. Women constitute the majority of HIV infected adults and teenage girls are infected at a higher rate than boys. Sudan is the country with the lowest prevalence for HIV/ AIDS, below 0.2 percent.

Table 3-6: HIV/AIDS Prevalence in the Riparian Countries

Country	HIV/AIDs prevalence rate (%)
Burundi	1.1
Ethiopia	1.1
Kenya	5.4
Democratic republic of Congo	0.8
Uganda	7.3
Rwanda	3.1
Tanzania	4.7
Sudan	0.2
South Sudan	2.5

Source: WHO country profiles 2019

It is imperative to note that, HIV/AIDS has far-reaching adverse effects on the economic, cultural, and social spheres of society. The epidemic drains the economy of the country as funds need to be diverted to treat the infected patients. It is also a great economic burden on individual families with HIV/AIDS as a significant portion of the income needs to be spent on treatment procedures. High prevalence of HIV/AIDS cripples the entire society and reduced the nation's productivity. Implementation of the Nile cooperation for Climate Resilience Project will need to have an HIV/AIDs management strategy to mitigate the risk of spreading the disease.

3.2.8. Sexual and Gender based violence Justification of wife beating by spouses

Understanding the norms that govern a society can provide clues to the underlying causes of violence and how it can be prevented. For example, in certain cultures violence may be perceived as a normal and acceptable way to resolve conflict. Data on attitudes towards wife-beating offer clues on how girls and women are perceived within

a given society. The table below shows the percentage of girls and boys 15–19 years' old who consider a husband to be justified in hitting or beating his wife for at least one of the specified reasons, i.e., if his wife burns the food, argues with him, goes out without telling him, neglects the children or refuses sexual relations. From the data, majority of the women perceive it to be right for a husband to physically beat them when they are at fault be it trivial or something serious. This is indicative of the degree of social acceptance of such practices which propagates and exacerbates gender based violence.

Table 3-3: Attitudes and perceptions

Country	Male(%)	Female(%)
Burundi	48	63
Ethiopia	33	60
Kenya	37	45
Democratic republic of Congo	69	75
Uganda	53	58
Rwanda	24	45
Tanzania	50	59
Sudan	-	36
South Sudan	-	72

Source: WHO country profiles 2019. Note: (-): Data not available

3.2.9. Intimate partner violence

Intimate partner violence includes any physical, sexual or emotional abuse perpetrated by a current or former partner within the context of marriage, cohabitation or any other formal or informal union. Although both girls and boys can be victims, girls are at greater risk. Violence against girls and women persists for many reasons and one of the contributing factors is the widely held view that girls and women have low status in society and are expected to comply with, and conform to, certain defined gender roles of devoted mothers and wives. When such roles are not fulfilled, partner violence is seen as a justified form of punishment. Notably, in Africa it is commonplace and although documented, some cases go unreported because of the cultural beliefs and norms which render it a taboo to report such cases to relevant authorities. In the table below, the percentage of ever-partnered girls aged 15 to 19 years who have experienced physical and/or sexual violence by a current or former intimate partner during the last twelve months is shown.

Table 3-4: Experience of partner violence

Country	Partner violence for girls between 15-19 years (%)
Burundi	38
Ethiopia	24
Kenya	23
Democratic republic of Congo	36
Uganda	31
Rwanda	-
Tanzania	30
Sudan	-
South Sudan	-

Source: WHO country profiles 2019: Note: (-): Data not available

Status of Child Labor

Children around the world are routinely engaged in paid and unpaid forms of work that are not harmful to them. However, they are classified as child laborers when they are either too young to work or are involved in hazardous activities that may compromise their physical, mental, social or educational development. In the least developed countries, slightly more than one in four children (ages 5 to 17) are engaged in labor that is considered detrimental to their health and development. The issue of child labor is guided by three main international conventions: The International Labor Organization (ILO) Convention No. 138 concerning minimum age for admission to employment and Recommendation No. 146 (1973); ILO Convention No. 182 concerning the prohibition and immediate action for the elimination of the worst forms of child labor and Recommendation No. 190 (1999); and the United Nations Convention on the Rights of the Child. These conventions frame the concept of child labor and form the basis for child labor legislation enacted by countries to which riparian countries are signatories. The table below shows the prevalence of child labor of children between 5-17 years and it shows that both under-age boys and girls are victims of child labor in all the riparian countries with Ethiopia having the highest percentage (49%) and (51%) under-age males and females in employment respectively.

Table 3-5: Prevalence of child labor

Country	Male (%)	Female(%)
Burundi	31	30
Ethiopia	49	51
Kenya	-	-
Democratic republic of Congo	27	22
Uganda	18	17
Rwanda	19	17
Tanzania	24	25
Sudan	18	20
South Sudan	-	-

Source: UNICEF country profiles 2019: Note: (-): Data not available

3.2.10. Prevalence of sexual violence in riparian countries

Sexual violence is one of the most unsettling of children's rights violations. As such, it is the subject of dedicated international legal instruments aimed at protecting children against its multiple forms. Acts of sexual violence, which often occur together and with other forms of violence, can range from direct physical contact to unwanted exposure to sexual language and images. The table below shows the percentage of women and men aged 18 to 29 years who have experienced sexual violence by age 18. From the data below it is evident that the percentage of women who have experience sexual violence before the age of 18 is more than that of men. Given this trend, it is imperative the project design, devises mitigation measure against any form of sexual violence against women and men.

Table 3-6: Incidence of sexual violence in riparian countries

Country	Male (%)	Female (%)
Burundi	**0.2**	**4**
Ethiopia	-	5
Kenya	2	4
Democratic republic of Congo	-	13
Uganda	1.3	5
Rwanda	0.1	10
Tanzania	-	7
Sudan	-	-
South Sudan	-	-

Source: UNICEF country profiles 2019: Note: (-): Data not available

3.2.11. Violence against children

Violence against children takes many forms, including physical, sexual, and emotional abuse, and may involve neglect or deprivation. Violence occurs in many settings, including the home, school, community and over the Internet. Similarly, a wide range of perpetrators commit violence against children, such as family members, intimate partners, teachers, neighbours, strangers and other children. Such violence not only inflicts harm, pain and humiliation on children but it also kills. All children have the right to protection from violence, regardless of the nature or severity of the act and all forms of violence can cause harm to children, reduce their sense of self-worth, affront their dignity and hinder their development. Therefore, project design should be cognizant of these issues and work towards averting them before, during and after project implementation.

3.2.12. Violent discipline

Violent discipline at home is the most common form of violence experienced by children. While teaching children self-control and acceptable behaviour is an integral part of child rearing in all cultures, many caregivers rely on the use of violent methods, both physical and psychological, to punish unwanted behaviour and encourage desired ones. In the Nile basin existing data reveals that Burundi has the highest percentage of children aged 1-14 years who experience any violent discipline by both genders.

Table 3-7: Violent Discipline among the Riparian Countries

Country	Male (%)	Female (%)
Burundi	91	89
Ethiopia	-	-
Kenya	-	-
Democratic republic of Congo	82	81
Uganda	85	85
Rwanda	-	-
Tanzania	-	-
Sudan	65	63
South Sudan	-	-

Source: UNICEF country profiles 2019: Note: (-): Data not available

3.2.13. Child marriage in riparian countries

Marriage before the age of 18 is a fundamental violation of human rights. Many factors interact to place a child at risk of marriage, including poverty, the perception that

marriage will provide 'protection', family honour, social norms, customary or religious laws that condone the practice, an inadequate legislative framework and the state of a country's civil registration system. While the practice is more common among girls than boys, it is a violation of rights regardless of sex. Data from the WHO website reveals that this practice is prevalent in the riparian countries with Ethiopia having the highest prevalence levels of child marriage (14%) below 15 years and (40%) married by 18 years of age while Rwanda has the lowest reported percentage of (7%) married before the age of 18.

It is pertinent to note that child marriage, often compromises a girl's development by resulting in early pregnancy and social isolation, interrupting her schooling and limiting her opportunities for career and vocational advancement. Although the impact on child grooms has not been extensively studied, marriage may similarly place boys in an adult role for which they are unprepared, and may place economic pressures on them and curtail their opportunities for further education or career advancement.

Table 3-8: Prevalence of child marriage

Gender	Female (%)		Male (%)	
Country	**Married by 15**	**Married by 18**	**Married by 15**	**Married by 18**
Burundi	3	19	-	1.4
Ethiopia	14	40	-	5
Kenya	4	23	-	3
Democratic republic of Congo	10	37	-	6
Uganda	7	34	-	6
Rwanda	0	7	-	1
Tanzania	5	31	-	4
Sudan	12	34	-	-
South Sudan	9	52	-	-

Source: UNICEF country profiles 2019: Note: (-): Data not available

3.2.14. Education and literacy

Ensuring inclusive and equitable education for all by 2030 is critical for all riparian countries as it has transformative effects on other sustainable development goals. SDG4 spans a spectrum of education levels, from pre-primary to youth and adult education. It emphasizes learning outcomes, skills acquisition, and equity in both development

settings. An overview of education indicators regarding attendance and completion of school in the various riparian countries is shown below.

Table 3-9: School completion rates in riparian countries

Gender	Primary		Lower secondary		Upper secondary	
Country	**Male(%)**	**Female(%)**	**Male(%)**	**Female(%)**	**Male(%)**	**Female(%)**
Burundi	46	54.1	25.7	19.4	3.6	3.4
Ethiopia	51	51	41.7	36.3	13.3	13
Kenya	77	82	61	69	44	38
DR Congo	71	66	59	49	30	21
Uganda	33	36	24	21	16	14
Rwanda	48	61	25	30	19	16
Tanzania	75	84	31	27	32	27
Sudan	71	73	45	43	34	29
S.Sudan	30	18	23	10	13	4

Source: UNICEF country profiles 2019

Literacy levels

Literacy rates among youth aged 15 to 24 and from 24 years and above is the test of an educational system, and the overall trend in the riparian countries is positive, owing largely to the expansion of educational opportunities within the countries. Regional and gender disparities still persist albeit minimal but overall literacy is higher among men than women as shown in the table below. Literacy is important in project development as it makes it easy to communicate project benefits to communities such as this one.

Table 3-10: Literacy levels by gender

Gender	15-24 years		15 years and above	
Country	**Male**	**Female**	**Male**	**Female**
Burundi	88	88	-	-
Ethiopia	-	-	-	-
Kenya	-	-	85	78
Democratic republic of Congo	-	-	-	-
Uganda	89	90	83	71
Rwanda	84	89	78	69
Tanzania	-	-	-	-
Sudan	73	73	65	56
South Sudan	48	47	40	29

Source: UNICEF country profiles 2019: Note: (-): Data not available

4. RELEVANT NATIONAL AND INTERNATIONAL POLICIES AND REGULATORY FRAMEWORKS

4.1. Country Policy Framework

The implementation of the project and the environmental and Social Management Plan will be guided by the laws and policies of each of the Nile Basin member countries. Each country has provisions pertaining to how they handle environmental and social impacts that emanate from development projects. The hydromet stations are subject to potential impacts on the environment and the society. The policy frameworks assessed for the different countries include country based national policies as outlined below, per country.

In **Burundi,** The National Water Policy, Vision 2025, the Burundi National Development Plan and the National Forestry Policy are the critical policy documents that will be used as a guide during project implementation and planning to ensure proper impact reduction. These policies are all aimed at ensuring sustainable management and protection of environmental and water resources in Burundi. The **DR Congo** has a lot of natural resource wealth. When this is coupled with good governance, resource rights and proper environmental conservation and protection, sustainable development can be galvanised to enable the Congolese people to benefit from their immense natural wealth. In **Ethiopia,** The Environmental Policy of Ethiopia (1997) provides guiding principles requiring adherence to principles of sustainable development and ensuring proper Environmental Impact Assessment and planning is conducted for all development projects. Other relevant policies include The Conservation Strategy of Ethiopia; Federal Government of Ethiopia Water Resources Management Policy (1999); and the Biodiversity Conservation and Research Policy (1998). These policies provide a critical reference point for the project towards sustainable environmental management and ensuring minimal environmental impacts during and after project implementation.

In **Kenya,** The National Environment Policy 2013 provides a framework for an integrated approach towards sustainable management of natural resources and the environment. This policy, in conjunction with other policies like National Policy on Water Resources Management and Development, The Kenya National Adaptation Plan 2015-2030, The Policy Paper on Environment and Development, and the National Shelter Strategy to the year 2000 all have a common goal, which is to provide a better

quality of life to the present and future generations through sustainable management of the environment. **Rwanda** has provisions which guide environmental and social impacts which emanate from development projects like the Hydromet project. The Rwanda National Environment and Climate Change Policy, 2019- aims to give the nation a clean and healthy environment that is resilient to climate variability and change that supports a high quality of life. In addition to this, the other policies that ensure environmental conservation in the country include National Policy for Water Resources Management, 2011, Rwanda Vision 2020 that aspires to transform Rwanda to high living standards which also incorporates the environment sector, Biodiversity Policy and the Land Policy, 2004. These policies have specific guidelines on the sustainable use of natural resources and are relevant to the project to ensure that it promotes green technology, promotes climate change adaptation, adheres to water resources management and land issues. In **South Sudan,** the National Environmental Policy, 2015-2025 is the focal policy in the country dealing with environmental issues. It contains provisions for ensuring protection, conservation, and sustainable utilization of the natural resources in the country. It also fosters proper water resources management, environmental planning, climate change adaptation and mitigation and proper environmental and social impact assessment towards sound environmental management. Other relevant policies include Disaster Risk Management Policy, the National Water Policy, The Forest Policy 2014, the Draft Policy on Wildlife Conservation and Protected Areas 2012, and the South Sudan Vision 2040. These policy documents provide a critical reference point for the project towards sound planning and strategies aimed at reducing environmental impacts during and after project implementation.

In **Sudan,** the National Water Policy 2006, Forest Policy, National Water Supply and Sanitation policy 2009, Natural Resource Management Policy and the National Action Plan to Combat Desertification are the relevant policy documents towards ensuring sustainable utilization and management of environmental resources in Sudan. These policies provide a critical reference point for the project towards sustainable environmental management and ensuring minimal environmental impacts during and after project implementation. In **Tanzania,** The National Environment Policy, NEP (1997) provides policy guidelines to address Tanzania's top agenda of sustainable development. The Hydromet project is highly likely to have environmental and social

impacts to the environment and the employment of such relevant policies will help mitigate and prevent these impacts from taking place. Other policies relevant to the project include the National Environment Action plan, National Land Policy, National Forest Policy, National Water Policy and National Wildlife Policy. These policies have provisions that are relevant to the project in issues such as climate change adaptation, sustainable water resources management, land use management and the sustainable use of natural resources. In **Uganda,** there are several state policies that are relevant to the hydromet stations project development activities. The National Environment Action Plan aims to provide sustainable economic and social development that enhances environmental quality and resource productivity on a long-term basis to serve both the present and the future generations. Others include the Water Action Plan and the Uganda vision 2025. It is a requirement that all aspects of implementation of the Hydromet project complies with these policies to enhance sustainable development.

4.2. Nile Basin Initiative Policies

4.2.1. NBI Environmental and Social Policy June 2013

This policy addresses critical environmental and social issues and challenges. In addition, it provides guiding principles, specifies targets and priority outcomes and introduces policy interventions. The policy also enhances implementation arrangements and fosters cooperation which ultimately maximizes the values and benefits of the Nile water resources towards sustainable development. This policy is relevant to the project since it will guide the project on the proper actions to take to either prevent environmental impacts or prevent them altogether to foster sustainable development.

4.2.2. NBI Wetland Management Strategy June 2013

This strategy primarily focuses on the trans-boundary management of Nile Basin wetlands to guide and ensure they are sustainably utilized and to enhance their contribution towards the common benefit for the Nile Basin. The main objectives of the strategy are to strengthen the knowledge on wetlands of transboundary importance in the Nile Basin, raise awareness on the importance of wetlands, and strengthen national policies and institutional capacities on the management of wetlands and to develop a

basin-wide approach for the corporate and sustainable management of wetlands. This policy is relevant to the project as it will provide guidance towards the protection of water resources and mitigation of any impacts that arise during and after project implementation.

4.2.3. NBI Communication and Stakeholder Engagement Strategy 2018-2023

The strategy was built from the 2012-2016 strategy policy for the purpose of building on the successes and addressing its shortcomings. It contributes to the achievement of the six strategic goals of the NBI through cross-cutting the strategic direction 6.5 that basically aims to build a consensus among the member countries' public and stakeholders for cooperative basin development and management. The main objectives of the strategy are to create a foundation for a constructive and factual dialogue on Nile Basin issues and to also access a buy-in for the operations of NBI to better address the challenges in the Nile Basin. This particular strategy is relevant to the project as it will ensure that the challenges of the project are heard, considered and ultimately addressed by the relevant stakeholders.

4.2.4. NBI Information Disclosure Policy

The Policy on Information Disclosure is premised on the principles derived from regional and international laws and standards and evolving member states' experience on information disclosure. The main objective of the policy is to disclose all information in its possession while protecting the confidentiality of sensitive information. The information is made available to the public either upon request or on a routine basis. The policy is relevant to the project in the sense that all information pertaining the project will be within the reach of the public. The public will have knowledge of all the activities and decisions that were made during the implementation of the hydromet stations in the member countries. In addition to this, long-term sustainability of data and information sharing is paramount to getting the benefits envisaged from the Nile monitoring.

4.2.5. NBI Climate Change Strategy June 2013

The strategy was developed following the need for climate change adaptation and mitigation. The strategy is essential to the landscape of NBI policies, strategies and guidelines and most significantly, it complements the national efforts of the NBI member countries. Its primary focus is on transboundary water resources management as a key element in climate change adaptation in the region. The main goal of the strategy is to strengthen basin-wide resilience to climate change and ensure climate compatible water resource management and development. In line with the strategy's goal and objectives, the project will benefit from the guidelines of these provisions to ensure that climate change is mitigated and that water resources are sustainably utilised.

4.2.6. NBI Strategy for Management of Environmental Flows

Environmental flows are the quality and quantities of water required to make an aquatic ecosystem to enable it to continue to serve its purpose. The major goal of this strategy is to facilitate and develop a culture of incorporation of collaborative, best practice E-flow management into the water resource planning, management and policies of the member countries to ultimately establish an integrated, basin scale E-flows management system. This strategy is relevant to the project as it will provide guidance towards ensuring water resources is sustainably utilized.

4.3. Institutional framework

4.3.1. Regional Institutions

The NBI's various divisions will be instrumental in ensuring implementation of the project in each of the Nile riparian countries in their own capacities. The Nile Council of Ministers (Nile COM) has the responsibility of ensuring the contribution of the member countries to the activities of the organization for the success of efforts towards sustainable management of the Nile water resources. Creating a platform for cooperation is a crucial component of the project. On a larger scale, the Nile COM ensures a larger platform for member countries' cooperation in projects and programmes for the Nile. The Nile Technical Advisory Committee (Nile TAC) is instrumental in technical backstopping and offering valuable management advice and development actions related to the project so as to ensure minimal impact and

optimization of benefits both socio-economic and environmental. The Nile TAC is made up of country representatives from national institutions of each member country. These institutions are responsible for implementation, and monitoring of related development projects. The Nile TAC will therefore be instrumental in facilitating stakeholder interactions within the project countries, and provide advisory on the best possible strategies to engage in implementation of the project components.

Nile Secretariat (Nile SEC) will be responsible for implementation of the first component of the project i.e. advancing the Nile basin-wide cooperation. The main functions of Nile SEC are facilitating cooperation and informational services, which places it at a better position to strengthen the platform for basin-wide cooperation; facilitation of information services for climate resilience investment planning; and enhancement of the availability and use of water quality data. The other divisions include Eastern Nile Subsidiary Action Program Team (ENSAPT), Nile Equatorial Lakes Subsidiary Action Program Coordination Unit (NELSAP-CU) and Eastern Nile Technical Regional Office (ENTRO). NELSAP will be involved in the implementation of the second component of the project which is improving mechanisms for cooperation in the Nile Equatorial Lakes region. With support from the other project implementing partners, NELSAP will advance cooperative water management and development actions in the Nile Equatorial Lakes (NEL) region. ENTRO will be involved in implementation of the third component of the project, on improving mechanisms for cooperation in the Eastern Nile. ENTRO will be supported in promoting cooperation among Eastern Nile riparian countries through the provision of flood and drought risk services, strengthening dam safety, and strengthening the network of youth and professionals in the sub-basin.

Nile Basin Discourse (NBD) will also be instrumental in the implementation of the project. NBD will be responsible for the fifth component of the project, enhancing stakeholder engagement in the Nile Basin in an effort to improving cooperation and shared understanding of water related issues in the Nile Basin. Other regional organizations such as the Lake Victoria Basin Commission (LVBC) will also play a key role in the successful implementation of the project. LVBC is a specialized institution for the East African Community that is based in Kisumu, Kenya and works in the five EAC

Partner States. Their mandate is the coordination of sustainable development and management of the Lake Victoria water resources. The LVBC will be instrumental in implementation of the fourth component of the project, on water quality monitoring in the Lake Victoria sub-basin. The LVBC will work together with the partner states and NELSAP to identify and clarify opportunities of harmonizing policies which are related to water quality management in the Nile Equatorial Lakes (NEL) region.

4.3.2. Development partners such as the GIZ and World Bank

GIZ, through their Safeguards and Gender Management System enables the identification of potential risks to be identified at an early stage through scrutinizing planned projects to assess potential and unintended impacts. The GIZ is funding this component of the project, and therefore, their safeguard policies on the planned project activities shall ensure that all potential environmental and socio-economic risks emanating from the project are dealt with. The World Bank has keen interest in the protection of the environment especially for projects supported by the Bank. These projects have to be in line with the World Bank environmental and social standards (ESS). These standards provide guidelines which are aimed at preventing damage to the environment as a result of the project's activities. In preparation of this ESMP, the role of the World Bank is critical in ensuring that all the relevant ESSs are followed to the latter, and any potential impacts are accompanied by appropriate mitigation strategies.

4.3.3. Country Based Institutions

In **Burundi,** the operations of the institutional arrangements of the country are stipulated in the Code of the Environment. The ministry is overall in charge of all the environmental issues, in conjunction with the Burundian Office of Environmental Protection and the Geographic Institute of Burundi. **In DR Congo,** the policies governing the environment include the National Policy of Water Resources and Sustainable Management that is enforced by institutions like the Ministry of Environment and Sustainable Development. **In Ethiopia**, the environmental institutions which are critical for providing guidance during project implementation towards ensuring adherence to environmental standards and guidelines by the project include Ministry of Environment, Forestry, and Climate Change; and Sectoral Environmental Units.

In Kenya, the institutions like National Environment Management Authority, National Environmental Complaints Committee and the Ministry of Energy are all geared towards the same objective of sustainable development. Other relevant institutions include the Ministry of Environment and Forestry, the Water Resources Authority (WRA) and the Ministry of Public Service, Gender and Youth Affairs. These policies and institutions are critical to the project as they shall be employed in guiding the project towards proper environmental management and reducing environmental impacts during and after project implementation. **In Rwanda,** the Ministry of Environment is responsible for environment, climate change, and natural resource management at local and national levels. The guidance it provides will see to the sustainable implementation of the project activities, as per the ESMP. Other relevant institutions include Rwanda Environmental Management Authority, Ministry of Lands, Forests, and Mines; and Ministry if Infrastructures. In **South Sudan,** the institutions responsible for environmental protection and management which are critical for the implementation of the project activities include, but not limited to the Ministry of Environment and Forestry, Ministry of Water Resources and Irrigation, South Sudan Land Commission, South Sudan Directorate of Metrological Services and the Ministry of Humanitarian Affairs and Disaster Management.

Environmental institutions in the **Sudan** are also critical to the project in terms of providing guidance and strategic planning and management backstopping towards sound project implementation in an effort to reduce environmental impacts and optimize socio-economic and environmental benefits from the project. The relevant institutions include the Higher Council for Environment and Natural Resources; Ministry of Environment, Forestry and Physical Development; The National Drought and Desertification Control, Coordination and Monitoring Unit; Ministry of Water Resources; and The Forests National Corporation. **In Tanzania,** the key institutions that will be critical in implementation of the ESMP include the National Environmental Management Council, the Ministry of Land, Housing and Human Settlement Development, Ministry of Water and Irrigation and Occupational Safety and Health Authority. **In Uganda**, institutions such as the National Environment Management Authority are responsible to seeing to the enforcement of environmental and social impact assessment guidelines and standards. Other institutions which will be relevant

to the success of the project in terms of implementation of the environmental management plan include the Ministry of Water and Environment.

4.4. Country Regulatory Frameworks and ESIA Procedures

4.4.1. Legal Framework

The following laws will be applicable to the management and implementation of the project. In developing this Environmental and Social Management Plan, and implementing the project, they will be used as reference points for the proper actions to be taken in ensuring all potential environmental impacts emanating from the project are well dealt with.

Burundi: The Environment Code of the Republic of Burundi (2000) lays down the basic rules for environmental protection and management against all forms of degradation to safeguard and enhance rational exploitation of natural resources to address resources and scarcity and pollution. This law provides for the need of every development project to undergo ESIA to mitigate impacts. Water Code 2012 gives water utilization and control guidelines to promote agriculture and livestock production and ultimately enhance capacity building in the water sector. Other laws in the Country include; Land Act 1986, Law n°102 of 25th March, 1985, and the August 2011 Land Code.

DR Congo: The Constitution of the Democratic Republic of Congo of 2006 guarantees the right to a healthy environment. Also, it provides for the provision of the classification of public spaces for conservation. Order No. FB/0030/98 of 19 May 1998 establishes a guideline for water resources utilization, access, and management. The other laws include; Law no. 11/009 (2011) that provides for the basic principles of environmental protection, Law no. 14/003(2014) proposes innovation for conservation like public participation in the decision-making process.

Ethiopia: The Constitution of the Federal Democratic Republic of Ethiopia includes the concept of improved living standards, sustainable development, and rights to a clean and healthy environment. The FDRE Water Resources Management Proclamation (2000) ensures pollution control in the nation's water resources and that they are conserved and protected from harmful impacts coming from development projects and other sources. Other laws include; The ANRS Rural Land Proclamation no. 133/2006, Proclamation 94/1994 on Forest Conservation, and Proclamation no.315 of 2003 on fisheries conservation.

Kenya: The laws which govern the environment include the Constitution of Kenya, 2010 which is the overall legal instrument backing Environmental management for the benefit of the society. It Provides requirements for all development projects to take environmental impacts into consideration through ensuring an appropriate environmental management plan is in place. The other laws include section 58 of the Environment Management and Coordination Act, 2015; the Wildlife Conservation and Management Act, 2013; The Water Act 2016; Fisheries Management & Development Act 2016 (Cap 378); The Physical and Land use planning Act 2019; and Forest Conservation & Management Act, 2016.

Rwanda: The constitution of the Republic Rwanda (2003) is the supreme law of the land, which provides that every citizen holds the right to live in a clean, safe, and satisfactory environment. It goes further to ensure that each individual's responsibility is to safeguard, protect, and secure environmental promotion. The water law no. 62/ 2008 widely embraces the principles of sustainable water resources utilization and management in the contemporary era. Other laws relevant to the project include Organic Law 2005, organic law on the environment no.4/2005, National Forest Law 2010, The Organic Land Law, 2005, and ii.2.4. Law n° 43/2013 of 16/06/2013 Governing Land in Rwanda.

South Sudan: The constitution of South Sudan is the supreme law in the Country. Section 2 of the constitution states that every individual has the right to an environment subjected to sustainable development achieved through pollution prevention, conservation, and sustainable use of natural resources. Environmental Protection Bill 2013 provides for the preparation of National Environment Action Plans, Designation of Environmental Sensitive Areas, and protection against impacts of development. the other laws include; Wildlife Conservation and Protection Bill (2015), the Draft Water Bill 2015, which provides for the protection of water resources from the adverse impacts of development projects. Other laws include The Forestry Commission Act, Wildlife Conservation and Protected Areas Bill 2010, Land Act 2009.

Sudan: The Constitution of the Sudan provides for the right to a clean and diverse environment. The Environmental Protection Act of 2001 has guidelines of the regulations of setting environmental, combating pollution, and the protection of biodiversity. There is also the Water Resources Act of 1995, The Forest and Renewable

Natural Resources Act 2002, Wildlife Conservation and National Parks Act, and The Title of Land Act of 1889.

Tanzania: The Environmental Management Act (EMA) NO.20 (cap.191) 2004 is the principal legislation governing Tanzania's environmental management. It provides a legal framework for coordinating harmonious and conflicting activities by integrating these activities into the overall sustainable environmental management system by providing critical technical support to the sectoral ministries. The Act is relevant to the project considering the project is likely to negatively impact the environment. The Country is also governed by other laws relevant to the project, like The Water Resources Management Act (2009), whose main objective is to ensure that the nation's water resources are protected, developed, conserved, and managed in ways that are according to fundamental principles. Other laws include the National Environment and Management Act (2004), The Forest Act no.14 of 2002, The Wildlife Conservation Act (2009), Land Act Cap 114 no 4 of 1999.

Uganda: The National Environment Act 2019 provides for the management of the environment for the ultimate goal of sustainable development. The National Environment Management Authority is the monitoring, coordinating, regulatory and supervisory body for all the issues relating to the environment. It provides for all projects to undergo EIA and also provides penalties for the offenses under the Act. The Water Act, 2016 (CAP 372) ensures the sustainable management of water resources and sanitation and management. Other laws relevant to the project include The Land Act 1998, The Water Act (1995), The National Forestry and Tree Planting Act 2003, and Wildlife Act 2019.

4.4.2. Country Specific ESIA Procedures

Burundi: The requirements for Environmental and Social Impact Assessment for development projects are stipulated in Chapters II, III and IV of the decree of the Environment and the ministerial decision No. 70/983. The institution mandated to approve or disapprove development project on grounds of Environmental and Social Impacts is the ministry of environment. The procedure of ESIA in Burundi starts with environmental screening, upon which a decision is made on whether the project needs to undergo a full ESIA. This is followed by scoping, then conducting the ESIA study including stakeholder participation. Article 16 of the Environment code outlines the

contents of the ESIA report, including the environmental and social management plan. The report is then submitted to the ministry of environment for review following the guidelines outlined in articles 25, 26 and 27 of the environmental code. The review process is supposed to take not more than 3 months after the final day of the public participation phase. After decision has been made, a certificate of approval is then issued which stipulates the justification and standards to be met following the implementation of the project. Monitoring of the progress of the project with regards to implementation of the Environmental and Social Management Plan follows.

DR Congo: The national laws that govern ESIA include sections 53, 54, 93 and 123 of the Constitution; Law No. 11/009 0f 09 July 2011 that outlines the fundamental principles that are related to environmental protection; and Decree No. 14/019 of 02 August 2014 which lays down the operating rules for procedural mechanisms that are related to environmental protection. The procedure for the ESIA includes the project proponents submitting a screening request to the Congolese Environmental Agency (ACE) which then makes the decision whether the project requires a full ESIA or not. If necessary, the project is then taken through an ESIA study and the ESIA report, which comprises of the Environmental and Social Management Plan, are submitted to ACE. The ACE then establishes a panel of experts who are tasked with reviewing the report. The panel can then approve the report, reject it, or ask for amendments to be made. If the project is approved, the proponent is again asked to submit a more elaborate ESMP which is again reviewed by the ACE. When both the ESIA report and the final ESMP are approved, the project is then issued an environmental certificate allowing the project to commence.

Ethiopia: Most of the duties and responsibilities have been delegated to the state level on account of the nation being a federal republic. The ESIA procedures are guided by the EIA proclamation, 2002. The decisions and review are undertaken by the Environment, Forest and climate Change Commission. The initial step for the ESIA is a screening, which is done in the form of an Initial Environmental Examination (IEE), as suggested by the EIA guidelines. Scoping is a voluntary step, which may be forgone. Then the ESIA study is conducted. The report and ESMP are then taken for review and decision making. When the project has been approved, an environmental clearance licence is then issued. Finally, compliance monitoring is then done during and after the project has been implemented.

Kenya: Environmental and Social Impact Assessment is imperative for the fulfilment of the legislative requirements of the Environmental Management and Coordination Act (EMCA) 2015, the Kenya Gazette Supplement in Environmental Impact Assessment. According to EMCA 2015, all new projects have to undergo an Environmental Impact Assessment study so as to be in compliance with the EIA Regulations 2003 and ensure there are provisions in place for environmental protection. In conducting an ESIA, the main objective is ensuring compliance with all the regulations and guidelines as stipulated under EMCA 2015. All projects which fall under the second schedule of the Act have to undergo a comprehensive ESIA Study. The approach of the study has to include environmental screening, scoping, review of relevant documents, site assessments, public consultations and participation, conducting impact assessment and determining mitigation measures; developing an environmental and social management and monitoring plans, reporting then submitting the reports to the National Environment Management Authority for Approval. This is then followed by obtaining an appropriate licence from the National Environment Management Authority to proceed with the project, which is subject to confirmation that all the ESIA requirements have been met by the project.

Rwanda: The Environmental Organic Law (2005) requires development projects to undertake an Environmental and Social Impact Assessment at their own cost before starting or financing a project. The types of project which require an ESIA are listed, and for the listed development projects, the law prohibits any work to commence without a valid EIA certificate. The scope of ESIA studies is based on legal requirements as per the Rwanda Environmental Management Authority (REMA)'s EIA guidelines 2006. The procedure for conducting an ESIA in Rwanda incudes developing a project brief, submission and registration of the project, screening, scoping and consideration of alternatives, collection of baseline data and analysing the initial state, impact prediction and analysis of alternatives, preparation of the ESIA report including an environmental and social management plan, holding a public hearing, review of the ESIA report by REMA, decision making and issuance of a certificate of approval and then implementation of the EMSP, and monitoring by both the project and REMA.

South Sudan: The ESIA process has not yet been legally established. The Ministry of Environment is the institution that deals with EIA issues in the country. The Draft Environmental protection bill gives direction on how the legal requirements of the ESIA

should be established. It also makes provisions on the screening, assessment, review and monitoring processes. Upon reparation of the ESIA report, it is submitted for review to the ministry, which takes approximately 45 days. The decision is then made, a certificate of approval awarded, the project commences, then finally compliance monitoring is conducted.

Sudan: It is a requirement by the government that development projects should undergo an Environmental and Social Impact Assessment. The Environment Conservation Act, 2001 highlights specific issues which need to be considered in Environmental Impact Assessments in Article 18. The provisions of the Act are implemented by the National Council for the Environment. The procedure includes screening, scoping, conducting the assessment, then the ESIA report, along with the ESMP are submitted for review and decision making.

Tanzania: An ESIA is a requirement pursuant to the Government of Tanzania Environment Impact Assessment and Audit Regulations, 2018. The procedure involves a registration of the project with the National Environment Management Council, which is an application for an environmental permit. Then follows an environmental screening of the project which is done to determine whether the ESIA is required or not. Upon decision by the National Environment Management Council (NEMC) on moving forward with a full ESIA, scoping is conducted, and then the ESIA study is done, and then follows a preparation for the Environmental and Social Impact statement; and an Environmental and Social Management Plan (ESMP). This is then submitted to the NEMC for approval, and obtaining an EIA certificate of approval. Then the ESMP has to be implemented as stipulated in the certificate, this will follow subsequent monitoring, self-audit and finally a control audit by the NEMC.

Uganda: Applicable ESIA regulations are based on two considerations. One, projects which require limited ESIA, these are low impact projects, and projects which require a full ESIA. According to the schedule 4 projects, which require limited ESIA, a project brief is submitted to the National Environment Management Authority that follows the guidelines stipulated in the National Environment Act, 2019. The decision is made by NEMA based on the brief. According to schedule 5 and 10, the projects which require a full ESIA, higher impact projects, a more elaborate procedure is employed. This involves scoping and ToR, consideration of the ToR by NEMA, conducting the ESIA study which also includes stakeholder consultations, development of a comprehensive ESIA report

which includes an Environmental Management Plan, then submission of the statement to NEMA. The statement is reviewed in consultation with the lead agency and the public. NEMA then makes the decision which will either lead to a rejection of the project, withholding decision awaiting a public hearing and settling further requirements or issuance of an Environmental certificate of approval. Upon approving, the NEMA takes the responsibility of conducting on-site inspection and monitoring to ensure that the project is in compliance with the conditions stipulated in the certificate of approval.

4.5. Relevant International and regional Environmental Agreements

The project will take cognisance of the multilateral Environmental Agreements and International Conventions which have been signed and ratified by the different member states. Some of these include The Ramsar Convention, The Convention on the Prevention of Marine Pollution, Convention on Biological Diversity, Convention on International Trade in endangered Species of wild Fauna and Flora (CITES), The world Heritage Convention; United Nations Framework Convention on Climate Change (UNFCCC); Treaty for the establishment of the East African Community (EAC); Convention to Combat desertification; African convention on the conservation of nature and natural resources; Treaty of the Central African Forest Commission (COMIFAC Treaty); and Ramsar Centre for East Africa (RAMCEA).

4.6. Applicable GIZ Safeguards and Gender Management System

GIZ supports a multitude of social and environmental change processes through projects and programmes which are prone to emanating a range of risks related to the staff, society, the environment and even commercial aspects. There have to be checks and balances in place during the implementation of a project to ensure that the making improvement on one side does not cause deterioration on the other side. As such, the GIZ Safeguards and Gender Management System are meant to collate, analyse and minimize the potential risks. The relevant components of the system triggered by the project are indicated in the table below.

Table 4-1: Relevant GIZ Safeguards and Gender Management System

GIZ Safeguard Policies	Relevance to the Project
GIZ Sustainability Policy	Ensuring appropriate management of environmental and socio-economic risks related to the project. The project has the potential to negatively impact biodiversity, and local economic activities.

Human Rights	The project might infringe on rights of people to land use, and issues of protection against discrimination at work. This standard will provide a guideline towards ensuring that the risks are well managed.
Environment, Climate Change Mitigation	The project will involve vegetation clearing in some sites that are significant for climate change mitigation. Measures will be taken to ensure that this risk is well managed in accordance to the standard.
Environment, Climate Change Adaptation	Climate change will have an impact on the project in terms of floods barring accessibility to some hydromet stations. There are also environmental and socioeconomic impacts of the project that may affect ecosystem and human adaptability. These standards will ensure that such risks and impacts are well managed.
Conflict and Context Sensitivity	The project has a potential of causing conflicts especially in relation to land ownership and land use issues at the local scale. These standards will enable proper risk management towards ensuring that the activities are more sensitive to possible conflicts and enable proper mechanisms for conflict resolution including grievance redress mechanisms.
GIZ Gender Strategy	Gender equality is an important aspect of the project. The potential for gender discrimination is likely owing to the nature of the rural setup where the project will be implemented. As such, the policy/standard will guide towards development of an effective mechanism towards ensuring gender sensitivity is addressed on all project components.

4.7. Applicable World Bank Environmental and Social Standards

The current environmental and social standards (ESS) of the World Bank outline a mechanism through which potential and realized environmental and social impacts should be handled prior to, during, and after implementation of the project. The following ESSs are considered in preparation of this ESMP, against the potential impacts of the Hydromet project. The following are the relevant World Bank ESSs triggered by the project:

Table 4-2: Applicable World Bank Environmental and Social Standards

World Bank ESS	**Relevance to the Project**
ESS1 Assessment and Management of Environmental and Social Risks and Impacts	As stipulated, it is the responsibility of the Nile Basin Initiative to assess, manage, and monitor any environmental and social risks that emanate from the project. NBI has taken ample steps towards ensuring that all the potential impacts are well managed, including the development of this Environmental and Social Management Plan. This will enable the project to achieve environmental and social outcomes which are consistent with the ESSs of the World Bank.
ESS2 Labor and Working Conditions	One of the issues identifies by the project are poor payment and low levels of income of people working in the project site. The ESMP contains actions which will be undertaken to ensure that any persons working on the project during and after implementation are well compensated, and treated as is required by the World Bank ESSs.
ESS3 Resource Efficiency and Pollution Prevention and Management	Though minimal, the project has the potential of generating pollution in the water resources where it will be set up in the different countries. As such, the project will employ the use of sustainable energy sources, - solar; as well as ensuring that there is an adequate pollution prevention strategy in place for all the project sites. These measures will ensure that resource efficiency and pollution prevention is well managed throughout the project cycle.
ESS 4: Community health and safety	Thought the impacts on the health and safety of the local communities during the project life cycle from both routine and nonroutine circumstances. This will include community exposure to project-related traffic and road safety risks, diseases and hazardous materials. Measures will be taken o have in place effective measures to address emergency events and to ensure that the safeguarding of personnel and property is carried out in a manner that avoids or minimizes risks to the project-affected communities
ESS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	The project has the potential to cause disturbance to natural vegetation around the project sites. Measures will be taken to ensure that all persons who derive any livelihood from such ecosystems are not affected and the biodiversity of the area is still well conserved. The

	project recognizes the importance of environmental protection in sustainable development and has taken measures, as outlined in this ESMP, to ensure that there is no environmental destruction during the project cycle.
ESS10: Stakeholder Engagement and Information Disclosure	Substantial public approval is crucial for this project, as it the key to ensuring long term sustainability. As such, the project has put in place measures to ensure that there is active stakeholder engagement in all the countries throughout the project cycle.

5. STAKEHOLDER CONSULTATIONS AND DISCLOSURE

5.1. Overview and Purpose of Stakeholder Consultations

The participation of project stakeholders in project planning, design and implementation is now universally recognized as an integral part of environmental impact assessment. National environmental laws and the World Bank ESF standards on disclosure of information and stakeholder participation lay emphasis on enforcing the mechanism in every stage of project execution. Stakeholders are groups and individuals that are affected by or can affect the outcome of a project. As part of the Environmental and Social Assessment (ESA) process, stakeholder consultations are undertaken with primary as well as secondary stakeholders.

The purpose of stakeholder consultations is to ensure meaningful and adequate consultation with all affected or interested stakeholders in project planning processes. The ESMP preparation followed a participatory planning process with local inputs on decision–making and mitigation measures to ensure that stakeholders concerns are addressed at the project design stage. In accordance with World Bank ESF standards 2017, public consultations are essential to fulfil the following objectives:

- Exchange of information related to the project and its possible utilization in the project designing/planning and implementation;
- Ascertaining the most acceptable solutions and mitigation measures for possible issues which could arise during implementation of the project activities;
- Eliciting community comments and feedback on the proposed project;
- Facilitate and maintain dialogue with the stakeholders to gain consent on carrying out project activities in the area;
- Encourage transparency and inculcate trust among various stakeholders to gain cooperation and partnership from the communities, local leadership, and NGOs.
- Record concerns regarding the various aspects of the project, including the existing situation, project area/area of influence, construction works and the potential impacts of the construction-related activities and operation of the project.

- Incorporate mitigation measures to address concerns rose with project design and implementation.

5.2. Consultation Process

The consultation process followed for the project is detailed below:

5.2.1. Identification and Classification of Stakeholders

The identification of stakeholders is important for project sustainability and helps to evaluate and envisage the role of stakeholders. The Stakeholders Analysis refers to the local community, associated departments/agencies, Non-Governmental Organizations (NGOs) and others, whose assets/land, installations, livelihoods, interests may be impacted due to the project activities. The influence or impact of stakeholders on the project is elaborated in the form of a matrix and the mitigation measures are proposed accordingly. The stakeholders that are likely to be influenced by the project activities or would like to participate in the project. Specifically, the Nile Cooperation for Climate Resilience Project stakeholders include; i) regional and national government ministries, departments and agencies with mandates for water resources, forestry, environment, natural resources, renewable energy, land, tourism, refugee management; ii) Local Government/national authorities, iii) Private sector, iv) Research and training institutions, v) NGOs/CSOs, including community based organizations; vi) Institutions representing Vulnerable and Minority Groups; vii) Conservation Financing institutions; viii) National and international NGOs, and, Donors in water, environment, wildlife and tourism sectors (**Table 6-1**).

Table 6-1: Stakeholder categories that should be targeted for consultation during the NCCRP formulation and designing the project Stakeholder Engagement Plan

Stakeholder category	Main Interests	Magnitude of impact /Influence +ve/-ve	Remarks
Basin country Ministers of Water Resources (Nile-COM, Nile-TAC, Permanent Secretaries, National Focal Points) Energy, Environment, agriculture, Finance, Labour Foreign Affair	Project Proponent Overall project planning and implementation, supervision and monitoring	HIGH	Ensure that hydromets are well constructed within cost, quality and expectations of stakeholders
	Mandate for Sustainable community development and cultural preservation Protection of human rights and vulnerable social groups. security of livelihoods Occupational and community health and safety. Labour rights and social justice at place of work	HIGH	Should guide, harmonize, mentor and advocate for all local governments in support of the vision of government to bring about socio-economic development of the country
	Overall mandate to monitor, assess and regulate water resource Monitor and guide the use of wetlands for sustainability	HIGH	Needs to be involved during the implementation process to provide technical guidance

Media (National, Regional, International)	National media has a responsibility to inform citizens on developments of NB cooperation, challenges, and opportunities	HIGH	National media Professionals need to be engaged as they would value and contact NBI regularly for information and fact checking.
Development Partners(WB,GIZ ,IFC)	Overall project financing and compliance with relevant safeguards and monitoring. Have significant and direct influence on project activities timings and implementation, funding	HIGH	Guide on compliance with international best practices in relation to social and environmental safeguards
Legislators in national assemblies and other opinion leaders	National legislators are responsible for the Nile Support bills/legislation that favor Nile Basin cooperation	HIGH	Should be adequately sensitized about Nile trans-boundary dimension
Private sector/National business associations	Private sector is a significant Nile water resource user; Private sector has a prominent role in sustaining the Nile (e.g. mitigating CC impact, water use efficiency, investment in WRD).	MODERATE	Need to be furnished with more information about the Nile Basin to be able to articulate and communicate benefits accruing from NBI cooperation
Regional/multilateral Organizations (AMCOW, LVBC, EAC, IGAD, AU,	Through Partnering with NBI these regional organizations help to enhances efforts to	HIGH	Need to be adequately engaged and leveraged to promote NB

COMESA, SDAC, CPEGEL, ECA, UNEP, IWMI, UNESCO-IHE,	improve the lives of basin populations .		cooperation
Academia and Research institutions	Provide advice and guidance to government hydrological and metrological planning processes	HIGH	Need to be consulted throughout the project life cycle
Local governments (LG) +Local basin communities (incl. women, youth , elders, PWDs)	They are key influencers and the primary beneficiaries and can also transform into custodians of these hydromet stations vendors. They can influence choices made by project in long run and also mobilize against project. Their interests may be negatively affected by several types of land use conditions, such as the restrictions to rehabilitation activities, or conditions for the use of forests or agricultural areas	MODERATE	Need a GRM in place and project focal person
Civil Society (national, regional NGOs – NBD, NMN, NBCBN; and international– IRN	Have direct interest in HIV/AIDS, livelihoods, vulnerable groups and other related sectors They can provide supplementary support to market vendors (directly / indirectly) They conduct advocacy.	HIGH	Need to be involved in implementation process

The consultation on the draft ESMF, SEF, LMP, and ESCP were conducted physically and remotely for the 9 riparian countries during August and December 2020 and in selected regions in Kenya and Uganda in December 2020. The objective was to inform the local communities, regional administrative units, key statutory Ministries, departments and agencies about the objectives and scope of the NCCR Project, potential risks and impacts (both positive and negative) as well as the proposed mitigation measures to be incorporated into the ESMP for the project implementation.

5.2.2. Consultation Methodology

One to one meetings were conducted with the primary stakeholders. Sessions were formal to encourage friendly environment, lend credence to the consultation process, and comfortable enough for participants to express their concerns, questions and opinions about the project activities in addition to seeking clarification regarding the project. The consulting team highlighted the potential benefits of project implementation and documented any aspects, which need to be covered in detail during the execution stage. The meetings progressed in the following manner:

- A brief sub-project description was provided to the stakeholders.
- Stakeholders were given the opportunity to raise queries or concerns regarding the project.
- Queries were responded to and concerns were documented.

5.2.3. Consultation Findings and Stakeholder Concerns

Consultations were carried out with primary stakeholders in selected riparian countries specifically Uganda and Kenya at community, regional administrative units and institutional levels. This was done because of budgetary limitations and the time constraint associated with extensive, meaningful, adequate and propionate consultations. Since the construction, rehabilitation and installation of specialized equipment activities will be carried out on government owned land, stakeholders did not express any major concerns regarding land acquisition and displacement. Most of the hydrological and metrological

sites are in existence, however some are operational while others are dysfunctional. The sites are not inhabited by communities and lie within the 200m buffer zone, hence the project does not pose any major environmental and social implications. The stakeholders consulted were briefed about the proposed development of hydromet stations and asked about their concerns, views and suggestions. Consultation record and photographs are presented in summary below.

5.3.2.1. Lake Victoria at Jinja Pier Station-(UGA-001-Hyd)

The hydromet station located in Jinja at the Uganda Railways Corporation (URC) inland port. It has an existing site walk-in structure and has a long-term observer on site. Close to it there is a boat making and repair site. The land itself on which the station sits is owned by URC which is a government entity therefore a formal engagement through a letter to Management and a field team will be required to serve as notification about the planned installation and rehabilitation of the Hydromet.

Meeting with URC Jinja Pier Station officers

Existing Hydromet station

Meeting with Jinja District Environmental Officer.

Meeting with the Boat builder/shipwright and community member.

5.3.2.2. Lake Albert at Butiaba-(UGA-012-Hyd)

This site is located in Buitaba in Buliisa district. The station is within the 200m buffer zone and therefore no land acquisition is required. At the time of the field visit, the consultant

found that the whole area including the community homesteads are currently submerged in water as a result of increased water levels. The Hydromet station is also non-functional and has been out of used for a very long time. From the consultations with the district environmental and community development officers, it was recommended that another site be found to construct a new Hydromet station as the current one is no longer viable.

Meeting with Buliisa District Community Development and Environmental Officers

Submerged structures on land along the shoreline in Butiaba

5.3.2.3. Nyando (Ogilo) (KEN-003-Hyd)

The site is located on the banks of River Nyando at Ogilo, Wang'aya Sub- Location, Nyando Sub-County, Kisumu County at GPS Coordinates Lat. -0.1523447, Long. 34.9828699. The station was upgraded by IGAD-HYCOS Project Funded by the European Union although the year of renovation was unknown to the local people and the station's meter reader/observer. The station is located approximately 100 metres from the bridge at River Nyando at Ogilo village. The size of the fence enclosure is 3.5m by 4m and is surrounded by different types of trees, shrubs and grass, and crops.

The geographical location provided in the Hydromet Design document for this site (Latitude -0.95004, Longitude 34.20970) was false and gave inconsistent directions. However, through local contacts we managed to locate the station. The correct GPS co-ordinates for the site is Latitude -0.1523447, Longitude 34.9828699. The area experiences river bank erosion posing a high potential to negatively affect the land that the station sits on. At the time of the visit, the water level was very low and there were many herds of cattle grazing up to the location of the station and the water metres.

Part of the team contemplating on how to access the site with assistance from local people

Nyando (Ogilo) Hydromet Station

Farming Activities at the Site

Focus Group Discussion with the locals and station meter reader/observer

5.3.2.4. Yala (KEN-002-Hyd)

The site is located at Daraja/Kaferi, at Odhuro Village, Nyamonye at GPS Coordinates Lat. 0.093335, Long. 34.1637986. The site is surrounded with a lot of vegetation. The concrete walk in structure is completely covered with tall vegetation that it cannot be easily spotted. It seems like it has not been opened for quite long. The live fence surrounding the concrete walk in structure is measuring 5m by 5m in size. The station is located approximately 100 metres from the bridge. The activities which are taking place around the site are domestic chores like washing clothes, bathing, swimming and cattle grazing. Farming is done in the surrounding area, but it does not extend up to the station. There used to be farming even at the place where the station is located, but due to the frequency of floods, farming around the concrete structure is seasonal and the area is now mainly used for grazing.

The geographical location provided in the Hydromet Design document for this site (Latitude -0.35440, Longitude 34.80540) was false and gave inconsistent directions. However, through local contacts we managed to locate the station. The correct GPS co-

ordinates for the site is Latitude 0.093335, Longitude 34.1637986. The station name is also confusing and is not consistent with the geographical and administrative location of the site. The station located at Kadenge, which is the site on record, is a weather station that is located inside Dominion Farms. The hydromet station is located at Kaferi in Nyamonye. The Hydromet station is located at Daraja/Kaferi, at Odhuro Village in Nyamonye that is several kilometres away from 'Kadenge'.

Yala Hydromet Station at Odhuro village. Note that the concrete structure is surrounded by fully grown vegetation on the background

Accessing the concrete structure at the station

Discussions with the local meter reader

Cattle grazing at the station

Table 6-2: Key Issues raised by Stakeholders

Date	Official Engaged	Issues raised	Response/Action Plan
Uganda			
22nd December 2020	Jinja District Environment Officer	• Some of the hydromets are non-functional and therefore their rehabilitation and installation of new specialized equipment is a welcome development will help in mitigating natural disasters such as floods. • Project should liaise with the district during the implementation of this project for purposes of monitoring to ensure that social safeguards are upheld. • The project proponent needs to share ToRs with the district environment technical team to assess the scope of the project and provide further guidance on risk and impact mitigation	Noted The project will work closely with relevant district technical official during project implementation to ensure that they work closely to uphold environmental and social safeguards standards This information will be provided to seek further guidance and feedback from the district.
21st December 2020	Jinja Pier Boat making/repair site-Boat builder/shipwright	• They operate close to the hydromet station. However, there will be very limited impact to their business if any regarding the installation of the new specialized hydromet equipment • There are no female workers at the site and therefore to not envisage any risks related to sexual exploitation and harassment or gender based violence.	Noted, project will also towards minimizing the risk of disrupting people's livelihoods. Noted. However, workers will still be required to adhere to the code of conduct when carrying these activities
21st December 2020	Technician and Operator –Eskom Uganda Limited	• The hydromets are of great benefit to us as a company since they provide us with data that informs our release of water based on the water levels for purposes of power	Noted

		generation. • Installation of specialized equipment will also help to provide more accurate data to ESKOM for operational decision making based on continuous data feeds combining weather forecasts, real-time weather information, and real-time business data. • Eskom would also like to be connected to this new specialized equipment such that they can be able to access data remotely. • Water levels are also rising and it is becoming increasingly difficult to access the stations since the equipment gadgets are almost submerged.	Noted Eskom will have to liaise with the relevant institutions such as Ministry of Water and Environment to realize this and more importantly training on how to access this data will have to be conducted The project will assess and make recommendations on how best this information can be accessed
21st December 2020	Station officer Jinja port-Uganda Railways Corporation	• Before implementation of the project (The project proponent will have to formally introduce the contractor to the Uganda Railways Corporation to guard against any form of impersonation by wrong elements • On the issue of land –The hydromets are currently installed on Uganda Railways Corporation Land and therefore there be no need for land acquisition • The place is secure and there have been no previous experience of vandalism and theft. The area is also guarded by maritime police and URC security.	In line with principles of stakeholder engagement, the project will continuously engage and consult with different stakeholders throughout the lifecycle of the project. Note-this will help to mitigate against any illegal claims on the land which has slow down project work. Noted

		• There only 3 women on the site one working for URC security and the other 2 working for Uganda Police-Maritime department. • Potential risks and impacts related to sexual harassment and gender based violence are not envisaged during implementation as work place policy, rules and regulations prohibit it. • Improved hydromet services will enhance the water transport sector through provision of fundamental weather services such as observations, forecasts, storms and numerical weather prediction which inform their planning and movement on the water bodies • Hydromet services also save lives. Advanced early warning using reliable hydromet data can make the difference on whether fishermen, and movement of people on the water bodies due to an impending storm.	Noted Noted –The project will also have a strict code of conduct for its workers, prohibiting them from engaging in any form of activity that runs counter to national laws and World bank safeguards standards. Noted
28th December 2020	Buliisa District Technical officials – District Environment Officer and District Community Development Officer	• On the issue of land –The hydromets are located within the mandatory 200m buffer zone and therefore there will be no issues with land acquisition. However, the whole area is currently submerged in water as a result of increased water levels. • The hydromet station is also non-functional and has been out of used for a very long time. • The road and access to the hydromet has also been submerged in water. • Similarly, as a result of the floods, most of the	Noted Noted This feedback will be shared with the implementing agency to inform their planning in line with this project. Noted

		communities in Butiaba have been displaced and most of the houses submerged in water. • When the lake water levels rise and flood the shores and neighboring land it takes a while to rescind. • Therefore, the project proponent might need to consider and explore identifying another site because of the constant flooding which will curtail and rehabilitation and installation work related to the current station. • Before any construction is done, it is essential that the project proponent carries out a site suitability assessment to avoid setting up the hydromet is an area that is prone to flooding. • Before commencement of any activities after the development of the ESMP, the project will need to engage and consult the district technical team on issues related to management and security of this hydromet. • The project will also to state clearly the responsibility, maintenance and management of this hydromet.	This feedback will be shared with the implementing agency to inform their planning in line with the rehabilitation and installation of specialized equipment. The project will take the necessary measures and carry out due diligence on the potency of the current site and any other that might be proposed to ensure that the hydromet equipment and station is installed in an area that is free from social and environmental encumbrances. As previously mentioned, if a new site is identified the necessary measure will be taken to establish the potency of the proposed site to ensure that the hydromet equipment and station is installed in an area that is free from social and environmental encumbrances. This will be worked through the existing institutional framework between the District Local government and the Central government

		• Judging from the scale and scope of workers, the risk of child labor, sexual exploitation and assault and gender based violence are minimal and can be mitigated.	Noted. However, workers will still be required to adhere to the code of conduct when carrying these activities in the communities. The project will also work closely with sub-county Community development officers and Local leaders to ensure that these risks are minimized
Kenya			
28th December 2020 at Nyando (Ogilo)	Nyando Station meter reader/ observer and local community members	• The geographical location provided in the Hydromet Design document for this site (Latitude -0.95004, Longitude 34.20970) was false and gave inconsistent directions. • The station was constructed several decades ago. The construction took about one week and materials such as bricks, hardcore for back-filling, stones, ballast, metal and sand were used. • The local community has poor knowledge of the functions or the roles of the Hydromet station. They only know that the station was built by "water people" and there is a person who takes meter readings on a daily basis. • There has not been any training done for the meter readers/observers over the years they had worked as meter readers. • Meter readers/observers do not have a formal forum where they can share information amongst themselves. • The meter readers/observers have been	Noted. The correct GPS co-ordinates (Latitude -0.1523447, Longitude 34.9828699) for the site should be used and updated on the official documents Noted. The project should sensitize the local communities especially those living around the stations on the role of the stations through education and awareness. Meter readers/observers should receive trainings and followed by refresher trainings on data capture and handling The local community should be

		subjected to resistance and negativity by the people who own farms close to the station since the land originally belonged to an individual. • The site was vandalized in 2014 and metal structures stolen but the culprits were apprehended by the area Chief. • The meter readers/observers should be paid promptly to enhance accurate and timely records. • The concrete structure hosting the Hydromet station is locked and the meter readers/observers do not have access to it. • There is no clear road or path that leads to the site and accessibility is by walking through people's land/farms. • The site is affected by river bank erosion	sensitized on issues surrounding land ownership and use in riparian areas to reduce conflicts, and to enhance their acceptance of the project. Noted The project should build the capacity of meter readers/observers by training them as Hydromet station technicians at the site level. The contractor through the Water Resources Authority (WRA) should ensure that access road to the site is maintained. The project should work towards controlling river bank erosion through building of gabions and planting appropriate trees along the river near the Hydromet station.
29th December 2020 at Yala	Yala Station meter reader/observer and local community members	• The station located at Yala Kadenge is a weather station that belongs to Dominion Farms. The station managed by WARMA and where water levels are constantly monitored is the one located at Odhuro village at Kaferi/Daraja and is easily accessible through Nyamonye in Bondo sub-county.	The geographical location of the site should be changed from Latitude -0.35440, Longitude 34.80540 to the correct GPS co-ordinates for the site as Latitude 0.093335, Longitude 34.1637986 in the Hydromets Design document and other relevant documents. The station should be renamed as

		• There was no information by the locals on when the site was constructed, and the people who were involved in the construction. • Awareness of the work of the station and its importance is very low among the locals. • The locals graze their cattle at the site and any attempts to prevent grazing leads into conflicts. • The meter reader revealed that inside the concrete structure, there is equipment that also records the water levels, but at the moment it is not operational. • Payment for the meter reader/observer is inconsistent. He is supposed to be paid Kenya Shillings 1,000 every month and he has not been paid for the last 10 months. • There have not been any incidences of vandalizing the structure. The only issues are the destructive grazing activities which are taking place around the station. • The natural fence around the concrete structure has not been well maintained. The vegetation has overgrown and completely covered the structure limiting accessibility to the site.	"Yala at Odhuro Bridge" The future works should consider community sensitizations and awareness creation among local communities. The authorities concerned particularly WRA should ensure timely payments to the water meter reader/observer. The station should be fenced (probably using chain-link and barbed wire) to prevent people from trespassing. The tall vegetation surrounding the station should be cut and the station fenced using chain –link and barbed wire.

Table 6-3: Key Stakeholder Issues identified during ESMF development

Level and Category	Key concerns	Response
Nile TAC members	✓ All were aware of the NCCRP ✓ Aware that hydromets equipment will be procured and installed in specific countries and welcomed the project. ✓ Approximately 4 hydromets are to be constructed. More details about hydromets would be provided at the subsequent stages of stakeholder engagement.	✓ Noted. The SEP which guides the consultations includes strategy for identifying and engaging vulnerable groups
	✓ Hydromet take little space, so environmental and social safeguards will be very minimal.	✓ Noted. However please note that some hydromet stations will be constructed and these may have negative risks and impacts. The project will ensure that environmental and social impacts are mitigated as much as possible and relevant safeguards management tools such as the ESMF and other attendant instruments such as SEP, ESCP and LMP are being developed.
	✓ There is need to build the capacity of the local people settled near the hydromet stations to know the role of the stations to cushion them from risk of potential vandalism.	✓ Stakeholder consultations including local communities will be carried out prior to commencement of works. ✓ The consultants shall recommend securing of hydromet stations through fencing, guarding or installation of the hydromets within guard houses. This will help minimise the potential for unauthorised access, vandalism and interference with wildlife.
	✓ While it is important to get the views of the 'higher-level' stakeholders, it is also pertinent to get the views of the community members to enhance ownership of the project at all levels.	✓ The project will have a stakeholder engagement framework (SEF) that will guide on extensive, proportionate and meaningful consultations.
	✓ The rehabilitation and construction of the hydromets will help in flood/ drought management - early warning systems as a result of the rehabilitation and use of the hydromet stations which will minimize the impacts of floods and enhance	✓ Noted

Level and Category	Key concerns	Response
	preparedness to floods and drought impacts. This will help in reducing destruction of crops and property of local communities.	
	✓ On the benefits of the project, the Nile TAC team noted that implementation of the project will enhance weather and climate change data and analysis capacity at national level and NBI Secretariat.	✓ Noted. The specialized hydromet equipment will help mitigate increasing frequency and intensity of trans-boundary flood events in the Nile region.
	✓ Anticipate the project to create Employment opportunity in areas where the hydromets will be constructed and rehabilitated.	✓ The project will ensure that local content is considered during implementation and operation stages. ✓ Labor Management Procedure (LMP) has been developed for this project and it should inform the labor and employment process for the project.
	✓ Construction of the hydromets may require excavation works which may lead to loss of some plants/vegetation in the work area.	✓ Where such losses occur, the project should support tree planting, grasses and scrubs around the project sites for modulating the environment around the affected project sites.
	✓ The implementation of the hydromets will not in any way affect communities as they are not allowed to settle within the buffer-zone where the hydromets are installed.	✓ This is noted, however, just in case communities are affected in terms of property being affected, the project should support the affected persons around the project sites.
	✓ Where hydromets are installed on private land and encroachment on public land, there may be social implication such as land acquisition and compensation. However, the already existing ones are along the river buffer zone which is regarded as public land.	✓ No land acquisition has been envisaged by the project since most of the hydromets sit on public land which is within the restricted 50*200 buffer-zone. However, for planned construction activities where land could have been encroached on, National Laws and international best practices will be followed to ensure that displacement is minimized

Level and Category	Key concerns	Response
		and where it is inevitable fair and adequate compensation will be given to affected member of the community
	✓ The project may bring about sediments arising from construction works.	
LVBC	✓ Regarding displacement of communities through land take, this is not anticipated given that hydromets are installed within the buffer-zones and this is a restricted area. Some hydromet stations are also located on government owned land in government institutions such as Meteorological Department offices or public schools.	✓ Recommended safeguards related to physical displacement specifically the World Bank ESS5 will be followed if any land take issues leading to physical displacement occur.
	✓ The project is a welcome initiative and LVBC has been working closely with NBI on issues related to installation of hydromets.	✓ Noted. However, given the nature of undertaking by NBI, all necessary measures will be taken to mitigate environmental and social risks and impacts.
	✓ Due to the nature of the project no grievances are foreseen since the project shall not have any significant impacts, however, both legal and institutional guidelines are available in each East African Community country, which will be applicable for handling any potential grievances.	✓ This is noted, however, relevant grievance redress procedures will still be formulated and adopted by the project to ensure that that there is a formal grievance mechanism to mitigate against any issues that might arise during project implementation.
	✓ To guard against any vandalism, hydromet should be fenced off to mitigate against any breach or unauthorized access.	✓ This is noted and the structures that will house the hydromet stations have adopted a security oriented design with a perimeter fencing around it and with a dedicated onsite guard
Nile Basin SEC, NELSAP-CU, ENTRO	✓ Screening for Environmental and social safeguards has already been done and documents available and initial findings indicate that there are no risks, threats or negative impacts on the environment and social aspects. ✓ Issues of Land ownership, Sustainability, vandalism of facilities and maintenance of hydromet stations may arise.	✓ This is noted. However, at project level social and environmental issues may arise and therefore the need of an ESMF which will guide on how best these issues can be mitigated. ✓ Where feasible, the Project shall avoid land

Level and Category	Key concerns	Response
	✓ Need to have the right level of capacity in terms of safeguards when implementing such a project. ✓ There are some centres like NELSAP which have Environmental and Social Safeguards Personnel, but they are employed on project basis. ✓ Capacity building needs at the community level ✓ Risk of GBV but minimal since the workers will not be many, but this still remains a risk. ✓ There is a concern that if any of the stations are located within indigenous groups land, ESS7 might be triggered. Personal visits have been made by NBI technical to about 95% of the stations and none of them are located on land that belongs to indigenous groups or people and therefore ESS7 will not be triggered. ✓ In 2015 there were 79 stations recommended for rehabilitation, but following consultations with the Nile Basin countries in 2020, they are now 73 stations. The 73 stations also include the new stations. ✓ There are stations like the DRC stations which will be moved to a new location. This does not mean that there will be need to acquire any new land. The relocation is due to reasons which were well explained by DRC and were acceptable to NBI. There is no issue with land acquisition. The new site in DRC will be within a protected area. However, access and acquisition of the land is not an issue. ✓ All the stations are accessible. There will be no need for land acquisition. All the sites are accessible by road. There will be no changes to local communities and no disruptions.	related issues by establishing the hydromet stations within public or institutional land such as Public schools or government office compounds. ✓ Sustainability shall be ensured by ensuring that the respective governments and local communities are engaged as stakeholders through sensitizations and trainings on the role of the Project and specifically the hydromet stations. ✓ Environmental and Social safeguard specialists will be employed to ensure that they manage environmental and social related issues on the project. ✓ All the stations which will be rehabilitated and constructed are located in public land and not in any personal or group land. Even the new stations will be put up in public lands. ✓ EMSPs are going to be developed for the hydromet stations in respective countries.

Level and Category	Key concerns	Response
	✓ During site identification for the sites, all possible environmental impacts were considered. Therefore, there will not be any need for an Environmental Impact Assessment for the sites. Environmental and Social Management Plans will be sufficient.	
MDAs (Water Resources Authority (WRA), Ministry of Environment and Forestry, Ministry of Gender Labor and Social Development (MGLSD)	✓ Need to carry out meaningful consultations with the affected communities. ✓ There is need to look at special interest groups such as youth, elders, women. ✓ The ESMF should be in line with various national policies and guidelines in relation to children, women, people with disability, women and workers. ✓ Ensure that the project has an HIV/AIDs management plan and policies in place to inform sensitization of communities. enhance their capacity to collect the required climate and weather data rather than installing new ones.	✓ A SEF has been developed for this project to guide on all public and institutional engagements in line with National Policies, guidelines and international Best Practices to guide the subsequent consultations with specific interest groups such as youth, elders, women. ✓ Relatedly, the stakeholder engagement will also focus on consultations and sensitization about risks and impacts and possible mitigation. These will include diseases such as HIV/AIDs, COVID19 among others. ✓ Various management plan such as HIV/AIDS will be developed to inform the management of such risks. ✓ The project also has a capacity building component that will help to enhance the skills and knowledge of the serving staff members.

6. POTENTIAL ENVIRONMENTAL AND SOCIAL RISKS IMPACTS AND MITIGATION MEASURES

The anticipated E&S risk and impacts for the NCCR project could potentially be triggered by the rehabilitation and construction of 73 hydromet stations by GIZ in the Nine Riparian countries. Procurement and installation of the specialised equipment is anticipated to have minimal impacts given the nature and duration for field activities. Therefore, the contractor will develop ESMPs with its attendant mitigation measures for the civil works to ensure that there is compliance with ESS. These ESMPs will be furnished to the World Bank project team to carry out its due diligence and monitoring mandate of the project.

6.1. Potential Positive Project Impacts and their Enhancement Measures

6.1.1. To strengthen the Nile basin riparian counties' cooperation and capacity

The Nile Cooperation for Climate Resilience Project plans to establish cooperation forums to address challenges arising from climate change due to the growing water demands, inconsistent water availability and sustainable use of environmental resources around the basin. These forums and platforms will have the opportunity to reduce potential for conflicts over national-level water allocations and enhance inter-sectoral coordination at regional and national level. A case in point is the NBI's mediation in the conflict between Egypt, Sudan and Ethiopia over the construction of the Grand Ethiopian Renaissance Dam which Egypt had reservations about as it would reduce the water that goes to her country on which it entirely depends.

Concerning the capacities of the Nile Basin riparian Countries, the Hydromet project is designed to establish a regional monitoring network of 73 hydrological stations basin-wide that will be operated by the national hydrological Agencies/Department within the member countries. Each country will benefit from installation /rehabilitation of stations with telemetric equipment, it is therefore clear that the project shall contribute to the improvement of national hydrological monitoring systems.

Enhancement Measure:

- In order to enhance these platforms, NBI will provide data, information, analyses and studies, decision support tools which will be generated from NBI and also from international sources. This will help to inform the decision making processes and

deliberations regarding water resources will be data-driven and evidence based, as opposed to politicization and securitization of issues.

6.1.2. Employment Opportunities

Installation of specialized hydromet equipment will create employment opportunities for the unskilled and the semi-skilled people during construction within the project beneficiary communities and are also likely to acquire some skills, knowledge and experience especially in construction equipment operation and construction works, hence upgrading their skills. More so, temporary employment for guards, reading of the data, maintenance of the equipment will be created. With acquired skills, such workers will be better placed for future employment opportunities to work in the same industry elsewhere. This is a long-term benefit on the part of trained workers that cannot be reversed even when the project decommissions.

Enhancement measures:

- Make a provision in the contract which compels the contractor recruits all non-skilled workers from the local community.
- Widely advertise for the potential jobs in the local media (Radio Stations); also publicise the jobs through local fora (church/mosque and other public gatherings), pinning job adverts in strategical places in the locality and using local leaders to disseminate information for the available jobs
- Involve the local leaders in the respective countries to support identify workers from the local community.
- Worker grievance redress mechanism be established with involvement of Labor officers in respective countries
- Qualified women be targeted and encouraged to apply for jobs.

6.1.3. Capacity Building of technical personnel

Currently, there are disparities in capacities among the riparian countries and associated regional institutions based on their unique backgrounds and practices. This is evinced in the regional challenges of low level of harmonization of regional and national policies; low uptake of regional policy frameworks; reduced mutual benefits for water users; uncoordinated water resources development; and loss of opportunities for optimal

investments in water. Therefore, the project will have a strategy of building the capacity of different technical staff in the Riparian countries.

Enhancement measures

- Mapping of training needs and opportunities including logical sequencing of the capacity development activities
- Scoping of major capacity development activities including institutional strengthening, short term tailored courses, exchange visits, study or experiential tours, supervised practice, collaborative applied research studies.
- Development of criteria for prioritizing training
- Mainstreaming and sustainability of the capacity development and retention of competences
- Scoping appropriate modes of training and materials required including Peer- to-peer earning, face to face, and Blended learning or virtual learning.

6.1.4. Increase access to reliable climate and water resources related information

Hydrological and meteorological (or "hydromet") hazards are responsible for 90% of total disaster losses worldwide. With population growth, rapid urbanization and climate change, this is projected to become more severe[2]. Once installed, within the Nile Basin countries, hydromet services will provide real-time weather, water, early warning, and climate information products to end users, based on weather, water and climate data for better planning and decision making to mitigate loss of lives, property and livelihoods.

Enhancement measure:

- As an institution, NBI together with its implementing partners can enhance this benefit, by standardizing procedures to promote trans-boundary collaboration within the riparian countries and ensure that hydromet services are linked to regional and global centers, to improve and sustain the sharing of data that is authentic and reliable. Therefore, the Hydromet project shall upgrade the National data centers with technical software and related tools having the required functionalities.

[2] https://www.worldbank.org/en/results/2017/12/01/hydromet

6.1.5. Enhanced food security in the communities

Natural disasters such floods, landslides, drought are directly interconnected with food insecurity because they weaken and impede agricultural activities and consequently this has an impact on food production, trade and supply. This mainly puts the poorest and vulnerable communities at a risk of going without food and as such, these communities need to be better prepared with early warning systems, information and strategies to manage disasters. Therefore, the hydromet project will enhance food security through the capture of climate related data which will be shared to countries and farming communities to plan their agricultural activities in line with the available data and become less susceptible to the risk of natural disasters.

Enhancement measure:

- Farmers need to be furnished with reliable and timely weather and climate information for decisions and long term planning. Seasonal climate outlooks are increasingly important tools for decisions such as what crops to plant and when to plant them and whether to sell livestock in the event of a looming drought.
- When hydromet stations will be in operation, agricultural development offices in the basin will be provided with climate and weather information that help them to advise farmers and private investors on weather and climate information based cropping calendar

6.2. Potential Negative Environmental Risks and Impacts

6.2.1. Solid wastes

Solid wastes will likely be generated during refurbishment of existing hydromet stations and during construction of the four new stations across the Nile Basin by the NBI using funds from the GIZ. The refurbishment/construction of hydromet stations will generate wastes from soil debris, excess concrete, clearance of vegetation, soil excavation, etc. If not well managed or properly dumped, such waste may negatively impact local vegetation and aquatic systems when eroded downstream. Besides, some of the wastes like cement and paints are corrosive and may negatively impact on local plant biodiversity. Although not much anticipated, the equipment installation work that will be supported by the WB may generate limited solid waste in relation to unused or obsolete equipment or equipment

parts that will need to be replaced and so will need to be disposed of by the contractor. The NBI, consultant and contractor will need to do due diligence to ensure that solid waste generated from refurbishment and construction works are properly managed and disposed through sound measures and procedures in accordance to the WB's ESF and GIZ Environmental and gender framework.

Mitigation measures

The contractor should provide sound waste management procedures and solid waste disposal systems during construction, refurbishment and installation of equipment as follows:

- The contractor should provide solid waste collection bins at each respective construction/refurbishment site
- The contractor should give training for its workers on waste management including segregation at source
- The contractor should ensure the segregation of wastes at source and suitably stored on a temporary basis in a waste management area
- Where feasible, the contractor should appoint a reputable garbage collector for safe handling and disposal of solid wastes
- The contractor should ensure that wastes, including excavated soil and debris are properly disposed of by backfilling or dumping in approved grounds by the respective local/county/municipal authority
- Where feasible, the contractor should promote recycling and re-use of wastes appropriately
- The contractor should enhance sustainable waste management by developing waste management performance indicators in relation to recycling and reuse
- The contractor should develop a solid waste management plan to include e-waste management

6.2.2. Exposure to electromagnetic radiation (EMR)

The relaying of information from the hydromet stations to the central data or information centre(s) will use electromagnetic currents that may have potential impacts on biodiversity and human beings. Although it was initially thought that radio frequency electromagnetic radiation on wireless communication gadgets does not result into health effects, recent

studies have confirmed that it causes DNA damage apparently through oxidative stress. Documented studies have shown that birds lose their navigational ability leading to confusion during flight, and honeybees experience colony collapse disorder (CCD) condition negatively impacting their reproduction and social activities. Plants exposure to EMR negatively affects their growth and weight, while EMR leads to death of micro-organisms near the upper soil surface. Though mild, EMR also has oxidative bio-effects induced by exposure of electromagnetic fields on humans.

Mitigation measures

- The NBI/GIZ should procure hydromet equipment with low-radiation electromagnetic waves emitters for wireless communication.
- The NBI/contractor should promote consumption of natural anti-oxidants among human beings living in the nearby hydromet stations and who might potentially be exposed to the EMR. Examples of natural anti-oxidants include plum (*Prunus domestica*), bitter orange (*Citrus aurantium*), green tea (*Camellia sinensis*), rosemary (*Rosmarinus officinalis*), basil (*Ocillium basilicum*), garlic (*Allium sativum*) and *Loranthus longiflorus*. Other natural antioxidants that can protect cells against radiation induced damage include vitamins C, E and their derivatives, date palm pollen, quercetin, caffeine, chlorogenic acid, ellagic acid, bixin, flavonoids, epigallocatechin and other polyphenols.
- The bioeffects induced by exposure to electromagnetic fields on humans can be also reduced by eating a diet rich in fruits, vegetables, whole grains, legumes, and omega-3 fatty acids can help humans in decreasing oxidative stress. Dietary supplements with antioxidants may play a role on the neutralization or buffering of the effects of electromagnetic fields with oxidizing properties.

6.2.3. Mercury/Infrared pollution

Mercury and/or infrared pollution arising from poor disposal of or contact with obsolete equipment or parts of vandalized hydromet equipment with mercury or infrared content like thermometers.

Mitigation measures

- The contractor should ensure adequate equipment monitoring and proper disposal mechanism should be put in place and adhered to.

- The NBI/contractor should ensure adequate training of hydromet staff and local communities on handling of obsolete, unused or old equipment from the hydromet stations.
- The NBI/contractor should ensure that respective personnel in each country are adequately trained on disposal of old or obsolete equipment. The disposal of such equipment will be at the behest of the Ministry responsible for the Environment in each respective country.

6.2.4. Loss of flora due to land clearance, poaching/illegal harvesting of wildlife

Although the hydromet stations require minimal land area for set-up, location in an open space with reduced vegetation canopy is mandatory for clear reception and transmission of data. In some areas, setting up of security establishments like watchman house, fencing, area rehabilitation or refurbishment of old hydromet stations may be crucial to secure the hydromet stations. Four new hydromet stations shall be constructed. These may result into land/vegetation clearance hence loss of local vegetation.

The risk of poaching or illegal harvesting of wildlife resources by workers during construction and refurbishing/rehabilitation of hydromet stations and land or vegetation clearance are likely since some of the civil works will take place in protected or sensitive ecosystems habituated by wildlife. For the stations located in the protected areas, diseases transmission between construction employees/contractors and wildlife in the area is possible regardless of the short duration of construction activities

Mitigation measures

- Undertake a pre-clearance survey for endangered species, breeding birds, burrowing mammals, reptiles and amphibians throughout the construction
- No construction activities will take place outside defined project boundaries and the prescribed construction boundary limit shall be clearly demarcated
- Cover of all vulnerable soil with erosion resistant material and revegetation and special focus should be on this during the rainy season.
- The contractor should minimize the area earmarked for clearance.
- Hunting, cultivation and deforestation by employees and contractor staff members will be prohibited

- Staff will sign an acknowledging receipt and understanding of the brochure and contractors will be required to implement measures to prevent hunting
- The contactor in consultation with the NBI should ensure careful site selection and avoid project implementation in sensitive areas especially for establishment of new hydromet stations.
- A policy of re-vegetation should be employed by the NBI. Identify land at a nearby location to plant an equal area of vegetation cleared or where possible, suitable vegetation can be planted in areas where vegetation is cleared.
- NBI and implementing agencies should enhance vegetation cover by promoting tree planting to be undertaken by local communities or public entities like local schools.
- At the end of construction at the new hydromet sites, the contractor should undertake measures to restore the affected biodiversity through landscaping including planting of trees and grasses to cover unpaved areas.
- To avoid the spread of non-native invasive plant species, the re-vegetation programme during the construction will only use native species. Where non-native invasive plant species are identified in the project boundaries, a non-native species management plan will be developed and materials contaminated by invasive plant material (seeds, roots etc) will be appropriately treated.
- The contractors should develop a Code of conduct (CoC) for all workers involved in civil works that shall minimize unwanted clearing of land/vegetation, poaching/illegal harvesting of wildlife. The respective contractor should ensure that all persons engaged in civil works sign and adhere to the provisions of the CoC.
- All food waste will be kept in sealed containers to prevent access by wildlife. Construction employees and contractors must use the provided welfare facilities (toilets)
- An employee/contractor health scheme should be established to monitor and reduce the risk of diseases being brough on to site and transmitted and contractors will instruct all personnel with regards to the mandatory use of toilets and clearly advise of disciplinary action associated with non-compliance
- All welfare facilities will be fenced to prevent access by wildlife.

6.2.5. Temporary disturbance of land surface

Hydromet stations will require enclosed structures such as concrete walk-in shelters or suspension on raised masts. The construction (concrete foundation, walling and roofing structures) and the refurbishment of the enclosures will be done by NBI using funds from the GIZ before installation of the specialized water quality equipment using funds from the WB. The construction works and some aspects of refurbishment may lead to minimal land surface disturbance. Consequently, the digging/sinking of land may lead to land disturbance during replacement or installation of new masts for raising the hydromets.

Mitigation measures

- The contractor should minimize excavation of the soil where possible.
- Where possible, the contractor should use a compressor to push the masts into the soil surface to minimize disturbance on the mast area as opposed to normal digging or excavation.

6.2.6. Occupational Health and Safety (OHS) risks e.g. exposure to noise, dust and vibrations

The NBI with support from GIZ shall undertake civil works during refurbishment or construction of new hydromet, when necessary. Such works are likely to generate occupational, health and safety risks emanating mainly from noise, dust and vibrations, which are likely to affect the health, safety and wellbeing of project workers and neighbouring communities. Wildlife and grazing animals are likely to be equally affected by noise, dust and vibrations.

Mitigation measures

- Insert clauses in contractor's agreements to ensure compliance with all policies, plans, procedures and identified mitigation measures.
- The contractor should provide workers with personal protective equipment (PPE) including sound arresting devices and face masks to prevent noise and guard against dust respectively.
- Training program particularly covering health and safety use of PPE and cultural awareness briefings
- Project implementation should observe seasonal sensitivity. For example, the contractors should avoid work during animal breeding and migration seasons.

- The contractor should erect warning/informative signs (billboard) at the respective site during the refurbishment/construction or installation
- The contractor should ensure that each staff member has an individual contract of employment
- A worker code of conduct should include:

  (a) prohibition of use of drugs, alcohol and smoking with information about testing and penalties for contravention

  (b) prohibition of hunting and fishing and penalties for contravention

  (c) rules regarding safe use of PPE and project equipment including disciplinary procedures for inappropriate use

  (d) Maintaining of safe and tidy area

  (e) reporting of incident and accidents

  (f) respect for colleagues, communities and behaviour expectations with regards to harassment and bullying

  (g)Rules for working in park and protected areas and environmental conservation

  (h) Guidance about how to behave to prevent the spread of HIV/AIDS and other sexually transmitted diseases, etc.
- A community health and safety campaign will be conducted and will focus on:
  - Road safety, HIV/sexually transmitted diseases, spills of hazardous waste, etc
  - Site security measures such as fencing, road safety, enforced speed limit for the project vehicles and hazard warning signs.

6.2.7. Risks from Photovoltaic (PV) installations

The hydromet stations are likely to be powered by solar photovoltaic energy. Photovoltaic (PV) technologies generally come in two forms. Silicon-based PV panels do not pose a material risk of toxicity to public health and safety. Similarly, Cadmium Telluride (CdTe) technology also poses negligible toxicity risk to public health and safety while significantly reducing the public's exposure to cadmium by reducing coal emissions. Scientific studies have shown that CdTe differs from cadmium due to its high chemical and thermal stability. The tiny amount of cadmium in these panels does not pose a health or safety risk. The PV systems do not emit any material during their operation; however, they do generate electromagnetic fields (EMF), sometimes referred to as radiation. EMF produced by

electricity is non-ionizing radiation, meaning the radiation has enough energy to move atoms in a molecule around (experienced as heat), but not enough energy to remove electrons from an atom or molecule (ionize) with minimal negative risks on DNA. Humans are all exposed to EMF throughout our daily lives without negative health impact. For example, someone outside of the fenced perimeter of a solar facility is not exposed to significant EMF from the solar facility.

Mitigation measures

Generally, the negative health and safety impacts of PV development are negligible, while the public health and safety benefits of installing these facilities are significant and far outweigh any negative impacts. Overall, there is no need to formulate mitigation measures for the use of PV in the hydromet equipment due to their low to negligible impact.

6.2.8. Risks of using solar battery: potential for fire and toxic chemicals

The hydromet stations will be powered by solar. There is limited evidence of solar power installations being the cause of fire. However, with any electrical installation, the risk of fire exists, particularly if a fault occurs and when the installation is done incorrectly, or if incorrect equipment is used. For example, the high current, particularly when it is a direct current, can cause high temperatures or arcs if there is a bad or high resistance connection. Solar battery in the hydromet system may pose danger as they store a large amount of energy, and if that energy is dissipated (used or released) in a short period of time, for whatever reason, the consequences can be substantial. If this amount of energy will be released in a very short period of time due to a short circuit for example, then it may cause a potentially explosive effect that could occur leading to explosion or fires, and potential battery damage and battery acid spoilage. Generally, toxic chemicals are used in the manufacture of solar powered installations and batteries but there is little evidence to suggest that they can easily be released into the environment, or dangerous to people in normal situations. However, in case the hydromet installations are involved in a fire, toxic chemicals may be released and be of particular concern for firefighting.

Mitigation

- The NBI/GIZ should procure solar installations that use a low voltage direct current (DC) in the wiring system to reduce the risk of fire in case there is a short circuit.

- The contractor should ensure that the site location of hydromet system is in open place with little vulnerability to fire.
- The NBI/GIZ should procure fire extinguishers. The fire extinguishers should be installed by the contractor near the hydromet stations (where feasible) or within institutions (e.g. local schools or government offices) where the hydromet stations are located to respond to any eventuality of fire within the vicinity of the hydromet installations.
- The NBI/contractor should ensure that the staffs that will be installing and operating the hydromet equipment are well trained to better understand usage and safety protocols for the specialised hydromets equipment.
- The NBI/contractor should ensure that the personnel responsible for maintaining the stations are adequately trained on proper disposal of solar battery, and the disposal should be at the behest of the Ministry responsible for the Environment in each respective Project country to ensure compliance.
- The NBI/GIZ should ensure that the solar panels to be procured use rechargeable batteries. The rechargeable batteries should have a long-life span of at least three years in order to minimize the need for routine disposal. During procurement of solar battery/panels, the NB/GIZ should ensure that a warranty of at least 3 to 5 years is negotiated with the suppliers or manufacturing companies. This would ensure that the solar battery will be returned to the manufacturers for safe disposal within the warranty period.

6.2.9. Risks related to establishment of Hydromets in sensitive areas

The sensitivity of the areas where the 15 hydromet stations are established across the basin (Table 3.3) requires mitigation measures that would reduce the potential risks and impacts related to biodiversity including vegetation and wildlife resources. The sensitive areas include national parks, game reserves, controlled hunting areas, wildlife sanctuaries etc.

Mitigation

- Perimeter fencing of hydromet stations within protected areas, where applicable, to guard the hydromet equipment from human/wildlife interference and potential physical damage by wildlife.

- Rehabilitation of existing and/or construction of new concrete walk in shelters within which the hydromet equipment will be installed to protect the equipment from unwanted access and potential damage.
- The contractor should choose and use appropriate or camouflaging colours to paint the concrete walk-in shelters to avoid scaring wild animals that are likely to use the areas around the hydromet stations for grazing, browsing or drinking water. 'Shouting' colours (e.g. red) may be scary to most animals.
- Seek permission from respective local wildlife or protected area authorities/agencies prior to conducting any activity in the protected or sensitive areas.
- Conduct construction/refurbishment activities in the company of wildlife or forestry personnel to provide security against the risk of wildlife attacks.
- The NBI should conduct trainings and create awareness among staff managing protected areas on the role of hydromet stations, monitoring activities and reporting of suspicious activities around the sites.
- The contractor should ensure that appropriate billboards indicating on-going civil works and locations of hydromet stations are placed at strategic places within the protected or sensitive areas and in consistency with the laid down procedures of the respective environment or wildlife agency in each country.

6.2.10. Flooding risks

The hydromet stations are located adjacent rivers, streams and lakes on floodplains. These locations are subject to flooding during high flows particularly during rainy seasons. The stations are sometimes fully or partially merged in water depending on the location and intensity of the rains and floods. This affects accessibility to the hydromet sites locations and potential of water to access the equipment within the hydromet enclosures hence rusting of metallic components of the equipment.

Mitigation

The contractor should employ flood-proofing mechanisms in technical works including the following measures:

- Raised elevation including construction of raised concrete walk-in shelters for new hydromet sites.

- Dry flood-proofing by making the concrete walk-in shelters located within floodplains watertight below the flood level to prevent water from entering the hydromet enclosures.
- Where new sites shall be built on floodplains, wet flood-proofing can be used whereby the bottom parts of hydromet enclosure structures like concrete walk in shelters are built to allow water to enter and exit the structures to reduce structural damage.
- Hydromet workers should employ safe use of motorized boats for monitoring the hydromet sites during flooding regimes or high waters.

6.2.11. Hazardous waste and materials

During the construction of new hydromet stations, renovation of the existing ones and installation of hydromet and water quality equipment different types of hazardous waste which include oil and lubricants, batteries, used solvents, chemicals can be generated. These hazardous wastes can contaminate the receiving environment (water, soil and air) if proper disposal facilities are not in place.

Mitigation

The contractor should employ all possible hazardous waste management practices, which include but not limited to:

- Collection by competent carrier and fully exploration of recovery and re-use options
- Collection, segregation on site and transport to waste management areas where they exist and disposal in a licensed facility, recycling , crushing them and burring them in a landfill after incineration by competent company if appropriate.

6.2.12. Construction/renovation of gauge houses

The construction and renovation of the new and existing stations, respectively, will imply, soil excavation, concrete mixing which can temporally lead to the contamination of receiving water bodies through sedimentation, fugitive dust emissions, excavation materials,

Mitigations

The following mitigation measures are suggested:

- Waste concrete can be crushed and used as road material or fill or buried in a separate landfill
- Soil contaminated by cement can also be used as landfill cover and if surplus quantities are present, collection by competent carrier for recovery and re-use.
- Concrete wash water to be used on site wherever possible.

6.3. Potential Negative Social Risks and Impacts

6.3.1. Gender-Based Violence and Sexual Exploitation and Abuse or Harassment

It is estimated that the rehabilitation and construction of new hydromet stations by GIZ will require labor of approximately 2-3 personnel to carrying out of civil works for 2-3 days and 2-3 personnel for the installation of the specialised equipment being financed by the World bank for a day throughout the 9 Nile Basin Countries which could potentially trigger the risk of Gender Based Violence and Sexual Exploitation and Abuse in communities particularly towards the most vulnerable women and girls for hydromet stations that could be close to communities although this risk is expected to be low. Since this project mainly involves the use of men for casual, semi-skilled and skilled labor, the stay away from their families for extended periods could increase their propensity to fraternize with women and the young girls hence increasing the risk of sexual and gender based violence and exploitation.

Mitigation measures

- This will be mitigated by training and sensitization and capacity building of project workers, including the NBI project staff, on addressing gender-based violence among the project workforce and between the project workforce and project-affected communities
- The implementing teams (Nile SEC) will coordinate with the contractor to develop and implement measures and actions to regularly assess and manage the risks of Gender Based Violence extending from project activities
- Nile SEC project staff will coordinate, train and build capacity on a regular basis of the personnel responsible for compliance to environmental and social safeguards with special emphasis to do no harm principle (sexual abuse, gender violence, inclusivity among others).

- Regular sensitization/capacity building sessions among project workers and the affected communities about sexual and gender-based violence and how to combat it.
- Instituting Grievance redress committee to handle among others sexual abuses perpetrated by project workers, and members of the community.
- Involving relevant authorities such as law enforcement, community leaders in handling sexual abuse in specific communities to ensure that perpetrators are brought to book.
- Engagement of high capacity implementation support agencies such as local NGOs and CBOs.
- Ensure that NBI and other implementing agencies make it mandatory for all contractors to ensure all workers to sign a Code of Conduct (CoC) that specifies appropriate behavioral conduct, responsibility and penalties for non-compliance with SEA/SH, among other social misconducts. Among other things, the CoCs will prohibit sexual relations with minors, subordinates, vulnerable groups, and will protect them against various forms of sexual harassment in the work place.
- Ensure that the CoC is translated into local languages and explained to workers in languages that they understand during project implementation.
- Similarly, communities should also be made aware of the CoC provisions at implementation through community sensitization.

6.3.2. Risk of Child Sexual Abuse and Exploitation

Influx of construction workers from outside and within the project area who shall be in gainful employment may pose social risks of child sexual abuse and exploitation. Since these workers shall have disposable income, some of them may get tempted to engage in defilement of minors leading to harm, teenage pregnancies and school drop-outs. social tension in some homes if husbands earn salaries and resort to drinking, disruption of marriages due to fraternization of contract workers with women in the community triggering gender-based violence. The consultant team observed that some of these hydromets are located in areas such as the Butiaba port where people are poor and destitute and this could potentially increase the risk of young girls fraternizing with sexual activities in a bid to seek financial favours. Interactions could potentially increase in sexual violence against both girls who are attending school and those out of school.

Mitigation Measure

- Develop and enforce Code of Conduct for Child Protection to workers, sub-contractors and site visitors
- Workers and communities shall be sensitized in a language that is understandable on child protection code of conduct and shall abide by this code.
- Children shall be restricted within the campsite and the construction site
- Where need arise, a nominated service provider will be contracted to support child protection activities including designing IEC, sensitizations, monitoring and collaboration with key duty bearers.
- The Contractor should have a sexual harassment policy and mainstream it to ensure strict adherence to established mechanisms to avoid the emergence of these challenges.
- Integrate HIV and AIDS awareness to children
- The community should be sensitized on the risks of child abuse

6.3.3. Risk of Theft and Vandalism

There is a risk of stealing and vandalizing hydromet equipment by the communities where they are installed. Since most of these hydromet stations are located in remote areas at isolated sites, this could potentially invite vandalism and stealing of the equipment especially if the communities are not sensitized on the use and benefit of hydromets.

Mitigation measures

- Need for awareness and continuous sensitization of communities on the use and benefit of having hydromet stations
- The project should secure the piece of land by fencing it off where the hydromet stations and guard against vandalism by communities and wildlife.
- Consult all user groups at project sites during project implementation to enhance 'ownership' of the project by local communities.
- The NBI should ensure that all the hydromet stations raised on masts should have fence enclosures to reduce the rate of access to the stations by unauthorised persons and/or wildlife.

- During installation of equipment, the solar panels should be secured by mounting them on the raised masts or on top of concrete walk-in shelters to avoid vandalism and theft.

6.3.4. Risks of spreading HIV/AIDS and STI/STDs

With an anticipated labor force of 2-3 personnel for installation of specialised equipment by World Bank, and the same number of personnel for rehabilitation and construction of hydromets by NBI, social interactions even if minimal cannot be ruled out. Therefore, due to social interactions between migrant workers and the locals, there is a risk of spread of HIV/AIDS whose average prevalence rate is 2.9% for all the 9 Riparian countries (See

Table **3-**). Risky sexual behaviour and engagement in illicit sex by both gender has found to be one of the vices as a result of irresponsible behaviour. Therefore, the project should have an HIV/AIDS strategy to counter the risk of spreading HIV/AIDS.

Mitigation measures

- These risks will be mitigated through HIV/AIDS sensitization and awareness for the workers and the community within the Riparian countries.
- provision of health and safety gears, first aid kits that include condoms, involving existing health providers and services.
- The project will establish HIV/AIDS Workplace policy
- develop and implement Joint HIV/AIDS Community work plans with relevant Health Officials

6.3.5. Risk of Inadequate access to Grievance Redress Mechanism

GRMs act as recourse for situations in which, despite proactive stakeholder engagement, some stakeholders have a concern about a project potential impact on them. However, in some situations there could be barriers to access the grievance redress mechanism, and these may include a lack of awareness of the mechanism, language, literacy, costs, physical location and fears of reprisal when a grievance is registered. It is therefore important, to inform project stakeholders of the existence of a project grievance redress mechanism its purpose, and of the procedure they should follow to raise complaints

Mitigation measures

- Publicize the existence of the GRM and the procedure for using it in languages that apply in those specific areas to ensure that members of the community and other relevant stakeholders have a clearer understanding of the existence and the role of the GRM.
- Where members of the community are illiterate pictorial illustrations will be used to sensitize them about the GRM and the procedures of lodging a complaint.
- Receive and log requests for dispute resolution
- Track and document efforts at grievance/dispute resolution and their outcomes.
- Review and make improvements to the GRM that would enhance its effectiveness, accessibility, predictability, transparency, legitimacy, credibility, and capacity.
- The GRM will respond to concerns and grievances of project-affected parties related to the environmental and social performance of the project in a timely manner.
- The GRM will address concerns promptly and effectively, in a transparent manner that is culturally appropriate and readily accessible to all project-affected parties, at no cost and without retribution.
- The GRM, process, or procedure will not prevent access to judicial or administrative remedies.
- The Nile SEC project team will inform the project-affected parties about
- the grievance process in the course of its community engagement activities, and will make publicly available a record documenting the responses to all grievances received; and
- Handling of grievances will be done in a culturally appropriate manner and be discreet, objective, sensitive, and responsive to the needs and concerns of the project-affected parties. The mechanism will also allow for anonymous complaints to be raised and addressed.

6.3.6. Risk of contracting and spreading COVID19

Installation of hydromet equipment will involve movement of people from different places especially the casual laborers and other project workers. Human interaction will take place during the course of executing field activities including meetings and construction. Such interactions pose the risk to spread COVID-19 and other similar respiratory such as pandemic influenza. COVID19 is a new virus that had not been previously identified in

humans and therefore no population-level immunity exists. While the range of symptoms for the two viruses is similar, the fraction with severe disease appears to be different. For COVID-19, data to date suggest that 80% of infections are mild or asymptomatic, 15% are severe infection, requiring oxygen and 5% are critical infections, requiring ventilation[3]. Africa is currently experiencing an outbreak of COVID19 with over 754,390 confirmed cases with 12,838 deaths. Similarly, contractor workers' operators and other project personnel have the potential to increase the local transmission of such a communicable disease especially at a time when there is an outbreak in the globally and Africa with reported community transmissions with some individuals found to be asymptomatic.

Most countries have eased the lock down with governments allowing free movement of goods and persons albeit with several measures to mitigate the spread of COVID-19. This is a Major risk and impact that requires serious attention, monitoring and reporting.

Reported illnesses range from mild symptoms to severe illness and sometimes death for confirmed COVID-19 cases. These symptoms may appear 2-14 days after exposure:

- Fever
- Running Nose (flu)
- Cough
- General Weakness
- Difficulty in breathing if the patient develops pneumonia

The WHO[4] has provided guidance for responding to community transmission of COVID-19 as summarized below:

Situation	**Intervention**
Recommended in **all** situations.	• Hand hygiene • Respiratory etiquette • Masks for symptomatic individuals. • Isolation and treatment of ill individuals. • Monitoring symptoms of healthy contacts. • Traveller health advice • Environmental cleaning
Consider, based on local and/or global evaluation.	• Avoid crowding (i.e. mass gatherings). • School closures and other measures.

[3] https://www.who.int/publications-detail/responding-to-community-spread-of-covid-19

Situation	Intervention
	• Public transportation closures, and/or • Workplace closures and other measures. • Public health quarantine (asymptomatic contacts) and/or • isolation (ill individuals).

Mitigation measures

- Screen local workers for COVID-19 at recruitment and in case of positive cases during work, contact the respective Health Officers (HOs) to take the patients for treatment.
- Wear masks
- Practice social distancing – Consistently monitor site access points to ensure social distancing guidelines are being met. This might require changing the number of available access points on-site.
- Prioritize sanitation – Require employees to wash their hands with soap and water or to use sanitizers before entering and after leaving the worksite, as well as before and after handling all goods, materials and equipment.
- Limit physical contact – Make sure that the workers stagger break times to reduce congestion and physical contact in eating areas. Require the workers to keep at least 2-3 metres of distance between one another while eating.
- Enhance whole-of-society coordination mechanisms to support preparedness and response, including the health, transport, travel, trade, finance, security and other sectors. Involve public health Emergency Operations Centres and other emergency response systems early.
- Continuously sensitize the communities and workers and pass on any new guidelines by Governments and health practitioners.

6.3.7. Lack of employer compliance with national labor laws, including in relation to hours of work, provision of PPE, and minimum wage

Likelihood of non-compliance of labor laws by the employer may arise from labor wages/rates and delays of payment; disagreement over working conditions (particularly overtime payments and adequate rest breaks); provision of personal protective devices (PPEs); limited employment opportunities; and health and safety concerns in the work

environment. Further, there is a risk that employers may retaliate against workers for demanding legitimate working conditions, or raising concerns regarding unsafe or unhealthy work situations, or any grievances raised, and such situations could lead to labor unrest and stoppage of work.

The Project will be implemented by total adherence to the employment and labor legislations and policies of each respective country and detailed in Section 4 of this ESMP. The GRM prepared for this Project will also provide a platform for reporting and handling grievances to ensure NBI and contractors compliance to employment and labor laws.

Mitigation measures

- The NBI will ensure that the Project is implemented by total adherence to the employment and labor legislations and policies of each respective country as detailed in Section 4 of this ESMP.
- The NBI and contractors will ensure the GRM prepared for this Project as a platform for reporting and handling grievances to ensure compliance to employment and labor laws.
- The NBI and other implementing agencies will provide all project workers with information and documentation that is clear and understandable to the worker regarding their terms and conditions of employment. This information and documentation will set out the worker's rights under national labor and employment laws.
- The NBI will ensure that Project workers are paid on a regular basis as required under national law.
- The NBI will ensure that deductions from payment of wages are made only as allowed by national law.
- The NBI will ensure that contractors provide workers with adequate periods of rest per week, annual holiday and sick, maternity and family leave, as required by national law of the country where the project activity is being implemented.
- The NBI and contractors will provide project workers with written notice of termination of employment and details of severance payments in a timely manner.
- The NBI and contractors will ensure full implementation of the national employment laws of the Project country in relation to recruitment and employment of project workers.

- The NBI and other implementing agencies for the project will maintain, and ensure that contractors, sub-contractors and primary suppliers maintain records of all worker contracts and related documentation, and confirm that the above provisions are being adhered to.

6.3.8. Discrimination against women, ethnic minorities, and persons with disabilities in recruitment and employment

The potential areas of discrimination include inappropriate treatment or harassment of project workers related, for example, to gender, age, disability, ethnicity, or religion; potential exclusion or preferences with respect to recruitment, hiring, termination of employment, working conditions, or terms of employment made on the basis of personal characteristics unrelated to inherent work requirements; in training and development provision.

In this project no discrimination will be acceptable as per the respective countries employment and labor laws and policies detailed in sections 4 and 5 of this LMP. The PIM will be prepared in accordance with the NBI employment policy and ESS2, which support equal opportunities for women and men, and persons with disabilities, with emphasis on equal criteria for selection, remuneration, and promotion, and equal application of those criteria. Recruitment shall also follow the NBI Gender Mainstreaming Policy and Strategy that reduces the chance for discrimination based on gender within the NBI. Measures to prevent harassment of project workers, including sexual harassment, in the workplace will be addressed with GBV Action Plan that will be prepared for the Project.

Mitigation measures

- The NBI will prepare PIM in accordance with the NBI employment policy and ESS2, which support equal opportunities for women and men, and persons with disabilities, with emphasis on equal criteria for selection, remuneration, and promotion, and equal application of those criteria. The NBI will ensure that recruitment protocols are followed to the latter during recruitment by Nile SEC project team and contractors
- Recruitment by NBI will also follow the NBI Gender Mainstreaming Policy and Strategy that reduce chances for gender discrimination within the NBI.

- Contractors will put in place measures to prevent harassment of project workers, including sexual harassment, in the workplace by preparing the GBV Action Plan to be used throughout the contracts period.
- The NBI and other implementing agencies for the project, and project contractors and sub-contractors will focus on inclusive and non-discriminatory recruitment and employment policies and procedures in relation to all project workers, and that this requirement will also be applied and strictly adhered to by project contractors and subcontractors, as well as primary suppliers, wherever possible.
- The NBI and other Project implementing agencies will require that each project contractor/subcontractor shall not make decisions relating to the employment or treatment of project workers on the basis of personal characteristics unrelated to inherent job requirements.
- The contractor/subcontractor shall base the employment on the principle of equal opportunity and fair treatment, and shall not discriminate with respect to any aspect of the employment relationship, including recruitment and hiring, compensation, working conditions and terms of employment, access to training, job assignment, promotion, termination of employment or retirement, and disciplinary practices.

7. ENVIRONMENTAL AND SOCIAL MONITORING AND MANAGEMENT PLAN (ESMMP)

7.1. Overview and Objectives of the ESMMP

The ESMMP is a tool to manage and monitor environmental and social impacts and specifically focuses on implementation of mitigation measures on ground against likely environmental and social impacts. The activities related to the hydromet project will be managed and monitored according to the management plan elaborated in this chapter.

The primary objectives of the ESMMP with respect to project activities are to:

- Define the responsibilities of the project proponent and partners during design, construction and operations phase (institutional and organizational arrangements) to ensure effective communication of environmental and social issues;
- Define the responsibilities of the project proponent and contractors to comply with the mitigation measures against every potential impact discussed in the ESMP.

- Define a monitoring mechanism, identify monitoring parameters and training requirements in order to ensure the effectiveness of the mitigation measures and provide a plan for implementation of training session and monitoring plan; Provide a mechanism for taking timely action against any unanticipated environmental situations;
- Identify the resources required to implement the ESMP.

7.2. The Environmental and Social Monitoring and Management Plan

The ESMMP is summarized in **Table 7-1.**

Table 7-1: Environmental and Social Monitoring and Management Plan

Environmental & Social Impact/Risk	Mitigation/Enhancement Measures	Monitoring Indicators	Agency Responsible for Monitoring and implementation	Monitoring Activities to be undertaken	Monitoring Frequency and Location	Desired outcome/target
Positive Impacts						
Creation of Employment opportunities	▪ Make a provision in the contract which compels the contractor recruits all non-skilled workers from the local community. ▪ The contractor to widely advertise for the potential jobs in the local media (radio stations); also publicise the jobs through local fora (church/mosque and other public gatherings), pinning job adverts in strategical places in the locality and using local leaders	▪ Notices on project jobs displayed in Numbers of women employed in the project. ▪ Area Local employed on the project	▪ Contractor ▪ Supervising Consultant ▪ NBI	Records and interviews	Project site visits done monthly	▪ Equal opportunity employment ▪ Employment of

	to disseminate information for the available jobs ▪ Involve the local leaders in the respective countries to support identify workers from the local community. ▪ Worker grievance ▪ redress mechanism be established with					

Environmental & Social Impact/Risk	Mitigation/Enhancement Measures	Monitoring Indicators	Agency Responsible for Monitoring and implementation	Monitoring Activities to be undertaken	Monitoring Frequency and Location	Desired outcome/target
	▪ involvement of Labor officers in respective countries ▪ Qualified women be targeted and encouraged to apply for jobs.					
Capacity Building of technical personnel	▪ Development of ▪ Mainstreaming and sustainability of the capacity development and retention of competences	Trained techni cal personnel	NBI	Record of	Throughout project lifecycle	Trained techni cal personnel proficient in their respective professional disciplines

Strengthened cooperation and capacity of the Nile basin ripari an counties.	▪ NBI to generate data, analyses and studies at the regional scale, and decision support tools. ▪ Promote data driven and evidence-based decision making and deliberations on water resources within the basin. ▪ NBI to establish basin- wide cooperati on forums to address challenges arising from climate change, water related conflicts and enhance inter-sectoral coordination.	Countries accessing data and using the analyses as decision support tools. Reduced politicization, securitization a nd conflicts over water issues within the Nile basin. Number of cooperation forums established by the NBI. Water confli cts mediated across the basin.	NBI	Data platform access records in each country. Media a nd publication records on basin water use and conflicts.	Throughout project lifecycle.	Data sharing, access and analysis usage for decision support. Reduced conflicts over water in the basin. Enhanced basin-wide cooperation and successful water and related confli ct mediation among Nile basin ripari an countries.

Environmental & Social Impact/Risk	Mitigation/Enhancement Measures	Monitoring Indicators	Agency Responsible for Monitoring and implementation	Monitoring Activities to be undertaken	Monitoring Frequency and Location	Desired outcome/target
Increased access to reliable climate related information.	NBI and the other implementing partners can standardize procedures and data sharing and analysis protocols to promote trans-boundary collaboration within the riparian countries. NBI should ensure that hydromet services are linked to regional and global centers, to enhance the sustainability of data sharing to increase reliability and authenticity.	Standardised procedures developed for data capture, sharing, analysis and usage. Number of linkages of hydromet services created with regional and global data centers.	NBI	Data platform access records.	Throughout project lifecycle across the basin.	Procedures for regional data capture, sharing, analysis and usage established to tackle climate related challenges within the Nile basin.

Enhanced food security in the communities by improved and reliable early warning systems	NBI to furnish farmers with reliable weather and climate information for decision making and long term planning. NBI to enhance sharing of seasonal climate outlooks	Enhanced food security. Increased harvest quantity of food crops and livestock. Reduced crop damage and livestock	NBI Local communities particularly crop and livestock farmers.	Crop and livestock production and harvest records. Drought and floods impact records.	Throughout project lifecycle across the basin.	Increased crop harvests and livestock production. Reduced cases of famine across the Nile basin. Proper timing and

Environmental & Social Impact/Risk	Mitigation/Enhancement Measures	Monitoring Indicators	Agency Responsible for Monitoring and implementation	Monitoring Activities to be undertaken	Monitoring Frequency and Location	Desired outcome/target
	information that is important tool for decision making for crop production and timely sale of livestock during looming drought calamities.	deaths during extreme climatic conditions particularly flooding and drought.				planning for planting of crops and timely marketing of livestock.
Negative Risks and Impacts						

Risk of Gender Based Violence	▪ The Contractor should have deliberate measures for mainstreaming GBV interventions in the project. ▪ Instituting Grievance redress mechanism with provisions on effective handling of GBV complaints in the project. ▪ Involving the Local authorities and Family Protection Unit in handling complaints on gender-based violence. ▪ Contractor to prepare and implement a Gender Action plan to guide in the management of GBV in the project.	▪ Displayed sexual harassment policy ▪ Reported cases of gender-based violence ▪ Records of ▪ Availability of Gender sensitive facilities such as changing rooms, toilets, among others.	▪ NBI ▪ Supervising Consultant ▪ Contractor ▪ Local leaders	Records Site visits	Continuous through project implementation phase in all project sites	▪ Minimise the incidences GBV resulting from project implementation activities through sensitisation campaigns, instituting reporting systems and working closely with the GMCs and local leadership

Environmental & Social Impact/Risk	Mitigation/Enhancement Measures	Monitoring Indicators	Agency Responsible for Monitoring and implementation	Monitoring Activities to be undertaken	Monitoring Frequency and Location	Desired outcome/target
Risk of theft/or vandalism	▪ Need for awareness and continuous sensitization ▪ The project should secure the piece of land by fencing it off where the hydromet stations and guard against vandalism by communities and wildlife. ▪ Consult all user groups at project sites during project implementation to	▪ Record of	▪ Contractor/NBI desk officers /NBI /Field contact persons/GIZ	Reports on security	Monthly	Alleviate/or minimise any incidences of

HIV/AIDS, STDs	▪ HIV/AIDS sensitization and awareness for the workers and the community within the Riparian countries. ▪ provision of health and safety gears, first aid kits that include condoms, involving existing health providers and services. ▪ The project will establish HIV/AIDS Workplace policy	Reports of; number of HIV/AIDs programs conducted by the Contractor Number of testing, counselling provided Prevalence of	Contractor, /NBI environmental and social safeguards team/GIZ	HIV/AIDs testing and counselling, community outreach activities, condom distribution	Quarterly	▪ To reduce the transmission rate/spread of HIV/AIDS and other related infection as a result of project implementation activities

Environmental & Social Impact/Risk	Mitigation/Enhancement Measures	Monitoring Indicators	Agency Responsible for Monitoring and implementation	Monitoring Activities to be undertaken	Monitoring Frequency and Location	Desired outcome/target
	▪ develop and implement Join t HIV/AIDS Community work plans with relevant Hea lth Officials .					

Risk of Inadequate access to Grievance Redress Mechanism	▪ Publicize the existence of the GRM and the procedure for using it in languages that apply in those respective areas. ▪ Where members of the community are illiterate pictorial illustrations will be used to sensitize them about the GRM and the procedures of lodging a complaint. ▪ Receive and log requests for dispute resolution ▪ Track and document efforts at grievance/dispute resolution and their outcomes. ▪ Review and make improvements to the GRM that would enhance its effectiveness,	Established proj ect GMCs	Contractor, /N BI environmental and social safegua rds team/GIZ	Grievance Log books, grievance database	Monthly	▪ Have all project related resolved during implementation of the project.

Environmental & Social Impact/Risk	Mitigation/Enhancement Measures	Monitoring Indicators	Agency Responsible for Monitoring and implementation	Monitoring Activities to be undertaken	Monitoring Frequency and Location	Desired outcome/target
Risk of contracting and spreading COVID-19	▪ Screen project workers for COVID-19 at recruitment ▪ Wear masks ▪ Practice social distancing ▪ Prioritize sanitation	Establishment and observance to	NBI/contractor/GIZ	Testing and tracing workers for any signs and symptoms of COVID-19	Monthly	Minimise the risk of spreading COVID-19

Solid wastes	▪ Provision of solid waste collection bins ▪ Segregation of waste at source ▪ Appointing a reputable garbage collector for safe handling and disposal ▪ Proper debris waste disposal by backfilling or dumping in approved grounds by the respective local/county/municipa l authority ▪ Where feasible, enhance recycling and re-use of wastes ▪ Enhance waste management by developing waste management performance indicators in relation to recycling	Develop waste management performance indicators applicable to the project.	NBI/Environmental & Social Safeguards team/Contractor	Waste management records	During civil works at respective sites	To enhance sound waste management procedures and solid waste disposal systems to reduce resource wastage, pollution etc.

	and reuse ▪ Develop a solid/e-wastes waste					

Environmental & Social Impact/Risk	Mitigation/Enhancement Measures	Monitoring Indicators	Agency Responsible for Monitoring and implementation	Monitoring Activities to be undertaken	Monitoring Frequency and Location	Desired outcome/target
	management plan for the project					
Risk of potential exposure to electromagnetic radiation (EMR)	Procurement of hydromet equipment with low- radiation electromagnetic waves emitters for wireless communication. Promote consumption of natural anti-oxidants among people living in the nearby hydromet stations and who might potentially be exposed to the EMR. Promote consumption of diets rich in fruits, vegetables, whole grains, legumes, and omega-3 fatty acids.	Use of appropriate wireless communication. Awareness on healthy diets among local people.	NBI/Contractor	Diets/health records among local inhabitants.	Quarterly	Reduced exposure to EMR. Improved public health due to increased awareness on appropriate diets as a mitigation against potential exposure to EMR.

Risk of Mercury/Infrared pollution	Periodic equipment monitoring and adherence to proper equipment disposal.	Equipment knowledge to	NBI/Contractor/ Environmental &	Hydromet equipment status records. Training records.	Quarterly	Proper handling and disposal of hydromet equipment to reduce exposure to potential risk of

Environmental & Social Impact/Risk	Mitigation/Enhancement Measures	Monitoring Indicators	Agency Responsible for Monitoring and implementation	Monitoring Activities to be undertaken	Monitoring Frequency and Location	Desired outcome/target
	Training of hydromet staff and local communities on handling of obsolete, unused or old equipment from the hydromet stations. Responsible personnel in each country should be trained on disposal of old or obsolete equipment.	Awareness on effective duration of equipment use. Training module for responsible staff.				mercury/infrared pollution.

Loss of flora due to land clearance, poaching and/or illegal harvesting of wildlife	Minimize the area earmarked for vegetation clearance. Avoid sensitive areas, where feasible, for the new hydromets. Promote re-vegetation of cleared areas or tree planting in adjacent areas to be undertaken by local communities.	Areas of vegetation cleared and those planted with vegetation. Avoidance of Number of new hydromet sites with restored vegetation.	Contractor/ Environmental &	Local vegetation and wildlife status assessments. Wildlife kill records.	Quarterly and during civil works at respective sites	Near natural vegetation and wildlife status maintained or restored.

Environmental & Social Impact/Risk	Mitigation/Enhancement Measures	Monitoring Indicators	Agency Responsible for Monitoring and implementation	Monitoring Activities to be undertaken	Monitoring Frequency and Location	Desired outcome/target
	Restoration of areas affected by civil works through landscaping including planting of trees and grasses to cover unpaved areas Construction workers to sign Code of conduct (CoC) to minimize unwanted clearing of land/vegetation, poaching/illegal harvesting of wildlife.					

Temporary disturbance of land surface	Minimize excavation of the soil where feasible. Where possible, use a compressor to push the masts into the soil surface to minimize disturbance on the mast area as opposed to normal digging or excavation.	Quantity of soil excavated	Contractor/ Environmental &	Soil erosion and soil profile compactness assessment records.	During civil works at respective sites	Maintenance of soil profile and avoidance of soil erosion.

Environmental & Social Impact/Risk	Mitigation/Enhancement Measures	Monitoring Indicators	Agency Responsible for Monitoring and implementation	Monitoring Activities to be undertaken	Monitoring Frequency and Location	Desired outcome/target
Risks of Occupational Health and Safety (OHS) e.g. exposure to noise, dust and vibrations	Workers should be provided with personal protective equipment (PPE) e.g. sound arresting devices and face masks Observe seasonal sensitivity e.g. avoid work during animal breeding and migration seasons. Erect informative signs (billboard) at civil works sites	Number of workers provided with and using PPEs. Avoidance of works during biodiversity sensitive seasons or areas. Number of active work sites fitted with informative billboards.	Contractor/ Environmental &	Workers health records/status. Local wildlife survey records. Local awareness of on-going civil works.	During civil works at respective sites	Enhanced health of workers and consideration of plight of local wildlife.

Risks of using solar battery: potential for fire and toxic chemicals	Use low voltage direct current (DC) in the solar installations wiring to reduce the risk of fire. Siting of hydromet equipment in open place with little vulnerability to fire. Install fire extinguishers	The DC input in the solar battery. Location of hydromet sites in open or less vegetated areas. Number of fire extinguishers installed. Training	NBI/GIZ/Contractor / Environmental &	Equipment manuals and specifications. Hydromet sites survey records and location maps. Training schedule for	Quarterly and during equipment installations	Enhanced longevity of solar equipment use and avoidance of potential for fire and release of toxic chemicals

Environmental & Social Impact/Risk	Mitigation/Enhancement Measures	Monitoring Indicators	Agency Responsible for Monitoring and implementation	Monitoring Activities to be undertaken	Monitoring Frequency and Location	Desired outcome/target
	near hydromet stations or local institutions Staff training on usage, safety protocols and disposal of hydromet equipment. Procure rechargeable- battery solar panels with at least 3-5 years warranty.	manual/modules developed. Adequate training of responsible staffs. Period of warranty of procured solar equipment.		staffs.		

Potential risks related to establishment of Hydromets in sensitive areas e.g. national parks, game reserves, wildlife sanctuaries, hunting areas etc.	Perimeter fencing of hydromet stations within protected areas, where applicable Rehabilitation of existing and/or construction of new concrete walk in shelters to limit potential access and damage of equipment Use appropriate camouflaging colours for	Damage or attempted damage to hydromet sites e.g. fence enclosures. Counts of wildlife tracks around the hydromet sites. Grazing intensity around the hydromet sites. Level of awareness on hydromet sites	Contractor/NBI/ Environmental &	Hydromet structure status reports including attempted damage. Wildlife population survey records. Records on changes in	Quarterly and during equipment installations	Reduced interference with wildlife habitats and behaviour within protected or sensitive areas.

Environmental & Social Impact/Risk	Mitigation/Enhancement Measures	Monitoring Indicators	Agency Responsible for Monitoring and implementation	Monitoring Activities to be undertaken	Monitoring Frequency and Location	Desired outcome/target
	paining concrete walk-in shelters to avoid scaring wild animals Seek permission from protected area authorities for access and work Conduct trainings and create awareness among staff managing protected areas Use appropriate billboards indicating on-going civil works within sensitive or protected areas.	among staff working in protected or sensitive areas. Existence of				

Flooding risks	Raised elevation including construction of raised concrete walk -in structures for new hydromet sites. Dry flood-proofing by making the concrete walk	Number of stations with potential for damage to floods. Moisture/water content in enclosed hydromet structures. Ease of accessibility	Contractor/NBI/ Environmental &	Annual flooding frequency and water height records. Records of	Quarterly a nd during construction of	Fully functioning hydromet stations Without external damage by floods or internal interference with moisture and water damage.

Environmental & Social Impact/Risk	Mitigation/Enhancement Measures	Monitoring Indicators	Agency Responsible for Monitoring and implementation	Monitoring Activities to be undertaken	Monitoring Frequency and Location	Desired outcome/target
	in shelters located within floodplains waterti ght below the flood level. Where new sites shall be built on flood-plains, use wet flood-proofing whereby the bottom parts of hydromet enclosure structures are built to allow water to enter and exit the structures to reduce potential structural damage. Hydromet workers should employ safe use of motorized boats for monitoring the hydromet sites during flooding regimes or high waters.	to the stations during flooding regimes. Availability of Quantity of rust on metallic equipment parts.		height i n enclosed hydromet structures during flooding		

8. NSTITUTIONAL ARRANGEMENTS

8.1. Project Implementation Arrangements

The relevant institutions that will be charged with the responsibility of implementing the ESMP at the basin-wide level include: NBI Secretariat (Nile-SEC) together with its governance bodies (Nile-COM, Nile-TAC and National Focal Point Officers), World Bank and GIZ as the funding agencies and a contracted implementation consultant and contractor.

8.1.1. Nile Basin Initiative Secretariat (Nile SEC)- NBI Project Task Team

The activities and investments under the hydromet project will be implemented through NBI Secretariat (Nile-SEC). Nile-SEC would establish a dedicated Project team to assist in the implementation of the project activities. Nile SEC, will be responsible for appointing a Project team leader and assigning NBI staff to key roles and consultants as per project requirements. The project team would have responsibility for implementing the hydromet project including, but not limited to, reporting, monitoring and evaluation, social and environmental management, procurement, financial management, audit and disbursements, as well as coordination with the line agencies, the GIZ and the World Bank. The project team will be adequately resourced with skillsets and competencies required for project implementation and monitoring.

The project team would be created and adequately staffed before commencement of the construction, rehabilitation and installation of hydromet equipment for purposes of effectiveness and efficiency. To ensure overall guidance and coordination for project implementation, technical staff from NBI and representatives from other implementing partners, and funding agencies will work together to oversee and achieve the expected compliance tenets as set out in the ESMP. The Environmental Safeguards Specialist and Social Safeguards Specialist at NBI will be directly responsible for the compliance of the ESMP, project screening and effective implementation, internal monitoring and progress reporting. The Specialists will have close coordination with country environmental agencies and Ministries of Water Departments of the respective riparian countries to address their concerns regarding hydromet project interventions and to ensure that Nile Basin, GIZ safeguards system and World Bank Environmental and social safeguard policies are upheld. The ESMP will be implemented under the overall

supervision of the project team leader. NBI will be responsible for hiring of Construction Contractor and supervision of contractors work on the sites in accordance with ESMMP. Roles and responsibilities of the Nile SEC Project Team have been detailed in **Table 8-1** below. In cases of overlapping roles by more than one Specialist, higher authority will have the authority to redesignate the roles and responsibilities of those officers in the best interest of the project and to ensure clarity of responsibilities for ESMP implementation.

Table 8-1: Roles and responsibilities of the NBI Project TaskTeam

Organization	Position	Responsibility
NBI Project Task Team	Project team leader	● Ensure ESMP implementation
	Environmental Safeguards Specialist	● Ensure implementation of the ESMP during various stages of design and construction; ● Ensure that timely and robust environmental monitoring is carried out in the field; ● Ensure that the construction contracts include clauses for ESMP implementation; ● Ensure that environmental trainings are planned and implemented; ● Overall monitoring and reporting of ESMP; ● Conduct financial management of the ESMP implementation; ● Coordinate and ensure development of awareness material; ● Commission annual third party validations of the project; ● Prepare Environmental Biannual Progress Reports (BPR) for the project

	Social Safeguards Specialist	● To carry out the screening of the sub-projects with respect to the social aspects as defined in the ESMF; ● Monitor and check the proper implementation of all social mitigation measures as suggested in ESMF/ESMP;

		● Monitoring and evaluation of social related matters of the project and maintain a social complaint register to document social issues; ● Supervise the Contractor's activities and make sure that all the contractual obligations related to the social compliance are met; ● Review of periodic social reports being prepared by the investor/contractor and submitting the same to the Bank ● Ensure inclusion of ESMP guidelines in project designs. ● Remain the focal point for managing the project GRM, and maintain analysis and reports on types of complaints received,resolved, time taken to action, etc.

8.1.2. Project Consultant

A Project Consultant will be hired for construction, rehabilitation and installation of the hyromets, and for the supervision of the project works. NBI will ensure compliance & implementation of ESMP at the different project sites, through dedicated safeguards staff. The consultant will carry out regular monitoring of the ESMP implementation at all working sites and will submit periodic reports to the Nile SEC Project Team regarding ESMP implementation and compliance status.

8.1.3. Construction Contractor

The Hydromet Construction Contractor (CC) hired by NBI will be responsible for on- field implementation of the ESMP. All the required liabilities under the World Bank and GIZ guidelines, and applicable country specific laws and guidelines will be fulfilled by the construction contractor at the project sites. Contractor ESMP will be an integral part of the contract documents and details will also be included in the bid to address the budget for environmental and social safeguards. Contractor will hire requisite staff to ensure compliance of ESMP. Nile SEC Project Team and the consultant will ensure that the following plans have been prepared, while the contractor will ensure that these plans are being implemented:

- Energy and Water Conservation Plan
- Traffic Management Plan
- Solid Waste Management Plan
- Hazardous Waste Management Plan
- Workers Health and Safety Plan
- Emissions Monitoring Plan
- Debris Management Plan
- Emergency Response Plan
- Public Safety Plan
- Labour Management Plan
- HIV/AIDs Management Plan
- Stakeholder Engagement Plan
- Gender Management Plan
- COVID-19 Management Plan

The Contractor will ensure that the proposed hydromet activities are in compliance with the ESMP, World Bank's ESS and GIZ Environmental and Social Safeguards Systems. Provision will be made in the agreement with the contractor to:

- Train staff on regular basis on Environment, Social, Health and Safety compliance;
- Implement ESMP in the field;

- Ensure safe working conditions;
- Provide Provisions of PPEs to workers;
- Report every incident/accident;
- Monitor regular compliance with environmental and social mitigation measures as per ESMP.
- Execute onsite environmental testing

8.2. ESMP Monitoring Plan

Implementation of the ESMP will include both internal monitoring and reporting and external monitoring and evaluation. The monitoring and evaluation activities will include regular monitoring of implementation progress and performance, independent process monitoring, including regular assessments of community-level planning and reviews of the effectiveness and quality of capacity-building efforts. In addition baseline, mid-term and end-of-project as well as annual thematic studies including the assessment of the impact of installation of specialized equipment for hydromets on the affected populations shall be conducted jointly between NBI as well as NELSAP-CU, ENTRO, LVBC and NBD.

8.2.1. Internal Monitoring

It will be the responsibility of the NBI Project Task Team to conduct regular internal monitoring of the project to audit direct implementation of environmental mitigation measures contained in the ESMP. The overall supervision of the ESMP will be with the Nile SEC Project team and the Project Consultant who will be responsible for supervision of the contractors and monitoring at the project site on a regular basis. The Environmental and Social Safeguards team will conduct regular monitoring of the hydromet project site. Monitoring reports by the consultant will be submitted to the Environment and Social Safeguard Specialists in NBI for necessary corrective action.

8.2.2. Monitoring/Third Party Validation

The Consultant recommends that a consultant should be hired to carry out Annual Environmental Audits in line with National Environmental regulations and requirements. The statutory environmental regulatory bodies have the overall responsibility for issuing approval for the hydromet project and ensuring that their environmental guidelines are followed during Project implementation. Their role therefore is to review environmental monitoring and environmental compliance documentation submitted by the NBI and they

would not normally be directly involved in monitoring the Project unless some specific major environmental issue arose. Nile- SEC through the consultant will therefore provide the country specific regulatory bodies with reports on environmental compliance during implementation as part of their annual progress reports and annual environmental auditing reports for the construction, rehabilitation and installation of specialised hydromet equipment. Depending on the implementation status of environmentally sensitive project activities, the regulatory bodies will perform annual environmental reviews in which environmental concerns raised by the project will be reviewed alongside project implementation. Relevant representatives from the World Bank and GIZ should be incorporated. Where applicable communities living in close proximity with the hydromet stations should be engaged and consulted during the audit process.

8.3. ESMP Reporting

Implementation monitoring reports regarding environment and social compliance will be prepared by the Nile SEC Project team on a regular basis. Specialists on the project team will also compile monthly and quarterly ESMP implementation progress reports and the final report once the proposed project is completed. **Table below** shows the periodic distribution of reports to be prepared for the proposed project.

Table 8-2: Periodic distribution of reports to be prepared

Number	Report	Prepared by	Reviewed by	Distribution
1	Monthly	Project team	Environmental and Social Safeguards Specialists	Project team leader
2	Bi-annual	Environmental and Social Safeguards Specialists	Project team leader	National Environment Agencies, GIZ, World Bank
3	Annual	Consultant		National Environment Agencies, GIZ, World Bank

4	Final	Environmental and Social Safeguards Specialists	Project team leader	National Environment Agencies, GIZ, World Bank

The Annual Progress Reports (APRs) will provide progress on implementation of mitigation measures, safeguard monitoring, capacity building, and any other ESMP implementation activity carried out during the reporting quarter using monitoring checklist (**Annex 9**). Format of the Annual Report is provided in **Annex 10**. These reports will be shared with, among others, the World Bank and GIZ within one month of the completion of each quarter. The Annual Report will include environmental and social safeguards monitoring indicators.

8.4. ESMP Capacity Development and Trainings

Capacity building and training of the staff and contractors associated with ESMP implementation will be required for effective environmental and social management. Specific training on environmental and social impacts and mitigation will be arranged for the Project team leader, Environment and Social Safeguards Specialists, and other members of the Project team to deliver their monitoring responsibilities in an organized and effective manner as per requirement of the monitoring plan. The main objective of the training is to enhance the technical capacity of staff associated with ESMP implementation, keep the project team aware of the emerging environmental and social issues, and enable them to resolve those issues through proposed mitigation measures. Training will also be held for contractors on implementation of the ESMP. **Table 8-3** gives a tentative program for capacity building and training.

Workshops are to be held throughout the duration of the project. This includes refresher training. The workshops will focus on environmental and social issues arising during ESMP implementation, mitigation measures, and health & safety. They will also focus on sensitizing the participants about environmental and social responsibility, managing the on-ground problems, and assuring implementation of the ESMP.

Table 8-3: Tentative program for capacity building and trainings

Description of Training	Training Module	Location	Frequency	Participation
Two-day Training Workshop	Objectives, need and use of ESMP; Legal requirements of the ESMP (Legislations and the World Bank Operational Policies); Management of environmental and social issues and mitigation strategies as per ESMP; Monitoring Mechanism Documentation and reporting procedures	Confirmed physical location and or/online	Launch workshop at	Project team Staff including Project Team leader, Environment and Social Safeguards Specialists, and other members of the project team
One Day Training Workshop	ESMP with special focus on mitigation measures during design stage	Confirmed physical location and or/online	One training workshop at design stage of project	All architects, contractors, sub-contractors, and supervision consultants
One Day Training Workshop	ESMP with special focus on mitigation measures during construction stage	Confirmed physical location and or/online	One workshop during construction	All contractors, subcontractors, And supervision
			period of the project	consultants
One Day Training Worksh	ESMP with special focus on mitigation measures during operational	Confirmed physical location and	One workshop at the end of the project	Project team staff

op	phase	or/online		

8.5. Estimated ESMP implementation Budget

The ESMP implementation budget refers to all costs that will be incurred to implement the requirements or recommendations in this ESMP. In the ESMP the requirements are to ensure that implementation of the project integrates environmental and social issues for the sustainability of the hydromet project. Among other things the ESMP recommends the following key issues, namely; implementation and management of this ESMPs, site-specific ESMP Trainings, environmental screening, reviewing and monitoring mechanisms. The implementation of the environmental and social management plan will be the responsibility of the contractor. The estimated budget implementation of mitigation measures covered during the engineering/ constructions at selected sites is estimated at 125,00 USD as shown Table 8- 4 below.

Table 8-4: Estimated ESMP implementation Budget

#	Description	Target groups and institutions	Unit of measurement	Quantity	Total (USD)
1	Site specific ESMP Trainings (including materials, logistics, venue)	Communities (members and local leaders)	Workshops	7	50,000
2	PPE maintenance	Contractors, NBI Project Task Team	Years	1	10,000
3	Review and Validation of reports by consultant	NBI Project Task Team	Reports	2	25,000
4	Environmental safeguards (Air, Noise and Water	NBI, Contractor and supervising consultant	Months	9	20,000

5	Social safeguard monitoring(sensitization ,facilitation of GRM	NBI safeguards	Months	9	20,000
	,community consultations	team, N BI Project Task Team			
Grand Total					**125,000**

9. GRIEVANCE REDRESS MECHANISM

9.1. Principles of GRM

Grievances and concerns are bound to occur from the earliest or inception phase of the project. The activities and operations of the consultant at planning phase; and those of the contractor at implementation phase can result into undesirable social-economic and environmental impacts, which may annoy, irritate or cause feelings of discomfort and unfairness among different stakeholders which affect the license to operate, the progress of the works and the ability of affected persons to enjoy the benefits of the project. A GRM is to receive and facilitate resolution of affected stakeholders' concerns and grievances related to the Project's environmental and social performance. The GRM process should be disclosed publicly and available during the pre-construction, construction and operation phases of the Project, and to be used by all affected stakeholders, including employees and contractors.

The purpose of the GRM is to put in place a simple and easily accessible systematic process for recording, processing and promptly resolving grievances and concerns raised during ESIA detailed studies and during project implementation. The aim of the GRM is to achieve mutually agreed resolution of grievances raised by stakeholders and other parties. NBI field based team, contractor will work together with the local administrative structures to register and resolve concerns that may arise during project implementation.

Grievances should be received, recorded/ documented and addressed in a manner that is easily accessible, culturally appropriate and understandable to affected communities. Where feasible and suitable for the Project, the grievance mechanism may utilize existing formal and informal grievance mechanisms that will support the Project-

specific proposed arrangements. The Project dedicated personnel on handling grievances will be consistent, experienced and qualified to do so. The communities will be informed about the GRM during the stakeholder consultation and disclosure activities. The mechanism will be communicated and made available to all affected communities and in particular to both genders and vulnerable groups.

The Project dedicated personnel will be experienced and/or trained to seek solutions to complaints in a collaborative manner with the involvement of the affected community, taking into consideration customary and traditional methods of dispute resolution, and not impeding access to existing judicial or administrative mechanisms available in the country for resolution of disputes. The mechanism includes a redress aspect so that those who feel their complaint has not been addressed in a manner they find satisfactory can have recourse to an external body for reconsideration of their case. Concerns will be addressed promptly, using a transparent process that is readily accessible to all segments of the affected communities and at no cost to them and with no retribution. Grievances received and responses provided will be reported back to the community periodically (at least every six months). The Project will provide an option for anonymous grievances, including for worker grievances whereby the worker's identity can be protected from their supervisor or any repercussions.

9.2. The GRM Process

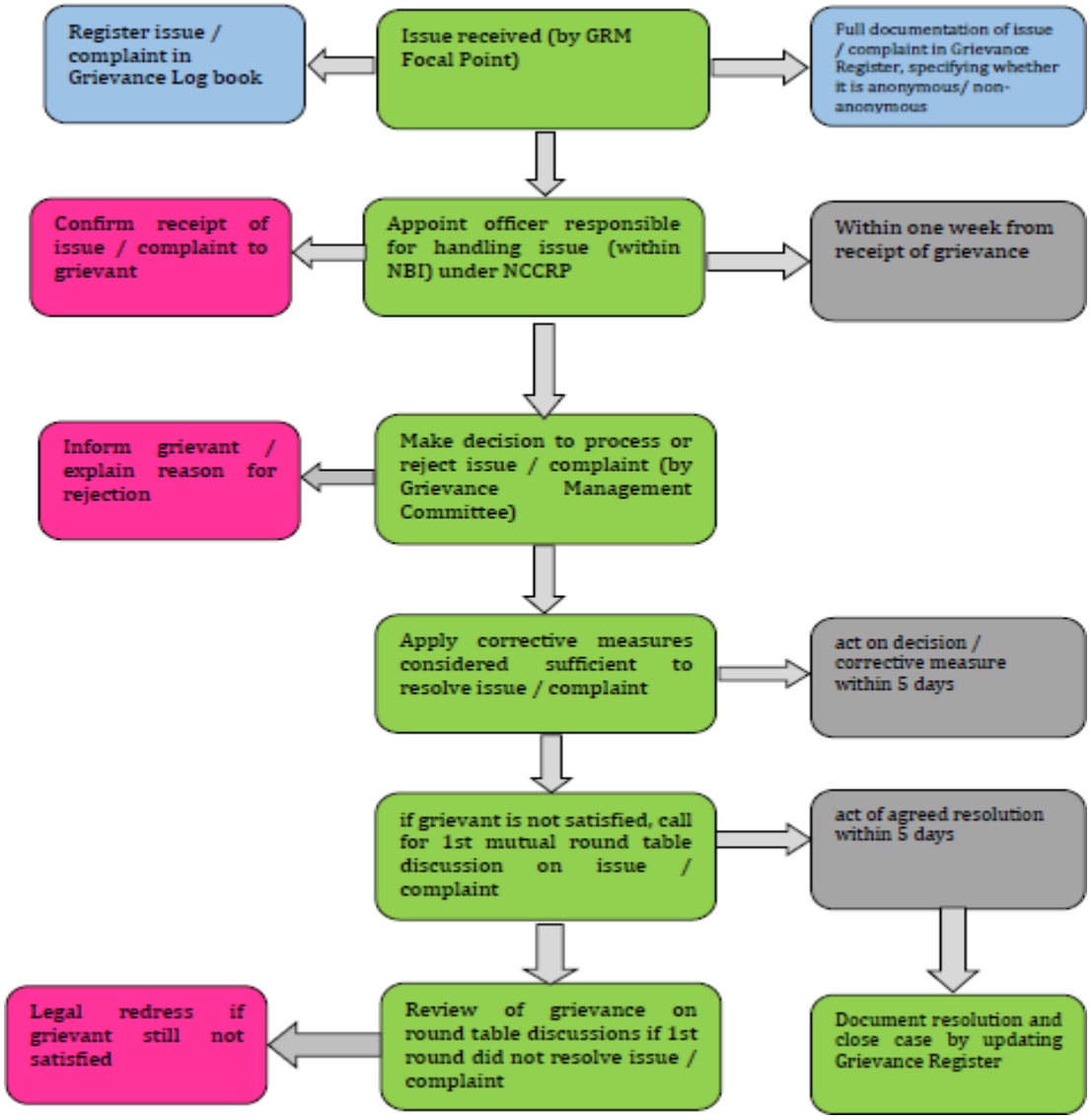


Figure 9-1: The GRM Process

9.3. GRM Focal Points

NBI will select a GRM Focal Point: GRM focal point will include the Environmental and Social Safeguards' specialists on the project. The GRM Focal Point's contact details will be made available to all stakeholders. Grievances will be lodged by anyone to the GRM Focal Point within the Nile Basin. The GRM Focal Point will work with project safeguards officers to support the handling of complaints brought to the attention of the GRM Focal Point and will be the secretary of the Grievance Management Committee.

9.4. Monitoring GRM

The Project GRM focal point will also be responsible for documenting (recording), logging grievances received and addressed (both anonymous and non-anonymous, and reporting on a regular to the Project committee members. To ensure that the identity of non-anonymous complainants is protected, grievance logbooks and reports should not include identifying information on individuals.

9.5. Disclosure of GRM

The GRM will be disclosed as early as possible and maintained throughout the Project lifecycle. It will be disclosed in a culturally appropriate manner in English and other languages in respective countries in an understandable format to all affected communities, stating the following information:

- Anyone can raise complaints, grievances, concerns, ask questions or make comments or suggestions related to the Project;
- Anyone can contact the GRM focal point using the GRM focal point's contact details provided;
- the GRM focal point is responsible for receiving complaints, grievances, concerns, questions, comments, suggestions, and for responding to the person on a non- anonymous basis or generally via the Project's website on an anonymous basis;
- the GRM focal point will confirm receipt of the complaint, grievance, concern, question, comment, suggestion, either providing a preliminary answer or confirming the expected timing to provide an answer; and
- by using this grievance mechanism, the complaint, grievance, concern, question, comment, suggestion with respect to the mini grid Project development will be received by the Project proponent which will endeavour to answer the complaint, grievance, concern, question, comment, suggestion and engage with the complainee and the Project's other relevant parties to mitigate any complaint, grievance, concerns, or incorporate any comment, suggestion in the Project development to the extent possible.

The local government and all contractors will also be advised on the GRM so that they can communicate the step-by-step process to the Project affected people.

10. ESMP DISCLOSURE

This ESMP will be disclosed on the websites of Nile-SEC and on the World Bank Info Shop. Hard copies of this ESMP will also be shared with the National Environmental Agencies, project stakeholders, contractors, Civil Society Organizations among others. A copy of the ESMP will be placed in the Project team office, Ministries, Departments and Agencies of the 9 riparian countries for public access. Similarly, a brief of the reports for each project shall be displaced on public places accessible to the local people in English and/or in French, and if possible, in local languages. The purpose will be to inform them about the project activities, negative environmental and social impacts expected from the project and proposed mitigation measures. The Project office and social safeguards specialist will keep the residing population informed about the environmental and social impacts and facilitate in addressing grievance(s). The ESMP study team has made an endeavor to hold consultative and scoping sessions with these stakeholders to demonstrate their views on the proposed Project, among other critical issues, their opinions, suggestions, understanding on various issues and concerns.

11. RECOMMENDATIONS

- Conduct site-specific visits to ensure updated information is provided with regard to the Hydromet stations. For example, the field visits in Kenya revealed that the geographical locations for the hydromet sites visited (Nyando Ogilo and Yala) were both inaccurate. Also, the name 'Yala Kadenge' was misleading for the site hence we propose the change of name for this site as "Yala at Odhuro Bridge".
- Additionally, in Uganda, the project proponent might need to consider and explore identifying another site because of the increase in water levels which constantly flood the area which will curtail rehabilitation and installation work related to the current station at Butiaba gorge.
- Trainings and awareness creation to the locals should be mandatory during implementation of the ESMP in order to sensitize the local communities and relevant stakeholders on the importance and role of the respective stations.
- Training of relevant staff at country levels on both GIZ safeguards and World Bank ESF standard should be mandatory to ensure proper implementation of the ESMP.
- Accessibility should be improved through maintenance of access road to the sites especially those stationed in the rural and remote locations.

- Security should be enhanced in remote hydromet stations and constant monitoring through linkages with local communities.
- Enhance the resource capacity of the ESMP implementation team by hiring Environmental and Social Safeguard specialists as recommended in the ESMP and ESMF reports.

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13. ANNEXES

Annex 1: Integrated Environmental and Social Screening Checklist (ESSC)

Item	Yes	No	Remark
Sub Project location			
Is the subproject located within or adjacent to an area vulnerable to natural hazards (e.g. low-lying, waterways, floodplain, wetland, steep sloping land)?			
Is the subproject located adjacent to a sensitive site or facility (e.g. village, historical or archaeological or culturally significant site, conservation reserve, school, hospital/ medical facility)?			
Is the subproject located in or near natural habitats or sensitive area (conservation areas, protected areas, forests etc.)			
Land related impacts			
Will the subproject include any physical construction work?			
Does the sub project include upgrading or rehabilitation of existing physical facilities?			
Does the sub project involve installation of equipment?			
Is the sub project likely to cause partial or full damage to, or loss of housing, shops, or other resource used?			
Is the site chosen for subproject free from encumbrances and claims?			
If any land required for the work is privately owned, will this be purchased or obtained through voluntary donation?			
Is the plot size and ownership status officially registered?			
Livelihood			
Will the subproject affect livelihoods of people living in the project area (affect crops or any property or damage to agricultural lands, standing crops, trees, etc)?			
In case there are people/ businesses who may suffer temporary loss of incomes or livelihoods, have they been identified and consulted?			
Has there been any livelihood assistance such as any financial assistance?			
Might the sub-project have opposition from the communities where the implementation is going to take place?			
Are there any people or communities who are engaged in activities near the sub project site (e.g cultivating, wash clothes, fetch water etc) who may be partially or fully affected because of the			

Item	Yes	No	Remark
civil works?			
Grievance Handling			
Is there an effective grievance redress mechanism (GRM) within the communities?			
Is GRM accessible for all people of the community?			
Does local population submit their grievances through GRM channels?			
Are grievance logbook and intake channels available at subproject sites?			
Have the nearby communities been sensitized on grievance redress?			
Are there any possible potential social conflict and risk that could be triggered as a result of project implementation?			
Are grievances recorded and shared with the safeguards team?			
Gender Equality and Women's Empowerment			
Is there likelihood that the proposed Project would have adverse impacts on gender equality and/or the situation of women and girls?			
Would the Project potentially reproduce discriminations against women based on gender, especially regarding participation in design and implementation or access to opportunities and benefits?			
Would the Project potentially limit women's ability to use, develop and protect natural resources, taking into account different roles and positions of women and men in accessing environmental goods and services?			
Would the project discriminate against women and girls based on gender especially regarding participation in design and implementation or access to benefits and opportunities e.g. employment, provision of services?			
Stakeholder Engagement and Information Disclosure			
What would be the best way of enhancing adequate public engagement and participation during project design and implementation?			
Do you have any existing stakeholder engagement plan for the project?			
Do you think the project will lead to significant population density (forceful relocation, relocation of the local communities in the project areas?			
Do you think the project implementation will lead to significant population density increase (short-long-term, affecting environmental sustainability and social infrastructure?			

Item	Yes	No	Remark
Do you think the project has the potential to cause social problems and exacerbate conflicts for instance related to land tenure and access to resources?			
Cultural Heritage			
Are there any sites of natural, spiritual and cultural significance in the project area? If Yes, please specify the location?			
Do these sites have the potential for the presence of cultural and natural heritage remains?			
Community Health and safety			
Would elements of Project construction, operation, or decommissioning pose potential safety risks to local communities?			
Would the Project pose potential risks to community health and safety due to the transport, storage, and use and/or disposal of hazardous or dangerous materials (e.g. explosives, fuel and other chemicals during construction and operation)?			
Would the proposed Project be susceptible to or lead to increased vulnerability to earthquakes, subsidence, landslides, erosion, flooding or extreme climatic conditions?			
Would the Project result in potential increased health risks (e.g. from water-borne or other vector-borne diseases or communicable infections such as HIV/AIDS)?			
Would the proposed project activities including rehabilitation and construction works of Hydromet stations or installation of Hydromet equipment result in temporary disturbance of the land surface?			
Does the Project pose potential risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during Project construction, operation, or decommissioning?			
Does the Project involve support for employment or livelihoods that may fail to comply with national and international labor standards (i.e. principles and standards of ILO fundamental conventions)?			
Labor and Working conditions			
How many workers are anticipated to be employed or will be needed for the sub-project, with what skill set, and for what period?			
Has the project employed local community members?			
Is there a risk of child and/or forced labor?			
Will there be workers brought in from outside?			

Item	Yes	No	Remark
Does the project have Human Resource (HR) policy and procedures, HR manual, and Health & Safety (H&S) procedures, for the project			
Project workers might potentially be exposed to accidents at work resulting in injuries or fatalities. Does the project have an Emergency management plan?			
Provide the distance to be travelled to and from the site by workers, and the relative conditions of road regarding risk of road accident.			
Is there a way to contact the emergency services from site?			
Cases of discrimination, harassment, sexual harassment or non-compliance with law and ESS2 might arise during project implementation. Does the project have a sexual harassment policy and employee code of conduct?			
Project workers might want to raise grievances or start voluntary arbitration / legal proceedings to settle a dispute. Does the project have a grievance redress mechanism			
Some workers will be working between 2-3 day .Are all sanitary facilities at these project sites?			
Pollution prevention and resource efficiency			
Would the Project potentially result in the release of pollutants to the environment due to routine or non-routine circumstances with the potential for adverse local, regional, and/or transboundary impacts?			
Would the proposed Project potentially result in the generation of waste (both hazardous and non-hazardous)?			
Would the project workers be exposed to noise, dust and vibrations during any phase of the project activities including rehabilitation/construction of Hydromet stations or installation of the Hydromet equipment?			
Will the proposed Project potentially involve the, release, and/or use of hazardous chemicals and/or materials (e.g. solar batteries)?			
Would the project have the potential to cause accidental fires resulting from the solar/electric installations during the operation of the Hydromet equipment?			
Are the installed equipment such as solar panels, solar batteries, cables etc. are likely to be stolen or vandalised?			
Does the Project include activities that require significant consumption of raw materials, energy, and/or water?			

Item	Yes	No	Remark
Biodiversity Conservation and Sustainable Management of Living Natural Resources			
Would the Project potentially cause adverse impacts to habitats (e.g. modified, natural, and critical habitats) and/or ecosystems and ecosystem services?			
Are any Project activities proposed within or adjacent to critical habitats and/or environmentally sensitive areas, including legally protected areas (e.g. nature reserve, national park), areas proposed for protection, or recognized as such by authoritative sources and/or indigenous peoples or local communities?			
Would the project lead to loss of natural vegetation or clearance of the land surface?			
Would the project lead to poaching or illegal harvesting of wildlife (for bush meat trade/consumption, cultural activities, medicine etc.) potentially by workers involved in project activities within areas used by such wildlife as their habitats including but not limited to protected areas?			
Does the project involve changes to the use of lands and resources that may have adverse impacts on habitats, ecosystems, and/or livelihoods?			
Would the Project pose a risk of introducing invasive alien species?			
Would Project activities pose risks to endangered species?			
Do the project activities by the project workers likely to pose potential risks resulting into wildlife poaching and illegal harvesting of resources like vegetation (trees, herbs, grasses etc.) in the natural habitats?			
Would the Project generate potential adverse transboundary or global environmental concerns?			
Would the Project result in secondary or consequential development activities which could lead to adverse social and environmental effects, or would it generate cumulative impacts with other known existing or planned activities in the area?			

Annex 2: Chance Find Procedures

A Chance Finds Procedure guides management of any accidental discoveries of histo-cultural resources in the process of the Project implementation. In case archaeological sites, historical sites, remains and objects, including graveyards and/or individual

graves are discovered during excavation or construction, the following procedures shall be followed:

1. Stop the construction/equipment installation activities in the area of the chance find;
2. Delineate the discovered site or area;
3. Secure the site to prevent any damage or loss of removable objects. In cases of removable antiquities or sensitive remains, a night guard shall be arranged until the responsible local authorities or the national culture/museums/monuments (depending on the respective country) take over;
4. Notify the responsible Task manager or supervisory Engineer who in turn will notify the responsible local authorities and/or the national culture/museums/monuments administration or directorate immediately (within 24 hours or less);
5. Responsible local authorities and the national culture/museums/monuments would be in charge of protecting and preserving the site before deciding on subsequent appropriate procedures. This would require a preliminary evaluation of the findings to be performed by the responsible archaeologists. The significance and importance of the findings should be assessed according to the various criteria relevant to cultural heritage including the aesthetic, historic, scientific or research, social and economic values;
6. Decisions on how to handle the finding shall be taken by the responsible authorities at the local and national levels. This could include changes in the layout (such as when finding an irremovable remain of cultural or archeological importance) conservation, preservation, restoration and salvage;
7. Implementation for the authority decision concerning the management of the finding shall be communicated in writing by relevant local authorities; and

Project implementation work particularly construction work (when applicable) could resume only after permission is given from the responsible local authorities or national administration concerning safeguard of the heritage.

Annex 3: Country Specific Policies and Institutions

Country	Policies	Project Relevance
Kenya	**National Environment Policy 2013-** offers an opportunity to integrate environmental concerns with the country's development plans. This ensures that environmental conservation and management becomes integral in decision making platforms. The main objective of the policy is promoting sustainable development to enhance better quality of life.	This policy is critical to the project as it touches on water quality, waste management, air quality and radiation measures, all which will be essential during the implementation of the project.
	National Policy on Water Resources Management and Development- enhances a systematic development of water facilities in all sectors while also recognizing the by-products of these processes like wastewater. The policy therefore protects people's health through the development of proper sanitation systems.	This policy is entirely crucial to the project as it emphasizes water resources management, proper sanitation and proper management of wastewater in the country.
	Kenya National Adaptation Plan 2015-2030- aims to consolidate Kenya's vision 2030 on adaptation supported by macro-level adaptation actions which relate with the economic sectors and the level of vulnerabilities in the country to enhance adaptive capacity and long-term resilience.	This is relevant as it provides climate change adaptation strategies which can be incorporated in the project.
	Policy paper on Environment and Development (sessional paper No.6 of 1999) – The policy recommends the need for enhanced recycling/ re-use of residue including wastewater, the use of low waste technologies and increased public awareness of a clean environment.	The policy is extremely relevant to the project considering it calls for waste management and clean environment meaning it will provide guidelines on how the project can achieve this.
	Relevant Institutions	
	National Environment Management Authority (NEMA)- This institution was established under the Environmental Management and Coordination Act (EMCA) No. 9 of 1999 as the primary government instrument in the implementation of all environmental policies.	NEMA ensures that natural resources are properly managed and conserved and as a result of this, the institution will ensure that the project follows the right environmental protocols to the letter.
	Ministry of Energy- **KPC** generates policies that are designed to create a proper environment for efficient operation and growth of the energy sector.	This institution will ensure that energy is conserved and sustainably used in the implementation of the project and even when it will be

	Kenya's vision 2030 identifies energy as an infrastructure enabler for the transformation of a new industrialised country to provide a high quality of life in a clean and secure environment.	running. The use of renewable energy to power the Hydromet stations will be critical for use in remote areas where the main electricity grid line is not available.
	National Environmental Complaints Committee- An institution that is responsible for investigating complaints/ allegations against any authority or person in respect to the condition of the environment and how it is managed.	This institution is relevant to the project since the grievances emanating from the project implementation may be channeled to the committee for consideration.
	Ministry of Environment and Forestry undertakes National Environment and Forest Policy and Management, Restoration and protection of strategic water towers and wetlands, Protection and conservation of Natural environment, Meteorological services and Climate change affairs.	The ministry will facilitate the enabling policies on use of Hydromets, environmental sustainability and mitigating the effects of climate change to enhance data acquisition and usage at the national scale.
	Water Resources Management Authority (WRA) safeguards the right to clean water by ensuring the proper regulation of the management and use of water resources, in order to ensure sufficient water for everyone, now and in the future.	The WRA will work closely with NBI to ensure maintenance of the Hydromet stations for water resources data acquisition in Kenya, enforcement of the regulations under the Water Act and regulating the management and use of water resources including rivers.
	Ministry of Public Service, Gender and Youth Affairs provides policy direction and management of the human resource function in the public service as well as promotion of gender equity and equality and empowerment of women.	The gender policy will be a reference point for project implementation to ensure community involvement and impartiality in recruitment (if any) and service provision, and reporting of related grievances during project implementation including gender based violence (GBV).
Tanzania	**The National Environment Action Plan, NEAP (1994) –** The plan encompasses a keen focus on environmental conservation and sustainable development on every development activity.	The hydromet stations project will have impacts on the environment which will have to conform to the policies under this plan to ensure sustainable development.
	The National Environment Policy, NEP (1997) – seeks to provide policy guidelines to the determination of priority actions for monitoring and regularly reviewing policies, programmes and plans for the main Agenda of Tanzania's sustainable development. In addition to this, the policy also looks into ensuring secure and equitable use of resources for present and future generations.	The nature of the project requires sustainable of the overall natural resources which this policy effectively and sufficiently provides guidelines on how to go about such matters.
	National Water Policy (NAWAPO 2002)- lays a foundation for sustainable	The main objective of this policy is to protect water resources from

	development and management of water resources. It also seeks to address cross-sectoral interests in water, participatory approaches for water resources planning, development and management.	hazards and pollution. If the project is not executed with great care, it might result into pollution and for this reason, this policy will be of great significance.
	National land policy (1995)- promotes a secure land tenure system which as a result encourages optimal use of land resources to facilitate social and economic development.	The policy will be relevant to the project as it will ensure the project adheres to the policy guidelines of proper land use in a way that is also sustainable.
	The National Forest Policy (1998) – it provides sustainable development measures to ensure environmental stability and maintenance of the ecological balance.	Forests act as water catchment areas ang hence the need to protect them to get safe and clean water. The project might convert forest land for its implementation or it might cause potential damage to the forest environment and for this reason, this policy will extremely be helpful in preventing this.
	Relevant Institutions	
	Wildlife policy (1998) promotes the conservation of biological diversity while including all stakeholders in the management, conservation and sustainable utilization of wildlife resources.	The project might interfere with urban vegetation which small animals exist. For this reason, the policy will be relevant in ensuring proper measures are taken in preventing such issues from taking place.
	National Environment Management Council (NEMC) was established to address the national need of an institution that would oversee environmental management issues. In addition to this there was also the need of an institution that would implement the resolutions of the Stockholm Conference whose main objective was to strengthen national environmental councils on environmental issues.	This is crucial to the project as it outlines the environmental measures which the project should implement to ensure sustainable use of natural resources.
	National Environmental Advisory Committee- under the EMA 2004, advises the minister responsible for the environment.	In this project, the National Advisory Committee will have to recommend to the sector ministry on the protection and management of the environment based on the EIS.
	The Vice President's office (Division of Environment, NEMC) focuses on co-ordinating Environmental management policy, EIA guidelines and environmental Management Act.it also advices the government on all environmental issues.	This institution is critical as it ensures the project has undergone EIA process to ensure the mitigation of possible impacts to the environment during and after the implementation of the project.

	Ministry of land, housing and Human Settlements Developments- handles land use planning, and issuing of right of occupancy.	This authority is relevant to the project as it ensures the project land is rightfully owned and also ensures that it does not interfere with human settlement.
	Ministry of water and irrigation- contributes to national development by supporting and promoting integrated water resource management to enhance water accessibility and availability.	This institution is extremely relevant to the projecting owing to the guidelines it puts forward towards sustainable water resources management.
	Occupational Safety and Health Authority- ensures compliance to occupational health and safety.	This authority is relevant to the project as it will ensure the rules and regulations under OSHA. This will enhance proper sanitation and be a preventative measure for diseases.
Uganda	**The National Environment Action Plan, 1995-** this action plan aims to achieve the balance between development and environmental management. In addition to this, it also aims to sustainably manage and develop water resources in a coordinated and integrated manner.	Access and Water resource management aspects of the project and sustainable development and climate resilience projections based on the projections of the country
	Uganda Vision 2040 – provides strategies and development paths for Uganda in its agenda of transforming from a predominantly low-income country to a competitive upper middle-income country. This vision emphasizes on sustainable development through the preservation of natural resources like land, wetlands and forests. Section 165 of the version mentions: Uganda has abundant freshwater resources that provide numerous opportunities which can foster faster socio-economic transformation.	Vision 2040 is relevant to the project as it provides a path in which such a development project should take in order to attain the goals of the vision if Uganda is to transform into a middle-income country.
	The National Environment Management Policy, 1994- The overall policy goal is sustainable development, which maintains and promotes environmental quality and resource productivity for socio-economic transformation. One of the key principles guiding policy development and implementation include the need to conduct and ESIA for projects that are likely to have potential impacts on the environment.	All the proposed sub-projects that will have potential impacts on the environment will be required to undertake an ESIA which comply with national guidelines and apply to required permits.

	National Climate Change Policy, 2012: The goal of the policy is to ensure a harmonized and coordinated approach towards a climate-resilient and low-carbon development path for sustainable development in Uganda. The main objective of the policy is to ensure that all stakeholders address issues pertaining climate change impacts through the administration of proper measures while at the same time, promoting sustainable development with the ultimate goal of achieving a green economy.	This policy is important as it will address climate change issues through the provision of mitigation measures and strategies.
	Relevant Institutions	
	The Uganda National Land Policy, 2013- The land policy addresses the contemporary land issues and conflicts facing Uganda. The vision of the policy is: "Sustainable and optimal use of land and land-based resources for transformation of Ugandan society and the economy" while the goal of the policy is: "to ensure efficient, equitable and sustainable utilization and management of Uganda's land and land-based resources for poverty reduction, wealth creation and overall socio-economic development".	Land acquisition and issues relating to compensation will be addressed as guided by this policy in the implementation of the project.
	National Environment Management Authority (NEMA)- This institution is Uganda's principal agency for the management of environment and is tasked with the responsibility of monitoring, supervising, coordinating and regulating environmental activities. NEMA is the institution that advises the Ugandan Government on environmental matters while spearheading the development and implementation of environmental policies laws, regulations, standards and guidelines. It manages the process of ESIA and Environmental Audits for development projects.	NEMA is relevant to the project as it will ensure the approval of ESIA and also ensure that the project operates within the environmental provisions of the country will adhering to conservation and sustainable development.
	Ministry of water and Environment- has the responsibility of developing, managing, and regulating water and environment resources in Uganda. This ministry is totally committed to minimizing, avoiding and mitigating all adverse environmental and social impacts that are associated with	This ministry is significant to the project as it will help prevent and mitigate any environmental impacts which will arise during and after the construction of the project.

	development projects.	
Rwanda	**National Policy on Environment (2003)**- Its key responsibility is to ensure the sustainable protection and management of the environment. It proposes on the reinforcement of human and institutional capacity building in regards to the environment. One of the guiding principles of the policy is that environmental impact has to be assessed when carrying out development projects.	The policy is relevant to the project as it will ensure proper assessment of environmental impacts of the project as well as the publics participation on environmental protection and management in regards to the project.
	Rwanda National Environment and Climate Change Policy- reaffirms Rwanda's commitment to a healthy and clean environment that is resilient to climate change variability to enhance sustainable development.	This policy is critical to the project in providing guidance to climate change resilience measures that is relevant to the scope of the project within the country.
	National Policy for Water Resources Management, 2011- The policy addresses the issues that the 2004 policy failed to address like rapid urbanization pressures which impacts wetlands, changing water demands, inappropriate land use practices and climate change uncertainties. The guiding principles of the policy include; integrated management of water resources is a key aspect, the catchment-based water resources management must be done, and international water resources benefits must equally be shared.	The policy is relevant to the project as it will ensure collaborative management of water resources of the Nile within the project.
	Revised National Land Policy 2019: The Rwanda land policy calls for rational use and sound management of national land resources, and that land use be based on established master plans. The policy also provides development of land use plans based on suitability of the areas/lands thus distinguishing the different categories of land and their purpose.	The policy will ensure that the project is implemented within the provisions of the policy through rational use and sound management of national land resources.
	Relevant Institutions	
	Ministry of Environment (formerly Ministry of Natural Resources of Rwanda)- The institution is a national entity responsible for environment, climate change, and natural resource management at local and national levels. In partnership with national stakeholders, the institution has a	The institution will be relevant in the project as it promotes climate resilience and can address the various impacts which might arise as a result of the project implementation.

	strategy to climate resilience, green growth and the sustainable management of natural resources. The primary goal of the institution is to offer solutions to environmental and resource challenges faced including and not limited to the imbalance that exists between natural resources and population which can result to serious impacts in the sectors of energy, water resources and forestry, agriculture and infrastructure in achieving long-term national sustainable development.	
	Rwanda Environmental Management Authority (REMA) - a sub-agency of the Ministry of Natural Resources that oversees compliance with environmental regulations and it is also the institution that approves all the Environmental and Social Impact Assessments. The entire biophysical environmental management in the country is entrusted to REMA. Its main mission is the implementation of the national policy of the environment. It advises the government on legislation and other measures pertaining environmental management, it coordinates environmental protection activities and promotes integration of environmental issues and also plans for programmes to address proper management and rational use of environmental resources.	The roles of the institution make it relevant to the project considering it will first see to the approval of the Environmental Impact and Social and Assessment and give overall advise on the proper measures to partake, with ultimate goal of sustainable production to improve the welfare of Rwanda.
	Ministry of Lands, Environment, Forests, Water and Mines (MNITERE)- The institution is responsible for the development of environmental policies and procedures, land use development policies, natural resources protection (land, water, flora and fauna), environmental legislation, biodiversity and other environmental issues.	The institution is relevant to the project as it will develop plans and procedures for efficient land use and the management of other natural resources including water and forests which are crucial to the project.
	Ministry of Infrastructures- responsible for public infrastructure (roads, buildings, etc), energy, transport and communication. This ministry is also responsible for town and housing planning. It primarily gets engaged with environmental management through urban planning.	This ministry will be relevant to the project through its expertise in urban planning which will ensure the construction and transport sector are properly and efficiently managed.
Burundi	**National Water Policy, 2009**- The policy aims at ensuring sustainable	This policy document contains provisions aimed at protecting the

	coverage of water needs for all the people through instituting harmonious development of the national water resources. It contains provisions for protecting water resources against degradation and damage; mitigation of climate disasters, improving water infrastructure; and improving the behaviour of the population in relation to proper water management and practices.	hydromet stations, as part of water infrastructure in the country, against damage. Also, ensuring proper access and management to water resources by all users.
	Vision "Burundi 2025"- highlights a commitment towards the prioritization of rational protection and management of the environment. In recognition of the environment being a critical part of sustainable development, the policy document commits to taking into account the environment in all developmental and socio-economic policies.	The policy document provides a critical point of reference in ensuring that the project activities are in line with the sustainable development visions of the country, especially in the water resources management, and climate change sectors.
	Burundi National Development Plan (NDP) (2018-2027) - entails sustainable environmental management, natural resources, climate change and spatial planning.	It will guide the project's implementation towards ensuring proper climate change adaptation, natural resources management and water resources protection.
	Relevant Institutions	
	National Forestry Policy- is focused on ensuring social, economic, and ecological functions of current and future generations through the preservation of existing forest resources.	Enable the effective management of catchment areas that feed into the project sites as well as protection of the natural vegetation around the project site. The provisions herein will ensure that the project activities do not cause any forest cover loss.
	Ministry of Water, Environment, Land Management and Urban Planning – Primary ministry that regulates and administers environmental management and protection	Important in ensuring that the laws and policies governing the protection of the hydromet stations of the project are in place and adhered to.
	Burundi Office for Environmental Protection – Enforcement of all environmental protection related legislations including water, and climate change. It is also responsible for the establishments of environmental standards and norms which safeguard the protection of the environment	This institution offers a critical point of reference for environmental standards which the project is required to adhere to in the project country so as to ensure minimal to no environmental impacts.
Democratic Republic of	**National Policy of Water Resources and Sustainable Management –**	Enables the sustainable utilization and management of water

Congo	Contains provisions for enabling sustainable environment, and enabling proper water resources management.	resources in the country, including providing guidelines towards acceptable water resources development.
	Relevant Institutions	
	Ministry of Environment, Nature Conservation and Tourism – Responsible for the environment, including environmental impact studies and the institution of policies pertaining to environmental and natural resource protection.	Provision of guidance to the project on the proper environmental management strategies during and after project implementation.
	Environment under Reconstruction: Environmental Law and Policy in the Democratic Republic of Congo – Responsible for administration of environmental and social impact assessment in the country; defining the procedures for Environmental and Social Impact Studies and ensuring the execution of all projects and development programmes are undertaken in accordance with strict environmental and social standards.	Provides guidance on the environmental and social standards that the project needs to operate within to enable minimal effects on the environment.
South Sudan	**The National Environment Policy, 2015 – 2025** – ensures the protection, conservation and sustainable utilization of natural resources of the country, taking into consideration the tenets of inter-generational equity. It contains environmental protection provisions focusing on water resources management, environmental planning, climate change, and environmental and social impact assessment.	Provides a guidance towards proper environmental planning and management during and after project implementation, especially pertaining to climate change issues, and water resources management.
	Disaster Risk Management Policy Contains strategies for dealing with floods and other environmental disasters	The policy will serve as a critical response point in the quest for the project to enhance climate change resilience in the country. It will also help in guiding the optimal use, management and protection of the hydromet stations towards better climate interventions.
	National Water Policy contains provisions for improved participation of stakeholders in water utilization and management. Also, the protection and sustainable management of transboundary water resources	This policy document is critical for provision of guidelines towards ensuring proper stakeholder engagement in managing the water resources of interest to the project in order to enhance socio-economic and environmental benefits; and reduce environmental impacts.

	The Forest Policy 2014 recognizes the critical roles played by forests in climate change mitigation, providing critical environmental resources and water catchment. It also provides measures for ensuring sustainable development and management of development impacts on forest resources.	The project involves the management of water resources of the Nile which are home to rich diversity of flora and fauna. The policy provides guidelines on this.
	Draft policy on Wildlife Conservation and Protected Areas 2012 provide measures for sustainable management of natural ecosystems for the benefit of biodiversity.	The project may impact biological diversity in the project sites, this policy document will guide the project on measures that should be taken to ensure minimal to no effect on the natural ecosystems during and after project implementation.
	South Sudan Vision 2040 – Working towards the adoption of appropriate measures to limit pollution resulting from development projects so as to foster sustainable environmental management	Provide a strategic reference point for the project to enhance sustainable environmental management by limiting and appropriately dealing with any environmental impacts that ensue.
	Relevant Institutions	
	Ministry of Environment and Forestry – Ensuring that environmental standards are achieved when implementing development projects	Due to the potential and existing environmental impacts posed by the projects, the provisions, guidelines, and standards as outlined by this institution will ensure the project's implementation adheres to said standards.
	Ministry of Water Resources and Irrigation – Has the responsibility of drawing up and overseeing the implementation of policies, guidelines, masterplans, and regulations for water resources development, conservation and management in the country.	Enable proper strategizing on reducing environmental impacts posed by the project
	South Sudan Land Commission – The mandate of this commission is to entertain claims on land ownership, conducting arbitration, mediation and enforcement of laws on compensation.	Some of the project sites are believed to be either state or personally owned. This institution is critical in provision of guidance on proceedings and issues pertaining to the lands where the project ill be implemented.
	South Sudan Directorate of Metrological Services – Provision of forecasting and data collection services, and assisting in disaster preparedness and climate issues	Strategic and technical planning guidance towards proper project implementation towards minimizing environmental and socio-economic impacts while enhancing longevity and success of the project
	Ministry of Humanitarian Affairs and Disaster Management – Disaster	Strategic and technical planning guidance towards proper project

	Preparedness and Risk Reduction with regards to environmental disasters, as well as climate change adaptation mechanisms	implementation towards minimizing environmental and socio-economic impacts while enhancing longevity and success of the project
The Sudan	**The National Water Policy, 2006** – ensuring sustainable and integrated management of available water resources through advocating for cost effective and appropriate technologies research and public-private partnerships	Provides a critical reference point for the project towards sustainable environmental management and ensuring minimal environmental impacts during and after project implementation.
	Forest Policy – Establishes framework and principles required for the protection of forest resources and conservation of the environment	The project involves the management of water resources of the Nile which are home to rich diversity of flora and fauna. The policy provides guidelines on this.
	The National Water Supply and Sanitation Policy, 2009 - ensure equitable and sustainable utilization and provision of safe water and sanitation	Will serves as a suitable point of reference of cooperative management of the water resources relevant to the project.
	Natural Resource Management Policy – ensures sustainable utilization and management of natural resources	Essential for water resources sustainable management functions of the project.
	The National Action Plan to Combat Desertification – Provides a description and analysis of the scale and management of desertification in South Sudan	Guidance on disaster management, and strategic planning towards achieving the bigger project goals.
	Relevant Institutions	
	The Higher Council for Environment and Natural Resources – Coordination ad supervision of environmental issues; provision of policy and technical backstopping to responsible ministries as required by the law; also responsible for enforcement and compliance with environmental assessment.	Provision of relevant guidance towards proper environmental management in an effort to minimize environmental impacts posed by the project during and after implementation.
	Ministry of Environment, Forestry and Physical Development – Mandate includes surveying, construction, urban planning and environmental protection in all development projects in Sudan	Strategic guidance towards sound environmental management during project implementation.
	The National Drought and Desertification Control, Coordination and Monitoring Unit – Collection of scientific data and information covering water and rainfall among others	Provides a point of corroboration for implementation strategies towards ensuring sound environmental management during and after project implementation.

	Ministry of Water Resources – Setting national water resources policies, plans and strategies, fostering sustainable utilization of Sudan's share of Nile Waters, cooperation between the Nile basin countries; and Applying research aimed at efficient utilisation and management of water resources	Provides a point of corroboration for implementation strategies towards ensuring sound environmental management during and after project implementation.
	The Forests National Corporation – Responsible for laying down forest policies, increasing cover and development, fostering sustainable forest utilization and environmental protection	Enabling protection of catchment areas feeding water resources in The Sudan.
Ethiopia	**The Environmental Policy of Ethiopia (1997)** – Contains provisions for improving and enhancing quality of life and promoting sustainable socio-economic development through sound use and management of natural resources and the environment. Also provides guiding principles requiring adherence to principles of sustainable development and ensuring proper Environmental Impact Assessment and planning is conducted for all development projects.	Provides guidance towards development of proper environmental impact mitigation measures and contingency plans for the project towards sound environmental management.
	The Conservation Strategy of Ethiopia – recognizes the importance of including environmental factors from the beginning of development activities so as to enhance environmental protection for social, economic and cultural development	This strategy ensures that the potential environmental risks and impacts and the right measures are taken into consideration during project execution.
	Federal Government of Ethiopia Water Resources Management Policy (1999) – enhancing and promoting all national efforts towards the efficient and optimum utilization of the available water resources for socio-economic development on a sustainable basis. Development of water resources for social and economic benefits; efficiency in use, equal access and sustainability of water resources; combating and the regulation of floods through prevention mitigation and rehabilitation; and conservation, protection and enhancement of water resources and the aquatic environment sustainably.	Provides a critical reference point for the project towards sustainable environmental management and ensuring minimal environmental impacts during and after project implementation.
	Biodiversity Conservation and Research Policy (1998) – effective	Essential for the project in ensuring biodiversity conservation in the

	conservation, rational development and sustainable utilization of Ethiopia's biodiversity	activities to be undertaken for the project.
	Relevant Institutions	
	Environmental Protection Authority – provides regional authorities with guidance, technical support and capacity building with regards to sustainable utilization and management f environmental resources. Also, ensures that all investment projects comply with national EIA regulations and associated requirements	Provision of guidance during project implementation towards ensuring adherence to environmental standards and guidelines by the project.
	Sectoral Environmental Units - coordination and follow up to ensure the activities of the competent agencies are in harmony with environmental protection requirements.	Provision of guidance during project implementation towards ensuring adherence to environmental standards and guidelines by the project.

Annex 4: Country Specific Environmental Laws and Regulations

County	The Law/Regulation
	Environmental Laws
Kenya	**The Constitution of Kenya 2010** is the overall legal instrument backing Environmental and Social Impact Assessment. It provides a broad framework that regulates current and future developments in Kenya in which all National and sectoral documents are drawn. Article 42 recognizes the right of citizens to clean and healthy environment and calls for the participation of both its citizens and government to ensure that this is provided while mitigating environmental degradation. **Section 58 of the Environment Management and Coordination Act**, 2015 emphasizes on mandatory application of EIA on each project.
Tanzania	**The Environmental Management Act (EMA) No. 20 (Cap. 191) of 2004** requires the undertaking of Environmental Impact Assessment (EIA) prior to commencement of development projects.
Uganda	**The National Environment Act 2019** stipulates guidelines to replace repeal and reform laws relating to environmental management in Uganda to ensure environmental management. It also provides all projects to undergo EIA and to provide penalties for offences under the Act.
Rwanda	**The Constitution of Rwanda 2003** is the supreme law that recognizes under **Article 22** the right of its citizens to live in a clean and healthy environment. **Organic Law on Environment No4/2005**-establishes the modes of protecting, safeguarding, and promoting the Rwandan Environment. It focuses on forests, land, water, biodiversity and agriculture.
Burundi	**Environment code, 2000- chapter III** focuses on environmental Impact Assessment process emphasizing all projects should undertake EIA.
DR Congo	**The Constitution of the DR Congo** entrenches environmental rights as fundamental human rights. **Law No. 11/009 (2011)** provides for basic principles related to the protection of environment. **Law No. 14/003 of 11 February 2014** on Nature Conservation has new innovations for conservation of the environment including public participation in the decision-making process, local communities' involvement, social and environmental impact studies for projects, traditional knowledge, access to biological and genetic resources, just and equitable benefits derived from resources
South Sudan	**The constitution of South Sudan Section 2** states that everyone has a right to have the environment protected for the benefit of the present and future generations through prevention of pollution and ecological degradation, conservation, and sustainable ecological development and use of natural resources. **Environmental Protection Bill 2010** stipulates Environmental Impact Assessment Regulations **Environmental Protection Bill 2013** provides for the preparation of National Environment Action Plans, designation of Environmental Sensitive

	Areas, and protection against impacts of development.
Sudan	**The Constitution of the Sudan 1998** provides for the right to a clean and diverse environment. **The Environmental Protection Act of 2001** provides for regulations for setting environmental standards, protection of biodiversity and combating pollution. It requires environmental screening to be done prior to commencing development projects.
Ethiopia	**The Constitution of the federal Republic of Ethiopia** includes the concept of improved living standards, sustainable development and rights to a clean and healthy environment **The Proclamation of Environmental Impact Assessment (2002) makes** EIA mandatory for all development activities.
Wetland Laws	
Kenya	**Environment Management and Coordination Act, 2015** emphasizes on the sustainable use of wetland resources through the Wetlands, River Banks, Lake shores and Sea shores Regulation, 2009. **Fisheries Management & Development Act 2016 (Cap 378)** provides for equitable and sustainable utilization and development of fishery resources including within wetland areas.
Tanzania	**The National Environment and Management Act (2004)** and other sectorial legislations like the Forest and Land Acts provide for the proper management of wetland areas and requires Environmental Impact Assessments to be undertaken where any development matters are concerned
Uganda	**National Environment Wetlands, River Banks, and Lakeshores Management Regulations, 2000** aims to promote the conservation and wise use of wetland resources.
Rwanda	**Organic Law, 2005** determines the use and management of land in Rwanda. It outlines the modalities of protection, conservation and promotion of environment in Rwanda.
Burundi	**Land Act, 1986** provides measures on issues related to access to land and agriculture. **National Adaptation Programme of Action (NAPA)** provides a process to identify priority activities that respond to the immediate needs to climate change adaptation and implementation of projects that reduce the social and economic costs of climate change.
DR Congo	**Law No. 14/003 of 11 February 2014** provides for guarding of protected areas against any direct or indirect pollution of waters, rivers and water areas.
South Sudan	**Wildlife Conservation and Protection Bill 2015** – Provides for the protection of wetlands as wildlife habitats and water sources.
The Sudan	**The Environmental Protection Act of 2001** provides for the protection of natural environments
Ethiopia	**The ANRS Rural Land Proclamation No. 133/2006** provisions under article 13 clearly indicated the need for considering effective land use plan which includes wetlands
Water Management Laws	

Kenya	**The Water Act 2016**- provides the general protection and governance of water resources including pollution control, flood control, drainage, abstraction, and irrigation water. The Act also recognizes the implications of climate change on water, sanitation, and health. It proposes interventions which aim to restore water catchments and avail water for livestock, agriculture and domestic use.
Tanzania	**The Water Resources Management Act No.11 of 2009** provides for legal and institutional framework for the sustainable management of water resources; sets regulations and procedures for water resources extraction and also provides for water pollution control and participation of the general public and stakeholders in water resources development issues.
Uganda	**The Water Act (1995)** provides for the use, protection, and management of water resources. It provides for issuance of a water permit for the extraction of water from a natural resource and also an issuance of a wastewater permit for the discharge of wastewater.
Rwanda	**Water Law No. 62/2008** embraces modern principles of sustainable water resources utilization and management.
Burundi	**The Water Policy 2009-** emphasizes integrated management of water resources. **Water Code (Law 1/02 of 26/03/2012**) enacting the water code in Burundi) gives guidelines for water control to enhance agriculture and livestock production, and capacity building in water sector.
DR Congo	**Law No. 15/026 of 31 December 2015** on Water. **Order No. FB / 0030/98 of 19 May 1998** establish the direction of Water Resources utilization, access and management. **Law No. 14/003 of 11 February 2014** provides for guarding of protected areas against any direct or indirect pollution of waters, rivers and water areas.
South Sudan	**The Draft Water Bill 2015 –** provides for the protection of water sources from pollution, erosion and other adverse impacts from development projects; provisions for the conservation of water resources, manage water quality, prevent pollution of ground and surface waters, manage floods and drought and the mitigation of water related disasters
The Sudan	**The Water Resources Act of 1995** establishes the National Council for Water Resources (NCWR) responsible to design and rationalize the management and use of water resources to mitigate the effects of natural disasters resulting from drought and floods. Irrigation and Drainage Act of 1990 establishes that any work related to irrigation or drainage provided needs a permit from the Ministry of Irrigation and Water Resources.
Ethiopia	**The FDRE Water Resource Management Proclamation (2000)** and **Regulations No. 115 of 2005** ensures pollution control in the Water Resources of Ethiopia; ensures water resources are conserved and protected from harmful impacts and utilized for economic and social benefits.
Forest Management Laws	
Kenya	Forest Conservation & Management Act, 2016 - focuses on sustainable development and management of forest ecosystems by conserving and utilizing forest resources for the socioeconomic development of the country. It outlines forest lands which require special protection and the rules

	which govern the use of forest lands.
Tanzania	**The Forest Act No. 14 of 2002** provides for the protection of forests and forest products. It requires that any development within forest reserves, private forests or sensitive forests undergo and Environmental Impact Assessment. It also requires permits and licences to be sought out for any activities undertaken within said forests.
Uganda	**National Forestry & Tree Planting Act, 2003** provides for the establishment, development and sustainable management of forest resources, and the conservation and utilization of forest ecosystems.
Rwanda	**National Forest Law, 2010** provides for establishment, development and sustainable management including conservation and rational utilization of forest for socioeconomic development.
Burundi	**Law n°102 of 25th March, 1985** defines forest domain and also contains provisions on forest reserves and forest protection. **Law No. 102 of 25th March, 1985** defines forest domain and also contains provisions on forest reserves and forest protection.
DR Congo	**Law No. 011-2002 of** August 2002 on the Forest Code provides for principle for forest utilization and management. **Law No. 14/003 of 11 February 2014** provides for management of biological and genetic resources, and protection against any exploration or logging of forests.
South Sudan	**The Forestry Commission Act** - responsible for the regulation, management and utilization of forests and forestry resources.
Sudan	**Forest and Renewable Natural Resources Act 2002 –** promotes inter-sectoral approach to the management of natural resources. It required 5% of irrigated agricultural and 10% rain fed land to be planted trees.
Ethiopia	**Proclamation 94/1994 on Forest Conservation** which provides for the protection and conservation of forests and forest resources against development impacts.
Wildlife Management Laws	
Kenya	**Wildlife Conservation and Management Act, 2013** provides for the conservation, protection and sustainable management of Wildlife in Kenya
Tanzania	**The Wildlife Conservation Act, 2009** states that any development activities set to be undertaken in wildlife protected areas, management areas, buffer zones, migratory routes of or dispersal areas have to undergo an environmental impact assessment.
Uganda	**Wildlife Act, 2019** provides for the conservation and sustainable management of wildlife with an aim to continue the existence of Uganda Wildlife Authority, continue the existence of wildlife fund, and to streamline the roles and responsibilities of the institution involved in Wildlife conservation and management.
Rwanda	**Organic Law on Environment No4/2005** establishes the modes of protecting, safeguarding, and promoting the Rwandan Environment including focus on wildlife and biodiversity
DR Congo	**Decree No. 10/15 of April 10, 2010** protection of flora and fauna; biodiversity conservation.

	Law No. 14/003 of 11 February 2014 provides for protection of wild fauna and flora species threatened with extinction, and management of biological and genetic resources.
South Sudan	**Conservation and Protected Areas Bill, 2010** covers all matters concerned with wildlife conservation, the establishment and management of Protected Areas and controlled areas and to preserve Southern Sudan's natural heritage including its unique wildlife. **Wildlife Conservation and National Parks Act, 2003** provides guidelines for access and use of natural resources in protected areas. **The Wildlife Forces Act, 2003** describes the duties and responsibilities of military forces deployed to protect wildlife and protected areas.
Sudan	**The Wildlife Conservation and National Parks Act (1986)** provide for biodiversity conservation and management in wildlife protected areas.
Ethiopia	**Proclamation No. 315 of 2003 on fisheries conservation** ensures the sustainable use of fisheries resources. It supports EIA but does not require fishery developers to submit EIA reports to any environmental agencies. **Proclamation No. 541 of 2007** stipulates for the active participation of local communities in conservation.

Annex 5: Relevant International Environmental Agreements ratified by specific countries

Country	Conventions and Treaties Ratified	Relevance to the Project
Tanzania	The Ramsar Convention	Wetlands are part of the water resources of the Nile Basin. The project will include activities on the management of water resources and rehabilitation of facilities which impact on wetland areas.
	The Convention on the Prevention of Marine Pollution	The project will involve rehabilitation of dams and hydroment stations; and capacity building on proper management and utilization of said facilities; and cooperative management and development of climate change interventions in the Nile Riparian countries. This includes pollution prevention on the Nile water resources in all the countries.
	Convention on Biological Diversity – Ratified by Tanzania in 1996	The operations of the projects sub-projects and future resource use might encounter areas which endanger flora and fauna species and their habitat. These areas and species will need to be protected under the provisions of this convention.
	Convention on International Trade in endangered Species of wild Fauna and Flora (CITES) (1981)	The project activities on rehabilitation of dam and hydromet facilities and cooperative management of water resources may encounter critical flora and fauna species and as such, they need to be protected against illegal and insensitive trade.
	The world Heritage Convention	The will involves measures on combating climate change impacts like drought, the prevention and adaptation and cooperative development within the Nile Riparian Countries. This convention provides for guidance of the same.
	United Nations Framework Convention on Climate Change (UNFCCC) (1998)	The project may encounter sites of cultural significance in its rehabilitation activities, capacity building and cooperative empowerment of member states to collectively conserve and manage such sites. This convention offers important guidelines.
	Treaty for the establishment of the East African Community (EAC) (2007)	The will involves measures on combating climate change impacts like drought, the prevention and adaptation and cooperative development within the Nile Riparian Countries. This convention provides for guidance of the same.
	Convention to Combat desertification	The project requires cooperation and cooperative management of water resources and climate change within the River Nile Member states. This treaty offers a platform of cooperation within the East African Community.

	African convention on the conservation of nature and natural resources (1968)	The project involves the management of water resources and this convention provides guidelines and regulations for the management of nature and natural resources within the African context.
	EAC protocol on environmental and natural resources management (2007)	The project involves the cooperative management of water resources within the Nile riparian countries and as such, this protocol provides a joint platform of collaboration and guidance on approaches within the East African Community.
South Sudan	United Nations Framework Convention on Climate Change (UNFCCC)	The will involves measures on combating climate change impacts like drought, the prevention and adaptation and cooperative development within the Nile Riparian Countries. This convention provides for guidance of the same.
	The Convention on Biological Diversity	The operations of the projects sub-projects and future resource use might encounter areas which endanger flora and fauna species and their habitat. These areas and species will need to be protected under the provisions of this convention.
	The UN Convention to Combat Desertification	The will involves measures on combating climate change impacts like drought, the prevention and adaptation and cooperative development within the Nile Riparian Countries. This convention provides for guidance of the same.
	The Ramsar Convention	Wetlands are part of the water resources of the Nile Basin. The project will include activities on the management of water resources and rehabilitation of facilities which impact on wetland areas.
The Sudan	The International Convention on Biological Diversity	The operations of the projects sub-projects and future resource use might encounter areas which endanger flora and fauna species and their habitat. These areas and species will need to be protected under the provisions of this convention.
	The Ramsar Convention	Wetlands are part of the water resources of the Nile Basin. The project will include activities on the management of water resources and rehabilitation of facilities which impact on wetland areas.
	United Nations Framework Convention on Climate Change (UNFCCC)	The will involves measures on combating climate change impacts like drought, the prevention and adaptation and cooperative development within the Nile Riparian Countries. This convention provides for guidance of the same.
	The United Nations Convention to Combat Desertification	The will involves measures on combating climate change impacts like drought, the prevention and adaptation and cooperative development within the Nile Riparian Countries. This convention provides for guidance of the same.
	The World Heritage Convention	The project may encounter sites of cultural significance in its rehabilitation activities, capacity building and

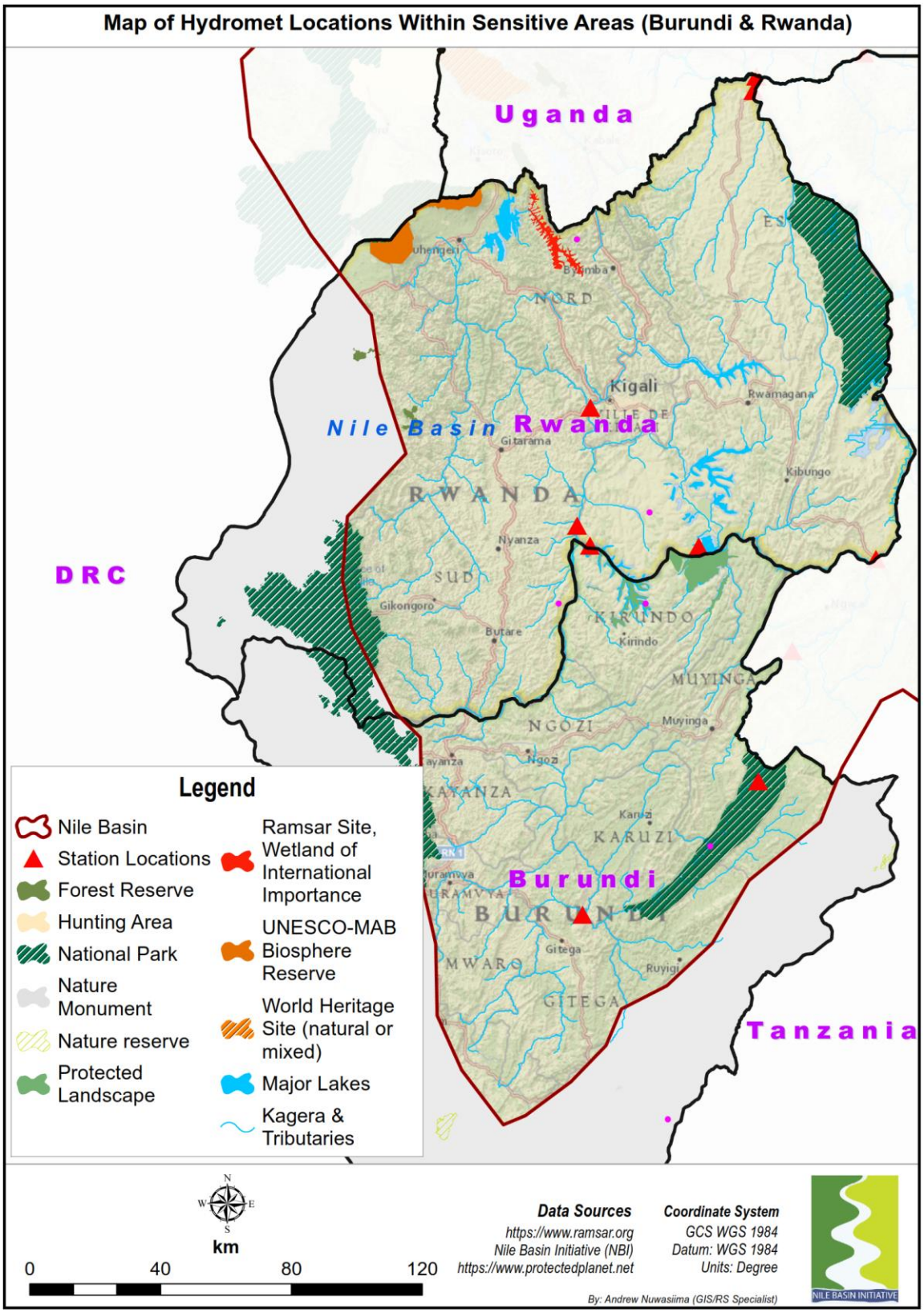
		cooperative empowerment of member states to collectively conserve and manage such sites. This convention offers important guidelines.
	The Convention on Conservation of Migratory Species of Wild Animals	The project activities on rehabilitation of dam and hydromet facilities and cooperative management of water resources may encounter critical flora and fauna species and as such, they need to be protected against illegal and insensitive trade.
	The African Convention on Conservation of Nature and Natural Resources	The project involves the management of water resources and this convention provides guidelines and regulations for the management of nature and natural resources within the African context.
	Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES)	The project activities on rehabilitation of dam and hydromet facilities and cooperative management of water resources may encounter critical flora and fauna species and as such, they need to be protected against illegal and insensitive trade.
Ethiopia	Convention on Biological Diversity	The operations of the projects sub-projects and future resource use might encounter areas which endanger flora and fauna species and their habitat. These areas and species will need to be protected under the provisions of this convention.
	United Nations Convention to Combat Desertification (UNCCD)	The will involves measures on combating climate change impacts like drought, the prevention and adaptation and cooperative development within the Nile Riparian Countries. This convention provides for guidance of the same.
	United Nations Framework Convention on Climate Change (UNFCCC)	The will involves measures on combating climate change impacts like drought, the prevention and adaptation and cooperative development within the Nile Riparian Countries. This convention provides for guidance of the same.
	International Convention on Trade in Endangered Species of Flora and Fauna	The project activities on rehabilitation of dam and hydromet facilities and cooperative management of water resources may encounter critical flora and fauna species and as such, they need to be protected against illegal and insensitive trade.
Democratic Republic of Congo	Convention on Biological Diversity	The operations of the projects sub-projects and future resource use might encounter areas which endanger flora and fauna species and their habitat. These areas and species will need to be protected under the provisions of this convention.
	Convention on International Trade of Endangered Species	The project activities on rehabilitation of dam and hydromet facilities and cooperative management of water resources may encounter critical flora and fauna species and as such, they need to be protected

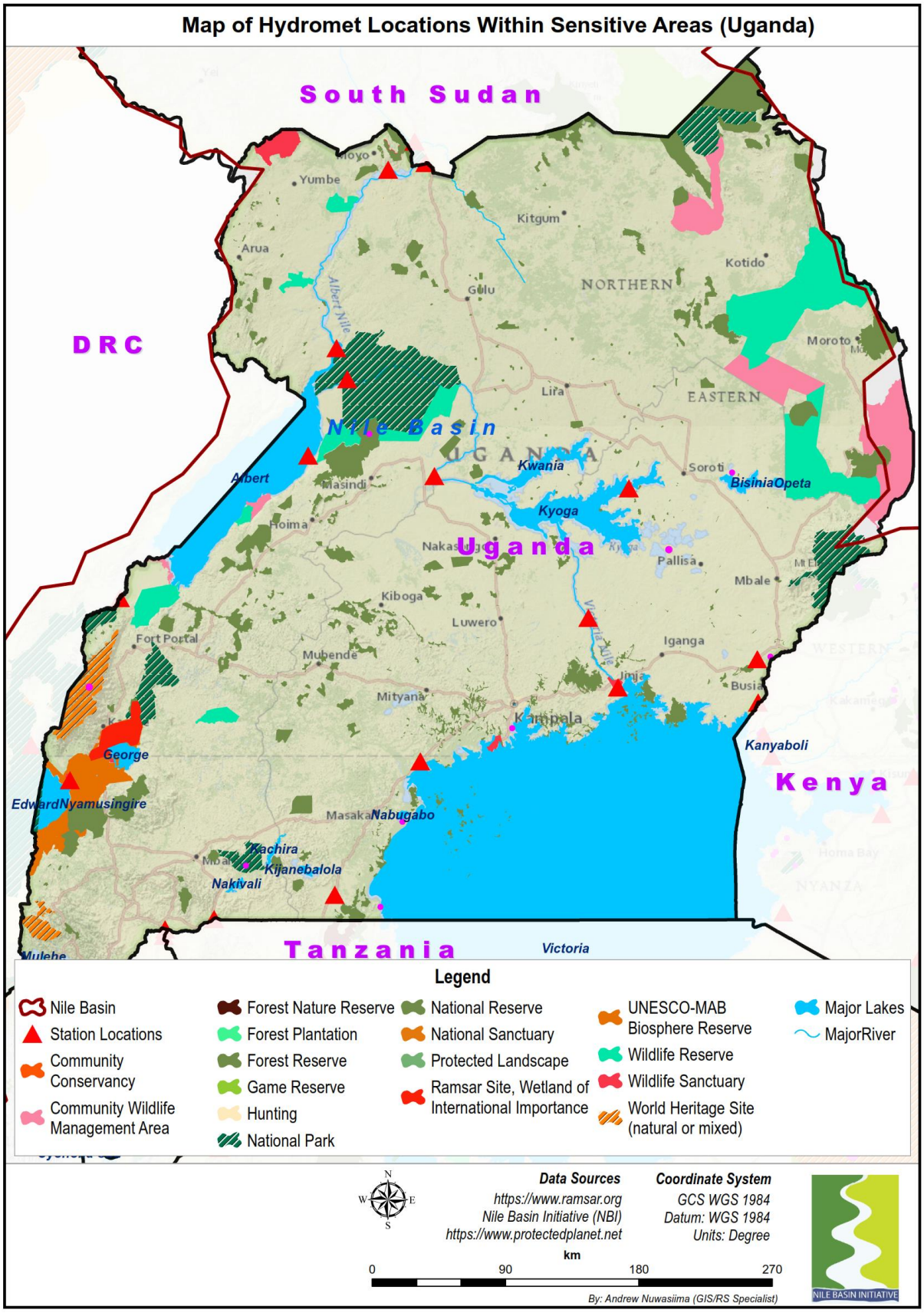
		against illegal and insensitive trade.
	Treaty of the Central African Forest Commission (COMIFAC Treaty)	Provision of a guiding platform for cooperative work towards Climate Change resilience
	United Nations Framework Convention on Climate Change	The will involves measures on combating climate change impacts like drought, the prevention and adaptation and cooperative development within the Nile Riparian Countries. This convention provides for guidance of the same.
	The Ramsar Convention	Wetlands are part of the water resources of the Nile Basin. The project will include activities on the management of water resources and rehabilitation of facilities which impact on wetland areas
	United Nations Convention to Combat Desertification	The will involves measures on combating climate change impacts like drought, the prevention and adaptation and cooperative development within the Nile Riparian Countries. This convention provides for guidance of the same.
Kenya	United National Convention on Biological Diversity	The operations of the projects sub-projects and future resource use might encounter areas which endanger flora and fauna species and their habitat. These areas and species will need to be protected under the provisions of this convention.
	The Ramsar Convention	Wetlands are part of the water resources of the Nile Basin. The project will include activities on the management of water resources and rehabilitation of facilities which impact on wetland areas.
	UN Framework for Combating Climate Change	The will involves measures on combating climate change impacts like drought, the prevention and adaptation and cooperative development within the Nile Riparian Countries. This convention provides for guidance of the same.
	The United Nations Convention to Combat Desertification	The will involves measures on combating climate change impacts like drought, the prevention and adaptation and cooperative development within the Nile Riparian Countries. This convention provides for guidance of the same.
	Convention on Migratory Species	Protection and conservation of flyways and habitats from negative impacts of development project
	World Heritage Convention	The project may encounter sites of cultural significance in its rehabilitation activities, capacity building and cooperative empowerment of member states to collectively conserve and manage such sites. This convention offers important guidelines.
	Convention on International Trade in	The project activities on rehabilitation of dam and hydromet facilities and cooperative management of

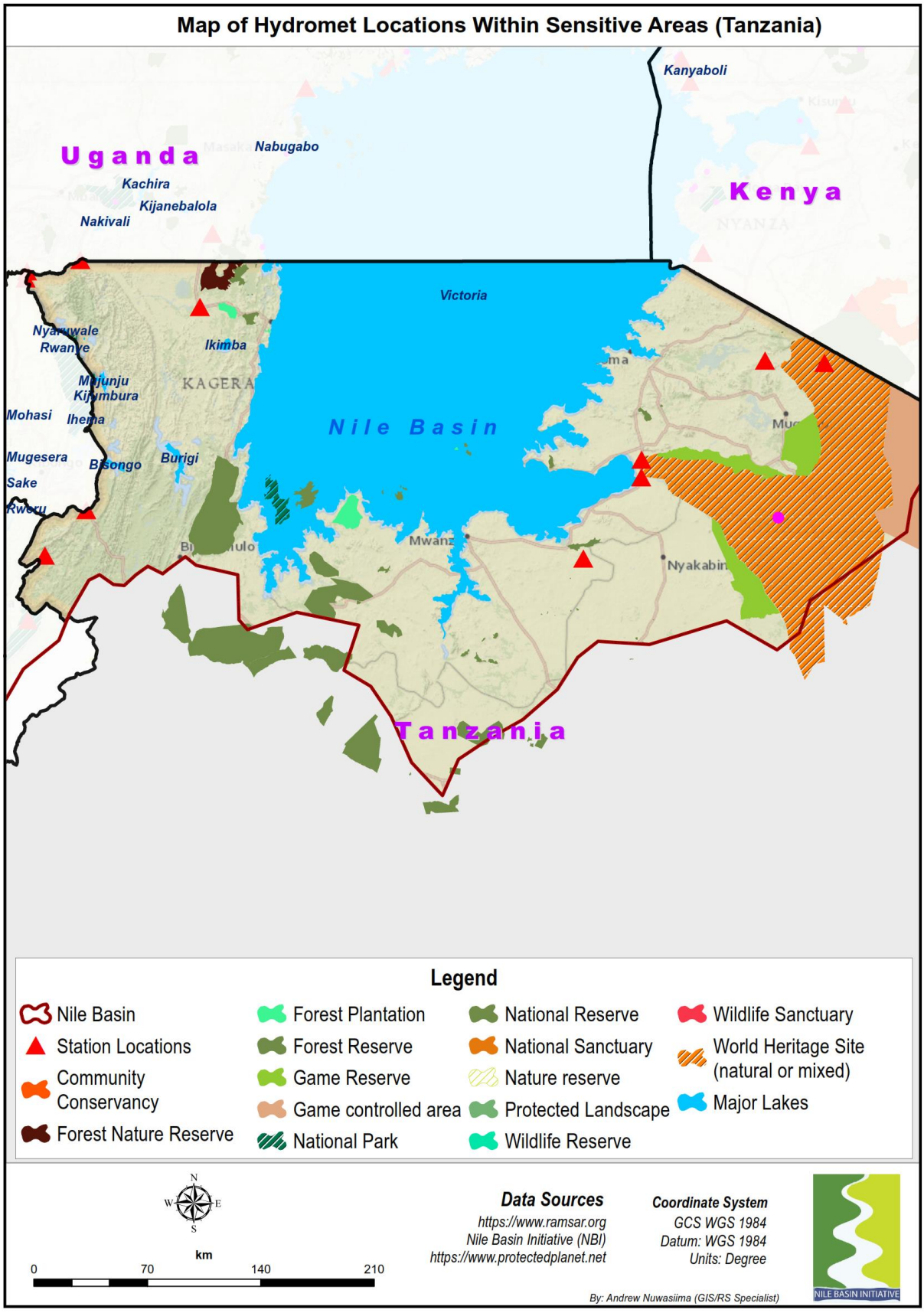
	endangered Species of wild Fauna and Flora (CITES)	water resources may encounter critical flora and fauna species and as such, they need to be protected against illegal and insensitive trade.
Uganda	The Ramsar Convention	Wetlands are part of the water resources of the Nile Basin. The project will include activities on the management of water resources and rehabilitation of facilities which impact on wetland areas.
	UN Framework on Combating Climate Change	The will involves measures on combating climate change impacts like drought, the prevention and adaptation and cooperative development within the Nile Riparian Countries. This convention provides for guidance of the same.
	United Nations Convention on Combating Desertification	The will involves measures on combating climate change impacts like drought, the prevention and adaptation and cooperative development within the Nile Riparian Countries. This convention provides for guidance of the same.
	Convention on Migratory Species	Protection and conservation of flyways and habitats from negative impacts of development project.
	World Heritage Convention	The project may encounter sites of cultural significance in its rehabilitation activities, capacity building and cooperative empowerment of member states to collectively conserve and manage such sites. This convention offers important guidelines.
	African Convention on Conservation of Nature and Natural Resources	The project involves the management of water resources and this convention provides guidelines and regulations for the management of nature and natural resources within the African context.
	Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)	The project activities on rehabilitation of dam and hydromet facilities and cooperative management of water resources may encounter critical flora and fauna species and as such, they need to be protected against illegal and insensitive trade.
Rwanda	Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES)	The project activities on rehabilitation of dam and hydromet facilities and cooperative management of water resources may encounter critical flora and fauna species and as such, they need to be protected against illegal and insensitive trade.
	UN Framework on Combating Climate Change	The will involves measures on combating climate change impacts like drought, the prevention and adaptation and cooperative development within the Nile Riparian Countries. This convention provides for guidance of the same.
	The Ramsar Convention	Wetlands are part of the water resources of the Nile Basin. The project will include activities on the management of water resources and rehabilitation of facilities which impact on wetland areas.
	Convention on Biological Diversity	The operations of the projects sub-projects and future resource use might encounter areas which endanger

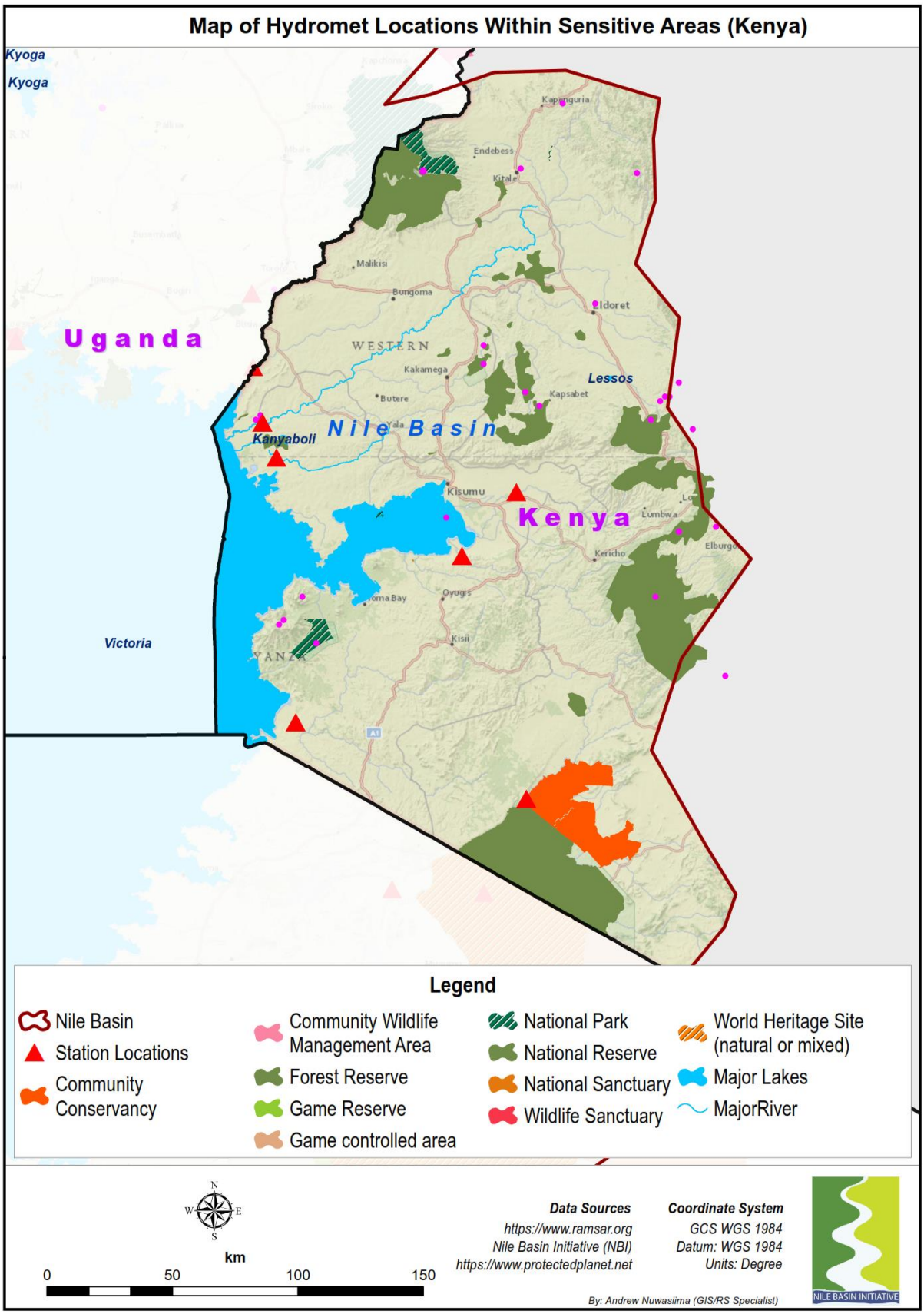
		flora and fauna species and their habitat. These areas and species will need to be protected under the provisions of this convention.
Burundi	The Ramsar Convention	Wetlands are part of the water resources of the Nile Basin. The project will include activities on the management of water resources and rehabilitation of facilities which impact on wetland areas.
	Ramsar Centre for East Africa (RAMCEA)	Regional platform for joint action for the conservation of wetlands as water resources of the Nile Basin.
	Convention on Biological Diversity	The operations of the projects sub-projects and future resource use might encounter areas which endanger flora and fauna species and their habitat. These areas and species will need to be protected under the provisions of this convention.
	Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)	The project activities on rehabilitation of dam and hydromet facilities and cooperative management of water resources may encounter critical flora and fauna species and as such, they need to be protected against illegal and insensitive trade.
	United Nations Framework Convention on Climate Change	The will involves measures on combating climate change impacts like drought, the prevention and adaptation and cooperative development within the Nile Riparian Countries. This convention provides for guidance of the same.

Annex 6: Maps showing the locations of hydromet stations in relation to sensitive areas across the Nile Basin Riparian Countries




Map of Hydromet Locations Within Sensitive Areas (Uganda)
South Sudan
DRC
Kenya
Tanzania
Uganda
Nile Basin
Victoria
Albert
Albert Nile
Victoria Nile
Yumbe
Arua
Kitgum
Gulu
Kotido
Moroto
Lira
NORTHERN
EASTERN
WESTERN
Kwania
Soroti
BisiniaOpeta
Kyoga
Masindi
Hoima
Nakasongola
Pallisa
Mbale
Kiboga
Luwero
Iganga
Busia
Jinja
Kampala
Fort Portal
Mubende
Mityana
George
EdwardNyamusingire
Masaka
Nabugabo
Kachira
Kijanebalola
Nakivali
Kanyaboli
Homa Bay
NYANZA
Legend
Nile Basin
Station Locations
Community Conservancy
Community Wildlife Management Area
Forest Nature Reserve
Forest Plantation
Forest Reserve
Game Reserve
Hunting
National Park
National Reserve
National Sanctuary
Protected Landscape
Ramsar Site, Wetland of International Importance
UNESCO-MAB Biosphere Reserve
Wildlife Reserve
Wildlife Sanctuary
World Heritage Site (natural or mixed)
Major Lakes
MajorRiver
Data Sources
https://www.ramsar.org
Nile Basin Initiative (NBI)
https://www.protectedplanet.net
Coordinate System
GCS WGS 1984
Datum: WGS 1984
Units: Degree
km
0
90
180
270
By: Andrew Nuwasiima (GIS/RS Specialist)
NILE BASIN INITIATIVE


Map of Hydromet Locations Within Sensitive Areas (Tanzania)
Kanyaboli
Uganda
Nabugabo
Kachira
Kijanebalola
Nakivali
Kenya
Victoria
Nyaruwale
Rwanye
Ikimba
Majunju
Kiyumbura
KAGERA
Mohasi
Iherna
Nile Basin
Mugesera
Bisongo
Burigi
Sake
Rweru
Mwanz
Nyakabir
Tanzania
Legend
Nile Basin
Station Locations
Community Conservancy
Forest Nature Reserve
Forest Plantation
Forest Reserve
Game Reserve
Game controlled area
National Park
National Reserve
National Sanctuary
Nature reserve
Protected Landscape
Wildlife Reserve
Wildlife Sanctuary
World Heritage Site (natural or mixed)
Major Lakes
N
W
E
S
km
0
70
140
210
Data Sources
https://www.ramsar.org
Nile Basin Initiative (NBI)
https://www.protectedplanet.net
Coordinate System
GCS WGS 1984
Datum: WGS 1984
Units: Degree
By: Andrew Nuwasiima (GIS/RS Specialist)
NILE BASIN INITIATIVE


Map of Hydromet Locations Within Sensitive Areas (Kenya)
Kyoga
Kyoga
Uganda
Kapenguria
Endebess
Kitale
Malikisi
Bungoma
Eldoret
WESTERN
Kakamega
Lessos
Butere
Kapsabet
Nile Basin
Kanyaboli
Kisumu
Kenya
Lumbwa
Kericho
Elburgo
Oyugis
Victoria
Kisii
Legend
Nile Basin
Station Locations
Community Conservancy
Community Wildlife Management Area
Forest Reserve
Game Reserve
Game controlled area
National Park
National Reserve
National Sanctuary
Wildlife Sanctuary
World Heritage Site (natural or mixed)
Major Lakes
MajorRiver
N
W
E
S
km
0
50
100
150
Data Sources
https://www.ramsar.org
Nile Basin Initiative (NBI)
https://www.protectedplanet.net
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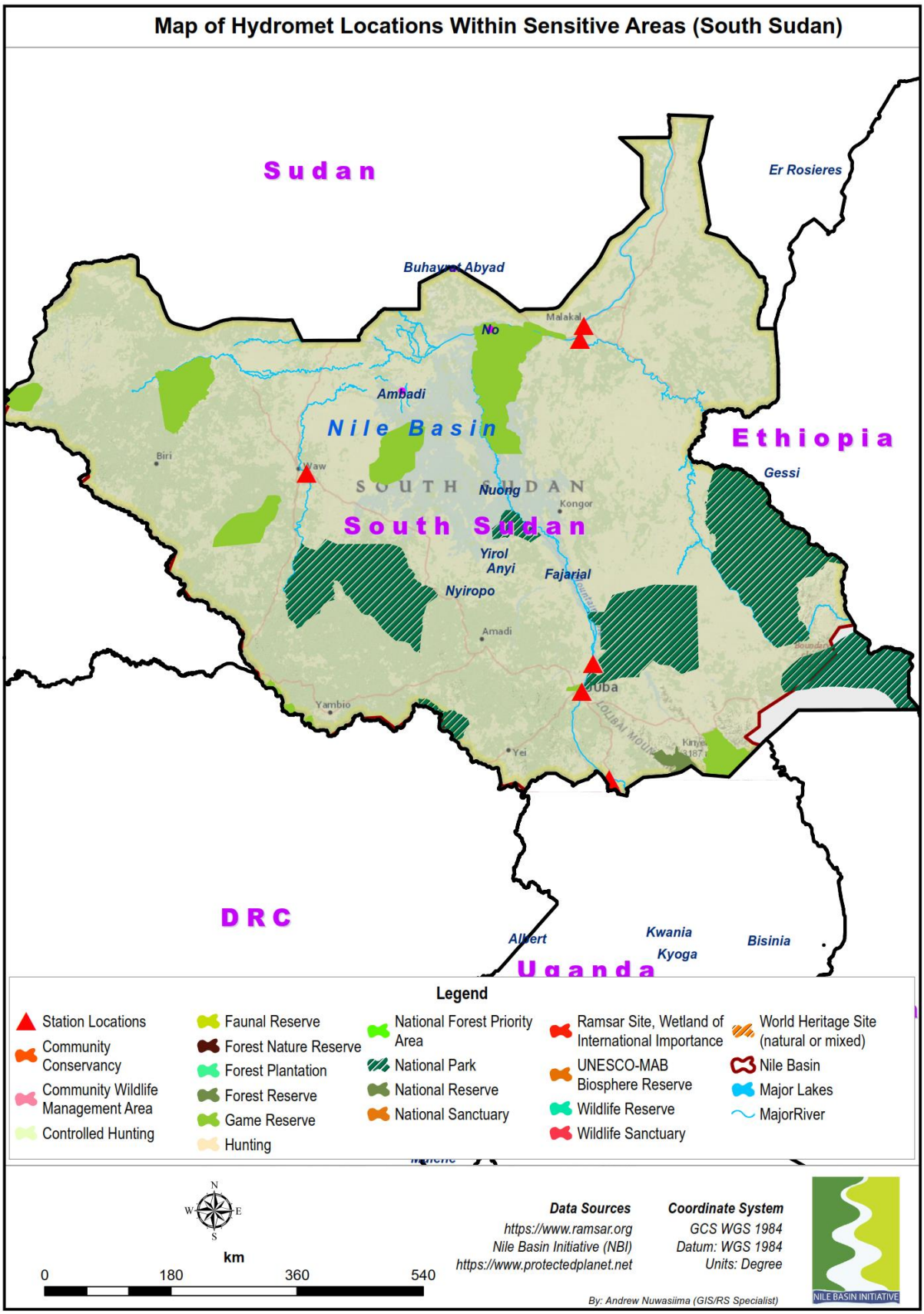
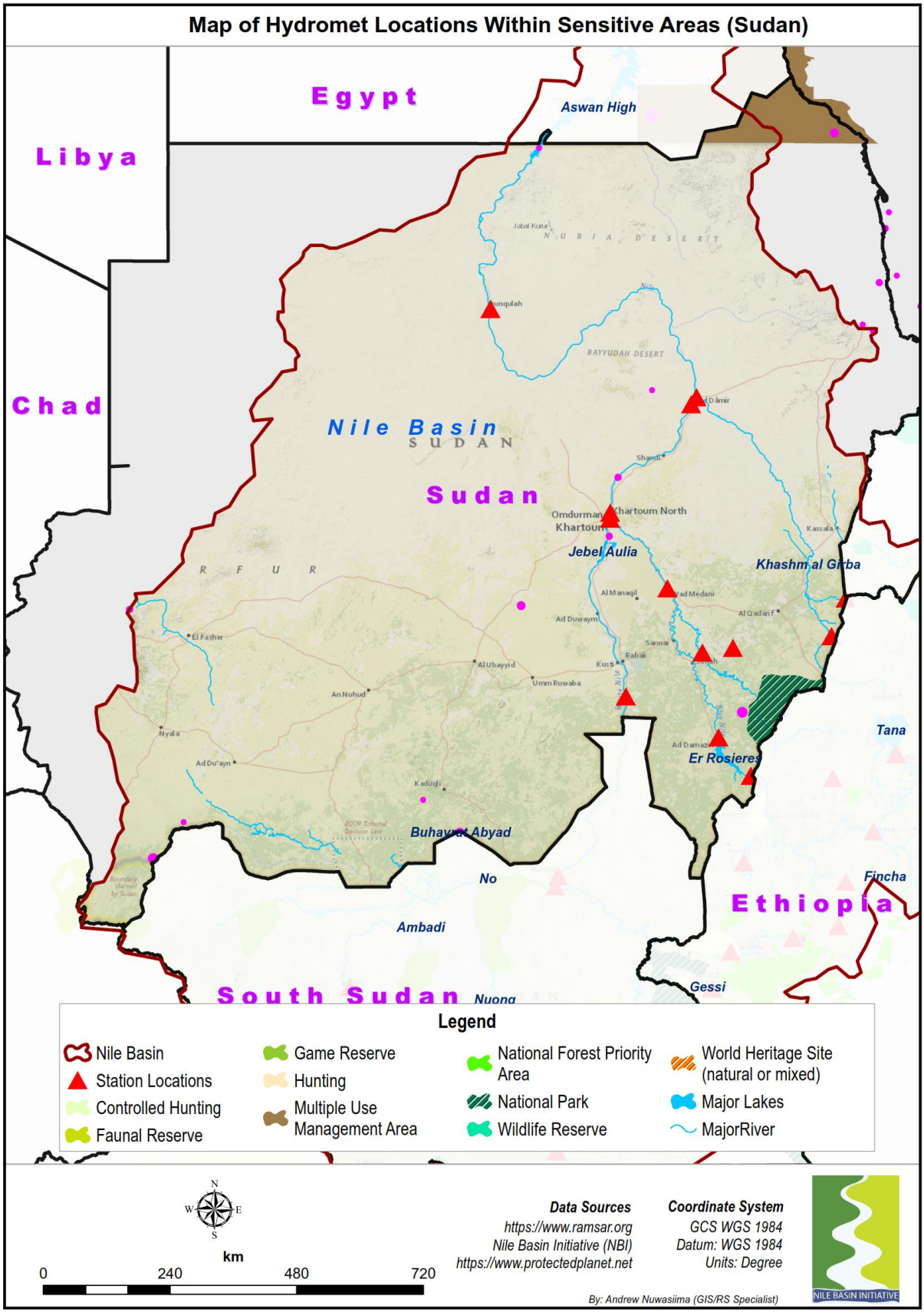
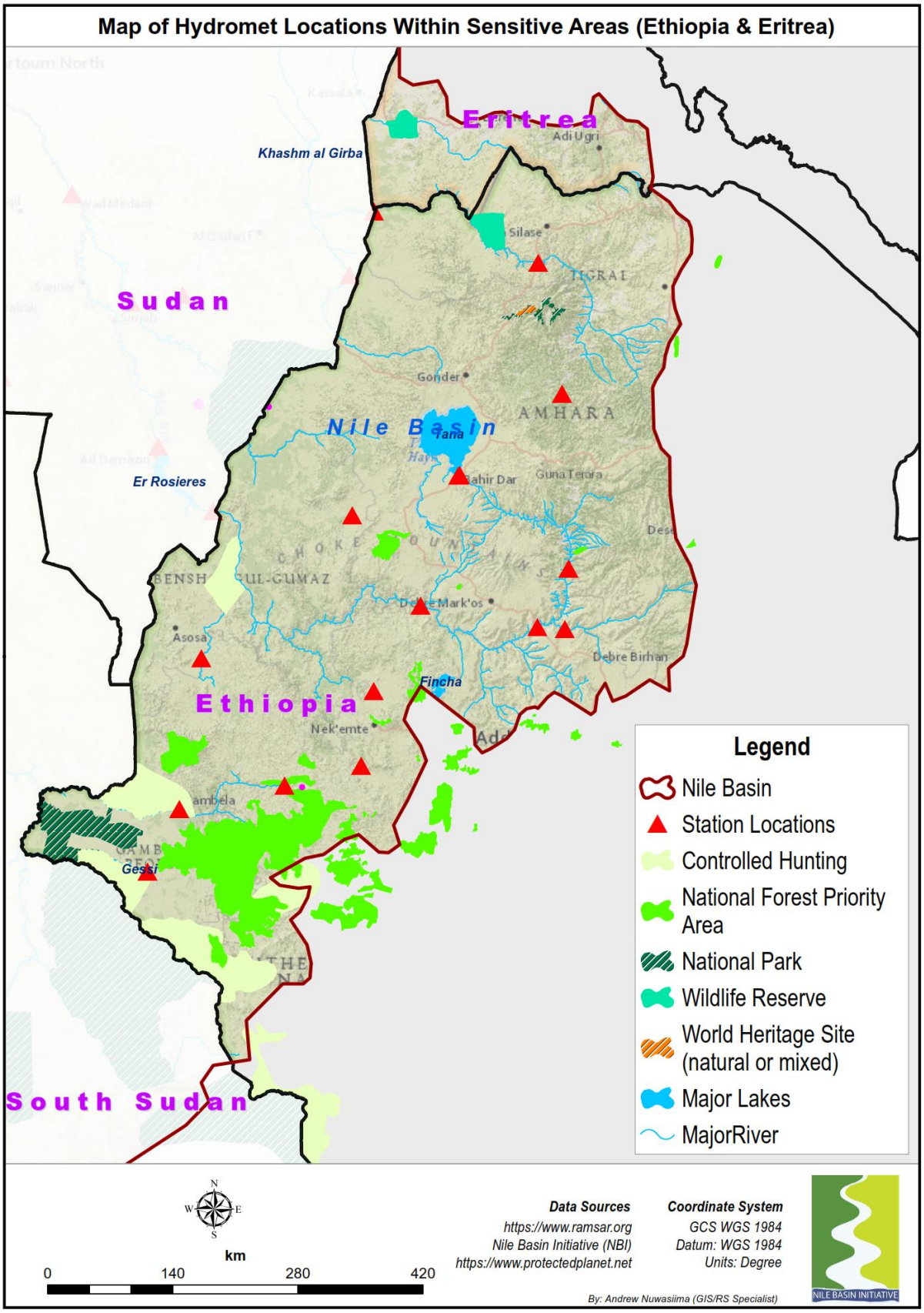
NILE BASIN INITIATIVE


Map of Hydromet Locations Within Sensitive Areas (South Sudan)
Sudan
Er Rosieres
Buhayrat Abyad
Malakal
No
Ambadi
Nile Basin
Ethiopia
Biri
Waw
Gessi
SOUTH SUDAN
Nuong
Kongor
South Sudan
Yirol
Anyi
Fajarial
Nyiropo
Amadi
Juba
Yambio
Yei
DRC
Albert
Kwania
Kyoga
Bisinia
Uganda
Legend
Station Locations
Community Conservancy
Community Wildlife Management Area
Controlled Hunting
Faunal Reserve
Forest Nature Reserve
Forest Plantation
Forest Reserve
Game Reserve
Hunting
National Forest Priority Area
National Park
National Reserve
National Sanctuary
Ramsar Site, Wetland of International Importance
UNESCO-MAB Biosphere Reserve
Wildlife Reserve
Wildlife Sanctuary
World Heritage Site (natural or mixed)
Nile Basin
Major Lakes
MajorRiver
N
W
E
S
km
0
180
360
540
Data Sources
https://www.ramsar.org
Nile Basin Initiative (NBI)
https://www.protectedplanet.net
Coordinate System
GCS WGS 1984
Datum: WGS 1984
Units: Degree
By: Andrew Nuwasiima (GIS/RS Specialist)
NILE BASIN INITIATIVE


Map of Hydromet Locations Within Sensitive Areas (Sudan)
Egypt
Libya
Chad
Aswan High
Nile Basin
SUDAN
Sudan
Omdurman
Khartoum North
Khartoum
Jebel Aulia
Khashm al Girba
Er Rosieres
Buhayrat Abyad
Ethiopia
South Sudan
Tana
Fincha
Gessi
Ambadi
Legend
Nile Basin
Station Locations
Controlled Hunting
Faunal Reserve
Game Reserve
Hunting
Multiple Use Management Area
National Forest Priority Area
National Park
Wildlife Reserve
World Heritage Site (natural or mixed)
Major Lakes
MajorRiver
km
0
240
480
720
Data Sources
https://www.ramsar.org
Nile Basin Initiative (NBI)
https://www.protectedplanet.net
Coordinate System
GCS WGS 1984
Datum: WGS 1984
Units: Degree
By: Andrew Nuwasiima (GIS/RS Specialist)
NILE BASIN INITIATIVE


Map of Hydromet Locations Within Sensitive Areas (Ethiopia & Eritrea)
Eritrea
Adi Ugri
Khashm al Girba
Silase
TEGRAI
Sudan
Gonder
AMHARA
Nile Basin
Tana
Er Rosieres
Bahir Dar
Guna Tenara
Debre Mark'os
Asosa
Debre Birhan
Fincha
Ethiopia
Nek'emte
Gessi
South Sudan
Legend
Nile Basin
Station Locations
Controlled Hunting
National Forest Priority Area
National Park
Wildlife Reserve
World Heritage Site (natural or mixed)
Major Lakes
MajorRiver
N
W
E
S
km
0
140
280
420
Data Sources
https://www.ramsar.org
Nile Basin Initiative (NBI)
https://www.protectedplanet.net
Coordinate System
GCS WGS 1984
Datum: WGS 1984
Units: Degree
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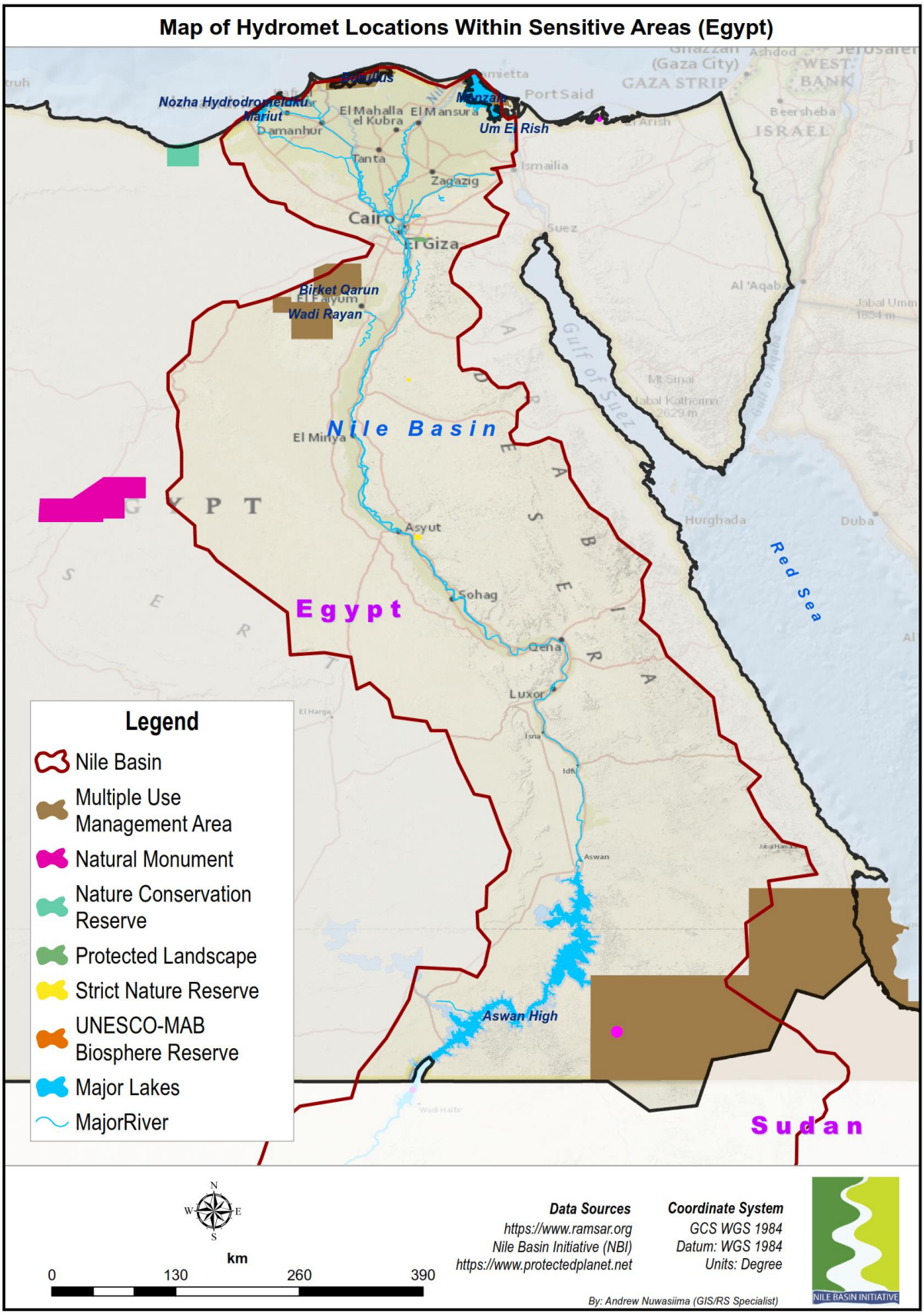
NILE BASIN INITIATIVE


Map of Hydromet Locations Within Sensitive Areas (Egypt)
Nozha Hydrodrome
Mariut
Damanhur
El Mahalla el Kubra
El Mansura
Manzala
Port Said
Um El Rish
Tanta
Zagazig
Ismailia
Cairo
El Giza
Suez
Birket Qarun
Wadi Rayan
El Fayum
El Minya
Nile Basin
Asyut
Sohag
Qena
Luxor
Aswan
Aswan High
Red Sea
Hurghada
Egypt
Sudan
Legend
Nile Basin
Multiple Use Management Area
Natural Monument
Nature Conservation Reserve
Protected Landscape
Strict Nature Reserve
UNESCO-MAB Biosphere Reserve
Major Lakes
MajorRiver
km
0
130
260
390
Data Sources
https://www.ramsar.org
Nile Basin Initiative (NBI)
https://www.protectedplanet.net
Coordinate System
GCS WGS 1984
Datum: WGS 1984
Units: Degree
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NILE BASIN INITIATIVE