Part I: Project Information

GEF ID
10784

Project Type
FSP

Type of Trust Fund
GET

CBIT/NGI
CBIT **No**
NGI **No**

Project Title
Enhancing the sustainable management of Senegalo-Mauritanian Aquifer System to ensure access to water for populations facing climate change (SMAS)

Countries
Regional, Gambia, Guinea-Bissau, Mauritania, Senegal

Agency(ies)
UNEP

Other Executing Partner(s)
Sahara and Sahel Observatory (OSS); Executing partner: National counterpart agencies: Department of Water Resources Management and Planning (DGPRE) Gambia: Department of Water Resources Guinea Bissau : General Directorate of Water Resources (DGRH) Mauritania : National center for water resources (CNRE)

Executing Partner Type
Others

GEF Focal Area
International Waters

Sector

Taxonomy

Focal Areas, Capacity, Knowledge and Research, International Waters, Pollution, Nutrient pollution from Wastewater, Strategic Action Plan Implementation, Freshwater, Aquifer, River Basin, Transboundary Diagnostic Analysis and Strategic Action Plan Preparation, Land Degradation, Sustainable Land Management, Improved Soil and Water Management Techniques, Climate Change, Climate Change Adaptation, Ecosystem-based Adaptation, Climate information, Least Developed Countries, Climate resilience, Biodiversity, Biomes, Wetlands, Rivers, Influencing models, Transform policy and regulatory environments, Demonstrate innovative approache, Convene multi-stakeholder alliances, Strengthen institutional capacity and decision-making, Stakeholders, Civil Society, Trade Unions and Workers Unions, Community Based Organization, Academia, Non-Governmental Organization, Beneficiaries, Local Communities, Communications, Awareness Raising, Education, Type of Engagement, Participation, Partnership, Information Dissemination, Consultation, Gender Equality, Gender results areas, Access to benefits and services, Capacity Development, Participation and leadership, Access and control over natural resources, Knowledge Generation and Exchange, Gender Mainstreaming, Sex-disaggregated indicators, Women groups, Gender-sensitive indicators, Integrated Programs, Food Security in Sub-Sahara Africa, Integrated Land and Water Management, Resilience to climate and shocks, Knowledge Generation, Knowledge Exchange, Targeted Research, Learning, Theory of change, Adaptive management, Innovation

Rio Markers

Climate Change Mitigation

No Contribution 0

Climate Change Adaptation

Significant Objective 1

Biodiversity

No Contribution 0

Land Degradation

No Contribution 0

Submission Date

12/9/2022

Expected Implementation Start

7/31/2023

Expected Completion Date

7/31/2027

Duration

48In Months

Agency Fee($)
299,250.00

A. FOCAL/NON-FOCAL AREA ELEMENTS

Objectives/Programs	Focal Area Outcomes	Trust Fund	GEF Amount($)	Co-Fin Amount($)
IW-3-5	Enhance water security in freshwater ecosystems through advance information exchange and early warning	GET	700,000.00	8,000,000.00
IW-3-6	Enhance water security in freshwater ecosystems through enhanced regional and national cooperation on shared freshwater surface and groundwater basins	GET	750,000.00	7,730,000.00
IW-3-7	Enhance water security in freshwater ecosystems through investments in water, food, energy and environment security	GET	1,700,000.00	32,600,000.00
		Total Project Cost($)	**3,150,000.00**	**48,330,000.00**

B. Project description summary

Project Objective

Foster multi-country cooperation and to enhance institutional capacity for the protection and sustainable management of the transboundary Senegalo-Mauritanian aquifer system and its dependent ecosystems in order to improve water and food security, and resilience to climate change.

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing($)	Confirmed Co-Financing($)

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing($)	Confirmed Co-Financing($)
Component 1 Improving the understanding of the status and functioning of the Sengalo-Mauritanian Aquifer System (SMAS), and of its interactions with the Senegal and Gambia rivers.	Technical Assistance	Outcome 1.1 Improved shared knowledge of the status and potentialities of the SMAS, of its dependent ecosystems and of its interactions with surface waters, reinforces transboundary cooperation and enables joint priority setting.	1.1.1. Regionally harmonized groundwater management tools (Database; GIS; aquifer?s hydrogeological and transport conceptual model including water balance; monitoring network design and protocols), and data sharing mechanism 1.1.2 Regional and national level diagnostic assessment (TDA) identifying SMAS?s challenges and opportunities and trans-boundary issues of concern, jointly developed by the countries sharing the aquifer, with consideration of future	GET	803,550.00	5,500,000.00

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing($)	Confirmed Co-Financing($)
			climatic scenarios, ecosystems health, and socio-economic aspects, including gender.			

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing($)	Confirmed Co-Financing($)
Component 2 Developing a regional Strategic Action Program (SAP) for the Senegalo-Mauritanian aquifer system and facilitating conjunctive surface and groundwater management	Technical Assistance	Outcome 2.1 Strategic Action Program (SAP) developed and endorsed by the participating countries enables the sustainable management of the transboundary SMAS	Output 2.1.1. The Strategic Action Program for the sustainable management of the transboundary SMAS, developed and submitted for countries? endorsement at ministerial level. Output 2.1.2 Partners? and donors? roundtable organized for resource mobilization for the implementation of SAP	GET	627,550.00	8,000,000.00
		Outcome 2.2 Countries informed and prepared to consider overall options for regional governance framework/s for the conjunctive management of their surface and groundwater resources.	Output 2.2.1. Governance options for the conjunctive surface and groundwater management in the Senegal and the Gambia river basins developed and submitted for countries? consideration			

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing($)	Confirmed Co-Financing($)
Component 3 Piloting the implementation of groundwater-based adaptation measures to mitigate the impacts of climate change and related hazards	Investment	Outcome 3.1 The successful joint implementation of small-scale demonstration measures strengthens transboundary cooperation and feeds into the SAP formulation process.	Output 3.1.1 Small pilots demonstrating, in a transboundary context, ways to address major concerns such as the need for improved water use efficiency in agriculture, for climate change adaptation, and for expanded water resources availability.	GET	1,091,550.00	27,820,000.00

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing($)	Confirmed Co-Financing($)
Component 4 Capacity development, Communication and Knowledge management	Technical Assistance	Outcome 4.1 Stakeholders ? enhanced knowledge and capacity, and women empowerment facilitate coordinated action for the sustainable management of the SMAS	Output 4.1.1 Regional information and data exchange platform for conjunctive water resources management established Output 4.1.2. Communication and Knowledge Management Strategy prepared and endorsed Output 4.1.3. Based on a need assessment, capacity building modules (in Database, GIS, Modeling, TDA/SAP, water resources allocation, etc.) organized for member countries and basin organizations. Output 4.1.4 Project results and lessons learned disseminated at the local, national, and	GET	477,350.00	4,280,000.00

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing($)	Confirmed Co-Financing($)
			regional levels through *ad hoc* interactive learning events. Output 4.1.5. Project visibility improved by establishment of a project website, and lessons learned shared for broader adoption through cooperation with IW: LEARN, including participation to IWCs, and production of Experience Notes. Output 4.1.6. The project monitoring-evaluation system is developed and implemented			
				Sub Total ($)	**3,000,000.00**	**45,600,000.00**
Project Management Cost (PMC)						
	GET		150,000.00			2,730,000.00

Project Management Cost (PMC)		
Sub Total($)	**150,000.00**	**2,730,000.00**
Total Project Cost($)	**3,150,000.00**	**48,330,000.00**

Please provide justification

C. Sources of Co-financing for the Project by name and by type

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount($)
GEF Agency	UNEP	In-kind	Recurrent expenditures	130,000.00
Recipient Country Government	Gambia	Public Investment	Investment mobilized	15,000,000.00
Recipient Country Government	Guinea Bissau	Public Investment	Investment mobilized	7,750,000.00
Recipient Country Government	Mauritania	Public Investment	Investment mobilized	12,730,000.00
Recipient Country Government	Senegal	Public Investment	Investment mobilized	12,000,000.00
Other	Sahara and Sahel Observatory (OSS)	In-kind	Recurrent expenditures	320,000.00
Other	(Senegal river basin Organization (OMVS)	Grant	Investment mobilized	300,000.00
Other	Gambia river basin Organization (OMVG)	In-kind	Recurrent expenditures	100,000.00
			Total Co-Financing($)	**48,330,000.00**

Describe how any "Investment Mobilized" was identified

The dollar amount shown as ?Public investment? for a total of USD 47,480,000 represents the approximate value of the components relevant for the project of the following ongoing and planned investments: Mauritania: ? AEP project from of Dhar aquifer ? Water and Sanitation Sector Project (PSEA) ? Study to improve knowledge of watersheds in Mauritania ? Water point creation and equipment program ? Construction of 25 retention basins Senegal: ? Africa Environmental Health and Pollution Management Project ? Senegal Rural Water Supply and Sanitation Project ? Stormwater Management and Climate Change Adaptation Project 2 ? Senegal - Water and Sanitation Sector Project (PSEA) Guinea Bissau: ? Support for Water Resources Management and Monitoring in CPLP Countries " ? Saltinho Hydroelectric Planning Project over Corubal River in Guinea-Bissau ? Strengthening adaptive capacity and resilience to

Climate Change in the Agrarian and Water Resources Sectors in Guinea-Bissau ? Enhancing livestock resilience to drought in Guinea Bissau The Gambia: ? Climate Smart Rural Wash Development Project ? Strengthening Climate Services and Early Warning Systems in The Gambia ? Building the Gambia?s Capacities and Resilience to Climate Change related Disasters ? Water and Sanitation Rehabilitation Project ? Water Supply Project in the Great Banjul Area (WASIB) It is expected that the project will interact with all the above sectoral initiatives of the four country governments, to achieve a coherent overall view of the water-related conflicts that might arise between sectors at the water nexus, shedding light on the benefits that may be derived from the consideration of solutions based on conjunctive surface and groundwater management, and of the value of the ecosystem services provided by the groundwater resources of the SMAS. In addition, another investment - estimated in $ 9,000,000 at PIF stage - is expected to be mobilized through the African Development Bank (AfDB) partner who is and has been engaged in transboundary water management and conjunctive management of surface and groundwater resources. OSS approached AfDB and conducted some exchanges in order to mobilize finance in the SASM basin. The Water Development and Sanitation Department (AHWS) of Water Coordination and Partnerships Division launched a call for proposals in July 2020 to develop priority projects, around Infrastructure Development, Climate Change, , Improvement of Livelihoods Improvement, Institutional Development, etc. On this matter, OSS submitted a project outlines and concept note on Water Resources Management Development /water security to be screened by AfDB for further development and possible support. The AfDB considered the project and accepted to support the elaboration of the Master Plan for the Development and Sustainable Management of the shared water resources of the Senegal-Mauritania aquifer basin. The internal process with the AfDB is still ongoing. The approval window is RPG Grant/Loan (ADF) - [Regional Public Goods (RPGs) projects Grants / Loan (African Development Fund - (ADF)]. This expected co-finance is not included here.

D. Trust Fund Resources Requested by Agency(ies), Country(ies), Focal Area and the Programming of Funds

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount($)	Fee($)	Total($)
UNEP	GET	Regional	International Waters	International Waters	3,150,000	299,250	3,449,250.00
			Total Grant Resources($)		**3,150,000.00**	**299,250.00**	**3,449,250.00**

E. Non Grant Instrument

NON-GRANT INSTRUMENT at CEO Endorsement

Includes Non grant instruments? **No**

Includes reflow to GEF? **No**

F. Project Preparation Grant (PPG)

PPG Required **true**

PPG Amount ($)

150,000

PPG Agency Fee ($)

14,250

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount($)	Fee($)	Total($)
UNEP	GET	Regional	International Waters	International Waters	150,000	14,250	**164,250.00**
				Total Project Costs($)	**150,000.00**	**14,250.00**	**164,250.00**

Core Indicators

Indicator 1 Terrestrial protected areas created or under improved management

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
0.00	16,000.00	0.00	0.00

Indicator 1.1 Terrestrial Protected Areas Newly created

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Total Ha (Achieved at MTR)	Total Ha (Achieved at TE)
0.00	0.00	0.00	0.00

Name of the Protected Area	WDPA ID	IUCN Category	Total Ha (Expected at PIF)	Total Ha (Expected at CEO Endorsement)	Total Ha (Achieved at MTR)	Total Ha (Achieved at TE)

Indicator 1.2 Terrestrial Protected Areas Under improved Management effectiveness

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Total Ha (Achieved at MTR)	Total Ha (Achieved at TE)
0.00	16,000.00	0.00	0.00

Name of the Protected Area	WDPA ID	IUCN Category	Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Total Ha (Achieved at MTR)	Total Ha (Achieved at TE)	METT score (Baseline at CEO Endorsement)	METT score (Achieved at MTR)	METT score (Achieved at TE)
National Park of Diawling in Mauritania	9310	Wilderness Area		16,000.00			6,000.00		

Indicator 3 Area of land and ecosystems under restoration

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
4636.70	4636.70	0.00	0.00

Indicator 3.1 Area of degraded agricultural lands under restoration

Disaggregation Type	Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
Rangeland and pasture	4,636.70	4,636.70		

Indicator 3.2 Area of forest and forest land under restoration

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)

Indicator 3.3 Area of natural grass and woodland under restoration

Disaggregation Type	Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)

Indicator 3.4 Area of wetlands (including estuaries, mangroves) under restoration

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)

Indicator 4 Area of landscapes under improved practices (hectares; excluding protected areas)

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
61213.00	61213.00	0.00	0.00

Indicator 4.1 Area of landscapes under improved management to benefit biodiversity (hectares, qualitative assessment, non-certified)

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)

Indicator 4.2 Area of landscapes under third-party certification incorporating biodiversity considerations

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)

Type/Name of Third Party Certification

Indicator 4.3 Area of landscapes under sustainable land management in production systems

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
61,213.00	61,213.00		

Indicator 4.4 Area of High Conservation Value or other forest loss avoided

Disaggregation Type	Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)

Indicator 4.5 Terrestrial OECMs supported

Name of the OECMs	WDPA-ID	Total Ha (Expected at PIF)	Total Ha (Expected at CEO Endorsement)	Total Ha (Achieved at MTR)	Total Ha (Achieved at TE)

Documents (Please upload document(s) that justifies the HCVF)

Title	Submitted

Indicator 7 Shared water ecosystems under new or improved cooperative management

	Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)
Shared water Ecosystem	Senegalo-Mauretanian Basin	Senegalo-Mauretanian Basin		
Count	**1**	**1**	**0**	**0**

Indicator 7.1 Level of Transboundary Diagonostic Analysis and Strategic Action Program (TDA/SAP) formulation and implementation (scale of 1 to 4; see Guidance)

Shared Water Ecosystem	Rating (Expected at PIF)	Rating (Expected at CEO Endorsement)	Rating (Achieved at MTR)	Rating (Achieved at TE)
Senegalo-Mauretanian Basin	1	1		

Indicator 7.2 Level of Regional Legal Agreements and Regional management institution(s) (RMI) to support its implementation (scale of 1 to 4; see Guidance)

Shared Water Ecosystem	Rating (Expected at PIF)	Rating (Expected at CEO Endorsement)	Rating (Achieved at MTR)	Rating (Achieved at TE)
Senegalo-Mauretanian Basin	2	2		

Indicator 7.3 Level of National/Local reforms and active participation of Inter-Ministeral Committees (IMC; scale 1 to 4; See Guidance)

Shared Water Ecosystem	Rating (Expected at PIF)	Rating (Expected at CEO Endorsement)	Rating (Achieved at MTR)	Rating (Achieved at TE)
Senegalo-Mauretanian Basin	2	2		

Indicator 7.4 Level of engagement in IWLEARN throgh participation and delivery of key products(scale 1 to 4; see Guidance)

Shared Water Ecosystem	Rating (Expected at PIF)	Rating (Expected at CEO Endorsement)	Rating (Achieved at MTR)	Rating (Achieved at TE)
Senegalo-Mauretanian Basin	2	1		

Indicator 11 People benefiting from GEF-financed investments

	Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)
Female	83,253	83,253		
Male	79,988	79,988		
Total	163241	163241	0	0

Provide additional explanation on targets, other methodologies used, and other focal area specifics (i.e., Aichi targets in BD) including justification where core indicator targets are not provided

The project refers to the Senegalo-Mauritanian transboundary aquifer that covers about 300, 000km2 and occupies the subsurface of the Senegal and Gambia river basins. The Core-Indicators that should be impacted by the project implementation are the following (referring to the table above): ? Core-indicators 1, 3, 4: The project plans to undertake adaptation actions in the pilot areas that have been defined during project preparation. ? Core-indicator 7: The project covers the entire aquifer and involves the 4 member countries. The objective of the project is to develop a TDA/SAP for this aquifer which will support the development of a framework for cooperation and concerted governance for Senegal and Gambia basin organizations and by the countries. The project will therefore have a significant impact on three shared water bodies, and on the 4 sub-indicators (7.1 to 7.4) ? Core-indicator 11: It is estimated that the direct beneficiaries are mostly concentrated in the pilot areas amounting to 163,241 people including those who are benefiting from trainings and other capacity building activities. Based on average ratio across the participating countries, the number of beneficiaries by gender is estimated at: Female: 83,253 and Male: 79,988.

Part II. Project Justification

1a. Project Description

1.1. BACKGROUND AND CONTEXT: *The Senegalo-Mauritania Transboundary Aquifer System (SMAS)*

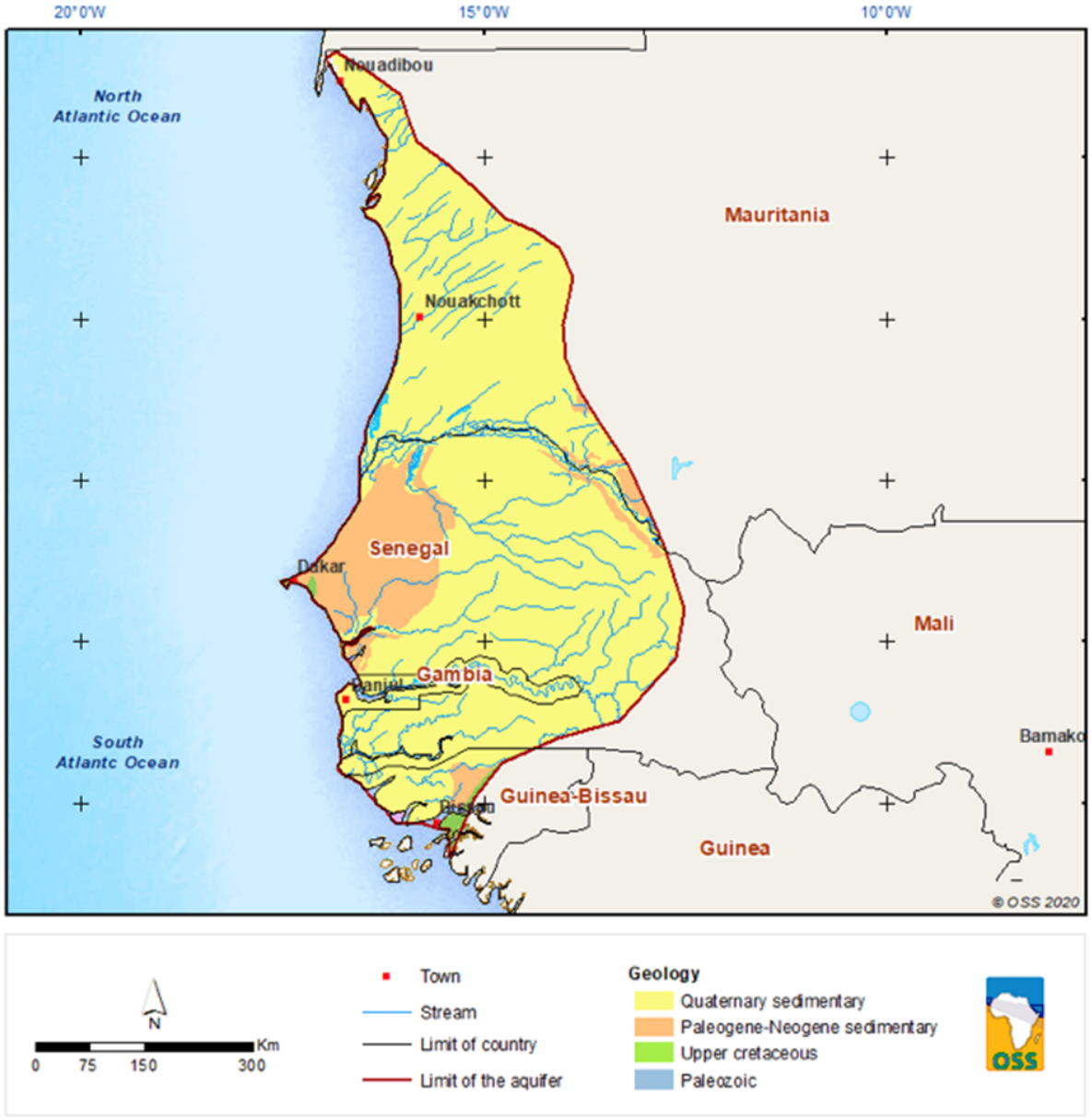

Figure 1. Map of the senegalo-mauritania transboundary aquifer system (smas)

The continental Senegal Mauritanian Sedimentary Basin which includes parts of Mauritania, Senegal, Gambia and Guinea Bissau is the largest of the northwest African Atlantic margin basins and covers roughly more than 300 000 km2. It approximately extends between 10? (Southern limit) and 21? Lat N (Northern limit), and contains three interconnected aquifers:

(i) the shallow aquifer system covering - albeit often discontinuously - the whole basin,

(ii) the intermediate aquifer system including Eocene and Paleocene carbonate formations

(iii) the deeper aquifer system, mainly of Maastrichtian age, present in most of the sedimentary basin, with variable hydrogeological potential.

Together, these three aquifers constitute the Senegal-Mauritanian Transboundary Aquifer System (SMAS)[1][1] shared by four countries: Gambia (9,900 km?), Guinea Bissau (20,100 km?), Mauritania (111,000 km?) and Senegal (159,000 km).

The Senegal-Mauritanian Aquifer System extends over approximately 1300 km between Cap Blanc in the north in Mauritania and Cap Roxo in the south in Guinea Bissau and is crossed by two important trans-boundary watercourses, the Senegal - and the Gambia Rivers. With a width of 550 km at the latitude of Dakar, it is limited to the West by the Atlantic Ocean, to the North by the Precambrian basement of the R?guibat ridge to the East and to the Southeast by the metamorphic rocks of the Mauritanide chain. To the south, the basin rests on the Paleozoic sediments of the Bov? basin. The characteristics, level of knowledge and uses of this major transboundary aquifer system vary among the four countries, which have different extensions, climate and geology, as described below (from North to South).

Mauritania

Mauritania has an arid climate as it is located in the Saharan desert and the Sahel region. Average annual temperatures range from 21?C to 30?C, with the lowest values ??measured on the northern coast and the highest in the southeast of the country. The total annual amounts of precipitation range from barely 20 mm on the north coast to 400 mm in the center-south which has a Sahelian climate. There is only one rainy season (unimodal precipitation regime) in Mauritania from June to October in the south, with a decrease in the duration of the rainy season and precipitation towards the north. Mauritania's landscape is mostly flat. The altitude rises from the coastal plains in the west towards the central mountains to reach the highest peak, that of Mount Kediet ej Jill (915 m), and down to the eastern plateau with altitudes ranging from 200 to 500 m.

The north of the country in particular is extremely dry, which is partly due to the northeast trade winds and the harmattan, a dry wind that blows from the end of November to mid-March and brings a lot of sand and dust. The south of the country has a Sahelian climate with higher rainfall. In accordance with

these aspects, Mauritania can be divided into three major agro-ecological zones (ZAE): desert, arid/Sahelian and semi-arid/Sudanese savannah. Each of these zones is characterized by a specific temperature and humidity and thus by different patterns of agricultural production and pastoral activity. As a whole Mauritania has very limited freshwater resources, except for the Senegal River, which flows along the border with Senegal. Its perennial flow provides millions of people with fresh water, farmland, pasture and fish in Mauritania, Senegal and Mali. Thanks to the dams on the Senegal River, water is available all year round and allows more intensive agricultural production. On the other hand, the constant presence of fresh water in the estuary has led to the spread of parasites and invasive species such as snails, which alter ecosystems and threaten human health and livelihoods in the coastal areas. There are other environmental pressures from human activities such as land degradation and desertification induced by poor agricultural practices, overgrazing and deforestation. Extreme weather events like flash floods and severe droughts are expected to intensify in the context of climate change, underscoring the need for the country to develop adaptation strategies to protect biodiversity and preserve fragile ecosystems and their services.

The Senegalese-Mauritanian Aquifer is made up of Meso-Cenozoic tabular terrain with deposits that thicken from east to west where they can reach 7000 m. The sedimentary terrains are made up of Triassic, Middle to Upper Jurassic, Cretaceous, Tertiary and Quaternary formations, resting on the pre-Mesozoic crystalline substratum. the Aquifer can be divided into 3 systems corresponding to the main geological formations:

? ? the superficial aquifer system or Terminal Complex which groups together the predominantly sandy clayey and sandy formations of the Quaternary, the Continental Terminal and the Oligocene;

? ? the intermediate aquifer system which includes mainly limestone, karstic in places, and marl-limestone formations of the Eocene and Paleocene;

? ? the deep aquifer system which only concerns the formation of Maastrichtian sands.

The shallow aquifer essentially includes the alluvial aquifer and the aquifer of the continental terminal. The alluvial aquifer is located all along the Senegal River in the North, in the alluvial sands of the Senegal River, on the right bank as well as on the left bank. It is exploited by cemented wells and shallow boreholes.

The Continental Terminal (CT) aquifer is made up of alternating sands and clays and is called the Trarza aquifer. It is bounded to the West by the Atlantic Ocean, to the South by the Senegal River, to the North and East by the metamorphic formations of the Mauritanide chain. It covers an area of ??approximately 40,000 km2. The basin is made up of Cretaceous marine limestone layers topped by detrital sediments from the Continental Terminal (CT) and the Quaternary, with an average thickness of 80 m, which can reach 150 m towards its north-eastern limit. This aquifer ensured until 2011 the drinking water supply of the capital, Nouakchott, from the large catchment field of Idini and it still supplies the towns and villages of the Trarza region and part of the Brakna region. The CT aquifer is the largest and most easily exploitable hydrogeological unit in the entire Senegal-Mauritanian basin. It is very heterogeneous detrital

sediments include intercalations of sands, clayey silts, and often reworked clays, of fluvial, lacustrine and wind origin. There are nearly 800 water points capturing this aquifer, whose reserves are estimated at nearly 100 billion m3.

This coastal basin is made up of three sets which are characterized by multilayer complexes varying from 50 to 150 m, housing aquifers in the clay-sandstone formations of the Continental Terminal of Mio-Pliocene age. These aquifers are the main source of drinking water supply. These are:

- ? Boulanoir in the North (about 4000 km2)
- ? Bennichaab in the center (about 6000 km2)
- ? Trarza in the South (largest region of around 20,000 km2).

The deep Maastrichtian aquifer system covers 4/5 of the Senegalese territory, it extends over the entire Senegalo-Mauritanian sedimentary basin, it is made up of sands and sandstones and forms an immense reservoir. It is the most exploited aquifer by boreholes (more than 1000) reaching in some places more than 350 m with flow rates varying between 100 and 250 m3/h. The Maastrichtian aquifer is characterized, in its western part, by the presence of deep salt water, even real "brines" which can reach concentrations greater than 100 g/l.

Groundwater uses

Until 2010, before the Aftout drinking water installations were commissioned to supply Nouakchott with water from the Senegal River, groundwater was the main source of drinking water. In addition to the 3 main towns of the wilayas Nouakchott, Rosso and S?libaby, which are supplied mainly by surface water, there are nearly twenty other localities supplied by small water treatment plants from the river.

Currently, groundwater abstraction from the Senegalese-Mauritanian basin reaches a maximum of 40 million m3/year, mainly intended for drinking water needs.

Piezometric monitoring

The National Water Resources Center has, apart from the abandoned OMVS network, piezometric networks for monitoring centered on a few groundwater abstraction areas:

- Idini field;
- Bouhchicha field;
- Bennichab field;
- Tasiast field;
- Boulenoir field;
- Kaedi field.

Each field includes three to 14 piezometers. The parameters measured in situ are generally the static level, the conductivity, the temperature and the pH.

Senegal

Senegal's climate is of the Sahelian type and is characterized by the alternation of a dry season from November to May and a rainy season from June to October. The seasonal variations of the rain which determine the climatic zoning, are very marked with the occurrence of a very wet season which is observed between July and September on the most northern latitudes and April to November further south. The average annual rainfall follows an increasing gradient from north to south of the country. It goes from 300 mm in the semi-desert North to 1200 mm in the South, with variations from one year to another. We can thus distinguish six main climatic zones of Senegal which therefore result on the one hand from the south-north gradient of precipitation, on the other hand from the influence of the sea to the west:

- ? the Grande C?te between Dakar and Saint-Louis which benefits from moderate temperatures and low amplitude (from 16? to 30?C) and relatively constant humidity, but low rainfall (300 to 500 mm/year) because in tail of squall lines;

- ? the Ferlo Sahelian zone, which is the driest and hottest in the country, with maximum temperatures in May-June (41?C) and a very short and reduced rainy season (300 to 500 mm/year);

- ? the region of Tambacounda which offers a typical Sudanese climate with six months of dry season and a maximum temperature in May (39?C) and six months of rainy season with 3 to 4 very rainy months: rainfall is abundant there (650 to 850 mm/year) and lead to a marked cooling of temperatures in August (32?C);

- ? the Petite C?te and the Sine-Saloum which benefit from the sea trade wind: the rainy season does not begin there until June with a few showers from weakened squall lines; this late start explains the delay in June of the thermal maximum (36?C) and the end of the rainy season is also early; on the other hand, the intervention, at the heart of the summer, of the active part of the FIT guarantees this region an annual total of precipitation equivalent to that of the Tambacounda region (600 to 800 mm);

- ? the upstream watersheds of Gambia, Kayanga and Casamance which are only subject to the harmattan for five months while the rainy season therefore extends over 7 months with 5 months of rainfall greater than 100 mm and an annual total of 800 to 1,100 mm; the thermal maximum is in April (40?C) and the temperature drop is very marked in August (31?C);

- ? Lower Casamance which has a slightly shorter rainy season but is the wettest region of the country (900 to 1,300 mm/year) because the rains are regular and abundant in July, August and September; the thermal regime is marked by a maximum in June (38?C) and attenuated amplitudes thanks to the maritime influence.

Recent trend of hydro-climatic variables in the Senegal River Basin from 36 rainfall stations and three hydrometric stations. Its results show that 3 distinct periods:

- ? between 1966 and 1972 noted in all the stations studied and which marks the drought of the 70s,

? between 1984 and 2002 where a dispersion of results between stations is noted, but which nevertheless indicates a partial recovery of precipitation compared to the previous period;

? beyond that, the study assumes a return of the wet period, at least in the Senegal River basin; indeed, for Senegal in particular and for West Africa in general, the 2000s saw an increase in rainfall.

The Senegalo-Mauritanian sedimentary basin covers most of the Senegalese territory except for the south-eastern part where the base is outcropping. It is made up of Meso-Cenozoic tabular terrain with deposits that ? similarly to what happens on the Mauritanian side - thicken from east to west where they can reach 7000 m. The sedimentary terrains are made up of Triassic, Middle to Upper Jurassic, Cretaceous, Tertiary and Quaternary formations, resting on the pre-Mesozoic crystalline substratum. The aquifers present in the sedimentary basin of Senegal can be divided into 3 systems corresponding to the main geological formations.

The shallow aquifer system, where in total, 641 boreholes were identified as tapping one of these superficial aquifers. The Quaternary aquifers are very much in demand in the Dakar and Thiaroye area and in the northern Littoral. The Continental Terminal aquifer is exploited in the Dakar area, on the northern Littoral, and in the Senegal River valley. The Oligo-Miocene is exploited with relatively low flow rates in Lower and Middle Casamance and in the area between Kaffrine and Tambacounda where its hydrodynamic and hydrochemical characteristics are favorable. It is present in the South, East and Northeast of the country with an extension in Gambia and further south in Guinea-Bissau where the system is represented. The waters of the superficial aquifers are very fresh with salinities of less than 1g/l over large areas of the sedimentary basin, and this is the case even in sectors with a high density of exploited boreholes such as in the northern Littoral and Sine-Saloum. However, small salinity domes above 1g/l are noted in the Tivaouane, Bambey-Diourbel and Podor sectors. In addition, in the deltaic areas of Senegal and Sine-Saloum, the salt wedge poses a serious threat to the water table; it is already advanced in the coastal localities of Sine Saloum. This aquifer system represents a significant groundwater potential due to its reserves in the order of 50 to 75 billion m3, and to its seasonal renewal (in particular by infiltration of rains) which is estimated from 1.5 to 2 billion m3/year (55 million m3/d) in a year of average rainfall.

The intermediate aquifer system is made up of Eocene and Paleocene limestone formations. The reserves are interesting in the zones of good permeability, especially in the parts having undergone phenomena of karstification. The Eocene limestone aquifer is especially productive east of the Dakar - Saint-Louis national road. Its thickness is very variable. It is always over 20 m with a maximum of 120 m for the major part of its extension zone. The karstified limestone formations offer good performance with boreholes capable of providing up to 300 m3/h with less than 1 meter of drawdown. This aquifer is hydraulically linked to the shallow aquifer, and it is collected by boreholes which contribute significantly to the water supply of Dakar. The Paleocene limestone aquifer is best known in the western sector of the country where the karstified Paleocene limestone contains large quantities of water. The transmissivities are of the order of 1.0 10-2 m2/s to 1.0 10-3 m2/s depending on the degree of karstification of the limestone formations. The sustained pace of exploitation has led to a continuous drop in piezometric levels and an increase in salinity at places where they are in contact with the ocean. This aquifer, exploited in this western sector, supplies the urban area of ??Dakar. In total, the Eocene is exploited by 348

boreholes and the Paleocene by 263 boreholes. Pockets of salinity greater than 2g/l are observed in the central western sectors of the country. However, the limestone water remains particularly fresh (less than 1 g/l) in the Paleocene and Eocene limestones of the northern Littoral and especially in the zone of high density of exploitation drillings supplying Dakar. The recharge area of the limestones is mainly the horst of Ndiass, along the northern Littoral (via the CT/Quaternary), in the valley of the Senegal River and on the eastern edge of the sedimentary basin.

The deep Maastrichtian aquifer system extending over 4/5 of the Senegalese territory, and made up of sands and sandstones, forms an immense reservoir. It is the most exploited aquifer in Senegal by boreholes (more than 1000) reaching in some places more than 350 m with flow rates varying between 100 and 250 m3/h. The Maastrichtian aquifer is characterized, in its western part, by the presence of deep salt water, even real "brines" which can reach concentrations greater than 100 g/l. The Maastrichtian aquifer in Senegal constitutes an immense reservoir whose reserves are estimated between 300 and 400 billion m? and contributes 40% of all withdrawals from the aquifers of the Senegalese sedimentary basin. The recharge zones of the aquifer are to be found in:

(i) the Horst de Diass area, near the International Airport (AIBD), where the formations outcrop on the surface. The recharge potential, during favorable rainfall periods is around 20 to 22 million m3/year. There is a clear imbalance with respect to the high withdrawals, which greatly exceed the recharge, with risks of irremediable salinization of the aquifer.

(ii) the contact with basement formations and unconsolidated formations in the south-eastern part of Senegal, where recharge would take place by indirect infiltration through the overlying formations. Chemical and isotopic methods confirm the existence of an effective recharge and of circulation from SE to NW. Estimates are between 150,000 to 450,000 m3/d.

(iii) the south of the basin at the outcrop of the Maastrichtian in Guinea-Bissau, the recharge is poorly known.

(iv) its northern limit (around Lac de Guiers) where reliable data on the current recharge of the aquifer are however absent. Recharge would come from direct infiltration of rainwater or indirect infiltration of river water and is estimated at around 103 x 10^6 m?/year. In rural areas, the population depends exclusively, with a few exceptions, on groundwater resources for their supply.

Groundwater uses

Groundwater is the main source of drinking water for urban and rural communities (84%); indeed the urban water supply networks are completely supplied by boreholes, with the exception of the urban area of ??Dakar, which from 1972 began to use surface water, which today accounts for half of the total water supply. Cities, such as Saint Louis located near the Senegal River, also depend on surface water. In addition, 50 of the 66 urban centers under the control of the national water supply company (SONES) are supplied largely or exclusively by groundwater. The agriculture sector uses most of the water, which depends mainly on surface water and rainwater. The use of groundwater for irrigation is low, generally limited to horticulture in the dry season.

However, as part of the policy of food self-sufficiency and poverty reduction, more and more agricultural programs are being implemented by the state, groundwater being their main source.

Industry, mining and tourism most often depend on groundwater, which they generally exploit through their own wells. Similarly, the zircon and phosphate mines, and cement factories use groundwater in the Niayes area, and around Dakar; withdrawals are estimated at 8.5% of consumption. Overall, the main uses are domestic, they represent ?, while supposedly agricultural uses represent less than 15%. For ecosystems dependent on groundwater, little information is available, except for the Niayes. The Niayes are a 10 km wide strip that stretches along the coast from Dakar to the mouth of the Senegal River. The area is characterized by dunes and small lakes and ponds fed by groundwater. The Niayes are very important in the economy of Senegal, they are used for growing vegetables, fruits and market gardening (estimated at 90% of national production). In general, ecosystems dependent on groundwater are rather linked to the superficial aquifer system. However, research is necessary to draw up an inventory of these ecosystems, but also to study the relations of dependence with the aquifers.

Piezometric monitoring networks and monitoring protocols

The DGPRE carries out piezometric monitoring campaigns, with series dating back to the 1960s. Similarly, SONES also has a piezometric network installed in the catchment fields supplying urban centers. The in-situ parameters (NS, EC, pH, T and TDS) are generally recorded. Transboundary Basin Organizations are also engaged in piezometric monitoring:

- ? the OMVS has been collecting hydrogeological data since 2018, upon request of the Permanent Water Commission (CPE); the stated objective is to improve knowledge of groundwater, to carry out a diagnosis in order to set up monitoring in areas where management has an impact on surface water.

- ? The OMVG supports the states for capacity building in terms of equipment and training for water monitoring. As part of the FAE project, 5 piezometers were installed, and for the energy project 5 others in basins with monitoring over 2 years. There is also a protocol for exchanging data with states.

The frequency of piezometric monitoring depends on the pressure on groundwater, in areas where the water table is less stressed (North area, Casamance, groundnut basin, Tamba and Kaffrine) in general it is twice a year. But in the "hotspots" like the horst, the frequency is closer (4 times a year), for the Dakar area for example, monthly monitoring is carried out. However, it is dependent on the availability of funding (funding projects). The monitoring carried out by the DGPRE considers the aquifer and the management problem, it has fairly good coverage; for example, in 2019: 498 structures were monitored (including 290 piezo, 127 boreholes, 16 boreholes-wells and 65 wells). The data is stored in the CHRONO database. SONES, on the other hand, carries out monitoring at least twice a year in the production areas. The quality parameters are monitored at the same time as the static level of the groundwater. The data is only shared internally or with state services. For private boreholes, the installation and operation of meters are often not effective.

In urban areas, the operator (SEN?EAU) collects daily production data to communicate them to SONES, a check is carried out monthly. Similarly, in rural areas under DSP, the delegate communicates production flow rates to OFOR, which often does contradictory monitoring. Only these data are not accessible, except to the authority on request. In addition, the analysis of time series of groundwater monitoring data is interpreted in the context of studies carried out by the DGPRE or State services. Sometimes it is published in bulletins for qualitative information to the general public.

However, problems remain:

- ? Piezometers out of service victims of vandalism, or land occupation
- ? Lack of financial availability, as well as difficult access to certain observation structures, maintenance and replacement of automatic recording facilities
- ? The irregularity of monitoring and the meshing are either weak or do not cover the entire extent of the aquifer
- ? Lack of technical capacity and human resources
- ? Inadequate coverage of the monitored aquifer, which is done by ?campaign? targeting rather geographical areas, and not the extent of the aquifer.

The Gambia

The Gambia is located within the transition zone between the Sahara Desert further north and semi-arid Sahel, and the forested southern regions to West Africa.

Its rainfall is highly seasonal and can range from 800 and 1,200 mm yearly, and a greater percentage of it falls between July and September, during the northward movement of the Inter-Tropical Convergence Zone (ITCZ) across Africa. Up to 37 percent of the rain falls in August, making it the rainiest month in the year. The rainfall pattern is variable in terms of the spatial and temporal scale, with higher rainfall up to 1,200 mm recorded in the southwest section of the country. Yearly rainfall quantities have diminished up to nearly 37 percent between 1950 and 2000, with intense drought events in 1968, 1972, 1983, 2002, 2012 and 2015, and a drop in the length of the wet season and an average monthly reduction rate of 8.8 mm every decade. This impact is highly variable in space and the greatest effect is felt on the western half of the country.

Seasonal average temperatures in the country range from 18?C to 28?C in January to 23?C to 36?C in June. An increasing pattern in the order of 0.3?C per decade has been evidenced by the temperature measurements since 1950. The highest mean temperature of 28.2?C was recorded in the year 2000 whilst the lowest mean temperature of 25.8?C was recorded in 1947.

Climate projections exhibit a significant warning trend, with mean temperature, presently estimated at 28?C, predicted to rise by 4.5?C by 2100. Likewise, the projections show a decrease in average annual rainfall which is anticipated to be less than 500 mm yearly by 2100. In this view, the 480 mm rainfall amount recorded in the 1982 ? 83 drought year, will be the norm by 2100. The distribution of rainfall is expected to be more unpredictable and would lead to more extreme events like droughts and floods. Sea level rise off the coast of the Gambia is projected to increase to 13 cm by 2025, 35 cm by 2050, 72 cm by 2075 and 1.23 m by 2100. With business-as-usual scenario, 1 m rise in sea level would submerge 60 percent of the mangrove forests, 33 and 20 percent of the swamp and rice growing areas, respectively. This would affect different parts of the country especially accelerating the rate of the salinization of coastal groundwater aquifers, which will impact water quality and water supplies in densely populated coastal regions and jeopardize the sustainability of sheltered shorelines ecosystems. Being closer to the southern limit of the Senegal Mauritania sedimentary basin, groundwater in the Gambia is restricted to only two main systems:

Shallow aquifer system

This aquifer is of Moi-Pliocene geological age, and mainly made of unconsolidated, medium to coarse grained sand found at 15 to 120 metres depth below the ground level. It is further partitioned into the Upper Phreatic Aquifer and a Lower Semi-Confined Aquifer, separated by a clay-silt aquitard of 15-30 m thickness. It is primarily recharged through local rainfall infiltration and a small portion of lateral inflow from across the border with Senegal.

Currently, the Gambia abstracts from this aquifer through traditional hand dug wells tapping from the upper phreatic aquifer while boreholes are drilled deeper into the lower semi-confined aquifer. Presently, the superficial aquifer system satisfies the country?s drinking water needs.

An inventory of about 681 water points indicated that hand dug wells reached as low as 6.40 (mbg) in the lowland areas (swampy areas), in the western part of the country, with the deepest recorded at 113.40m. The highest recorded aquifer thickness is 42m in the upper section of the North Bank Region of the country, with an average static water level of 9.5 (mbg), measured from February to April 2022 at the groundwater observation site within the area. The lowest recorded aquifer thickness is 1m, in the Upper River Region, at a depth of 39m. Static water level indicates an average of 9.2 (mbg) from February to April 2022 measured at the same groundwater observation site. In late January 2022, a high static water level of 6.13 (mbg) was measured along the coast of the Gambia, while the lowest level of 38.84 (mbg) was measured in the central North part of the country.

Deep aquifer system

In Gambia, this is known as the ?Deep Sandstone Aquifer (DSA)?, which mainly includes poorly consolidated sand and sandstone buried at 250 to 450 meters depth. This aquifer is largely undeveloped with only three exploratory boreholes in the East, Central and Western part of the Gambia. Recharge appears to be limited to lateral flow over long distances from the southern part of Senegal.

Groundwater uses

The total water abstraction was estimated at 168, 107 m3/day, which is translated into 61.4 Mm3/year. Out of this amount, about 46.6 Mm3/year is abstracted from the Greater Banjul Area which accounts for the three-third of the total abstraction. The main water sources are boreholes, in line with the recent trend of uncoordinated and unregulated borehole drilling especially in the urban areas. About 30 percent of water sources are unimproved (i.e., comprising of hand dug unprotected wells).

The following are the use categories of the abstracted groundwater:

- Domestic ? include household and municipal water use
- Commercial ? water bottling and packaging business
- Industrial ? Including tourism, manufacturing, construction and energy uses etc.
- Agricultural ? large scale abstraction for commercial farming targeting export, Horticultural production, livestock, aquaculture etc.

Piezometric monitoring

The groundwater monitoring program commenced in The Gambia in the early 1990s, with the exploratory boreholes drilled across the country by the National Water Electricity Company Limited (NAWEC). The monitoring was conducted driven by demand. The current monitoring network was established from 2011 to 2015 with funding by the African Development Bank (AfDB) through the African Water Facility (AWF). Data loggers (Orpheus Mini) were purchased and installed in 38 network boreholes across the country. The network consists of twenty newly drilled boreholes, and eighteen carefully selected boreholes from the pre-existing network, most of them found in the Greater Banjul Area. Unfortunately, the performance of these data loggers, due to reading inconsistency, was not satisfactory. The number of monitoring sites was later increased and more stable automatic data loggers installed. Collection of data from the network is done manually on a monthly basis. Focus is on the Shallow Sand Aquifer (SSA) and the three exploratory boreholes in the Deep Sand Aquifer.

Guinea Bissau

Influenced by both the seasonality of the monsoon rains and the dry winds of the Harmattan, the climate of Guinea-Bissau is hot all year round, with an average temperature of 26.3?C. The country has a relatively high level of precipitation, ranging from 1,500 to 2,000 mm per year in the coastal zone, to 1,000 to 1,500 mm in the interior. Almost all precipitation occurs between June and September/October. From December to April, the country experiences droughts.

The climate of Guinea-Bissau is strongly marked by an extreme fluctuation in the amounts of precipitation, the irregularity in the frequency of precipitation, the accentuation of drought and the extension of the period of seasonal drought in certain regions of the country, the increase in the average annual temperature (about 1?C), and sea level rise. The projections made by the Meteorological Service for the temporal horizon 2100 indicate a decrease in rainfall of the order of 11.7%, an increase in

temperature of +2% and of the mean sea level rise by 50 centimeters. The new climate scenarios predict significant changes in Guinea-Bissau. These scenarios systematically indicate an increase in the average daily temperature of up to +1.4?C for the period 2016-2045 and which could potentially reach up to +2.2?C by the horizon 2046-2075, according to the low emission scenario. Under the high emissions scenario, the expected changes are even higher with temperature increases of +1.6?C to +3.1?C for the period 2046 to 2075 respectively. In summary, climate variability will remain a dominant feature of the climate in Guinea-Bissau and, therefore, given these uncertainties, it will be necessary to develop of resilient planning for extreme drought events, particularly in the eastern part of the country, and flooding along the coastal zone.

The piezometric levels of the aquifers will drop and saline intrusions will increase. Groundwater will be more expensive to exploit and the quality of water resources will deteriorate in the coastal lowlands, due to its salinization and that of the hydromorphic soils which will acidify, impacting the production of Guinea's staple food (rice) that has already dropped considerably.

The eastern plateau is also under very strong pressure, with erosion and lend degradation due to deforestation.

The Maestrichtian Aquifer

Groundwater is mainly used for the supply of drinking water to rural and urban populations. In agriculture, they are used to water livestock and market gardening. Some large farms or "pontas" have boreholes and use the water for arboriculture. The Maestrichtian aquifer, the only one of the SMAS present in the country, is shared with Senegal and its level of exploitation is not negligible. Due to its shared nature and to the lack so far of an assessment jointly conducted by the two countries, the volume content of the aquifer is not known, nor its rate of recharge. The Maestrichtian aquifer extends under the continental shelf, but the tectonics and facies variations are not well enough known to invalidate or affirm the existence of direct hydrodynamic relations with the marine environment. Piezometric sketches show a general flow of groundwater in a westerly direction for the Maestrichtian aquifer with very low slopes. The Maestrichtian piezometry seems to indicate a low zone in the Bissau region. The number of measurements taken is not sufficient to specify its form or origin. In general, it is accepted that the horizontal hydraulic conductivity of the Maestrichtian aquifer is relatively constant. The renovation of the aquifer is estimated to be between 5 to 15 Mm3/year. It is the most interesting aquifer from the point of view of transmissivity (and yields per drilling), and is found throughout the province, but at increasing depths towards the west/northwest. Thus, the aquifer is the most productive for high flows. The need for good resource management is even more justified when it is considered that all exploitation is concentrated on the renewable groundwater resources of the Maestrichtian aquifer. The risk of marine contamination exists, although the aquifer is in principle protected by layers with low permeability and by a favorable piezometric situation.

Piezometric monitoring

Currently, there is no operational piezometric network in Guinea - Bissau. As for surface water, the old hydrometric network for quantitative monitoring of surface water is totally obsolete and not operational.

1.2. GLOBAL SIGNIFICANCE

The SMAS is of strategic importance for the social and economic development of the countries, and for the sustainability of the important ecosystems that depend on groundwater. Its surface expression includes large urban centers - such as Dakar, Nouakchott, Banjul - with approximately 23 million people (in 2015) and almost 33 million inhabitants projected by 2030. The aquifer system provides drinking water to the whole population in the area, as well as other economic activities such as agriculture, livestock, industries, etc. Countries sharing the aquifer are more than 80% dependent on groundwater resources to meet the domestic needs of their population. In rural areas, groundwater is often the only source available to meet water supply needs. Similarly, for urban centers such as the agglomeration of Dakar, Banjul, Bissau and Nouadhibou there is a strong dependence on the waters of the aquifer basin.

Table 1. Dependence on groundwater for drinking water supply

Sector	Guinea Bissau	Gambia	Senegal	Mauritania
Country	>80%	100%	84%	>80%
Urban (%)	Mainly groundwater, although deep boreholes are limited to major cities		50 of the 66 urban centers managed by SONES are fed by groundwater	Mainly groundwater (except for Nouakchott and Rosso, located on the Senegal River)
Rural	100%	100%	100%	100%
Capital	100%	100%	50%	33%

(Source: National reports on: the analysis of the context and situation and the development of the intervention strategy, 2022)

Due to demographic pressure, as well as economic transformation, in particular the rise in the standard of living of the populations and the development of irrigated agriculture, water needs in the region are expected to increase.

At the same time, the impacts of climate change are likely to reduce and make even more unequal the availability of water, especially surface water. Rising temperatures will increase evapotranspiration and negatively affect river flows. In addition, most scenarios for the region predict an increase in drought and a reduction in rainfall, as well as a reduction in the length of the rainy seasons. Given the increase in water needs and the decrease in the availability of surface water resources, it is likely that groundwater will be more exploited and will be an important element in building climate resilience.

Furthermore, due to its decentralized nature, SMAS waters can play an important role in addressing some of the development challenges in the region and contributing to its stability. Indeed, greater water security helps to reduce some of the drivers of immigration related to lack of economic opportunities and loss of livelihoods. Groundwater can be a catalyst for economic opportunities: agricultural intensification through irrigation can help create jobs and improve incomes up and down the value chain. In arid and semi-arid regions, groundwater plays a particularly important role for off-season crops.

While the exploitation of SMAS waters therefore represents a major political, economic and social asset, there are significant risks of overexploitation and pollution of this strategic resource which could

compromise water security in the region. Over-abstraction in some parts of East Senegal has resulted in change in the groundwater flow regime and has led to salinization of parts of the aquifer. Abstraction along parts of the coast is also resulting in salinization due to sea water intrusion.

1.3. THREATS, ROOT CAUSES AND BARRIER ANALYSIS

General lowering of water table due to excessive groundwater extraction

Water exploitation remains poorly controlled, and the resulting withdrawals are increasingly important due to population growth and the development of the agropastoral and industrial sectors in the basin. Over-abstraction has led to strong drawdowns and the further lowering of the water table in some parts of the aquifer. One example is the typical case of the Diass horst, located at 50 km east of Dakar and home to one of the largest well-fields in the aquifer area, that has been subject to intensive pumping for more than 50 years to supply drinking water to the localities of Dakar, S?bikotane, Pout, Mbour as well as to their industrial and agricultural needs. This intensive exploitation has led to a continuous drop in the water table of more than 30 m in two decades (from 1989 to 2009). This situation is one of the critical concerns happening in the basin.

Some major urban centers - such as Dakar are feeded from groundwater (Dakar gets over 50 % of its water from groundwater). This will be part of water pollution/water degradation as one of the major transboundary risks and is part of the TDA/SAP process in order to maintain the cities water resource (quantity and quality).

Degradation of water quality

One of the most common problems includes groundwater quality degradation. This problem resulted from a combination of several factors, mainly water salinization and pollution from agricultural and industrial sources. In some places, there is also contamination originating from natural sources such as high fluoride concentrations in the groundwater. Several areas with high contamination risks and where groundwater is potentially affected or likely to be affected have been identified across the whole aquifer system.

- *Water salinization*

Water in the coastal parts of the aquifer is to a large extent subject to high salinity concentrations. This high salinity is generally attributed to two main factors: *(i)* mixing with deep saline waters dating from very ancient periods (connate waters) and *(ii)* salt intrusion resulting from the overexploitation of aquifers. The second phenomenon is the most important one, especially around the pumping fields where drinking water is abstracted to supply the abovementioned large cities.

As mentioned above, in the Diass horst region, the intensive pumping that has caused the continuous drop in the water table level has resulted in changes in the flow regime and salinization by marine intrusion in the Sebikotane and Mbour parts of the aquifer.

Another significant root cause of groundwater salinization is linked to rising sea level causing submersion and erosion of the floodable areas resulting in rise in salinity in estuaries and in shallow coastal water tables.

- *Anthropogenic Pollution*

Some anthropogenic pollution of the aquifer has been reported in all the four countries. These are mainly pollution related to (*i*) widespread use of agricultural chemical products, (*ii*) industrial and mining discharges without compliance with environmental standards, (*iii*) and poor hygiene and basic sanitation conditions. These contaminations affect in particular the upper layers of the aquifer. The most significant cases of pollution are recorded in the Gambian part of the aquifer. However, there is lack of recent data to accurately assess the extent of these pollution pressures.

o *Natural hazards effects on groundwater quality in some areas*

High fluoride contents (up to 12 mg/l) are recorded in the aquifer, particularly in the Paleocene layers (compared to 1.5 mg/l for the WHO guide value for drinking water). The localization of high levels of fluoride is associated with the presence of natural deposits of phosphate mineral, that is the main source of fluoride in the water table. High fluoride levels are localized around Diourbel, Kaolack and horst de Diass. The health consequences associated with the consumption of water with high concentrations are dental and bone fluorosis.

Soils salinization which results in a significant loss of ecosystem services and arable lands

Soil salinization represents a major risk for the development of agriculture and especially irrigation in some areas with dramatic impacts on food security, household income and poverty levels. In Senegal, for example, more than 5% of the national territory is affected by soil salinity and more than 25% of irrigated land is experiencing this problem. The most affected areas are those neighboring the Senegal River Delta, in particular Saint Louis with an extension to Richard Toll and Podor, etc. The high salinity of the soils is controlled both by cropping and actual morpho dynamics and is manifested on the surface by a white layer of saline efflorescence. In the Senegal River Delta (an area with high agricultural potential with nearly 60,000 ha of agricultural land), the occurrence of a saline water table close to the soil surface (fluctuating between 1 and 3 m) during the year emphasizes this risk of significant capillary upwelling of salts to the surface outside irrigation periods during dry seasons. In case of flood irrigation, the implementation of a surface drainage is then recommended to avoid the rise of the water table and ensure the evacuation of salts from the water table.

Climate change

Forecasted changes in climate (i.e. temperature increase and variability in rainfall) will further impact water availability in the region. The recent information from climate change predictions on water resources are:

- About 50% decrease in the rainfall at St-Louis (period 1893 -2005);
- About 50% decrease of the annual river flow from 30 000 to 15 000 million m^3 over the century;
- Climate variability would have impacts on groundwater recharge, on water logging and salinization of soils, on water dependent ecosystems and on water supply for rural population;
- Depending on geomorphological settings, climate change will differently affect recharge regimes;
- Sea level rise is a major threat to the social-ecological system of the coastal area, as salinity can creep up the rivers and cause a decline in the productivity of the soil.

The late arrival of rainfall, the uneven distribution in space and the premature end of the rainy season, considerably influence the water resources available. They will significantly affect the basin due to its geographic coastal location. The low population incomes, lack of technology and low institutional capacity increases food insecurity in the sub-region of the basin. In conclusion, climate change impact will most probably intensify the effects of all of the problems listed above.

Root causes

The root causes of the various problems outlined above are as follows:

? Increasing demography with high demand for water is leading to higher water withdrawals and pressure on the aquifer and its dependent ecosystems.

The situation regarding water abstraction is not well known in the basin. The most recent estimates available date to 2012. The overall pumping rate was estimated at 200 million m^3/year in 2000 (30 million m^3/year in Mauritania, 115 million in Senegal and 55 million in Gambia and Guinea Bissau). The COWI study (2002) estimates withdrawals in Senegal at around 182 million m^3/year. Mohamed, A. S. (2012) estimates withdrawals in Idini (Mauritania) at around 28 million m^3 in 2010. Pumping at the basin level could be around 300 million m^3/year in 2010. This situation makes the planning and sustainable management of water resources very difficult and is also being affected by the following additional factors:

- ? Weakness of policies and strategies for sustainable planning and management of water resources together with limited data and information on the groundwater in the countries continues to be a major constraint for the establishment of reliable policies and strategies;
- ? The lack of systematic collaboration among the riparian countries that until recently has prevented the establishment of a framework for cooperation and concerted management of the aquifer system. The two key basin organizations (OMVS and OMVG) have a mandate for surface water management but as of yet not for groundwater consideration. There is a need for a conjunctive water management approach to be implemented; so far, a detailed evaluation of its exploitable potential has not been carried out.
- ? Poor management of irrigation in the Senegal River Valley region has contributed to an intensification of soil salinization problems.

Barriers

Based on the root causes of the main problems outlined above, the barriers that need to be addressed are the following:

? Barrier 1: Limited knowledge: Insufficient knowledge of the transboundary aquifer systems and the increasing demand for water, adverse effects of variability/climate change, degradation of water quality due to pollution from various sources and uses (agriculture mainly in some areas). The hydrological linkages between groundwater and surface water (from Senegal and Gambia rivers mainly) are also insufficiently appraised. The abstraction in the basin are not well known.

? Barrier 2: Lack of institutional, technical and financial capacity at regional scale for joint planning and management at the transboundary aquifer level. For example, there are currently no planning tools such as a transboundary diagnostic analysis (TDA) available, or a strategic action plan (SAP) for the

aquifer to identify transboundary socio-economic and environmental problems and sustainable solutions to these problems. In addition, there are no joint governance tools or harmonized aquifer management instruments.

? Barrier 3: Lack of a long-term strategy and policy planning efforts at the aquifer system scale, supported by reliable data, scientific information and knowledge as well as strong political commitment. These limitations represent significant barriers for basin organizations and managers in implementing appropriate water management planning tools and choosing appropriate adaptation options.

? Barrier 4: Limited engagement of various stakeholders and resource users in the planning and implementation of the IWRM in the basin to address global and local challenges in the basin

Gender Mainstreaming and Vulnerability Assessment

The differentiated impacts of climate change affect not only regions, different generations, and age groups but the sexes too. As numerous studies have shown, climate change has specific effects on women and men due to their different societal roles and differentiated access to social and economic resources. One of the main reasons for this is the particular roles and responsibilities women have in households, and communities as well as differentiated access and control of resources. Traditions and customs often limit women?s economic opportunities by relegating them to their reproductive and communal roles at the expense of their productive roles. If we take the case of Africa, the disparities resulting from social-gender relations have a major impact not only on vulnerability but on adaptation, mitigation, and resilience strategies as well.

As recalled during the COP21 in Paris, women are more exposed to the risks linked to climate change by virtue of their socio-economic and cultural status. An obvious example: droughts and floods create an overload of work for women, or young girls who are often absent from school to fetch water. It has also been reported that having to walk long distances to carry water makes women and girls vulnerable to sexual harassment and violence; especially children who are at particular risk of facing violence when they are forced to wait to fetch water from pumps or water tanks. [1]

Women and girls can suffer terribly in extreme weather situations and during natural disasters, when societies dictate certain behaviors and prohibit others, such as being out in public alone. According to Gotelind Alber of the Gender Equality Network Women for Climate Justice, women in Bangladesh are also more likely to die due to flooding, because they rarely seek refuge in emergency shelters. As she reports, "these shelters are very cramped, and for a Bangladeshi woman it's not appropriate to stand there face-to-face with men or to use the same toilet,". "That's why most women prefer to barricade themselves in their huts, where they're often simply washed away by the floods. [2]"

Key barriers common to all SMAS countries

The country-level assessments allowed the identification of key barriers that are common to the four-targeted countries. Unless taken into account in the project design and implementation, these barriers will hinder women?s effective participation in the project. While waiting for more specific barriers to be captured when more in-depth stakeholders ?consultations will be carried out (via surveys and interviews with women themselves), the online data collection has identified these principles barriers:

Barrier 1: A Low Female Literacy Rate

In Africa, especially in the rural areas, women tend to have lower literacy levels than men, and this

gap limits their participation in training and capacity-building activities. Consequently, the gender action plan incorporates this aspect by tailoring the knowledge acquisition methods to this identified gap. To overcome the illiteracy barrier, training materials, as well as the dissemination of knowledge will be designed in order to take into account the specific needs of women in regard to knowledge acquisition. Information and awareness-raising activities will be carried out in the local languages, and additional gender-targeted activities will include the development of specific modules that will specifically target women.

Barrier 2: Gendered division of labor

Women often miss opportunities because their activities at the reproductive and community levels are privileged to the detriment of activities in the productive domain. This is particularly true for women living in rural settings. Gender norms dictate women to assume the burden of unpaid household chores such as cooking, caring for children, sick or elderly people, and collecting water or fuel for cooking. The triple role that women play always generates an overload of work for them, especially the young girls. Women?s domestic chores either prevent them from investing in more profitable activities or lead them to have a double workday. To factor in this unequal distribution of daily workload, the project activities should be designed to not overburden women. Training and other activities will also need to take care of women?s needs such as daycare and allocation of specific schedules that will allow women to carry out their other activities.

Barrier 3: Lack of physical freedom

In rural contexts, women do not enjoy the same freedom as men. Certain cultural norms and regulations limit women?s mobility, and as such, they cannot go out when they want or go to certain places. This is why mitigation measures will have to be taken regarding the times and places of training and capacity-building activities that should be adapted so that women are not excluded. , To better identify the times and places conducive to their full participation, women will be involved and consulted during the development of training programs.

Barrier 4: the cultural norms in force in the project area

Cultural norms often constitute obstacles that can hinder the full participation of women in project activities. These obstacles may come from men who do not want their wives to leave the family sphere to seek additional income. These obstacles can also come from the women themselves, who may not be very motivated, or who may not want to go against social norms, even if they have the support of their spouses. The project will take these cultural norms into account by choosing adequate mitigation measures that will consider the social and cultural context. The training and capacity-building program that the project will implement will increase women?s self-confidence in overcoming this barrier. The program will also enhance women?s leadership skills and foster increased and more active participation in the activities put in place.

Barrier 5: unequal resource allocation

Women are active members of their households and communities. It has been documented that when paid and unpaid working hours are combined, women work much longer hours than men, yet their contribution remains unseen and unpaid. Rural women represent an important share of the agricultural workforce even though their contribution is largely unrecognized and undervalued. Women are further discriminated against in the labor market, being relegated to the end of the value chain. They are overrepresented in the informal economy and relegated to low-skilled, low-productivity jobs. Combined with their difficulty to have access to resources, especially water or land, women find themselves in precarious situations. The project will foster women?s access to the inputs and services put in place, and design gender-specific modules of training such as financial literacy, for example, to help women get access to market resources.

Risks:

Men's resistance to accepting women's access to decision-making bodies:

As the literature review has revealed, in most countries, women are absent from the decision-making processes, and their differentiated needs are not taken into consideration, as well as women?s control over natural resources. Even if it is women and young girls who are responsible for collecting water on a daily basis, they are often overlooked in decisions related to the supply, management, and governance of water. Numerous studies have shown that women's opinions have not been collected or taken into account in decisions on water supply and sanitation technologies, and they are not consulted when establishing the locations of water supply and sanitation facilities' water points. These studies show that these decisions are mostly made by men. The main barrier is women?s societal and cultural roles that trapped them in stereotypical portrayals. The project will undertake sensitization and awareness-raising campaigns for men to understand the benefits of including women in decision-making bodies.

Strengthen one sex at the expense of the other

One of the major risks in a gender-mainstreaming project is the fact of not involving men in the activities. Right from the participatory stakeholder consultations, the project seeks to involve men as well as women, to convey the message that gender is not oriented toward women, but toward society as a whole. The aim is to take into account disadvantaged people, men and women, and meet their specific needs and strategic interests. The project follows the logic that strengthening the economic power of women and neglecting men would be counterproductive because the goal is to establish an equitable sharing of the resources provided by the project. The project has also understood that contributing to the economic emancipation of women and causing social imbalance is not the goal; consequently, it will ensure that men will understand that equal opportunities for men and women are an added value for the household and an important process that should not be skipped.

Unequal voice in decision making

Regardless of the important roles they play both in the households and at the productive and the communal levels, women are nonetheless excluded from decisions that affect their daily lives and well-being. Socially defined gender roles limit their input in issues as important as water usage, access, or management. Women are responsible for supplying the households with water but have limited or no

decision-making power relating to water usage outside the house. Since it has been documented that men tend to embrace traditionally relegated female roles when they appear profitable (for example cooking in ceremonies), there is a risk that women will lose their traditional roles regarding water usage once the pilots will be implemented. However, through gender-sensitive communication carried out with the project's various stakeholders, the gender action plan will mitigate these various risks and mainstream opportunities such as increasing women?s leadership and participation in decision-making by enhancing their skills and providing opportunities through training and capacity building; and also increasing women?s economic empowerment by enhancing their skills and giving them opportunities to increase their earning through their involvement in the pilot projects.

1.4. BASELINE SCENARIO AND ANY ASSOCIATED BASELINE PROJECTS

The countries sharing the aquifer face major development challenges that have a regional transboundary dimension: poverty, food insecurity, human and animal infectious diseases, the degradation of natural resources and the deterioration of the environment. Water is a key entry point for solving these common development problems, and several regional entities (see box below) are active in water related aspects and are part of the baseline upon which the project will build.

OMVG

The Organization for the Development of the Gambia River (OMVG) was created in 1978 and brings together Gambia, Guinea, Guinea-Bissau and Senegal.

The main mission of the OMVG is the rational and harmonious exploitation of the common resources of the basins of the Gambia, Kayanga-G?ba and Koliba-Corubal rivers, which is critical for (i) achieving food self-sufficiency for the populations of the basins; (ii) reducing the vulnerability of the economies of OMVG Member States to climatic hazards;(iii) accelerating the economic and social development of Member States; (iv) preserving the balance of ecosystems in the sub-region and more particularly in the basins of the three rivers.

The OMVG has implemented several projects to strengthen the sustainable management of shared water resources, including the development of the Master Plan for the Development of the Gambia River Watershed, the Project for the Development and Management of Natural Resources, and the Integrated Water Resources Management Project in the Kayanga-G?ba River watershed, as well as hydroelectric development projects. Currently, the OMVG is developing an integrated development master plan for the Gambia, Kayanga-Geba and Koliba-Corubal rivers which also concerns groundwater.

OMVS

The Organization for the Development of the Senegal River (OMVS) was created in 1972 and brings together Guinea, Mali, Mauritania and Senegal. Its mission is to secure the economies of countries and

reduce the vulnerability of populations through the coordinated development of water and energy resources. The OMVS has a water charter, an international legal instrument, common to the four riparian States, which was adopted in 2002 and carries a political ambition for planning and social and economic development. The Charter refers to groundwater but the provisions concerning them are limited to the development of knowledge (inventory of recharge areas, delimitation of supply and catchment areas, interaction of surface water and groundwater).

OMVS has implemented several projects and programs. In particular a River Water Development and Management Master Plan (SDAGE) was adopted in 2011. The Program for Integrated Water Resources Management and Development of Multiple Uses of the Senegal River Basin, implemented since 2007 is in its third phase and aims to strengthen regional integration, increase productive uses of water, enable macro-economic growth while safeguarding the health and livelihoods of vulnerable communities in the river basin.

AMCOW and APAGroP

The Council of African Ministers in charge of Water (AMCOW) during its 6th session held in Brazzaville (Congo) from 30 to 31 May 2007, indicated in its resolution the need to promote "the institutionalization of groundwater management by basin organizations?. Furthermore, the final communiqu? of the 7th African Water Week (Libreville, October 29 ? November 2, 2018) ?urges AMCOW to set up a knowledge sharing and policy coordination body on groundwater in Africa?. In this wake, AMCOW launched in 2019 the AMCOW Pan African Groundwater Program (APAGroP) to provide a platform for the African water community to discuss issues around development and groundwater management and to improve the groundwater profile on the continent. During the 20th Congress of the African Water Association (AWA) in Kampala, Uganda (20-27 February 2020), a series of groundwater-related events were organized by AWA and the Government of Uganda, including the first meeting of AMCOW's Pan African Groundwater Program (APAGroP) Task Force, as well as a high-level policy dialogue involving key partners and members of the Technical Advisory Committee (TAC) from AMCOW. The main objectives of these meetings were to operationalize APAGroP, gain high-level political support and consolidate the partnerships needed to ensure the long-term benefits and impact of the programme.

ECOWAS and Water Observatory

Water is an important area of ??cooperation within the framework of the Economic Community of West African States (ECOWAS). ECOWAS adopted a Water Resources Policy for West Africa (WARP) in 2008 and the WARP Implementation Action Plan in 2015. In addition, a draft directive on the management of shared water resources of West Africa is in the process of being adopted. Through its Water Resources Management Center (WRMC), ECOWAS supports Member States in establishing a harmonized water and sanitation monitoring and reporting system in West Africa (monitoring and evaluation system) based on a common framework of indicators and methodologies. The ECOWAS Water Observatory aims to address the structural weaknesses of the national data and information management system and the lack of regular credible reports on the state of water resources and

sanitation. Once finalized, the system will help Member States carry out regular self-assessments with the information gathered in annual reports.

Permanent Interstate Committee for Drought Control in the Sahel (CILSS)

The Permanent Interstate Committee for Drought Control in the Sahel (CILSS) was created in 1973 following the major droughts that hit the Sahel in the 1970s. It brings together 13 member states, including the four BASM countries and aims to ensure food security, to fight against the effects of drought and desertification, for an ecological balance in the Sahel. In this context, strengthening water control is one of the four operational objectives of CILSS and groundwater plays an important role in the expansion of irrigation.

The "Dakar Declaration on Irrigation", adopted by the six Sahelian countries (including Mauritania and Senegal) in October 2013, under the leadership of CILSS and the World Bank, calls for a renewed effort to intensify the development of irrigation and improve the performance of the irrigation sector without overexploiting water resources, especially groundwater.

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Country-Level Gender Assessment

Efforts to achieve gender equality have been undertaken in all the four countries sharing the Senegal-Mauritania Aquifer system. There are however differences among the countries in the scope and effectiveness of these efforts, and much remains to be done in all of them in the recognition of women?s role, and their empowerment in water resources supply and management, in particular in rural areas.

? **Senegal**

The Government of Senegal has made significant progress in the promotion of a gender-sensitive environment.

Achieving gender equality and equity in Senegal may seem daunting in a complex socio-cultural environment marked by a strong preponderance of traditional values. However, despite women?s lower social status compared to men, joint efforts paved the way for significant progress that led to a greater recognition of women?s place and contribution to socio-economic growth. Women living in rural areas are highly active in the processing and marketing of agricultural, livestock and fishery products. Nonetheless, they are confronted with several hurdles of various nature, including a number of constraints that are yet to be overcome include:

? Access to land and land tenure security;

? Access to financing mechanisms;

? Access to factors of production and extension services;

? Effects of climate change;

? Access to markets

Gendered Access to land and water in Senegal:

Aggregate data from an FAO report shows that women comprise about 43 percent of the agricultural labour force globally and in developing countries[1]. Nonetheless, the agricultural sector remains underforming in many countries, partly, because women who represent a crucial lever in agriculture and the rural economy, face constraints that reduce their productivity[2][2]. As comes from a notable joint project of the World Bank, the Food and Agriculture Organization (FAO) of the United Nations, and the International Fund for Agricultural Development (IFAD), despite women being the main farmers or producers, gender inequalities severely limit women?s agricultural productivity and efficiency, undermining thus any development agendas. This is the case for women farmers in Senegal. Even though they are actively involved in agriculture sector, most agricultural growth in Senegal is due to men?s output, because of the fact that women are over-concentrated in subsistence farming. This fact is not proper to Senegal only, but constitutes a trend shared by the subregion as revealed the 2011 FAO Report on Women and Agriculture.

In Senegal like in most Sub-Saharian countries, inheritance laws favor men over women. As daughters, they are discriminated against by the inheritance practices which privileges boys over girls, and as wives, their property is controlled by their spouses. Since men are legally the head of the household, they have greater access to agricultural inputs and, more generally, to land and other resources

Unequal Access to financial resources opportunities

In regard to access to water and water governance bodies, women in Senegal are encountering the same inequalities and discrimination they face in the agricultural sector. Like in most societies, Senegalese women are primarily responsible for household water supply and management. In the agricultural field, they have the same needs as men, yet significant gender gaps can be found in Senegalese women?s access to water services. Available evidence indicates that ?the distribution of water services is heavily skewed toward men[3][3]?. As revealed by this report, significant gender inequality can be found in people?s access to other essential productive assets and services such as ?land, labour, financial services, water, rural infrastructure, technology and other inputs[4][4]?.

Since women?s representation in the water sector remains limited, the report thus recommended mainstreaming gender perspectives in all goals of the post-2015 development agenda (United Nations, 2015). Consequently, the United Nations General Assembly with a framework of 17 Sustainable Development Goals (SDGs) adopted the 2030 Agenda for Sustainable Development in 2015. (SDG 5) is dedicated explicitly to women, with the aim to achieve ?gender equality and empower all women and girls?. At the same time (SDG 6) focuses on water and sanitation with the goal to pay ?special attention

to the needs of women and girls[5][5]?. In spite of these laws, gender discrimination persists in the water sectors because of the influence of customary and traditional laws in Senegal.

? **Mauritania**

Through national policies, Mauritania has sought to empower women in all arenas and positions of leadership, including in legislative, judicial and executive institutions, as well as political parties, civil society organizations, military and security agencies, and businesses. Women have become influential actors who cannot be bypassed in national life. Mauritania remains committed to gender equality as an absolute necessity that it will continue to work to achieve. Mauritania is however, a society strongly rooted in tradition.

Although the law has allowed the presence of more than 20% of women in decision-making bodies (municipal and regional councils and the National Assembly), it has not allowed these elected women to take up responsibilities within these bodies. At the social level, transformations are taking place that have had an impact on the lives of women in general and rural women in particular. These transformations have affected social structures and created a new context in which women are required to assume responsibilities and take charge of their families. As a result, women head almost one third of households.

Faced with this situation, specific actions are needed to prepare women for the new challenges they must face both politically and economically. This should be done in particular by strengthening their capacities to take on the public role and by improving equitable and secure access for women to productive resources.

Women and Land Governance in Mauritania

As a desert or semi-desert country, in which only 0.5% of the country?s land is considered useful for agriculture, roughly 502,000 ha[6][6], Mauritania is a country characterized by land tenure insecurity. Because of the scarcity of land, and the inherent land-related disputes, landlessness remains a major challenge for small farmers and women. Despite the development of an arsenal of gender policies and action plans taken by the government to counter the weight of the sociocultural customs and traditions hindering gender empowerment, women in Mauritania still face glaring disparities compared to men.

What is noted is that Mauritanian women are caught between the adoption of progressive laws and the persistence of sociocultural factors that hinder the effectiveness of this legislation. Accordingly, a daughter may inherit only half of the property entitled to her male sibling, and in the case of family with only daughters, part of the inheritance of the deceased father goes first to his brothers and other members of the family and the remainder to his daughters and his wife[7][7]. So while women can have access to land ownership through inheritance, it was noted that the patriarchal system in place often hijacks this

right by ?compensating women with movable property instead of land to preserve the lineage character of land inheritance?[8][8].

Even though the Mauritanian Constitution of July 20, 1991 grants women full citizenship rights and equality status, reinforced by the 2001 Staff Regulations Code, women are still denied most rights such as access to land or credit.

Thus, what can be said about women's rights to land acquisition and ownership in Mauritania is that the adoption of the progressive laws between 1983 and 2014 did not yield the desired effect as women are still deprived of their rights. It is true that the number of women in elected positions has increased, but their access to land tenure and ownership is still problematic despite the land reform laws that recognize them as being equal to men.

This lack of access to land constitutes an underlying cause of women?s limited access to water as revealed by the UN Gender, Water and Sanitation study. Indeed, in most countries, land ownership is a precondition for water access, and since ?women hold title to less than 2 percent of the world?s private land[9][9],? this gap prevents them from exercising their water rights.

Unequal Access to financial resources opportunities

The Sigi Country report on Mauritania shows that women in Mauritania, have equal rights as men to open a bank account, access a line of credit, or register a business, regardless of their marital status. Yet, recent statistics show that only 15.5 percent of women 15 and older own an account at a financial institution or mobile-money-service provider; the percentage being slightly higher for men, at 26.3 percent[10][10]. The government developed a National Plan of Action for Rural Women 2009 - 2012, with specific actions for the promotion of savings in rural communities, and the strengthening and the developpement of microfinance structures and the establish of financial tools and financial management training programs destinated for the empowerment of rural women[11][11]. Despite this legislation, women in Mauritania still face ostacles in accessing formal financial services. The multiple challenges include the primacy roles of men as ?the head of the household and decision-makers in the family, and women?s limited access to land and livestock or other assets that they could use as collateral and their low levels of literacy and education?[12][12].

? **Gambia**

While significant steps have been taken for the empowerment of women through several legislative acts, as well as vigorous efforts to ensure gender parity in primary education, the welfare of the Gambian women continues to lag significantly behind that of men. Government is therefore determined to promote gender equity, equality and empowerment of women and girls for sustained socio-economic development.

Recent progress can be observed with respect to: the Formation of the Ministry of Women, Family and National Solidarity, which accelerated the approval of the National Gender Policy (PNIEG) and the formulation and implementation of the Plan of Action; increased awareness of women?s role; provision of support by UNWOMEN and UNIOGBIS to strengthen the Women Political Platform (PPN) for the full participation of women in elections, decision making and peace building; consultative and supportive missions by high UN Officials to foster a conducive and enabling environment for elections; and the adoption of the Law to end Female Genital Mutilation (June 2011) and Law to end domestic violence (July 2013).

Feminization of Poverty and Women?s Land Rights in The Gambia

Even though women make up almost 50 percent of the agricultural labour force in sub-Saharan Africa, an increase from about 45 percent in 1980, their contribution remains limited because of the multiple constraints they face. It has been noted that women play a key role in smallholder agriculture by constituting over 50% of full-time farmers; and that they do nearly 70 percent of all the agricultural work and food production, yet their productivity remains constrained by several factors. Among those factors, we can note the lack of access, control, and ownership of productive resources such as land, credit, and improved technology and extension services. Thus, even though the agricultural sector can be as an important engine of growth and poverty reduction, it remains nonetheless underperforming in many countries such as the Gambia. The reason being that women who represent crucial agents in the rural economy face constraints that reduce their agricultural productivity.

In the opinion of both the Gambia Sustainable Land Management Investment Framework 2016-2020 (GAMSIF) and the National Rice Development Strategy (NRDS) women in the Gambia, face the phenomenon of the ?feminization? of poverty. It has been noted higher levels of poverty among female-headed households that have been estimated to represent 63 percent compared to 48 percent of male-headed households. This is due, firstly, to the gendered division of labor in the agricultural sector.

Studies show that in the Gambia, most societies practice the traditional ?Land Tenure System, and as a result, Gambian women do not enjoy full control over the use and ownership of land[13][13]?.

Moreover, even those women who happen to have access to land have no awareness of financing opportunities or agricultural insurance schemes. This lack of financial education impacts women?s ability to strengthen their resilience to climate shocks, while men who are more aware of the financial options available are able to benefit from them.

Other progressive laws in favor of women have been taken in the Gambia such as the Gambia Agriculture and Natural Resources Policy 2017- 2026.

Yet, in spite of this comprehensive legislation, women continue to be discriminated against in the Gambia as revealed in the report Securing Women?s Resource Rights Through Gender Transformative Approaches. The reports reveal the barriers to women?s recognition of women?s land rights in the Gambia. The most recurrent barriers and constraining factors are mostly, the lack of capacities of

government agents to eradicate the incongruencies in existing provisions that define roles and the institutional structure within male-dominated institutional services in the land sector. Since the regulations and laws based on registration processes for regional lands are often unclear, women are unable to formalize their land rights. This is compounded by the scarcity of information on land allocation and sale that women are often unaware of.

Another factor is the lack of regulations that recognize pastoralist women and other seasonal land users, who find themselves often excluded from land formalization processes

Globally, when compared to their male counterparts, women in the Gambia continue to operate smaller farms, own fewer livestock, and are responsible for the overall burden of unpaid care work, including fetching water and fuel wood[14][14]. The report shows that Gambian women also have less access to education, and lack agricultural information and extension services as well. It is the same in regard to access to technology and financial services, and access to market, storage, and processing technology. Women?s access to those services is very limited, which hampers their value chain development[15][15].

? **Guinea Bissau**

The disparities analysed in the UNDP?s Gender Analysis (2020) revealed the interdependence of inequalities and the intersectional nature of gender and other parameters of marginalization. As main barriers to women?s equality and socio-economic and political empowerment, the UNDP study identified:

? lack of institutional capacity for gender mainstreaming;

? discriminating policies and laws (property, inheritance etc.);

? stark underrepresentation of women in decision-making positions, from the family up to the public administration and the government level;

? etc.

Gendered access to Land and Assests in Guinea Bissau

Even though Guinea Bissau is blessed with favorable agricultural conditions such as good weather that allows farmers to do year-round crops, as well as fertile lands, the majority of farmers, among whom are predominantly female farmers, are characterized by acute poverty.

Guinea Bissau?s main agricultural product is cashew, a valuable nut that represents the primary source of labor and income and the greatest share of Bissau-Guinean GDP. As it comes from the World Bank Report ?Guinea-Bissau and the Cashew Economy?, cashew represents 26% of income for female-headed households and 35% for male-headed households. Rice production is also dominated by men in Guinea

Bissau: women cultivate rainfed lowland and mangrove rice, while men are dominant irrigated rice farmers as revealed by the FAO report on Guinea Bissau.

A 2021 report on Guinea Bissau shows that only few women in Guinea Bissau own the land they work, despite the fact that they dominate the agricultural sector, ?representing up to 75% of the agricultural workforce in the capital[16][16]?. Very few women have secure access to land at all, and most of them resort to ?borrowing? or renting the land, undermining thus their autonomy and ability to sustain their families.

The report pinpoints the crucial link of the relationship between women?s land rights, food security, and poverty and advocates for the protection of women?s production resources in order to ensure that Guinea Bissau?s food needs are met and, ultimately, to reduce poverty. The same report shows that this discrimination in the agricultural field explains why Guinean women have not been able to engage in profitable and efficient business enterprises. Indeed, there is a direct link between women?s lack of assets constitutes and the development of business enterprises. Most financial institutions require land titles or other assets in order to benefit from loans or grants, and without lands in their own names, women are unable have access to innovative processes such as agricultural insurance schemes or loan options.

Like in many other sub-Saharan countries, women are absent from the decision-making processes, and their differentiated needs are not taken into consideration, as well as women?s control over natural resources. The main barrier was women?s social and cultural roles that trapped them in stereotypes and inaccurate portrayals.

Women and Water Rights

Even if it is women and young girls who are responsible for water on a daily basis, they are often overlooked in decisions related to the supply, management, and governance of water. Although women?s positions as central to the provision, management, and safeguarding of water resources, both in the household and in small-scale farming are widely recognized, the practical and effective implementation of the methods and strategies framed by the policy and legal framework remain questionable, especially in Guinea Bissau.

The right to safe and clean water for all, especially for women has been voted on 28 July 2010 by the United Nations General Assembly that recognized ?the right to safe and clean drinking water and sanitation as a human right[17]17?. Furthermore, they urged States to consider these two rights as international human rights and to strive to achieve ?universal access to water and sanitation for all, without any discrimination, while prioritizing those most in need[18][18]". In so doing, the United Nation called upon governments to have a clear commitment to both incorporate water and sanitation programmes explicitly into their national development strategies, and to ensure that a gender-based approach is adopted in relation to water and sanitation programs. Nevertheless, despite these strong resolutions, women?s rights to water in Guinea Bissau remain severely limited

[1] ESA Working Paper No. 11-02 March 2011 Agricultural Development Economics Division The Food and Agriculture Organization of the United Nations www.fao.org/economic/esa

[2] Sourcebook Gender in Agriculture, FAO

[3] The roles and activities of women in the six selected agricultural projects in Thulamela Local Municipality of Vhembe District Municipality in the Limpopo Province Publication of South African Society of Agricultural Extension (SASAE) On-line version ISSN 2413-3221 Print version ISSN 0301-603X

[4] Ibid

[5] https://www2.ohchr.org/english/issues/water/docs/CESCR_GC_15.pdf.10

[6] Mauritania Context and Land Governance, by Anne Hennings 16 September 2021

[7] Country Mauritania SIGI 2019 Category N/A SIGI Value 2019

[8] Ibid p 5

[9] UN Gender, Water and Sanitation study

[10] Country Mauritania SIGI 2019 Category N/A SIGI Value 2019 p 6

[11] Ibid

[12] Ibid

[13] The Gambia National Gender Policy 2010- 2020

[14] the State of Food and Agriculture, FAO, Women in Agriculture Closing the Gender Gap for Development,

[15] FAO, National Gender Profile, p 109

[16] Guinea-Bissau: Where land rights are not secure for women, Yasmina Nuny Silva, October 29, 2021

[17] A/RES/64/292 The human right to water and sanitation

[18] About water and sanitation OHCHR and the right to water and sanitation

The Regional Working Group for the protection and sustainable management of the Senegalese-Mauritanian Aquifer Basin (BASM)

The countries that share the aquifer have engaged since 2019 in a dialogue aimed at establishing transboundary cooperation on this shared water resource of critical importance. This dialogue takes place in close collaboration with the two transboundary basin organizations (TBOs) concerned: the Organization for the Development of the Gambia River (OMVG) and the Organization for the Development of the Senegal River (OMVS). The dialogue is being supported by the Geneva Water Hub (GWH) and by the Secretariat of the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (the Water Convention), hosted by the United Nations Economic Commission for Europe (UNECE), as well as through technical support from the International Groundwater Resources Assessment Center (IGRAC).

With a view to developing a common vision and action plan, the dialogue operates through a Regional Working Group (RWG) created on the basis of terms of reference signed by the ministers responsible for water in the aquifer countries, as well as by the high commissioners of the TBOs. The mandate of the RWG ? integrated by official representatives of the four States, OMVG, OMVS and the OSS (Sahara and Sahel Observatory) - is to foster cross-border cooperation and advise the countries sharing the aquifer and the TBOs towards the establishment of a long-term mechanism for concerted cross-border management of the SMAS. Since May 2020, pursuant to a ministerial mandate, the Regional Working Group focused on the creation of a joint project aimed at initiating transboundary cooperation, titled: ?*Implementing transboundary cooperation for the sustainable and resilient management of the Senegalo-Mauritanian aquifer basin (SMAB)?* and developed with the support of the Geneva Water Hub, the UNECE Water Convention Secretariat and IGRAC. This initiative will be implemented by SMAB countries, OMVS and OMVG under the leadership of the Regional Working Group.

The present project will not duplicate activities being planned in the framework of the overarching project developed by the RWG, but on the contrary will contribute to the implementation of a number of its relevant components (see figure below) as part of its overall vision and roadmap.

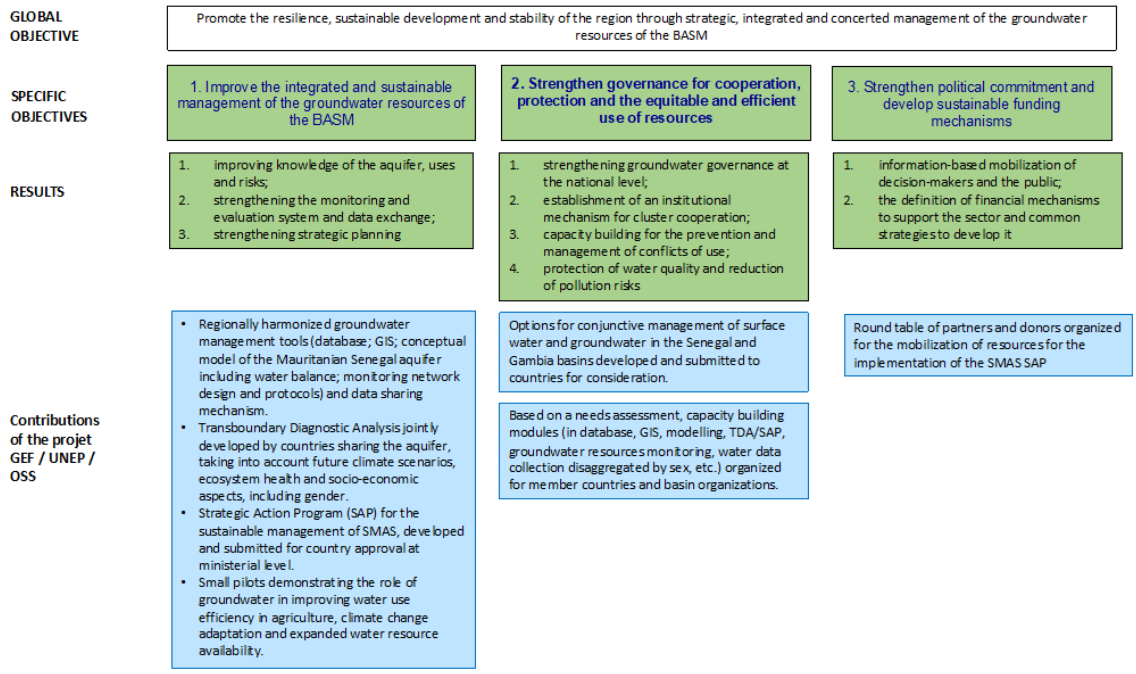

Figure 2. Contributions of the GEFIW project to the overall RWG program

Relevant Initiatives and Investments

Besides the above overarching initiative, the only one focusing on the Senegalo-Mauritania Aquifer System, other regional surface waters initiatives, including several GEF funded projects (most of them ongoing) in the two main basins of the Senegal and Gambia Rivers were implemented by OMVS (for the Senegal River Basin) and OMVG (for the Gambia River Basin). Some of these initiatives, although focusing on surface water, provide limited contributions to improved groundwater knowledge and governance. These contributions, in particular those of ongoing projects, will be assessed through direct contacts with the executing entities, during the project inception phase, as elements of the baseline for the proposed project. Some of the most important of these initiatives are:

? *OMVS for the Senegal River Basin*

The Senegal River Basin is currently endowed with fundamental tools for concerted and sustainable governance, planning and management of water resources, especially surface waters. These include an institutional governance body (OMVS), a Water Development and Management Master Plan, a TDA/SAP adopted by all the countries. All current initiatives are carried out within the framework of these tools. The main initiatives in the basin are:

- The PASIE[2] Program (1999-2005) co-financed by the World Bank, the African Development Bank, the French Cooperation and the Canadian Cooperation, aimed at defining and implementing a series of actions nested within a global strategy of protection and preservation of the environment. It covered several activities including, in particular, the Reservoir Management Optimization Program (POGR), the Program to Combat Water-borne Diseases, the Environment Observatory, rural electrification, income-generating micro-projects, harmonization of national legislation, etc.

- Reducing Dependence on POPs and other Agro-Chemicals in the Senegal and Niger River Basins through Integrated Production, Pest and Pollution Management (2005-2010)**.** This regional project is focused on the two principal river basins in the West African sub-region, the Niger and Senegal River Basins, and addresses riverine contamination issues related mostly to irrigated-farming activities in six countries. The Project Development objective is to protect transboundary waters in the Niger and Senegal River Basins through elimination of POPs pesticide-use and substantial reduction and elimination of other toxic pesticides used in agriculture while augmenting agricultural productivity and net economic benefits to farmers.

- The Senegal River Basin Water and Environmental Management Program (2003-2009). Funded by the World Bank, the overall objective of the project is to ensuring the sustainable management of the basin's water resources, biodiversity and environment with four main components: (i) The Environmental Management Structure Component, aiming at establishing effective institutional structures and mechanisms for the correct management of the Senegal Basin, both at regional and national level; (ii) The Knowledge Base Component, which would consist of a thorough inventory of the socio-economic and bio-physical conditions, and of easily accessible data bases established in each country and at OVMS (Basin Authority); (iii) The Priority and Opportunities Analysis Component, involving the identification of priority transboundary issues, the definition of mitigation measures, the identification of priorities and opportunities perceived by the public in the Basin; (iv) The Action Program for the Global Environment, including the integration of measures identified under (iii) in an action program featuring both national and regional/global components, and the implementation of necessary reforms, and of elements qualifying for GEF funding.

- The Senegal River Basin Climate Change Resilience Development Project (2014-2019**)** funded by the World Bank has for objective to strengthen transboundary water resources management in the Senegal River Basin including climate change adaptation and implementation of priority actions of the Strategic Action Plan. Some outcomes of this project incorporate transboundary IWRM principles (including environment and groundwater) and policy/ legal/institutional reforms into national/local plans.

The SMAS project knowledge improvement and TDA/SAP will build on the results obtained by these above initiatives, notably the water contamination issues related mostly to irrigated-farming activities, the inventory of the socio-economic and bio-physical conditions, and of easily accessible data bases established in each country and at OVMS.

? *OMVG for the Gambia River Basin*

Like the Senegal River Basin, also the Gambia River Basin has fundamental tools for the governance, planning and management of the basin's water resources. These include the OMVG (for institutional governance), a River Basin Scheme and a Hydraulic Scheme.

Since its creation, OMVG has carried out baseline studies on the basin's resources that have led to the design and implementation of several development projects and programs. The main initiatives among those projects are:

- The Project for the development and management of natural resources in joint Senegal, Guinea, Guinea Bissau and Gambia border areas: Funded mainly by the African Development Fund (2002-2007), this project aimed to increase agro-forestry and pastoral production, rationalize the exploitation of natural resources and improve the social infrastructure of the basin.

- The project of Integrated Water Resources Management (IWRM) in the Kayanga-Geba River Catchment. Its objectives are the concerted and integrated management of the water resources of the Kayanga-Geba river basin and the strengthening of the technical and institutional capacities of the member States of the basin. The project consists of support to OMVG for the IWRM of the Kayanga-Geba river basin, in order to provide the organization with the needed tools to enhance a concerted and shared management of the resources and for sustainability exploitation and use conflicts preventing.

The SMAS project will build on the results obtained by these above initiatives, notably the tools set up to enhance a concerted and shared management of the resources and for sustainability exploitation and use conflicts preventing. This will be considered as baseline for the establishment of the management framework to be set in place under the SMAS project.

? ***IUCN Senegal River Delta project****:* The rehabilitation of the delta of the Senegal River in Mauritania - Fielding the ecosystem approach (2003)[1].

Synergies could be built with this project which will serve as a baseline as: i) it focuses on the implementation of the management plan and the establishment of joint water management procedures with the park of Diawling authority and the various stakeholders (1996-2000); ii) it dealt with ecosystem restoration and enhancement of local livelihoods. Principles of the ecosystem approach have been established and will be taken into consideration; iii) it provided lessons learned to Improve wetland management.

Diawling National Park was created by presidential decree in January, 1991. It covers 16,000 ha along the Mauritanian bank of the Senegal River and its stated aims, developed with support from IUCN, are:

- to preserve and ensure the sustainable use of the natural resources of a part of the lower Senegal delta ecosystem;
- promote the continuous and harmonious development of the range of activities of the local population;
- co-ordinate pastoral and fishing activities within its boundaries

•***IUCN/OMVG Corubal project****:* Integrated Natural and Water Resources Management Project in the Corubal Basin (Bissau Guinea, Gambia, Guinea and Senegal).

Synergies could be built with this project which objective is to ensure the integrated and sustainable use of natural and water resources in the Corubal Basin through enhanced transboundary cooperation and governance. The project consists of 3 components: i) Compnent 1 - Corubal River Basin Development Assessment and Planning which outputs are TDA and SAP; ii) Component 2 - Governance and reinforcement of Institutions; iii) Component 3 - Knowledge Management, Monitoring and Evaluation and Communication.

•***WACA initiative -*** The West Africa Costal Areas Management Program (WACA) is a Coastal Zone Resilience Investment Project in West Africa funded by the International Development Association (IDA), the Nordic Development Fund (NDF) and the Global Environment Fund (GEF). The objective of WACA is to improve the management of shared resources and risks, integrating climate change, affecting communities and coastal areas in the West African region. The WACA project mainly concerns the western part of the Senegal-Mauritanian basin in Mauritania and Senegal and takes into account the strengthening of the sustainable management and protection of the Transboundary Biosphere Reserve in this area whose activities are financed by the GEF. Scheduled from 2018 to 2023, this regional project from which Mauritania and Senegal benefits is implemented through an integrated and multisectoral approach combining technical assistance and gray and green investments to reduce the risks faced by millions of inhabitants.

•***Cities IAP where Senegal and St Louis are part of -" Senegal Sustainable Cities Initiative":*** The Project Objective is to improve capacity to plan and implement sustainable city management practices, including climate resilience, in selected urban areas. The project will complement the World Bank Stormwater Management and Climate Change Adaptation Project (PROGEP) through: (i) strengthening the national urban policy framework to promote cities? sustainability, including climate resilience; (ii) mainstreaming of integrated sustainability and resilience planning tools, and improvement of planning and management capacities; (iii) small-scale investments in two pilot cities as a demonstration of the local and global environmental benefits anticipated from the application of sustainable cities? practices and tools; and (v) knowledge sharing and partnership development on sustainable cities and climate resilience at multiple levels.

The Senegal government has put in place a holistic approach, the Plan Senegal Emergent (PSE), to foster sustainable development. The PSE constitutes the national reference for economic and social policy in the medium and long term. The Senegal Sustainable Cities Initiative complements initiatives already taken by the PSE, with the proposed GEF investments in Diamniado and Saint Louis designed to complement Dakar?s overall urban planning.

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[1] Hamerlynck, O. and Duvail, S. (2003). The rehabilitation of the Delta of the Senegal River in Mauritania. IUCN, Gland, Switzerland and Cambridge, UK. viii + 88 pp.

? GEF funded initiatives

Most of ongoing GEF funded projects in the four countries sharing the SMAS aquifer are addressing some of the issues that are relevance to this project.

- **Gambia**

o Improving Water Availability in The Gambia?s Rural and Peri-Urban Communities for Domestic and Agricultural Use (GEF 7 ? approval fiscal year 2019)

o Landscape Planning and Restoration to Improve Ecosystem Services, and Livelihoods, Expand and Effectively Manage Protected Areas (GEF 6 ? approval fiscal year 2017)

o Strengthening Climate Services and Early Warning Systems in the Gambia for Climate Resilient Development and Adaptation to Climate Change ? 2nd Phase of the GOTG/GEF/UNEP LDCF NAPA Early Warning Project (GEF 6 ? approval fiscal year 2013)

o Enhancing Resilience of Vulnerable Coastal Areas and Communities to Climate Change in the Republic of Gambia (GEF 5 ? approval fiscal year 2012)

Synergies will be explored and built with these ongoing projects and other planned initiatives as amongst others i) they deal with land use issues which is key to groundwater governance and management; ii) they include procured equipment for the hydrometric monitoring network; iii) they also contribute to the groundwater network through the drilling of 20 new observation boreholes.

- **Guinea Bissau**

o Strengthening climate information and early warning systems for climate resilient development and adaptation to climate change in Guinea Bissau (GEF 7 ? approval fiscal year 2019)

o Managing Mangroves and Production Landscapes for Climate Change Mitigation (GEF 6 ? approval fiscal year 2016)

o Strengthening the Resilience of Vulnerable Coastal Areas and Communities to Climate Change in Guinea Bissau (GEF 6 ? approval fiscal year 2017)

o Strengthening Resilience and Adaptive Capacity to Climate Change in Guinea-Bissau?s Agrarian and Water Sectors (GEF 4 ? approval fiscal year 2010)

o LDC/SIDS Portfolio Project: Sustainable Land Management in Guinea-Bissau (GEF 3 ? approval fiscal year 2005)

Synergies will be explored with these projects in view of the objectives being, but not limited to i) the operationalization of meteorological and hydrological observation networks (hydrometric and tidal), as well as systems for the collection, processing and dissemination of information within the framework of strengthening the climate information and early warning systems in Guinea-Bissau; ii) restoration of mangroves, land rehabilitation to improve food security and mitigate climate change.

- **Mauritania**

o Continental Wetlands Adaptation and Resilience to Climate Change (GEF 6 ? approval fiscal year 2017)

o Improving Climate Resilience of Water Sector Investments with Appropriate Climate Adaptive Activities for Pastoral and Forestry Resources in Southern Mauritania (GEF 5 ? approval fiscal year 2013)

o Community-based Watershed Management Project (GEF 3 ? approval fiscal year 2006)

The SMAS project will build on the baselines of these projects as these initiatives will contribute, amongst others, i) towards mainstreaming adaptation across Mauritania?s national strategies for water resources and sustainable development; ii) reduce the vulnerability of rural communities through targeted climate-resilient management of water and forest resources.

- **Senegal**

o Strengthening Land & Ecosystem Management Under Conditions of Climate Change in the Niayes and Casamance regions- Republic of Senegal (GEF 5 ? approval fiscal year 2014)

o Project for the Restoration and Strengthening the Resilience of the Lake de Guiers Wetland Ecosystems (PRRELAG) (GEF 5 ? approval fiscal year 2013)

o Climate Change adaptation project in the areas of watershed management and water retention (GEF 5 ? approval fiscal year 2011)

o Groundnut Basin Soil Management and Regeneration (GEF 3 ? approval fiscal year 2006)

o SIP: Integrated Ecosystem Management in Four Representative Landscapes of Senegal, Phase 1 et 2 (GEF 4 ?completed).

Synergies will be explored with these projects, related, amongst others, to the activities and results i) building on water resources management through, capacity building, awareness raising and knowledge management at the national level; ii) supported ecosystem-based adaptation and building the enabling environments required for long-term climate resilience.

? Other projects and investments

During the project preparation, a mapping of all ongoing and planned activities related to the water sector was carried out in all four aquifer countries, with a view of identifying synergies and ensuring coherence with regional programmes and seeking collaboration with regional and national institutions in the region. A summary of past, current and planned investments related to water resources in the SMAS region based on existing reports, publications and discussions with stakeholders and partners, is presented in **Appendix 1**. Despite the critical role played by groundwater in the region, most existing initiatives ? while providing information and data useful for the achievement of the project?s intended outcomes ? do not address groundwater, focusing on surface water only.

Lessons learned from all initiatives:

The initiatives experience has mainly shown that:

involving local communities in the management of natural resources is both feasible and beneficial and can have positive impacts on biodiversity and livelihoods.

In relationships with the local communities, key concepts are **trust**, **benefits** and the **integration of indigenous knowledge:**

- - in order to build a relationship based on **trust**, a project must move slowly and carefully. Confidence can only be gained through proving assertions with action, and such results take time.
- - local community adhesion to sustainable resource use is proportional to the **benefits** they will reap from it.

•**Integration of indigenous knowledge** is very important in the sense that:

- - local stakeholders often have a longstanding relationship with an ecosystem. Although at times their explanations of certain phenomena may seem farfetched, scientific arrogance should be avoided. Patiently drawing out the experience of observant locals can be highly rewarding;
- - local knowledge should be formalised through scientific investigation. Monitoring and participatory research increase awareness and local capacity.

1.5. THE PROPOSED ALTERNATIVE SCENARIO WITH A BRIEF DESCRIPTION OF EXPECTED OUTCOMES AND COMPONENTS OF THE PROJECT

The purpose of the present project under the leadership of the Regional Working Group is to fill the existing gaps in the knowledge of the aquifer system functioning and of its interactions with surface water and freshwater ecosystems, and to advance transboundary cooperation for the mitigation of degradation trends. The project design adopts the approach recommended by the GEF for projects aimed at setting the foundations for cooperation and coordinated action in transboundary waterbodies river basins, lakes, aquifers and marine ecosystems, and successfully tested in a number of cases worldwide. Improved transboundary cooperation in shared natural resources and ecosystem management is essential for securing sustainability and in fact considered by the GEF as ?global environmental benefit?. This approach has been adapted to the hydrogeological peculiarities of the Senegal-Mauritania Aquifer System, to remove the barriers in order to enable effective mitigation and protection actions, and in line with ongoing and planned relevant activities, national laws, strategies and plans.

In addition, the project will create conditions conducive to adequate adaptive management of water resources to address resilience to shocks including climate change related extended extreme events through national inter-ministerial and regional expert committees and through the development of a data and information sharing system. On the basis of the identified priorities of the national strategic plans and the existing regional plans, the project will implement innovative cross-border actions to improve the sustainable use of water, promote IWRM and reduce the environmental problems and stresses identified in the basin through the TDA process. The potential impacts of climate change will be integrated into adaptation management actions for the SMAS as increased public awareness and enhanced capacity of stakeholders to act. The consideration of women, young people and marginalized people in the planning and financing of activities will be encouraged and strengthened, considering the maintainance of delineation of efforts that are pursued with e.g. LDCF/SCCF finance.

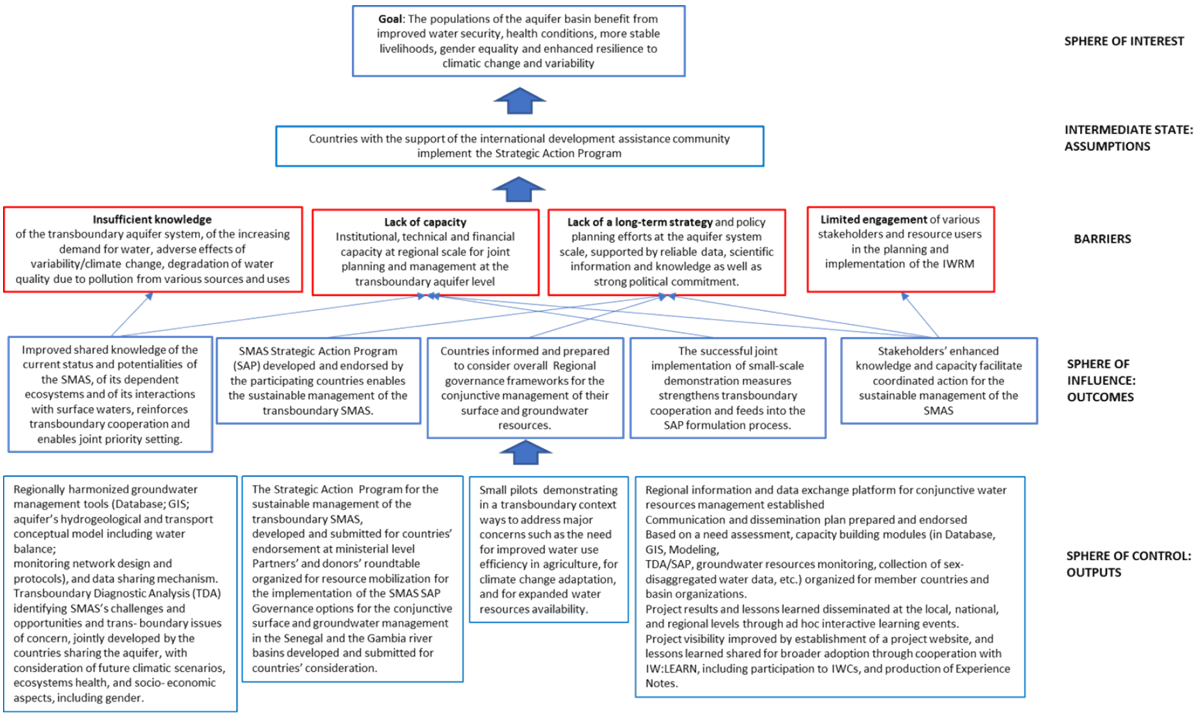
As in all GEF IW foundational projects, the Theory of Change at the basis of the project design builds on the notion that:

(i) if the Transboundary Diagnostic Analysis (TDA) and the Long-Term Vision for the aquifer basin are endorsed by the countries?representatives in the Steering Committee,

(ii) if the Strategic Action Program (SAP) is signed at ministerial level by the four countries sharing the aquifer;

then countries will be poised to undertake joint coordinated and cooperative actions aimed at reversing degradation trends in terms of groundwater quality and quantity, harmonizing groundwater governance frameworks, and protecting groundwater dependent ecosystems for the benefit of the populations of the aquifer basin.

Figure 3 .Theory of Change



The project is fully consistent with the Council approved PIF, the only difference being the increased budget allocated for Component 3 ?Pilots projects?[3], which was considered necessary given the interest demonstrated by the countries and the high quality and relevance of the proposed pilots.

It will consist of a blend of (i) Scientifically sound assessments to improve the understanding of the hydrogeologic features of the aquifer, its vulnerability to contamination, and the degradation processes affecting groundwater quality and quantity; (ii) facilitation of transboundary consensus building and decision making on main issues of concern and on remediation strategies and priority actions; (iii) on the ground testing of solutions for sustainable groundwater utilization, and monitoring practices, and (iv) strengthening of institutional capacity and promoting gender equality in the four countries.

Component 1: Improving the understanding of the status and functioning of the Sengalo- Mauritanian Aquifer System (SMAS), and of its interactions with the Senegal and Gambia rivers.

Water resources management can only be efficient if appropriate and reliable scientific knowledge and information is available. The main purpose of this outcome is to develop the scientific tools required to provide the reliable information needed for the development of the SMAS water resources planning and sustainable management foreseen in the framework of this project. This will essentially consist of setting up a regional database, defining the conceptual model of the SMAS, and establishing the SMAS's water balance with identification of the aquifer's hydraulic relationship with the surface waters (Senegal and Gambia rivers). A 3D mapping of aquifers and aquitards using a hydro-stratigraphic model to visualize and determine recharge zones, runoff directions and interactions with surface water, the technical and economic feasibility of the exploitation of the aquifer system in some specific zones (i.e., aquifer depth), volume of available water, vulnerability to contamination, etc.). To construct that model, a cartographic synthesis of available data and information on groundwater at the SMAS scale, by compiling and harmonizing available knowledge on aquifers, uses, natural and anthropogenic contamination, etc. will be realized.

This component will also seek to empower women and men, and other people in vulnerable situations, through their equitable involvement in the project management and decision-making particularly in groundwater management and transboundary governance, capacity building, gender sensitive institutional and regional frameworks and gender sensitive planning and development for improved management of SMAS water and dependent ecosystem resources. It will further seek to increase their resilience to climate change, water and food security, health and well-being.

Outcome 1.1: Improved shared knowledge of the current status and potentialities of the SMAS, of its dependent ecosystems and of its interactions with surface waters, reinforces transboundary cooperation and enables joint priority setting

Output 1.1.1: Regionally harmonized groundwater management tools (Database; GIS; aquifer?s hydrogeological and transport conceptual model including water balance and transport of e.g. Nitrogen, Fluoride; monitoring network design and protocols), and data sharing mechanism, including **gender-disaggregated data**

The main activities under this output are:

? Collecting existing data and information at the regional level and identifying gaps

? Collect baseline sex-disaggregated data to be included in the Database and in the monitoring protocols of all four beneficiary countries

? Developing a common Database for SMAS

? Defining the conceptual model of the aquifer (geometry, recharge and discharge zones, dependent ecosystems and interactions with surface waters).

? Establishing hydrogeological thematic maps (hydrogeology, water quality, etc.)

? Developing Hydrogeological and transport model

? Using existing climate prediction models in the sub-region for better water resources management planning.

Collection of existing data in countries will allow establishing a common regional Database which will feed the hydrological model and transport model. The transport model will also allow to connect water quality data to study sea water intrusion, and fluoride or nitrogen contamination or pollution.[4]

Output 1.1.2: Regional and national level diagnostic assessment (TDA) identifying SMAS?s challenges and opportunities and transboundary issues of concern, jointly developed by the countries sharing the aquifer, with consideration of future climatic scenarios, ecosystems health, and socio-economic aspects, including gender.

The main technical role of the TDA is to:

? identify, quantify, and set priorities among environmental problems that are transboundary in nature aiming affecting the SMAS, and to gather and interpret information on the environmental impacts and socio-economic consequences of each of these problems.

? Analyze the immediate, underlying, and root causes for each problem, and in particular identify specific practices, sources, locations, and human activity sectors from which environmental degradation arises or threatens to arise.

The Transboundary Diagnostic Analysis will be performed in two steps, the first step focusing on the national portion of the aquifer in each of the 4 countries, and the second step producing a regional TDA at the SMAS scale. It will be based on the scientific data and information produced in Output 1.1.1, and will address the analysis of thematic aspects such as: environment, hydrology, geomorphology, climate change, water uses of natural resources, socio-economic, institutional, regulatory and governance aspects of water resources, gender and cultural aspects, etc.

The TDA is a participatory and consultative process. It is the analytical component that identifies and analyses the transboundary problems, their impacts and causes.

The TDA provides the factual basis for the strategic component of the TDA/SAP Process ? strategic thinking, planning and implementation of the SAP. In addition to this, however, the TDA should be part of a process of engagement and collaboration with stakeholders through the initial TDA steps and the

subsequent development of alternative solutions during the formulation of the SAP. Consequently, studies of institutional capacity, governance, and investment are all essential components of the TDA.

it will involve and build on inputs and local knowledge, including. local agencies, national academics, NGOs, and also private sector where appropriate. The TDA also analyzes the legal, policy and institutional environment with regards to water and natural resources uses, permitting, enforcement, competing regulations and incentives etc.

The main activities will be the following:

? Identifying and prioritizing transboundary issues of concern in the SMAS considering the major problems in the Senegal and Gambia rivers basins

•?Assessing vulnerability of aquifer system to climate variability and to contamination

•?Assessing anthropogenic and marine intrusion impacts on the SMAS

•?Analyzing local populations resilience to climate change

•?Undertake a survey of the most water stressed population with an emphasis on female-headed households, Elderly people, people with disabilities and people living below poverty line, indigenous people

•?Establishing Causal Chain analysis for the major transboundary risks identified

•?Assessing the role of women in water supply and management

•?Water governance: Diagnostic analysis of national water resources management strategies (groundwater in particular) considering the Senegal and Gambia Basins Organizations? strategies

•?The Transboundary Diagnostic Analysis will also collect baseline sex-disaggregated data to be included in the Database and in the monitoring protocols of all four beneficiary countries. The analysis of the data will include the current gender and equality context (to identify issues of exclusion) as well as the projected impacts of any intervention on members of the community (women and men, boys and girls, elderly, young and people with disabilities).

Component 2: Developing a regional Strategic Action Program (SAP) for the Senegalo-Mauritanian aquifer system and facilitating conjunctive surface and groundwater management

The aim under this Component is to establish a planning tool (the SAP) for efficient and coherent allocation of water resources in general and groundwater resources in particular at the SMAS scale over the medium and long term.

Specifically, a Strategic Action Program (SAP) will be defined, setting out clear priorities for action at national and regional level (i.e., policy, legal, institutional reforms, or investments) to resolve the priority transboundary threats and opportunities identified in the SMAS TDA. This tool will be developed, negotiated and approved by the four countries.

The SAP will also be presented to different financial partners in order to solicit their support for the implementation of priority actions. Other key element in the cooperation process leading to the SAP involves the development of institutional mechanisms at the regional and national levels for implementing the SAP and of monitoring and evaluation procedures to measure effectiveness of the outcomes of the process.

The component also aims to enable marginalized people?s involvement and participation to the SAP development as well as to mainstream gender aspects in the SAP, such as the removal of existing barriers to gender equality in water resources use and management and with focus on rural areas and more vulnerable communities. It will enable Women?s and other people in vulnerable positions equitable and meaningful participation and involvement to the SAP development and negotiations.

Outcome 2.1 Strategic Action Program (SAP) developed and endorsed by the participating countries enables the sustainable management of the transboundary SMAS

The aim under this outcome is to establish a planning tool for efficient and coherent allocation of water resources in general and groundwater resources in particular at the SMAS scale over the medium and long term.

Specifically, a Strategic Action plan (SAP) will consist of a blend of national and regional actions (i.e. policy, legal, institutional reforms, or investments) aimed at addressing the priority transboundary threats and capture the opportunities identified in the SMAS TDA. The SAP will be negotiated taking into account the strategic priorities of the four countries sharing the aquifer and agreed upon and endorsed at ministerial level. Financial partners working in the region will be involved in the process and invited to participate to the partners? and donors? roundtables?.

This tool will be discussed and approved by the four countries. The SAP will also be submitted to different financial partners in order to solicit their support for the proposed actions implementation.

The RWG has been given the mandate in the Ministerial Declaration to establish a transboundary cooperation framework for the SMAS in conjunction with surface water and to launch a negotiation process to define this governance framework (point 5 of declaration). This project will support this vision and commitment by developing/reinforcing a conjunctive surface and groundwater governance options report to be submitted to the countries under the auspices of the RWG. This will consist notably of first identifying gaps and deficiencies in the institutional mechanism in order to fill the gaps or consolidate it.

Output 2.1.1. The Strategic Action Program for the sustainable management of the transboundary SMAS, developed and submitted for countries? endorsement at ministerial level.

The SAP will be based on the informed commitment by the countries and will be developed by the four countries concerned with the support of the OMVS, OMVG technical advisory committees and guided by a common vision for cooperation on the SMAS provided by the by RWG.

This output will be achieved through the following activities:

-
- ? Organizing national and regional consultations processes (strategic thinking workshops)
- ? Formulating and validating the Strategic Action Program (SAP)
- ? National validation workshops of the SAP
- ? Regional validation workshop of the SAP
- ? Adoption of the SAP by project steering committee

? Conference/Ministerial Meeting: Adoption of the SAP

The activities under this output will be guided by the TDA/SAP methodology (IW: Learn) and characterized by an inclusive multi-stakeholder consultation process. In the case of the SMAS SAP this will be driven by the four aquifer countries working under the cooperation framework of the Regional Working Group. The Ministerial Declaration establishing the RWG as a legal and institutional framework for transboundary cooperation for the sustainable management of the Senegalo-Mauritanian Aquifer Basin in conjunction with surface waters, informs this GEF project which will implement some of the key elements of the vision of the RWG. In that sense, the SMAS SAP development process will be embedded into the new regional cooperation structure provided by the RWG.

Output 2.1.2. Partners? and donors roundtable organized for resource mobilization for the implementation of SAP.

The main activity under this output is, after submission of the agreed upon SAP to different financial partners, the organization of a partners' and donors roundtable to facilitate adoption of the regional strategic framework for conjunctive management and resource mobilization to support SAP implementation.

Outcome 2.2: Countries informed and prepared to consider overall options for regional governance framework/s for the conjunctive management of their surface and groundwater resources.

Options and recommendations for expanding the mandate of the two basin organizations (OMVS, OMVG) to include groundwater, and for reinforcing their capacity to implement conjunctive surface and groundwater management will be part of the comprehensive Options Report. These recommendations will be developed with the RBOs and then validated through the RWG and presented to the Council of Ministers (COMs) of the RBOs for them to be amended and adopted.

Output 2.2.1. Governance options for the conjunctive surface and groundwater management in the Senegal and the Gambia river basins developed and submitted for countries? consideration.

The RWG has been given the mandate in the Ministerial Declaration to establish a transboundary cooperation framework for the SMAS in conjunction with surface water and to launch a negotiation process to define this governance framework (point 5 of declaration). This project will support this vision and commitment by developing a governance options report to be submitted to the countries under the auspices of the RWG.

Under the current project a governance options report for the conjunctive management of water resources of the SMAS will be developed which will include the assessment of the existing legal and institutional structures and processes within the SMAS, and the subsequent assessment of the regional framework of the SMAS to be developed with the RWG. The options report will be developed together with the countries, OMVS, OMVG and presented to the RWG for discussion and final validation in line with their mandate and vision.

The fact that the RWG has invited those members of OMVS and OMVG that do not share the Senegalo-Mauritanian Aquifer Basin, namely Guinea and Mali, to participate as observers will complete the whole

basin coverage demonstrating the aim for a systems approach and move towards conjunctive management of shared surface and groundwater resources.

Activities under this outcome will benefit from the strengthening of the RWG mandate under the Ministerial declaration and be embedded into the cooperation framework chosen to harmonise all initiatives to be implemented in the Basin including discussion of options for the institutional cooperation mechanism chosen to ensure sustainable, equitable and efficient use of the SMAS resources.

Options and recommendations for expanding through the RWG the mandate of the two basin organizations (OMVS, OMVG) to include groundwater, and for reinforcing their capacity to implement conjunctive surface and groundwater management will be part of the comprehensive options paper assessment. These recommendations will be developed with the RBOs and then validated through the RWG and presented to the Ministers. As the underlying agreements of the River Basin Organisations (RBOs) do not cover the whole SMAS groundwater resources, recommendations for expanding, through the RWG, the mandate of the two basin organizations (OMVS, OMVG) to include groundwater, and for reinforcing their capacity to implement conjunctive surface and groundwater management will be assessed in the options report. These recommendations will be adopted and expanded through the RWG to the Council of Ministers (COMs) of the RBOs for them to be amended by the Ministers. That will allow implementing conjunctive surface and groundwater management of the SMAS.

Component 3: Piloting the implementation of groundwater-based adaptation measures to mitigate the impacts of climate change and related hazards

In a context of growing demand for high-quality water, strengthening capacities for preventing and managing conflicts over water use at various levels - local, national and regional - is vital. A program of on the ground pilot projects implemented in the four countries will allow testing climate-smart policies and measures promoting the sustainable and equitable allocation of water resources, their efficient use, 1.4the protection of their quality and the artificial recharge of the aquifer. The pilot projects have been carefully selected based on their national (e.g. ?hotspots?) an73d regional (e.g. representative of common regional problems) impact. As part of these pilot projects, (i) small investments, including on monitoring, will allow equipping national and local users and institutions, with tools and infrastructures fostering climate change adaptation and the sustainable management of the aquifer, and (ii) training will strengthen the capacity of authorities and water users. Experience gained with the pilots will be exchanged at the regional level among stakeholders and countries.

Component 3 also seeks to ensure women?s equal and equitable access, to and benefit from, the implementation of groundwater-based adaptation measures and value chains, as well as to strengthen their capacity for an efficient involvement in the pilots. It will also provide inclusive employment opportunities for all beneficiaries.

Outcome 3.1: The successful joint implementation of small-scale demonstration measures strengthens transboundary cooperation and feeds into the SAP formulation process.

Output 3.1.1. Small pilots demonstrating, in a transboundary context, ways to address major concerns such as the need for improved water use efficiency in agriculture, for climate change adaptation, and for expanded water resources availability.

During the project preparation (PPG) the following pilot projects have been selected for possible implementation.

These pilot projects will be implemented in collaboration with the local government and key stakeholders through the National focal institution who will coordinate and facilitate the implemention of the activities.

Local NGOs play an advisory role in the implementation of the Community Pilot Projects.

Under the Community Pilot Demonstration Projects, NGOs are responsible for:

? Provide technical support to local beneficiary communities to assess the potential impact of pilot projects on the environment and communities;

? Carry out monitoring and evaluation of the pilot projects in accordance with the monitoring and evaluation plan developed for this purpose;

? Conduct periodic monitoring at the demonstration project sites to provide technical assistance and oversee the progress of the projects;

? Promote relations, cooperation and synergy with other projects/programs in the intervention area;

? Organize, with the support of the SMAS PCU, the National Focal Point, the SMAS Project Focal Point, CNU and local technical services, capacity building workshops and field visits to facilitate the exchange of experiences and develop communication between grantees and other actors;

? Facilitate the identification of local partners for project activities;

? Consider the project's social and environmental monitoring model in the implementation of pilot projects

Communities and stakeholders: The beneficiary Community-Based Organizations (women's groups, farmers' groups, natural resource management groups, etc.) who are the direct beneficiaries of the Community Pilot Demonstration Projects are responsible for:

? Implementing the Community Pilot Demonstration Projects;

? Establish a management committee for the implementation and monitoring-evaluation of the project at the remote monitoring platform;

? Monitor and evaluate the Community Pilot Demonstration Projects using the monitoring and evaluation system designed for this purpose with the support of the NGO;

? Ensure the sustainability and the perpetuation of the achievements of the community pilot projects;

? Share good practices and lessons learned with other actors

Mauritania Pilot 1: Implementation of a Trarza Groundwater Contract

In the Wilayat (Governorate) of Trarza and in the western part of the Wilayat of Brakna, over an area of more than 20,000 km2 the SMAS aquifer is heavily exploited. There are more than 1,500 villages and nearly 300,000 people whose drinking water supply and the agricultural and livestock activities needs are covered essentially from groundwater abstracted from this aquifer. The lack of data on the water table, of consultation between the various users, and of groundwater monitoring are jeopardizing water security in this region, vulnerable to groundwater salinization due to seawater intrusion. This area exemplifies conditions common all along the Atlantic coastal areas of the aquifer.

The objective of this pilot is to set up a mechanism for consultation of all users of the Trarza aquifer aimed at defining a plan for the sustainable management of the aquifer, including monitoring, that will allow a better inclusion of all stakeholders and consideration of climate change.

In the implementation phase, gender sensitive activities will be conducted to enable women?s and other peoples in vulnerable situations active participation and employment needs in the implementation of small-scale pilot projects including equal access to and control of resources. Those activities include, among others, the identification of the roles in the pilot activities for which women can be hired, awareness-raising campaigns on the rationale and benefits of engaging women in the pilot enterprises, especially with men, to manage any potential backlash, the provision of Gender-responsive capacity building and technical assistance to men and women so that they can enhance their skills in preventing and managing conflicting water uses.

Senegal Pilot 1: improvement of the efficient use of groundwater, in Niayes

The Niayes are a geographical area in northwestern Senegal, made up of dunes and depressions suitable for market gardening. They are located on the coastal strip that goes from Dakar to Saint Louis (180 km long) and have biophysical characteristics favorable to market gardening. It alone provides nearly 80% of the national production of fresh vegetables and fruits. The area is also the site of reforestation or restoration perimeters, made up of: (1) bare or insufficiently wooded land on which serious erosion is taking place or is likely to take place, (2) a strip of casuarina trees along of the coast, the main objective of which is the fight against wind erosion and the gradual silting up of market garden basins. It is home to large deposits of phosphate ore and titaniferous sands being exploited respectively by the Chemical Industries of Senegal and the Grande C?te Project.

Issue to be addressed - The water resources of the area come mainly from the aquifer of the coastal sands present to the West of the Dakar-Saint Louis Road. This shallow aquifer represents a hydrogeological reserve of capital importance for the water supply of the population and to meet the needs of agriculture and industries. Being hydraulically connected with the deeper aquifer of the Lutetian limestones, in the West, it also contributes to the water supply of the agglomeration of Dakar. The aquifer is currently facing difficulties linked to the advance of the salt wedge, the destruction of the casuarina strip, caused by land speculation and a drop of water table levels which vary from 4 to 15 cm/year. Withdrawals for

the irrigation of horticultural areas are not controlled. The same is true of the impacts of agricultural activities on groundwater, and of the effects of climate change.

In the implementation phase, gender sensitive activities will be conducted to enable women?s and other peoples in vulnerable situations active participation and employment needs in the implementation of small-scale pilot projects including equal access to and control of resources. Those activities include, among others, the identification of the roles in the pilot activities for which women can be hired, awareness-raising campaigns on the rationale and benefits of engaging women in the pilot enterprises, especially with men, to manage any potential backlash, the provision of Gender-responsive capacity building and technical assistance to men and women so that they can enhance their skills in preventing and managing conflicting water uses.

Methodology and expected results ? The pilot will experiment a strategy for saving groundwater for irrigation, and assess the impact on the water table, in a site chosen in connection with the services of the Ministry of Agriculture as well as research institutions and private producers. This activity should consider the dimension of the long-term preservation of water resources under anthropogenic and climatic constraints. It would also be in line with the achievement of SDG 6 (6.4: Rational use of water). An inventory will be carried out in the chosen site (quantitative and qualitative) to serve as a reference, and a water saving method identified and implemented with the participation of all stakeholders. A monitoring device (piezometer equipped with a probe) over a period of 2 seasons should make it possible to assess the impact of withdrawals on the water table; a model should make it possible to extrapolate the results and give recommendations, including the setting up a ?water users association? or similar entity for self-monitoring and collective management efforts.

Stakeholders and beneficiaries:

? ? Department of Water Resources Management and Planning (DGPRE)

? ? Directorate of Horticulture (DH)

? ? National Agency for Integration and Agricultural Development (ANIDA)

? ? Senegalese Institute of Agricultural Research (ISRA)

??? Association of Market Gardening Unions of Niayes (AUMN)

? ? National Agency for Civil Aviation and Meteorology (ANACIM)

Senegal Pilot 2: Testing the effectiveness of managed aquifer recharge (MAR)

The recovery of surface water is an important program of the Ministry of Agriculture and Rural Equipment, under the aegis of the Directorate of Retention Basins and Artificial Lakes (DBRLA) and the National Agency for Integration and Agricultural Development (ANIDA). Thus, areas have been identified where freshwater retention basins for agricultural and pastoral use have been developed. In addition, thanks to the exploitation of phosphate ores and titaniferous sands or quarries, artificial ponds have formed with groundwater exposed by excavation (ICS). In addition, many runoff water collection

systems have also been put in place. These systems range from water retention dikes to small hillside dams, including retention basins, and ponds equipped for the collection of runoff water. Thus, these storage structures, mainly intended for agricultural use and for watering livestock, can also be used to recharge shallow aquifers. An illustrative example of a groundwater accumulation and recharge structure is the Panthior dam not far from the village of Yenne Todd in the south of the Commune of Sendou.

In the implementation phase, gender sensitive activities will be conducted to enable women?s and other peoples in vulnerable situations active participation and employment needs in the implementation of small-scale pilot projects including equal access to and control of resources. Those activities include, among others, the identification of the roles in the pilot activities for which women can be hired, awareness-raising campaigns on the rationale and benefits of engaging women in the pilot enterprises, especially with men, to manage any potential backlash, the provision of Gender-responsive capacity building and technical assistance to men and women so that they can enhance their skills in preventing and managing conflicting water uses.

Issue to be addressed - In a context of climate change and extreme climatic events, intense and abundant rains are becoming more frequent; these threaten human lives, produce socio-economic damage (infrastructure, etc.), or environmental damage (destruction of habitats, water erosion). In most programs/projects aimed at recovering these runoff waters one of the objectives mentioned is to allow the recharge of aquifers. Their effectiveness, however, has never been verified.

Methodology and expected results - On experimental sites, chosen in relation to ongoing programs and projects and in appropriate geological and hydrogeological contexts, retention basins will be equipped with a device for monitoring the effectiveness of infiltration and recharge (automated piezometers). The results obtained will make it possible to better refine the choice of sites for the location of the basins, and to scale them, especially in the "hotspots" such as the Diass horst area, where there are very high withdrawals for Dakar, a continuous drop in the level of the water table, and consequently an advance of the salt wedge.

Stakeholders and beneficiaries

? ? Department of Water Resources Management and Planning (DGPRE)

? ? Management of Retention Basins and Artificial Lakes (DBRLA)

? ? National Agency for Integration and Agricultural Development (ANIDA)

? ? Research institutions

? ? National Institute of Pedology (INP)

? ? National Agency for Civil Aviation and Meteorology (ANACIM)

? City of Dakar Municipality

Senegal Pilot 3: Improvement of groundwater quality: in the Groundnut Basin area, assess the effectiveness of the use of nanofiltration facilities

In the implementation phase, gender sensitive activities will be conducted to enable women?s and other peoples in vulnerable situations active participation and employment needs in the implementation of small-scale pilot projects including equal access to and control of resources. Those activities include, among others, the identification of the roles in the pilot activities for which women can be hired, awareness-raising campaigns on the rationale and benefits of engaging women in the pilot enterprises, especially with men, to manage any potential backlash, the provision of Gender-responsive capacity building and technical assistance to men and women so that they can enhance their skills in preventing and managing conflicting water uses.

The Maastrichtian aquifer is exploited in Senegal by more than a thousand boreholes reaching in some places more than 350 m. The flow rates provided by these boreholes can be very high depending on the nature of the structure and its location; some boreholes capturing this water table for the water supply of large centers easily supply more than 100 m3/h. However, the main constraints of this aquifer relate to the quality of its water; indeed, the water table has a high salt and fluorine content over a large part of the groundnut basin (regions of Kaolack, Diourbel, Kaffrine, Fatick), where it remains the only source of drinking water. In this context, to achieve SDG6 (6.1 Universal access to drinking water), the Government's strategy is to build infrastructure to improve water quality, by identifying and implementing technical solutions that are efficient and bearable by the populations to improve the physico-chemical and bacteriological quality of the water distributed and consumed. Two solutions are envisaged depending on the context, either (1) transfer fresh water from an alternative source (generally CT aquifer) at a medium distance, or (2) set up treatment systems (e.g.: nanofiltration) to lower chloride and fluoride levels and chlorination systems.

Issue to be addressed - It is to this 2nd solution that the object of the proposed pilot relates. Indeed, several treatment units have already been installed in the groundnut basin in order to improve the quality of drinking water, either by the public authorities or by private individuals who market the treated water in certain urban centers affected by the poor water quality. However, the different treatment systems used have not been evaluated to find out about their effectiveness, functionality and impact on the target populations.

Methodology and expected results - This will involve targeting one of the most affected areas, chosen in conjunction with the Rural Drilling Office (OFOR), carrying out a survey of the system used (use, cost, functionality, difficulties, etc.) and analyzing raw water and treated water. The survey cannot hide the volumes of substrate produced compared to the gross volumes, and their disposition in the environment. Lessons learned can be shared for consideration on new sites.

Stakeholders and beneficiaries

? ? Department of Water Resources Management and Planning (DGPRE)

? ? Rural Drilling Office (OFOR)

? ? Research institutions

? ? Local authorities

? ? Private water production companies

? ? Associations of Borehole Users (ASUFORS)

The Gambia Pilot 1: Targeting the Greater Banjul Area ? Kanifing Municipality and West Coast Region

? ? Population of the of the Kanifing Municipality 382, 096 inhabitants

? ? Account for nearly 20.3% of the total population of the country

? ? Density is estimated at 5,057 persons per square kilometer

? ? 15.53% growth from 2003 and 2013

? ? The population is projected to double by 2033

? ? There is massive land cover change within this area that is shifting the groundwater recharge while groundwater demand is on the rise.

? ? Indiscriminate house borehole drilling is widespread as the services from the water utility are mostly not satisfactory.

? ? There is high potential for groundwater contamination as there are too many leaching individual households pit latrines and soakaways.

? ? Area of the West Coast Region is 1, 764 Km^2

? ? Population of the of the West Coast Region 699, 704 inhabitants

(GBoS 2013)

? ? Account for nearly 37% of the total population of the country

? ? Density is estimated at 400 persons per square kilometer

? ? Nearly 70 ? 80 abstraction boreholes of the National Water and Electricity Company (NAWEC)

? ? Domestic and other water supply needs are satisfied from the groundwater

? ? Iron contamination in the groundwater hampers adequate water supply for the various uses

? ? Commercial farming is growing and increasing abstraction from the groundwater

? ? There is huge competition for land

? ? There is currently no water abstraction licensing and thus not accounted and reported as required by the SDG 6.4.2 ?level of water stress: freshwater withdrawal as a proportion of the available freshwater resources?

? ? There are about 10 ? 15 monitoring boreholes that are currently inconsistently monitored thus the true groundwater fluctuation cannot be computed.

The pilot is intended to address three major issues affecting this over-populated area of the country: groundwater overexploitation, nitrates contamination, iron contamination. This would be done by (i) promoting of water use efficiency practices and techniques within households in the municipality, commercial agricultural entities and water utilities to ensure sustainable groundwater exploitation; (ii) Improve of water quality through mapping the extent of nitrate contamination and application of low-cost nitrate removal techniques; (iii) implementing innovative low technology iron removal techniques to provide clean and safe water supply to peri-urban communities affected by iron contamination in the West Coast Region.

In the implementation phase, gender sensitive activities will be conducted to enable women?s and other peoples in vulnerable situations active participation and employment needs in the implementation of small-scale pilot projects including equal access to and control of resources. Those activities include, among others, the identification of the roles in the pilot activities for which women can be hired, awareness-raising campaigns on the rationale and benefits of engaging women in the pilot enterprises, especially with men, to manage any potential backlash, the provision of Gender-responsive capacity building and technical assistance to men and women so that they can enhance their skills in preventing and managing conflicting water uses.

The Gambia Pilot 2: Soma Farafenni Corridor ? targeting the transboundary transport route from the Northern to the Southern Senegal

The Senegambia bridge corridor crosses two major provincial towns in The Gambia. Soma is located on the southern bank of the river and has an estimated 27, 205 inhabitants and the regional administrative center is the Mansakonko that is nearby. The town is supplied by the NAWEC with several boreholes, however, access to safe and reliable water supply coverage is a challenge. It is also the site for one of the Sub Stations for the OMVG Energy Project. There are also numerous satellite communities that depend economically to this town.

Meanwhile, Farafenni on the northern bank of the river has a population of 29, 867 inhabitants. It is commercial town with weekly market which attract traders from far and wide into Senegal. Farafenni is also supplied by NAWEC with severe water quality issues ranging from nitrate contamination from anthropogenic activities. The population of the town is rapidly increasing and social services such as clean water are also soaring. There are only two groundwater monitoring boreholes along this corridor, others are a bit far apart about 30 ? 35 km.

It is important to note that under the OMVG Master plan, this corridor is also identified as pilot site.

It is vital to note that integrated water resources management is not being streamlined in this region as there is hardly any appropriate hydrological representation in the activities and programmes at the regional level. Thus, there is no profiling of the various users and uses of water which would provide evidence to call for progressive social, economic and environmental activities at all stages including local communities and administrative.

This is region is found within the downstream limit of the saline front of the river Gambia with high seasonal fluctuation. The area is covered by freshwater for only 3 ? 4 months yearly, thus most water uses are dependent on groundwater.

The pilot intends to address the following issues:

- ? Improving the sustainable surface and groundwater utilization through the construction of sand dams, enhanced aquifer recharge, water harvesting etc., to increase agricultural water availability for the farming community especially women gardeners
- ? Increasing groundwater production through testing of aquifer characteristics and other water quality parameters including the exploratory borehole into the deep sand aquifer (Maastrichtian) location within the pilot area.
- ? Improving clean and safe water supply to towns and communities affected by iron and nitrate contamination within the pilot area, through implementing innovative and low technology iron and nitrate removal techniques

- In the implementation phase, gender sensitive activities will be conducted to enable women?s and other peoples in vulnerable situations active participation and employment needs in the implementation of small-scale pilot projects Equal access to and control of resources. Those activities include, among others, the identification of the roles in the pilot activities for which women can be hired, awareness-raising campaigns on the rationale and benefits of engaging women in the pilot enterprises, especially with men, to manage any potential backlash, the provision of Gender-responsive capacity building and technical assistance to men and women so that they can enhance their skills in preventing and managing conflicting water uses.

Guinea Bissau Pilot 1: Operationalization of three (03) pilot piezometers for monitoring the Maestrichtian aquifer in the city of Bissau and its coastal zone in the context of adaptation to climate change

In addition to the sixteen (16) boreholes that exploit the Maestrichtian aquifer and supply the public water supply network of the city of Bissau, under the supervision of the national electricity and water company of Guinea-Bissau (EEGB), there are an undetermined number of boreholes in private properties, diplomatic and other establishments in Bissau and peripheral areas, which capture and use the

Maastrichtian aquifer in an uncontrolled manner for other non-essential purposes and without minimal compliance with technical construction standards for this purpose.

Apart from that, there are also no meters installed and intended to quantify the water pumped from the Maastrichtian by these private boreholes. The situation is also the same for some boreholes under the jurisdiction of the EEGB company, which makes it almost impossible to objectively assess the level of exploitation of this aquifer in the city of Bissau, including the threat of contamination by saline intrusion. With the aim of monitoring and evaluating the behavior of groundwater resources, with the support of the African Development Bank (AfDB) in the second half of the 1990s, forty-four (44) piezometric boreholes for study were carried out in aquifer units including the Maestrichtian. However, little data was collected, and at the time only existed in paper format. Currently, no device for the qualitative and quantitative control of groundwater, including the largest in the country, the Maestrichtian, has been put in place by the authorities responsible for the management and protection of these resources.

Considering the importance of this aquifer in the national water supply context and the strong threat of contamination of the aquifer by human actions (uncontrolled exploitation of the aquifer essentially motivated by high demographic growth), and the worsening of climate change phenomena essentially linked to the gradual decrease in precipitation which facilitates the progression of the saline front, since the only mechanism for recharging aquifers in general and the Maastrichtian in particular, is dependent on the quantity of rain, resulting in the deterioration of the water quality of the aquifers in general, including the Maastrichtian, the most important in the country. Faced with this real threat of degradation, the reactivation and operationalization of a system for monitoring the Maestrichtian aquifer in the country in general, and especially in the greater Bissau region in particular becomes imperative. Consequently, the DGRH of the MRN, proposes on a pilot basis, to reactivate and make operational three (03) piezometric boreholes captured in the aquifer, located in the city of Bissau and its coastal zone, in order to be able, among other things, to measure the fluctuations of the levels and chemical quality of water in this major aquifer of the country.

In the implementation phase, gender sensitive activities will be conducted to enable women?s and other peoples in vulnerable situations active participation and employment needs in the implementation of small-scale pilot projects including equal access to and control of resources. Those activities include, among others, the identification of the roles in the pilot activities for which women can be hired, awareness-raising campaigns on the rationale and benefits of engaging women in the pilot enterprises, especially with men, to manage any potential backlash, the provision of Gender-responsive capacity building and technical assistance to men and women so that they can enhance their skills in preventing and managing conflicting water uses.

Institutions involved and beneficiaries:

? Public institutions:

- Directorate General of Water Resources (DGRH), Ministry of Natural Resources (MRN);
- National Electricity and Water Company of Guinea ? Bissau;

- National Public Health Laboratory (LNSP).

? Private sector:

- Companies specializing in the field of drilling;

? Civil society

- Association of Consumers of Goods and Services (ACOBES);

Component 4: Capacity development, Communication and knowledge management

The project will be aligned with the GEF and UNEP Gender Equality Policies, and with the GEF Gender Implementation Strategy. A Gender and Indigenous Peoples Action Plan has been developed based on a preliminary plan developed during the project?s detailed design phase (PPG) to ensure that gender, indigenous peoples and traditional communities? considerations are taken into account through a gender-sensitive approach and through specific activities aimed at strengthening participation.

Additionally, the component will provide evidence-based and effective policies for women?s empowerment and gender equality in water resources management enhance All SMAS countries? performance on gender-sensitive reporting on SDG 6 and capacity to make more visible women?s contribution to the field of water.

The Component will also put in place mechanisms for systematic awareness raising, stakeholder?s participation, gender mainstreaming, coordination and monitoring of progress with the aim of supporting the overall process for enhancing long-term sustainability of project achievements. For doing so, four main lines of action will be implemented:

? ? Stakeholders, including the private sector, awareness and engagement actions held at all levels based on an engagement plan, underpinned by strategic communication plan and actions.

? ? Preparation of Water and Gender and Indigenous Peoples Action Plan and related indicators.

- ? Organisation of training for stakeholders on the intersections of Gender and Water

? ? Events and targeted meetings for the coordination with other ongoing initiatives and projects.

? ? Full participation in GEF IW LEARN activities, creation of a project website, and preparation of experience notes.

In order to ensure effective implementation and, to follow the progress and performance of the project activities, a Monitoring and Evaluation Plan (M&E Plan) will be established and implemented under this component using the GEF tools and approaches in this regard. Indeed, the M&E Plan will integrate two tools, namely (i) the progress monitoring; and (ii) the evaluation of performance and achievement. It will be implemented by the Regional Project Management Unit (under the responsibility of the OSS) with

the support of the UNEP who will prepare all needed in this regard, inter alia, the progress implementation reports (PIRs), midterm reviews (MTR), and terminal evaluation (TE).

Outcome 4.1: Stakeholders? enhanced knowledge and capacity, and women empowerment facilitate coordinated action for the sustainable management of the SMAS.

Under this outcome, gender sensitive stakeholders? capacity building (material and human) will be undertaken, and the project's achievements and learning will be disseminated to a wide range of stakeholders for maximum outreach. There will be an initial capacity building and training needs assessment in the inception period of the project with emphasis on TDA/SAP training as requested by RBOs and countries.

Output 4.1.1. Regional information and data exchange platform for conjunctive water resources management established.

Activities will include development of a Database that will be feeding into the models and supporting the OMVS and OMVG information systems (RBOs do not have comprehensive Database systems covering the groundwater quality and quantity on SMAS).

Output 4.1.2: Communication and Knowledge Management Strategy prepared during the project inception phase and endorsed by the SC in its first meeting.

Activities will include formulating and implementing the project communication and knowledge management strategy, and elaborating communication and knowledge products for dissemination.

Output 4.1.3. Based on a need assessment, capacity building modules (in Database, GIS, Modeling, TDA/SAP, water resources allocation, etc.) organized for member countries and basin organizations.

Activities will include conducting a training needs assessment and identifying the target groups in the countries. Organizing training workshops on various themes (database, GIS, modeling, TDA/SAP, water resources allocation, etc.).

Output 4.1.4. Project results and lessons learned ? in particular those relative to the pilot projects (Component 3) ? disseminated at the local, national, and regional levels through ad hoc interactive learning events

Activities will include organization of annual regional events for project's results sharing and dissemination. This will be part of the Knowledge Management Strategy and promote interactive training and awareness raising of all the key stakeholders including the local and national levels. Implementation of exchanges with other African RBOs that integrate groundwater into the river basins management, in some cases based on legal agreements e.g. Niger Ittas; Orange-Senqu and Stampriet; Limpopo basin and underlying aquifers; etc.

Output 4.1.5. Project visibility improved by the establishment of a project website, and lessons learned shared for broader adoption through cooperation with IW: LEARN, including participation to IWCs, and production of Experience Notes. 1% of the GEF grant will be dedicated to this output.

Output 4.1.6. The project monitoring-evaluation system is developed and implemented

Activities will include the production of progress implementation reports (PIRs), conduct mid-term review (MTR), and terminal evaluation (TE).

1.6. ALIGNMENT WITH GEF FOCAL AREA STRATEGIES

In summary, this proposal will strengthen a concerted and conjunctive management as well as sustainable exploitation of the resources of the Senegalo- Mauritanian aquifer complex through the implementation of appropriate tools following the GEF innovating approach: an TDA/SAP development and its implementation. Therefore, the objectives and interventions of this project are consistent with the GEF-7 programming directions, in particular with objective 3 of the ?International Waters Focal Area?: Enhancing water security in freshwater ecosystems. The project interventions are in particular relevant for three strategic actions under this focal area, namely:

- IW-3-5: Enhance water security in freshwater ecosystems through advance information exchange and early warning;
- IW-3-6: Enhance water security in freshwater ecosystems through enhanced regional and national cooperation on shared freshwater surface and groundwater basins
- IW-3-7: Enhance water security in freshwater ecosystems through investments in water, food, energy and environment security

1.7. INCREMENTAL/ADDITIONAL COST REASONING AND EXPECTED CONTRIBUTIONS FROM THE BASELINE

The funding requested from the GEF will support the implementation of the proposed project interventions, with the overall objective of fostering of transboundary cooperation in the governance and sustainable management of the Senegalo-Mauritanian aquifer and its dependent ecosystems. At the same time, these interventions will contribute to strengthen the resilience to climate variability and change of communities and freshwater ecosystems in the 4 target countries by promoting the conjunctive management of surface and groundwater resources. These transformational changes might not happen without GEF incremental funding.

While GEF funding has been provided in the past for surface water interventions in the Senegal River Basin, including the development of a TDA/SAP and its implementation, the Senegalo-Mauritanian aquifer system has not yet benefited from GEF funding. Interventions relating to this transboundary aquifer complex are rather limited in terms of spatial extension and financial consistency. These interventions are often fragmented and focused on the needs at national level with a lack of consideration of transboundary issues of concern. Sectoral interests of each country often drive planning processes, resulting in insufficient systemic integrated approaches and thereby non-sustainable developments. So far, much of the financing depends on external aid and the sustainability of actions is often not guaranteed. It is expected that the actions planned under the current project will help enhance the achievements of previous GEF international waters initiatives and complement past and ongoing initiatives taken by countries in the national portions of the aquifer basin. GEF support will also increase

the institutional and technical capacity of member countries and the sustainability of interventions, contributing to lasting transboundary benefits. GEF support will fill some significant knowledge gaps and will result in a long-term strategic document (the SAP) for this shared aquifer. The SAP document will guide future investment by national governments or international cooperation partners in order to ensure their alignment with the agreed strategic priorities for the shared aquifer system.

In terms of co-financing, the project partners have pledged their commitments to the implementation of this project. Additionally, a number of key partners such as the World Bank, African Development Bank, the European Union, the Geneva Water Hub, and the UNECE are active in the region and have expressed their interest to contribute and assess options for financial and technical support for the implementation of the project. In the project preparation phase particular attention has been given to the mapping of partners and donors and their contribution to future investment coordination. Considering the current momentum around the work of the Regional Working Group this project will have an opportunity to attract and leverage additional resources and funding.

1.8. GLOBAL ENVIRONMENTAL BENEFITS (GEFTF)

The project area is among the world?s most vulnerable to climate change and the four countries concerned are among the least developed countries in the world. As mentioned, the shared water resources contained in the Senegalo-Mauritania Aquifer System and their dependent ecosystems are of crucial importance in facing the significant environmental challenges from both anthropogenic and natural sources that threaten countries? population. The sustainability of this precious transboundary water resource largely depends on the level of understanding of the Aquifer functioning, and on the establishment of effective transboundary cooperation in the aquifer?s management. The project will address both of these aspects, and hence accrue global environmental benefits in terms of increased transboundary cooperation and ecosystems health.

The water sector has also been identified as one of the most vulnerable sectors in the four countries and its vulnerability affects all other sectors and economic activities. Thus, in order to strengthen the resilience of socio-environmental and economic systems, it is essential to address the challenges of the water sector. This requires, first of all, effective management and governance of these resources. The project interventions are targeted, through the provision of scientific information, knowledge management and development of strategic planning tools to support the processes of concerted, conjunctive management and governance of groundwater in the Aquifer?s basin. With the development of the Transboundary Diagnostic Analysis (TDA) the project will promote more comprehensive knowledge base of the resources and thereby assist to prevent environmental degradation due to overexploitation of water resources and strengthen the resilience of the local populations. Building on the results of the TDA, the agreement on a Strategic Action Program for the Sengalo-Mauritania Aquifer will be facilitated as a key planning tool for OMVS and OMVG and the Regional Working Group. Priorities drawn up by beneficiary countries in a participative consultation process will provide the Basin organizations with a solid framework for identifying, updating and implementing priorities and identifying future funding to address these priorities. These planning tools will contribute to the development of Implementation/Action Plans and investment roadmaps for the Senegalo-Mauritanian

aquifer at the whole aquifer scale and will help to promote appropriate allocations among competing water uses, equitable distribution of benefits and burdens, and participation of all stakeholders concerned (with particular attention given to addressing women and youth) in the sustainability in water resource management.

1.9. INNOVATION, SUSTAINABILITY AND POTENTIAL FOR SCALING UP.

1.9.1. Innovation

This project addresses the sustainable management of an overexploited and threatened transboundary aquifer (The Senegalo-Mauritanian aquifer), and the establishment of an enabling framework for cooperative and concerted governance for this aquifer. The project is the second of this kind supported by the GEF in the Sahel region, coming soon after the one supporting the transboundary Iullemeden Taoude?ni Tanezrouft aquifer. Peculiar of the present project is its being part of a broader context of transboundary cooperation provided by the Regional Working Group, formed by the four countries sharing the aquifer and by the two basin organizations OMVS and OMVG, responsible for the management of the Senegal and Gambia river basins within which the aquifer is almost entirely located, with the objective of advancing towards the institutionalization of conjunctive surface and groundwater management.

In terms of hydro-diplomacy, this project, beyond the aspects of cooperative management of water resources and the environment, will support the ongoing dialogue and collaboration between the riparian countries and communities and provide tools that could preserve peace in the region.

1.9.2. Sustainability

The project's interventions are consistent with each country's water sectoral priorities with a particular emphasis on capacity building, including learning, both for institutional actors and for community and local actors. This aims to guarantee the ownership of the project's achievements and outcomes by the stakeholders. This should give them the ability to preserve, to sustain and to replicate the project achievements later. Particular attention will be devoted to the support of existing cooperative frameworks (Regional Working Group, OMVS, OMVG) and consultation initiatives in the Basin. This project will benefit from the experience of OSS in terms of transboundary aquifer governance mechanisms acquired in the framework of two the GEF IW projects: Northwestern Sahara Aquifer System (NWSAS) and the Iullemeden-Taoudeni/Tanezrouft Aquifer System (ITTAS).

1.9.3. Potential for scaling up

The project intends to support pilot demonstration activities (Component 3 of the project). The pilot activities will address priority issues and will be designed taking into consideration some key criteria, including replicability and scalability. These actions, which will initially be carried out on a limited scale, can be replicated and scaled up in a later process. Best practices and lessons learned from demonstration projects will be disseminated to further promote broader adoption. Similarly, the achievements and lessons learned from the project implementation may be useful for future interventions in other transboundary aquifers and sustainable management of shared waters.

[1] Also referred to as BASM (Bassin Aquif?re S?n?gal Mauritanie)

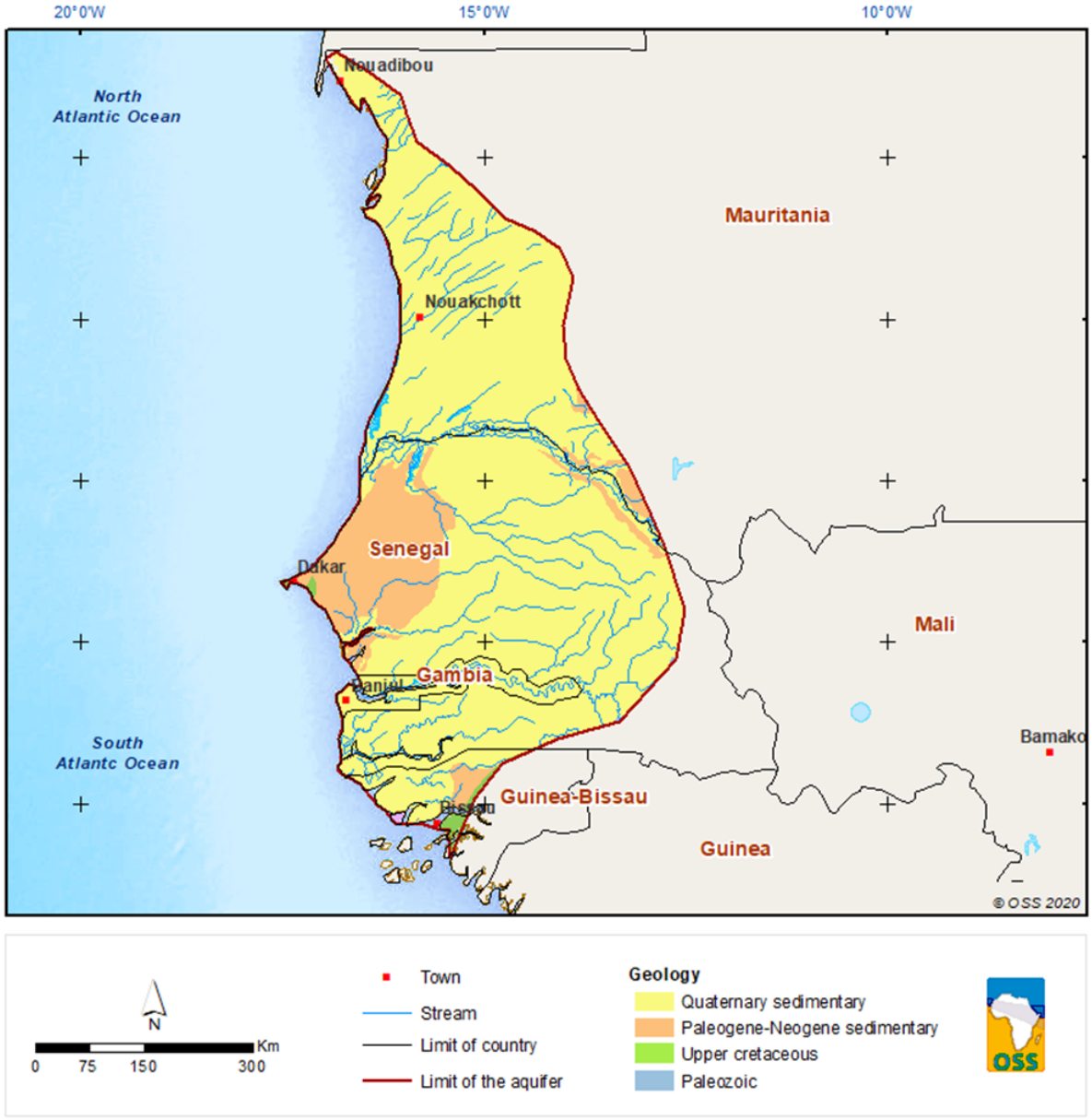
[2] Programme d?Att?nuation et de Suivi des Impacts de l?Environnement

[3] Without modification of the total GEF budget allocation

[4] OSS internal expertise on modeling will be utilized.

1b. Project Map and Coordinates

Please provide geo-referenced information and map where the project interventions will take place.



Hydrogeological framework of the Senegal-Mauritanian Aquifer System

Source of Data: Aquastat, FAO (2011).

1c. Child Project?

If this is a child project under a program, describe how the components contribute to the overall program impact.

N/A

2. Stakeholders

Select the stakeholders that have participated in consultations during the project identification phase:

Civil Society Organizations Yes

Indigenous Peoples and Local Communities Yes

Private Sector Entities Yes

If none of the above, please explain why:

The following table provides a summary of the analysis of institutional, civil society, academia and private sector stakeholders carried out in each of the four project countries during project preparation. It includes a description of the role played by each stakeholder and of the contribution to, and participation in the project. All of them will be in various ways engaged in project execution, either as representatives of the governments in the RWG and the project Steering Committee, as national coordinating bodies of project activities, as data providers, or as beneficiaries of capacity strengthening, or through consultations on specific issues and during the SAP definition and negotiations.

Please provide the Stakeholder Engagement Plan or equivalent assessment.

GAMBIA	
Institution	**Role**
Ministry of Fisheries, Water Resources and National Assembly Matters	To support the project through its supervisory and overall regulatory framework to achieve these goals of the project
Ministry of Environment, Climate Change and Natural Resources	As the focal point for the OMVG in the country, it shall play role in mainstream IWRM principles
Ministry of Agriculture	It supports the identification of key areas of intervention to improve water use efficiency as well as climate smart agriculture
Ministry of Justice	Provide legal advice and sharing of information, data and experience in business entity registration to be

GAMBIA	
Institution	**Role**
(Registration of companies? section)	replicated in the water abstraction registration and licensing
Hydrology Division under the Department of Water Resources	In charge of Water Resources Management and with relatively relevant human resources capacity. Would lead the project implementation with close collaboration and partnership with other stakeholders and partners
Gambia Country Water Partnership	Support policy implementation lobby for the mainstreaming of IWRM into the sectoral plans and programs
NAWEC	Share water supply network coverage, planned expansion. Also share with DWR, water abstraction data for all the pumping sites across the country
Public Utility Regulatory Authority (PURA)	Collaborate in the project implementation through setting up the groundwater exploitation regulation and licensing system especially for drillers, monitoring of household borehole water quality standards and on groundwater quality data management
National Environment Agency (NEA)	Support and strengthen the environmental conservation and hygiene crusade through enforcement of regulations on waste disposal especially of toxic and heavy metals into our groundwater systems (abandoned hand dug well)
Ministry of Health - WASH Unit	Assist in setting up guidelines on proper location/siting of boreholes with keen attention to environmental sanitation and hygiene.
Department of Community Development (DCD)	Mobilization of the local communities and ensure their effective participation through identification of the priority areas for intervention
National Disaster Management Authority (NDMA)	Support in the identification of the vulnerability, exposure and potential risk involved in order to provide guidance on how we could avoid groundwater pollution, depletion and land subsidence disaster happening.
Gambia Chamber of Commerce and Industry (GCCI)	coordinate the private sector participation
Department of Physical Planning	Share experience in the permitting system and possibly incorporate water resources issues in the housing development permitting procedure
Civil Society	**Role**

GAMBIA	
Institution	**Role**
NGO Affairs under the Office of the Vice President, African Centre for Democracy and Human Rights Studies,	Mobilization of potential NGO community to buy in through realignment of programs and activities to achieve the overall goal of this project thereby building synergies with the project
National Women Farmers? Association (NAWFA)	NAWFA is dedicated to improving the economic position of women in The Gambia through capacity building and campaigning for women?s rights, such as improving their capacity to produce more crops and livestock
Association for Development of Women & Children,Association for the Promotion of Women and Girls, Association of Women Entrepreneurs, Foundation for Women?s Research and the Environment,Network of Women in Peace and Security in the ECOWAS Space	The associations are are known for promoting gender rights in the Gambia
National Farmers? Platform The Gambia (NFPG)	The National Farmers? Platform aims to unite farmers from different regions and countries in West Africa. The organization serves as a means to empower farmers to mobilize themselves, engage in meaningful dialogue and advocate for their needs. It facilitates training of its members on the exchange of agricultural technologically innovative methods and knowledge
Academia	**Role**
University of The Gambia	It is the country?s main public university providing specialized and professional training in disciplines including Environmental and Earth Sciences
The Gambia Technical Training Institute (GTTI)/USET	The Gambia Technical Training Institute (GTTI) is a training institution mandated by the Government through an Act of Parliament in 1980 to provide relevant education and life skills to its growing youthful population. GTTI as part of its mandate continues to complement government?s efforts in the attainment of its various development blueprints such as the Recovery Focused National Development Plan (RF-NDP 2023 ? 2027).

GUINEA BISSAU	
Institutional	**Role**

Ministry of Natural Resources/General Directorate of Water Resources	Technical and institutional supervision of the Project
Ministry of Environment and Biodiversity	
Ministry of Foreign Affairs / State Secretariat for International Cooperation	
Ministry of Agriculture and Rural Development	
Ministry of Health/National Public Health Laboratory	
Ministry of Transport and Telecommunications	
National Institute of Meteorology (INM)	
Ministry of Energy/Water and Electricity Company of Guinea ? Bissau (EAGB)	
Regional directorates/decentralized services for water resources, energy, agriculture, health and other technical services in the regions of project intervention whose areas of intervention are interconnected with project activities	Local support structures for the PMU project implementation
Civil Society	**Role**
Community Based Organizations (OCB) UNFPA, UNDP, Association of Economically Active Women (Associa??o das Mulheres com Actividades Econ?micas), Association of Women Agricultural Producers and for Empowerment against Hunger (Associa??o das Produtoras Agricolas e para a Luta Contra o Fome), National Council of Working Women (Conselho Nacional das Mulheres Trabalhadoras), Institute for Women and Children (Instituto de Mulher e Crian?a) INASA National Institute for Public Health (Instituto Nacional de Sa?de P?blica) Ministry of Women, Family and Social Cohesion (Minist?rio da Mulher, Familia e Coes?o Social; Women?s Political Platform (Plataforma Pol?tica das Muheres)	Link between the project and beneficiary communities
The Institute of Biodiversity and Protected Areas (IBAP);	

The Association for Sanitation, Environmental Protection and Water of Bafata (ASPAAB) and other local structures specialized in the management of public water and environment services;	
Guinea-Bissau Red Cross and its decentralized structures	
Association of women exercising an economic activity in Guinea-Bissau and its decentralized structures;	
Student, academic and university associations	
Association of Consumers of Goods and Services of Guinea ? Bissau	
Association of farmers	
Breeders Association	

MAURITANIA	
Institutional	**Role**
Ministry of Hydraulics and Sanitation	Sector steering, Regulation, policies and strategies, action plans, IWRM and project management.
Ministry of Petroleum, Energy and Mines	Supervision of OMVS, identification of water demand for mines, hydroelectricity, supply of energy for hydraulic infrastructures
The Minister of Agriculture	Development of infrastructure for agricultural needs
Ministry of Livestock	Development of pastoral infrastructure
Ministry of Environment and Sustainable Development	Consideration of the sector in the NDC and Integration of climate change in the water sector
Ministry of Interior and Decentralization	Participation of local authorities in the programming, implementation of actions and water

Ministry of Urban Planning	Consideration of water development and management issues in urban development plans
Ministry of Health	Development of standards and monitoring of water quality, access to water and hygiene in health centers.
Ministry of Fisheries and Maritime Economy	Fisheries development
Ministry of Basic Education	Access to water and hygiene in schools
Ministry of Social Action, Childhood and Family	Mainstreaming Gender in the Water Sector
Ministry of Finance	Funding allocation from the national budget
Ministry of Economy	Planning and mobilization of external financing
Ministry of Justice and Finance and Directorate of Land and State Assets	Revision of texts granting women to access to land ownership and management
Ministry of Rural Development, SONADER,	Provide a quota of land to women farmers
Civil Society	**Role**
NGOs Word Vision, OXFAM, ACF, AWN El Moubachir, Tenmiya, UNODC and UNESCO UNFPA Mauritania, the Gender at the Centre Initiative (GCI)	Contribution to the implementation of local actions to improve access to drinking water, and help coordinate gender specific actions

SENEGAL	
Institutional	**Role**
The Ministry of Water and Sanitation	Ensures the management, general coordination of project activities and provides the regulatory and institutional framework for the achievement of project results
Ministry of Environment and Sustainable Development	As a GEF focal point, his involvement in the realization of the project is essential; it is also the guardian of the regulations on discharges, and could contribute to aquifer protection activities
Ministry of Agriculture and Rural Equipment	Agriculture is the sector that potentially uses the most water. The Ministry, in conjunction with its branches, makes it possible to target areas of intervention and better coordinate project activities.
Ministry of Higher Education, Research and Innovation	It can contribute, through its human resources and institutional capacities, to the improvement of knowledge on aquifers
Department of Water Resources Management and Planning (DGPRE)	Conducts general studies relating to water resources, inventory, evaluation, planning and management of water resources, develops the master plan and the water resources management plan; She will manage the project in Senegal
The Hydraulics Department (DH)	Conducts prospective studies, and can provide technical support, on standards for the construction and operation of equipment; it oversees and monitors the public service delegation contracts of OFOR and SONES
The National Water Company of Senegal (SONES)	It is responsible for the planning and execution of drinking water supply projects and programs in urban centers as well as the management of urban water resources. It has the piezometric monitoring data of the Institutional catchment fields, and the monitoring of the extracted volumes, in coordination with SEN?EAU (farmer), whose quality and service performance it controls.
Rural Drilling Office (OFOR)	Manages the heritage of rural hydraulics, in particular the public service of drinking water and all the equipment and works, of which it has data, it monitors the operation of rural hydraulic infrastructures and the quality of the water service. OFOR can also assist in linking up with beneficiary local authorities, but also with private service delegate companies.

Office of Lakes and Watercourses (OLAC)	OLAC is responsible for the development, planning and rational management of the waters of all lakes and inland watercourses, throughout the national territory, excluding the watercourses subject to international conventions. It mainly manages the waters of Lake Guiers and its outbuildings, which supply Dakar with nearly 50% of its needs. It is also responsible for the management of all the protection perimeters of lakes and inland waterways, the qualitative and quantitative monitoring of resources.
SEN?EAU	SEN'EAU has been operating and managing the public drinking water service in urban areas since January 2020. It has been mandated by the State of Senegal through SONES on the basis of an Affermage Contract for 66 urban centers
Local authorities	In urban areas their involvement in the water sector is not obvious. Nevertheless, local authorities often intervene to respond to a social demand from the populations. In rural areas also hydraulics is not in their competence, however the protection of underground and surface water resources is conferred on them. Local authorities can also contribute to the planning of projects and programs in the sector, with the Regional Development Agencies (ARD) which are their technical arm.
Private sector	**Role**
The private sector	Design offices, companies and national and international consulting firms are involved in the delegated project management or project management. They can contribute to improving knowledge of aquifers. Private companies with public service delegation manage the distribution of water, as such they hold data on boreholes, their operation and withdrawals. Large consumers, such as mining companies, can also play a role in providing aquifer data.
Civil society	**Role**
Non-Governmental Organizations (NGOs)	National and international NGOs have strongly contributed to the formation of Senegal's hydraulic heritage, in partnership with local authorities and grassroots community associations. They can assist in the participation and support of beneficiaries

UNIFEM, UNESCO, UNFPA,USAID, ACDI, FAO, UNDP, Centre Genre de la CEDEAO, Committee to Combat Violence Against Women (CLVF), Ginndi Center, Laboratoire Genre ? l?Institut Fondamental d?Afrique Noire/Universite Cheikh Anta Diop de Dakar (appuy? par le CRDI), Observatoire des Droits de la Femme, RADI R?seau Africain pour le D?veloppement Int?gr?, Direction de l?Equit? et de l?Egalit? de Genre	International and national organizations specializing in gender related issues
Users of the drinking water service (ASCOSEN: association of Senegalese consumers, ADEETELS, Associations of Borehole Users - ASUFORs)	Consumer associations address issues that primarily affect tariffs and the handling of user complaints. They are consulted and give their opinion on social connection programs in urban areas. In rural areas, the ASUFORs managed the production and distribution of water, as well as the maintenance of installations and equipment; the State authorizes and supports the delegation of operation to private parties (DSP).

In addition, provide a summary on how stakeholders will be consulted in project execution, the means and timing of engagement, how information will be disseminated, and an explanation of any resource requirements throughout the project/program cycle to ensure proper and meaningful stakeholder engagement

Select what role civil society will play in the project:

Consulted only;

Member of Advisory Body; Contractor;

Co-financier;

Member of project steering committee or equivalent decision-making body;

Executor or co-executor; Yes

Other (Please explain)

3. Gender Equality and Women's Empowerment

Provide the gender analysis or equivalent socio-economic assesment.

Regional overview

Efforts to achieve gender equality have been undertaken in all the four countries sharing the Senegal-Mauritania Aquifer system. There are however differences among the countries in the scope and effectiveness of these efforts, and much remains to be done in all of them in the recognition of women?s role, and their empowerment in water resources supply and management, in particular in rural areas.

Country-Level Gender Assessment

Efforts to achieve gender equality have been undertaken in all the four countries sharing the Senegal-Mauritania Aquifer system. There are however differences among the countries in the scope and effectiveness of these efforts, and much remains to be done in all of them in the recognition of women?s role, and their empowerment in water resources supply and management, in particular in rural areas.

SENEGAL

Senegal?s 2001 constitution guarantees equality between women and men in its article 7. The country has ratified the Convention on the Elimination of All forms of Discrimination against Women (in 1985), and the Optional Protocol on violence against women (in 2000). Senegal ratified the Protocol to the African Charter on Human and Peoples? Rights on the Rights of Women in Africa in 2005. Within the context created by these guiding principles and international laws, the Government of Senegal has made significant progress in the promotion of a gender-sensitive environment, through the adoption of the Parity Law, the Standard Operating Procedures on Gender Based Violence, a National Action Plan Human Rights and the Empowerment of Women, and the validation of the new National Strategy for Gender Equality and Equity. These measures have been developed and implemented under the technical leadership of the Ministry of Woman, Family and Childhood. Adopted in 2014, the Senegal Emerging Plan (PSE) is Senegal?s new development strategy and economic policy reference framework. It is based on three strategic pillars: (i) structural transformation of the economy and growth; ii) human capital, social protection and sustainable development; and iii) governance, institutions, peace and security. A National Strategy for Gender Equality and Equity (SNEEG) has been developed with the support of UN Women Senegal Program Presence to run from 2005-2015. SNEEG, updated in 2016 and aligned with the Senegal Emerging Plan (PSE), which aims to: "Contribute to make Senegal an emerging country in 2035 with a society of solidarity in a state of law, without discrimination, where men and women will have the same opportunities to participate in its development and enjoy the benefits of its growth".

Achieving gender equality and equity in Senegal may seem daunting in a complex socio-cultural environment marked by a strong preponderance of traditional values. However, despite women?s lower social status compared to men, joint efforts paved the way for significant progress that led to a greater recognition of women?s place and contribution to socio-economic growth. Women living in rural areas are highly active in the processing and marketing of agricultural, livestock and fishery products. Nonetheless, they are confronted with several hurdles of various nature, including a number of constraints that are yet to be overcome include:

? ? Access to land and land tenure security;

? ? Access to financing mechanisms;

? ? Access to factors of production and extension services;

? ? Effects of climate change;

? ? Access to markets.

In rural areas, the distribution of employment in different economic sectors reveals women?s involvement in water supply, agriculture, livestock farming and the environment where they represent 70% of the workforce. To mitigate these constraints heightened by climate change in Senegal, there is the need for a holistic support approach to overcome existing obstacles and spur a genuine empowerment of women farmers.

MAURITANIA

Through national policies, Mauritania has sought to empower women in all arenas and positions of leadership, including in legislative, judicial and executive institutions, as well as political parties, civil society organizations, military and security agencies, and businesses. Women have become influential actors who cannot be bypassed in national life. Mauritania remains committed to gender equality as an absolute necessity that it will continue to work to achieve. Mauritania is however a society strongly rooted in tradition. All ethnic groups relegate women and girls to the background in public, political and economic life. Aware that development cannot be achieved by marginalizing more than 51% of the country?s population, the Mauritanian authorities have embarked in recent years on major economic and social reforms aimed at achieving sustainable development. Women have been at the center of these reforms. These initiatives are made possible thanks to the political will of the State but also, and above all, by the various pleas and lobbying of the institutions in charge of the protocols or international conventions ratified by the country, accompanied by dynamic national actors committed to the cause of women. Although the law has allowed the presence of more than 20% of women in decision-making bodies (municipal and regional councils and the National Assembly), it has not allowed these elected women to take up responsibilities within these bodies. At the social level, transformations are taking place that have had an impact on the lives of women in general and rural women in particular. These transformations have affected social structures and created a new context in which women are required to assume responsibilities and take charge of their families. As a result, almost one third of households are headed by women.

Faced with this situation, specific actions are needed to prepare women for the new challenges they must face both politically and economically. This should be done in particular by strengthening their capacities to take on the public role and by improving equitable and secure access for women to productive resources.

GAMBIA

While significant steps have been taken for the empowerment of women through several legislative acts, as well as vigorous efforts to ensure gender parity in primary education, the welfare of the Gambian women continues to lag significantly behind that of men. Government is therefore determined to promote gender equity, equality and empowerment of women and girls for sustained socio-economic development. Key measures under this theme will include gender mainstreaming; capacity development of women entrepreneurs; establishment of a fund to improve access to finance; legislative reforms and

advocacy for enhanced representation and participation in decision making; gender-based violence reduction programs; and abolishing harmful traditional practices, such as female genital mutilation (FGM) and early marriage.

Recent progress can be observed with respect to: the Formation of the Ministry of Women, Family and National Solidarity, which accelerated the approval of the National Gender Policy (PNIEG) and the formulation and implementation of the Plan of Action; increased awareness of women?s role; provision of support by UNWOMEN and UNIOGBIS to strengthen the Women Political Platform (PPN) for the full participation of women in elections, decision making and peace building; consultative and supportive missions by high UN Officials to foster a conducive and enabling environment for elections; and the adoption of the Law to end Female Genital Mutilation (June 2011) and Law to end domestic violence (July 2013).

GUINEA BISSAU

The gender equality status in Guinea-Bissau is characterized by widespread discrimination of women and girls, caught up in traditions and social norms. Inclusive participation of women remains an ongoing challenge. The disparities analysed in the UNDP?s Gender Analysis (2020) revealed the interdependence of inequalities and the intersectional nature of gender and other parameters of marginalization. As main barriers to women?s equality and socio-economic and political empowerment the UNDP study identified:

? ? Lack of institutional capacity for gender mainstreaming;

? ? discriminating policies and laws (property, inheritance etc.);

? ? stark underrepresentation of women in decision-making positions, from the family up to the public administration and the government level;

? ? dominance of traditional gender roles and relationships - subordination of women; disproportionally high illiteracy rates, particularly among rural women;

? ? lack of operational basic health care;

? ? limited access of women to courts and to Justice Centres (CAJs), especially in cases of gender-based violence and sexual abuse due to structural barriers:

? ? fear, stigma, lack of operational protection structures for victims of SGBV;

? ? no societal recognition of domestic work and caregiving; low status of women in agriculture.

Does the project expect to include any gender-responsive measures to address gender gaps or promote gender equality and women empowerment?

Yes

Closing gender gaps in access to and control over natural resources;

Improving women's participation and decision making Yes

Generating socio-economic benefits or services or women Yes

Does the project?s results framework or logical framework include gender-sensitive indicators?

Yes

4. Private sector engagement

Elaborate on the private sector's engagement in the project, if any.

In the four riparian countries of the Senegalo-Mauritanian aquifer, particularly in the Senegal and Gambia river basins, the agricultural and industrial sectors are experiencing a growing trend towards modern irrigation and mechanization. These two sectors are run by private operators for the majority through public-private partnership contracts. These activities entail an increased use of groundwater from the aquifer with significant impacts in terms of quantity and quality in some regions (drastic drop in piezometric levels, saline intrusion, soil salinization, etc.).

The development of agriculture (irrigated agriculture in particular) will intensify in the forthcoming years with regard to the regional political vision in this area. The Dakar Declaration of 2013 made by the High-Level Forum of the six Sahelian countries (Burkina Faso, Mali, Mauritania, Niger, Senegal and Chad) on irrigation has the ambition to "significantly increase investment in agricultural hydraulics to increase from 400,000 hectares today to 1,000,000 hectares by 2020. The realization of this ambitious plan is underway through the establishment of the Regional Project termed ? *Sahel Irrigation Initiative Project (SIIP)* ?. Within the framework of this initiative, the exploitation of groundwater is mainly targeted in the areas where the involvement of private sector in water resources planning and management is of prime importance. This also has the advantage of exploring the potential of the private sector and to create favorable conditions for its contribution to the financing of water resources management.

In the demonstration pilots, private sector operators (e.g. in agriculture) and NGOs will be involved in targeted awareness-raising activities in order to enable them to act as multipliers of proposed options and amplifiers of impacts.

Private sector withdrawals in the context of the Senegal Mauritanian Aquifer system (BASM) include large or conglomerations of small entities/farms, mining, and other industries. These withdrawals can have significant impacts on the aquifer's water balance and the sustainability of the resource.

To engage the private sector, the Senegal Mauritanian Basin Organization (OMVS) has established a framework for cooperation between the public and private sectors. This framework aims to promote sustainable water management practices and ensure that the private sector is engaged in the development and management of the BASM in a way that is consistent with the project's objectives.

One example of private sector engagement in the BASM project is the Agricultural Value Chains Support Project (AVCSP). The project focuses on improving the efficiency and productivity of small and medium-sized farmers in the Senegal River Valley by increasing their access to irrigation water. The

AVCSP is implemented by the Senegal River Basin Development Authority (OMVS) in partnership with the private sector.

Another example is the Mining and Water Resources Management Project (PAEGRM), which aims to strengthen the capacity of the mining sector to manage water resources sustainably. The project focuses on improving water use efficiency in the mining sector, promoting the reuse of water, and reducing the sector's impact on the environment.

Overall, the engagement of the private sector in the Senegal Mauritanian Aquifer project is crucial to ensure the sustainability of the aquifer and its water resources. Through partnerships and collaboration, the private sector can contribute to the project's objectives while also promoting their own economic interests in a sustainable and responsible way.

During the project preparation phase particular attention has been given to identifying the different groups of actors from the private sector that are to be implicated in the formulation and then eventual implementation of the project activities.

A mapping of the entities which can be engaged in the execution of the project shows, according to their field of activities, 4 groupings:

? **Design offices/Consulting firms:** Design offices, companies and national and international consulting firms are involved in the delegated project management. Numerous studies have been entrusted by the public authorities to these private entities; to this end, reports have been produced that gather substantial data on water resources in general, and on groundwater resources in particular. From this point of view, these consulting firms have the practice and expertise that can be put to good use; they can thus contribute to the activities of improving the knowledge of aquifers, as service providers.

? **Private companies delegated to provide public services:** The private companies delegated with public services manage the distribution of water, and as such, the service providers have access to more up-to-date data and information on the functioning of groundwater wells, on withdrawals, but also on the quality of the aquifers tapped.

? **Mining and industrial companies:** Mining companies can also play a role in the provision of aquifer data. Whether it is in the exploitation of phosphate and zircon mines or the chemical industries in the Niayes area (in Senegal), their activities pose threats to water resources.

? **Agricultural users:** Agricultural users are also mainly actors, especially in the Niayes area (in Senegal) where small producers operate. Withdrawals are marginal compared to other uses (water supply, mining/industry), but the area is very vulnerable to pollution.

The project will pay particular attention to involving the private sector to support in the development of its activities.

During the project inception phase a more detailed assessment of the private sector role and of the ways to engage it in project execution will be conducted. A clearer picture will be defined of ? as relevant (i) the participation of the different private stakeholder groups (local small holders and larger industrial or agricultural private sector entities) in the implementation of innovative efficient water use systems, and (ii) how the project intends to support the mobilization of finance for the private sector.

The involvement of the private sector will be done from the beginning of the project through a national information and exchange seminars on the project activities. The process can be done through a platform for dialogue (such as the National Water Partnership of Senegal - PNES) between 7 interest groups: (1) Governmental institutions and basin organizations, (2) Private sector, (3) Associations of elected officials (national representation and local authorities), (4) Women's and youth associations, (5) User associations and groups, (6) Research and training institutions, (7) NGOs.

5. Risks to Achieving Project Objectives

Elaborate on indicated risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and, if possible, the proposed measures that address these risks at the time of project implementation.(table format acceptable):

Risks	Level	Mitigation
High level of water abstraction from agricultural activities increasing due to higher pressure from private investors Impacting on aquifer	Moderate/Significant	The Regional Working Group for the Senegalo Mauritanian Basin will provide the platform for cooperation, communication and targeted awareness raising and work with the relevant stakeholder groups to sensitize the actors to water resources vulnerability and impact of climate changes and anthropogenic activities on the water resources. This will be supported by the consultations facilitated by the Regional Basin Organisations (OMVS and OMVG). The project development of the SAP will further assist in identifying alternative scenarios for private investors.
Political and Institutional risks	Moderate	Cooperation between countries is good. But the conflict between Casamance and the Senegalese government may resurface, linked to the land problem, unemployment, etc. The Casamance maquis have long used the borders of their landlocked region, Guinea-Bissau to the south and Gambia to the north, as rear bases where they can withdraw and obtain supplies, or even find support. (Marut, 2008, p. 2)[1]. There were no tensions reported since years and during the PPG phase[2]. Working closely with the Project Steering Committee and Regional Working Group and relevant government offices and mandated partners to resolve any issues to be addressed. Ensure regular meetings of efficient coordination mechanisms (Steering committee, technical direction, national coordination unit, etc.) and adaptive management measures.

Risks	Level	Mitigation
Climate variability and/or climate change impacts on functioning of the aquifer system	Moderate	Efforts will be made to understand the functioning of the aquifer system and the expected impacts of climate variability and change, which will be considered in the planning and management of the system (component 1)
Weak adhesion to regional governance structures or national contributions fail to materialize	Medium	Efforts will be made in project implementation to raise awareness about the responsibilities of adhering to such regional governance mechanisms. The signing of the Ministerial Declaration for the SMAS continues to strengthen the Regional Working Group as the regional governance structure and with the convening role for water cooperative management through regional bodies OMVS or OMVG for surface shared water will facilitate commitments from countries concerned.
Countries and the Regional bodies (OMVS and OMVG) show little political will for conjunctive water management approach	Medium	The signing of the Ministerial Declaration for the SMAS continues to strengthen the Regional Working Group as the regional governance structure and with the convening role for water cooperative management through regional bodies OMVS or OMVG Following the assessments from the baseline project, the project will create awareness about the linkages and interdependencies between the surface water (mainly Senegal and Gambia River) and the Senegalo-Mauritanian Aquifer System (SMAS). Policy and governance activities in components 1 and 3 will reinforce and enshrine these linkages in regional and national policies, strategies and plans.
Low participation of communities, specifically women	Low/medium	A stakeholder?s participation plan has been developed during PPG and applied during project implementation. Key gender markers indicators will be developed and monitored

COVID related adaptive management, risks and opportunities.

Successful implementation of the project will result in increased resilience against future pandemics in the region. During the project implementation phase, we will prioritize the prevention and management of pandemics in the project area. Proactive measures will be taken in accordance with UNEP Environmental and Social Sustainability Framework (ESSF), specifically those outlined in Section 4.2 on ?Community Exposure to Health Issues? and 4.7 on ?Emergency Preparedness and Response?.

The project?s expected outcomes will support opportunities to increase participating countries' resilience to future pandemics by improving water availability and quality for public health purposes, and by fostering regional cooperation and coordination. Investing in sustainable transboundary aquifer management can contribute to more resilient and prepared communities, better equipped to respond to the challenges of pandemics and other water-related risks.

The project will give particular attention to developing an adaptive management strategy for dealing with the COVID 19 pandemic, both ensuring the safe and efficient implementation of project activities in terms of partners participation in meetings, trainings and capacity building as well as smooth implementation of the pilots on the ground. In that context the project will respect the specific national COVID measures and provide guidance for regional activities to be optimally implemented (i.e.: hybrid meetings with access to internet and translation offered where in presence is not possible; stakeholder consultations online, regrouping of meetings to avoid multiple travel and through special facilitation of circulation and clearance of documents).

This might also include supporting the smooth implementation of the activities on the ground to respond to local and regional water management needs, the possibility of hybrid meetings to ensure maximum flexibility in the participation of consultation processes for the TDA and in particular SAP. As the region works through and beyond the COVID-19 pandemic, the scope of interest for regional cooperation and guidance will play an important role. The RBOs for example, have an important convening potential to regroup stakeholder meetings at regional level and provide a solid and well-known framework for coordination for the participating countries. The project activities themselves provide opportunities for addressing COVID related concerns when developing the options for the Basins groundwater management and future conjunctive water management. The River Basin Organizations will have an important role to play in guiding countries and other partners involved in the implementation of the project activities on the necessary capacity building support, to jointly identify and integrate risks associated with the COVID 19 pandemic.

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[1] Marut, J.-C. (2008). *Guin?e-Bissau, Casamance et Gambie: Une zone ? risques*. ISSOpinion, Institut d?Etude de S?curit? de l?Union Europ?enne

[2] Paul Di?dhiou (2022) : Paul Di?dhiou e Eug?ne Tavares, ? Le Conflit de Casamance : Comprendre les motivations individuelles d?enr?lement des nationalistes du MFDC?, *Cadernos de Estudos Africanos* [Online], 42 | 2022

6. Institutional Arrangement and Coordination

Describe the institutional arrangement for project implementation. Elaborate on the planned coordination with other relevant GEF-financed projects and other initiatives.

The four countries together with the two main River Basin Organizations (OMVS and OMVG) and the support of key partners, will be guided by the vision and roadmap of the Regional Working Group (RWG) to ensure alignment with a long term sustainable transboundary cooperation for the concerted management of the SMAS. This current UNEP led project will support the commitments made in the context of the Regional Working Group by the two Basin organizations and the riparian countries.

Since the OMVS and OMVG and their Member States will be driving the regional governance process of the Aquifer, they will be fully involved in the implementation of this project and will lead a number of key governance related activities. According to their mandates and experience, they will have key roles in the execution of the project activities. The key institutional governance organizations that will be strengthened through the activities of this project are the two Basin organizations (OMVS and OMVG) that will lead and implement key activities such as the pilot demonstrations and facilitating the multi-stakeholder consultations related to the governance activities. UNECE and GENEVA Water Hub will be supporting OMVS and the OMVG on the governance aspects as well as capacity building and project communication. OSS will be mainly in charge of the component 1 activities on TDA/SAP due to its extensive technical experience on the topic. In this context, IGRAC could be the main technical partner for scientific tool development (database, modeling, etc.). In each country, the technical departments of Ministries in charge of water will be the key actors of the field activities implementation.

Governance and Management Arrangements

General roles and responsibilities in the projects? governance mechanism:

Executing Partner (OSS)

The Executing Partner is the entity to which UNEP has entrusted the implementation of UNEP assistance specified in this project document along with the assumption of full responsibility and accountability for the effective use of UNEP resources and the delivery of outputs, as set forth in this document.

The Executing Partner is responsible for executing this project. Specific tasks include:

? Project planning, coordination, management, monitoring, evaluation and reporting. This includes providing all required information and data necessary for timely, comprehensive and evidence-based project reporting, including results and financial data, as necessary. The Implementing Partner will strive to ensure project-level M&E is undertaken by national institutes and is aligned with national systems so that the data used and generated by the project supports national systems.
? Overseeing the management of project risks as included in this project document and new risks that may emerge during project implementation.
? Procurement of goods and services, including human resources.
? Financial management, including overseeing financial expenditures against project budgets.
? Approving and signing the multiyear workplan.
? Approving and signing the combined delivery report at the end of the year; and,
? Signing the financial report or the funding authorization and certificate of expenditures.

Responsible Parties

The officially appointed members of the Regional Working Group will be participating in the Project Board/Steering Committee. In this way, practically the RWG will be the Project Board/Steering Committee of the project.

Project governance structure

The executing partner (OSS) will supervise activities with the aim of achieving project outcomes and for the effective use of UNEP resources. It will have the responsibility to secure the establishment and supervision of the Project Coordination Unit (PCU). Matrix on management responsibilities agreed between UNEP GEF, and OSS will be developed during the project inception meeting.

The project organisation structure is shown in Figure below.

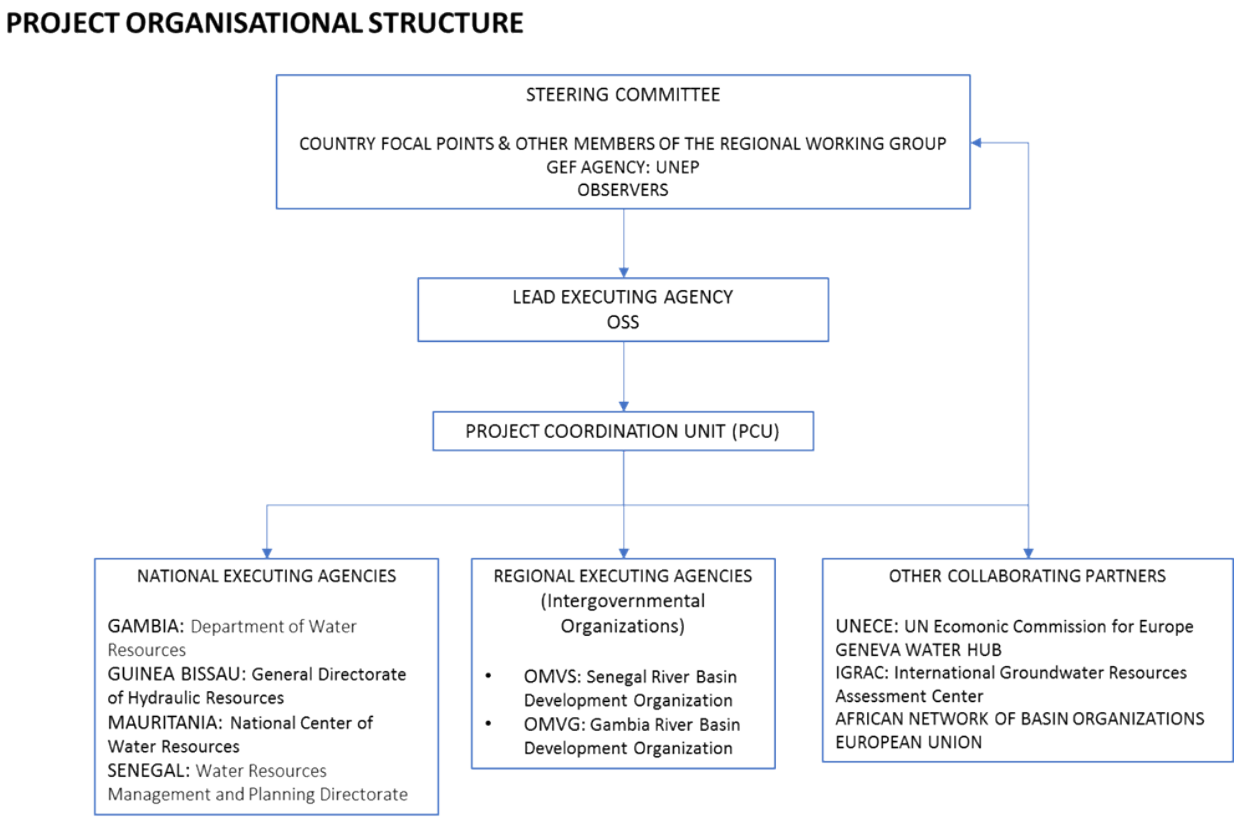

Figure 6. Project organizational structure

The **Project Board / Steering Committee** (PSC).

The Project Board (also called Project Steering Committee) is responsible for taking corrective action as needed to ensure the project achieves the desired results. In order to ensure UNEP?s ultimate accountability, Project Board decisions should be made in accordance with standards that shall ensure management for development results, best value money, fairness, integrity, transparency and effective international competition.

In case consensus cannot be reached within the Board, the UNEP Representative (or designate) will mediate to find consensus and, if this cannot be found, will take the final decision to ensure project implementation is not unduly delayed.

Specific responsibilities of the Project Board include:

? Provide overall guidance and direction to the project, ensuring it remains within any specified constraints;
? Address project issues as raised by the project manager;
? Provide guidance on new project risks, and agree on possible mitigation and management actions to address specific risks;
? Agree on project manager?s tolerances as required, within the parameters set by UNEP-GEF, and provide direction and advice for exceptional situations when the project manager?s tolerances are exceeded;
? Advise on major and minor amendments to the project within the parameters set by UNEP-GEF;
? Ensure coordination between various donor and government-funded projects and programmes;
? Ensure coordination with various government agencies and their participation in project activities;
? Track and monitor co-financing for this project;
? Review the project progress, assess performance, and appraise the Annual Work Plan for the following year;
? Appraise the annual project implementation report, including the quality assessment rating report;
? Ensure commitment of human resources to support project implementation, arbitrating any issues within the project;
? Review combined delivery reports prior to certification by the implementing partner;
? Provide direction and recommendations to ensure that the agreed deliverables are produced satisfactorily according to plans;
? Address project-level grievances;
? ensure gender mainstreaming according to workplans in the development and implementation of project activities;

? Approve the project Inception Report, Mid-term Review and Terminal Evaluation reports and corresponding management responses;
? Review the final project report package during an end-of-project review meeting to discuss lesson learned and opportunities for scaling up.

The composition of the Project Board must include the following roles:

a. Project Executive: an individual who represents UNEP ownership of the project and chairs the Project Board.
b. Beneficiary Representative(s): Individuals or groups representing the interests of those who will ultimately benefit from the project. Their primary function within the board is to ensure the realization of

project results from the perspective of project beneficiaries. The Beneficiary representative (s) will be identified during the inception of the project

c. Executing Partner (OSS): Individuals or groups representing the interests of the parties concerned that provide funding and/or technical expertise for the project.

d. Project Assurance: UNEP performs the quality assurance role and supports the Project Board and Project Management Unit by carrying out objective and independent project oversight and monitoring functions. This role ensures appropriate project management milestones are managed and completed. The Project Board cannot delegate any of its quality assurance responsibilities to the Project Manager.

National Governments? representatives on the Project Board are responsible for making by consensus management decisions when guidance is required to the project, including recommendation for UNEP/OSS approval of project plans, revisions and budget. The Chair of the PSC will be agreed on a meeting-to-meeting basis and will rotate between the four SAMS countries, UNEP will co-chair the meetings.

A face ? to ? face meetings of the PSC will be held annually and will take place at rotation between OMVS and OMVG.

The Project Manager will operate under the supervision of the Executing Partner and will take care of the project activities in the region on a day-to-day basis. The Project Manager?s prime responsibility is to ensure that the project produces the results specified in the project document, to the required standard of quality and within the specified constraints of time and cost. The project manager will prepare the reports to be presented to the the PSC. The Project Manager will secure to establish a close coordination with the national authorities? offices and national and regional consultants for the implementation of the project activities. The Project Manager function will end when the final project terminal evaluation report and corresponding management response, and other documentation required by the GEF and UNEP, has been completed and submitted to UNEP (including operational closure of the project). The Project Manager will be located at the Lead Project Executing Unit (PEU). The project Manager will supervise the activities of the project coordinator to be installed at the Project Coordination Unit (PCU). The Project Manager will be internationally recruited by the Executing Partner jointly with UNEP/GEF.

Project Coordination Unit (PCU): An operative Inception meeting/first meeting of the Steering Committee (SC) will be organized at the beginning of the project implementation phase. The first meeting of the SC of the project will review received proposals and decide on the location of the PCU. The PCU should be hosted within one of the beneficiary countries and facilities available should assure the functioning of the Unit. At the inception meeting/first meeting of the SC, the countries and all project partners will discuss and contribute to the preparation of the detailed workplan of the activities of the project. It is foreseen that an international recruitment will be launched by OSS to identify the most suitable expert to work as Project Coordinator at the PCU location. The Project Coordinator will operate under the supervision of OSS at the PCU and will coordinate with national institutions, national and regional consultants and take care of the project activities on a day-by-day basis.

Building on the MoU between OMVS and OMVG to host the Secretariat for the RWG in the OMVS, the PCU of the SMAS project will be hosted in the RWG Secretariat. Special responsibility for gender mainstreaming is provided by a dedicated gender and safeguards specialist as part of the PCU.

Country Execution Teams: Will include national staff responsible for executing/coordinating national activities throughout all components.

National executing agencies will be engaged in all activities on national and local levels. They will nominate a national counterpart focal point/s (expected the National Director in charge of water resources management) and provide in-kind/staff time support to the project (such as the expert in charge of Data collection and Database management, hydrogeologist, etc.).

The National Focal Point (NFP) will facilitate the missions of the consultants in the corresponding country, to significantly contribute to the development of the TDA / SAP process, in particular through the activities of the national inter-ministerial committees, the working groups for the development of National Action Plans (NAP) of surface and groundwater conjunctive management, and the National working groups for the formulation of the Strategic Action Program (SAP).

UNEP is accountable to the GEF for the implementation of this project. This includes oversight of project execution to ensure that the project is being carried out in accordance with agreed standards and provisions. UNEP is responsible for delivering GEF project cycle management services comprising project approval and start-up, project supervision and oversight, and project completion and evaluation. UNEP is also responsible for the Project Assurance role of the Project Board/Steering Committee.

7. Consistency with National Priorities

Describe the consistency of the project with national strategies and plans or reports and assesments under relevant conventions from below:

NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, INDCs, etc.

This project is consistent with the national priorities of the -four countries as stipulated in their sectoral development plans and strategies. These priorities concerns include mainly water resources management, food security through irrigation, wetland management and conservation, land degradation, institutional capacity building.

Gambia national priorities

The proposed project takes into account the policy and strategic orientations of the Government of The Gambia regarding the management and development of the country's water resources. The main sectoral strategic documents include in particular: *The Gambia's "Vision 2020", the National Development Plan (NDP) (2018-2021), the Water Policy (2006), the Sanitation Policy (2015-2020), the National Adaptation Programme of Action (NAPA) and the Agricultural Policy*. In all these documents, the issue of water is recognized as a priority for the Government whose vision for the sector is : "improved equitable access to safe and affordable water and sanitation, proper hygiene practices and environmental protection for all". To achieve this, the Government aims to improve water governance and to address the impacts of climate change on water resources. In agricultural sector, the Gambian Government ambition is to increase irrigation protection, particularly through groundwater uses to reduce future water shortages impacts and stress on the agricultural productivity.

After the enactment of a first National Policy for the Advancement of Gambian Women (NPAGW) in 1999, the Gambia further adopted a 2010 -2020 Gender Policy whose aims is to ?improve the life of all Gambians (meaning men, women and children) through the elimination of all forms of gender inequality by concrete gender in development measures[1]?. The gender policy priority areas are:

? Gender and Education

? Gender and Health

? Gender and Sustainable Livelihoods Development

? Gender and Governance ?

Gender and Human Rights ?

Poverty Reduction and Economic Empowerment

Guinea Bissau national priorities

Water sector is considered as priority by the Bissau Government and a wide range of policies, strategies and plans have been designed and adopted to address challenges regarding water resources management issues. These are among others:

? Guinea-Bissau?s Poverty Reduction Strategy Paper (2007), which stressed the importance of food security and water availability as fundamental goals in the fight against poverty;
? The Water Master Scheme (1997) encompasses actions regarding the rehabilitation and expansion of water; infrastructures, noting the important role played by water resource management in the agricultural sector;
? Strategy for Water Supply and Sanitation with reference to MDGs (final draft 2010);
? The Water Code, also approved by Government in 1992 sets out the general framework for water resource management, utilisation and conservation, and defines their institutional framework;
? The 2010-2020 Water and Sanitation Master Plan;
? National Plan for Natural Resource Management;
? National Environmental Management Plan (2004);
? Programme of Action to Fight Drought and Desertification (2006, 2011);
? Coastal Zone Master Plan (1993);
? Sustainable Financing Strategy of Adaptation to climate change in the short, medium and long term (2013).

Bissau Guinea adopted a National Policy for Gender Equality and Equity in 2014 that seeks to promote equity in all sectors. Additionally, the UNDP country report shows that its country programme contributes to Sustainable Development Goals 1, 3, 4, 5, 8 and 17, and is aligned with the UNFPA Strategic Plan, 2022-2025. And as such, it contributes primarily to ending unmet need for family planning and, secondarily, to reducing preventable maternal death and gender-based violence and harmful practices[2].

The current proposal is consistent with the priorities of these national policy and strategy instruments and will contribute substantively to their implementation.

Mauritania national priorities

The water and sanitation sector remain as a priority in Mauritania's development policy. The country has been promoting the IWRM process for decades, particularly through the *Organisation pour la Mise en Valeur du Fleuve S?n?gal (OMVS)* since 1972. The government has also set up a political, legislative, institutional and general framework that is adapted to the sectoral challenges. The main available instruments include:

? The ?*Strat?gie de Croissance Acc?l?r?e et de Prosp?rit? Partag?e (2016 - 2030)*? adopted in 2016. Water is one of the pillars of this framework document;
? The Water Code (2005), in coherence with other relevant sectoral laws (environment, agriculture, health, etc.), provides the framework for water sector legislation;
? The National Strategy for Sustainable Access to Water and Sanitation (SNADEA ? 2030). It was adopted in 2016 with 5 strategic axes (***Axis 1:*** to know, to monitor and to protect water resources; ***Axis 2:*** to provide access to drinking water to most people; ***Axis 3:*** to improve access to water for agriculture and livestock; ***Axis 4:*** To improve access to sanitation and hygiene; ***Axis 5:*** To improve sectoral governance). This strategy emphasizes the major challenges related to integrated water resource management, particularly in terms of knowledge, monitoring and protection of water resources. This strategy has tight link with other sectors (agriculture, environment, health) orientations of strategies.

Mauritania has also developed a National Action Plan on Gender Based Violence (2014-2018) and a ***National Strategy for the Promotion of Women*** (***2015-2019***) and both policies aim to provide greater protection for women and young girls.

The project is in line with the efforts made by the Government to achieve the objectives contained in these various strategic orientation documents.

Senegal national priorities

The Government of Senegal has adopted an action plan for IWRM (PAGIRE) with an IWRM Priority Action Program (PAP-IWRM) covering the period 2008-2015 for its first phase. The second phase of the plan implementation covers 2018-2030. The plan has five (05) strategic objectives, as follows:

? To strengthen water resources governance and management instruments.
? To preserve water bodies' integrity and sustainably improve the water quality and services.
? To promote integrated and sustainable water management in a Climate Change context.
? To promote water valorization for growth and food security.
? Improve and disseminate knowledge on water resources.

The PAGIRE considers the new issues and challenges related to the implementation of the orientations of the Sectoral Development Policy Letter (LPSD) 2016-2025, the requirements related to the implementation of the Sustainable Development Goals (SDGs), participatory water governance, gender and climate change.

In the environmental area, the PAGIRE promotes the necessity to preserve and sustainably protect aquatic resources and ecosystems against pollution from various sources and overexploitation, and to mitigate the effects of climate change on the renewal freshwater bodies and on water and sanitation services.

In addition, national climate-related policies and plans identify water as core priority for enhancing adaptation and resilience to climate change. Indeed, the UNFCCC First National Communication (1997) and Senegal's National Adaptation Programme of Action (NAPA) (2006) recognized water resources as a key sector for short and medium-term interventions to address the effects of climate change. Specifically, the NAPA identifies improving water retention capacity and increasing irrigation efficiency as key activities to address the effects of climate change on water resources. The NAPA also clearly identifies the links between climate change, induced water scarcity and groundwater depletion and the increased risks of reduced agricultural production and food insecurity. In 2009, the government further specified the type of activities to be supported and revised the costs associated with adaptation activities related to watershed management and water efficiency.

The current proposal supports the implementation of the priorities contained in all of these different strategies that are listed above.

Consistency with international relevant conventions and regional sectoral strategies

The project is consistent with and will contribute to the implementation of the three Rio Conventions on Biological Diversity (CBD), the United Nations Framework Convention on Climate Change (UNFCCC) and the United Nations Convention to Combat Desertification (UNCCD). The 4 countries are all signatories to these conventions and have adopted various national instruments for the implementation of these conventions. All the conventions and the associated implementation instruments recognize water as a central element of their respective objectives.

The project is also consistent and will contribute to the implementation of the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention). Senegal and Guinea Bissau are Parties to the Water Convention; the other two countries are considering accession.

At the regional level, the project is in line with the African Water Vision 2025 to which the 4 countries have adhered. This vision is stated as follows: "An Africa where water resources are used and managed in an equitable and sustainable manner for poverty reduction, socio-economic development, regional cooperation and environmental protection. It encourages the strengthening of knowledge and regional cooperation for the sustainable management of shared water bodies. The interventions of the project will also enable the implementation of the 2018-2023 strategy of the African Ministers' Council on Water (AMCOW) and that of African Network for Basin Organization (ANBO) 2020-2024. These two strategies focus on groundwater management and governance in view of their strategic role in meeting the water needs of African countries.

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[1] https://www.ilo.org/dyn/travail/docs/1958/Gambia%20national%20gender%20policy.pdf

[2] United Nations Population Fund Country programme document for Guinea-Bissau

8. Knowledge Management

Elaborate the "Knowledge Management Approach" for the project, including a budget, key deliverables and a timeline, and explain how it will contribute to the project's overall impact.

To share the knowledge generated from this project the following strategic approach will be refined during the initial phase of the project.

A detailed knowledge management and communication strategy will be prepared during the inception phase of the project, and submitted for approval at the first Steering Committee meeting. Its implementation will then start and continue throughout the project duration.

To optimize knowledge exchange and establish network between the project partners and basin stakeholders and, links will be established with the IW-Learn and with the knowledge management and communication activities planned for the RWG.

The approach will include:

? Use of the GEF IW Learn tool, which will be strongly used to learn from other similar experiences;
? Implementation of a web platform, as in other projects, to disseminate the results and achievements of the project. Data and information generated by the project will be systematically shared on this platform as well as on the project main executing partners websites, particularly OSS, OMVS and OMVG.
? Communication around project results. This project combines science and development and will promote the production of high-level scientific information for the benefit of decision-makers. To strengthen and maximize the assets and opportunities, Universities and Research Centers will be strongly involved in the implementation of the project. In each of the countries, a Scientific Committee will be set up within this framework. Scientific information will be presented during international events (workshops, seminars, symposia, GEF conferences on international waters, etc.) and published in high impact scientific journals. It is also in the interest of maximizing the sharing of the knowledge capital generated by the project with beneficiaries and various audiences beyond the countries and project area.
? Development and strengthening of mechanisms for information, data, monitoring indicators and best practices exchanging between countries. The Gender expert will work together with the consultant in charge of the knowledge management and communication strategy to ensure that the different needs of women and men in the development of project information and engagement schedules are taken into account;
? Drawing upon the participation of female and male practitioners in the development and review of project products in order to provide evidence-based and effective policies for women?s empowerment and gender equality in water resources management enhance All SMAS countries? performance on gender-sensitive reporting on SDG 6 and capacity to make more visible women?s contribution to the field of water;
? Using gender-sensitive language and gender-balanced images by Preparing gender-sensitive and culturally appropriated messages to include in the communication plan, including gender related climate change spots to be broadcasted by local radios in the intervention sites;

? Disaggregating data by sex" by aiming at a balanced number of participants, and second, by assessing men and women?s scientific needs for meaningful participation in GEF IW Learn tool and learning platform and finally, organizing training workshops in ways suitable for women?s schedules and needs, childcare for example.

Through its activities, particularly those planned under component 3, the project will implement the various actions described above. An appropriate budget (at least 1% of the total project budget, as required by the GEF) will be allocated to ensure the proper implementation of the knowledge management activities through IW: LEARN and the following non-exhaustive list of activities will be considered:

- collect and share best practices, lessons learned, and innovative solutions to common problems across the GEF International Waters portfolio through the Global Environment Facility's (GEF) International Waters Learning Exchange and Resource Network (IW:LEARN).

The Project will specifically contribute to, and participate in, the following IW:LEARN activities:

Participation in the GEF International Waters Conferences (landmark biannual events of the IW portfolio), with representation from the riparian countries and members of the PCU.

Production of Experience Notes (short case studies) to showcase worthy results and particular topic of relevance.

Use of IW:LEARN website toolkit to build the project website, which will ensure coherent styling of online presence with GEF IW portfolio and sustainability (though hosting provision) after project completion.

Participation to IW:LEARN Twinning. learning exchanges and other knowledge events with other GEF relevant projects and programmes.

Contribution to the knowledge portal IW:LEARN.net with specific content (e.g. updated SAP, trans-boundary data and maps, State of Lake reports, etc.).

Contribution to social media, news, events, etc.

Participation in GEF Communities of Practice (CoPs), when relevant

These public awareness, communications and knowledge management activities will be further complemented by the implementation of the Project?s Stakeholder Engagement Plan (see Appendix 3).

9. Monitoring and Evaluation

Describe the budgeted M and E plan

Project results, corresponding indicators and mid-term and end-of-project target will be monitored annually and evaluated periodically during project implementation to ensure that the project achieves the expected results. Baseline data for some indicators that are not yet available will be collected during the first year of project implementation. The Monitoring Plan below details the roles, responsibilities, and frequency of monitoring project results. Project-level monitoring and evaluation will be undertaken in compliance with UNEP requirements. UNEP will work with the relevant project stakeholders to ensure UNEP M&E requirements are met in a timely fashion and to high quality standards.

The cost M&E plan included below will guide the GEF-specific M&E activities to be undertaken by this project.

In addition to the mandatory UNEP and GEF M&E requirements, other M&E activities deemed necessary to support project-level adaptive management will be agreed during the Project Inception Workshop and will be detailed in the Inception Report. These activities may include UNEP guidance regarding adoption of remote monitoring approaches and M&E procedures should the COVID-19 pandemic continue throughout project implementation.

Oversight and monitoring responsibilities

Project Manager: The Project Manager is responsible for day-to-day project management and regular monitoring of project results and risks, including social and environmental risks and of the staff and the team of the project. The Project Manager will ensure that all project staff maintain a high level of transparency, responsibility and accountability in M&E and reporting of project results. The Project Manager will inform the Project Steering Committee and the UNEP-GEF of any delays or difficulties as they arise during implementation so that appropriate support and corrective measures can be adopted.

The Project Manager will develop annual work plans, including annual output targets to support the efficient implementation of the project. The Project Manager will ensure that the standard UNEP and GEF M&E requirements are fulfilled to the highest quality. This includes, but is not limited to, ensuring the results framework indicators are monitored annually in time for evidence-based reporting in the GEF PIR, and that the monitoring of risks and the various plans/strategies developed to support project implementation (e.g. gender strategy, knowledge management strategy etc.) occur on a regular basis.

Project Board / Project Steering Committee (PSC): The PSC will take corrective action as needed to ensure the project achieves the desired results. The PSC will hold project reviews to assess the performance of the project and appraise the Annual Work Plan for the following year. In the project?s final year, the PSC will hold an end-of-project review to capture lessons learned and discuss opportunities for scaling up and to highlight project results and lessons learned with relevant audiences. This final review meeting will also discuss the findings outlined in the project terminal evaluation report and the management response.

Project Executing Partner (OSS): The Executing Partner is responsible for providing all required information and data necessary for timely, comprehensive and evidence-based project reporting, including results and financial data, as necessary and appropriate. The Executing Partner will set annual targets, ensures they are on track and report them on regular basis in line with the M&E requirements for the project. OSS will regularly provide and retain all M&E records for this project for up to seven years after project operational closure in order to support ex-post evaluations undertaken by the UNEP Independent Evaluation Office (IEO) and/or the GEF IEO.

Additional GEF monitoring and reporting requirements

Inception Workshop and Report: A project inception workshop will be held within 2 months from the First disbursement date, with the aim to:

1. Familiarize key stakeholders with the detailed project strategy and discuss any changes that may have taken place in the overall context since the project idea was initially conceptualized that may influence its strategy and implementation.
2. Discuss the roles and responsibilities of the project team, including reporting lines, stakeholder engagement strategies and conflict resolution mechanisms.
3. Review the results framework and monitoring plan.
4. Discuss reporting, monitoring and evaluation roles and responsibilities and finalize the M&E budget; identify national/regional institutes to be involved in project-level M&E; discuss the role of the GEF OFP and other stakeholders in project-level M&E.
5. Update and review responsibilities for monitoring project strategies, including the risk log; SESP report, Social and Environmental Management Framework and other safeguard requirements; project grievance mechanisms; gender strategy; knowledge management strategy, and other relevant management strategies.
6. Review financial reporting procedures and budget monitoring and other mandatory requirements and agree on the arrangements for the annual audit.
7. Plan and schedule Project Board meetings and finalize the first-year annual work plan.
8. Formally launch the Project.

The Project Manager will prepare the inception report no later than one month after the inception workshop. The inception report will be cleared by the Executing Partner, the UNEP-GEF, and will be approved by the PSC.

GEF Project Implementation Report (PIR): The Project Manager, Implementing Partner and the UNEP-GEF Regional Technical Advisor will provide objective input to the annual GEF PIR covering the reporting period July (previous year) to June (current year) for each year of project implementation. The Project Manager will ensure that the indicators included in the project results framework are monitored annually in advance of the PIR submission deadline so that progress can be reported in the PIR. Any environmental and social risks and related management plans will be monitored regularly, and progress will be reported in the PIR. The PIR submitted to the GEF will be shared with the PSC. UNEP will coordinate the input of the GEF Operational Focal Point and other stakeholders to the PIR as appropriate. The quality rating of the previous year?s PIR will be used to inform the preparation of the subsequent PIR.

Lessons learned and knowledge generation: Results from the project will be disseminated within and beyond the project intervention area through existing information sharing networks and forums. The project will identify and participate, as relevant and appropriate, in scientific, policy-based and/or any other networks, which may be of benefit to the project. The project will identify, analyse and share lessons learned that might be beneficial to the design and implementation of similar projects and disseminate these lessons widely. There will be continuous information exchange between this project and other projects of similar focus in the same country, region and globally.

GEF Core Indicators: The GEF Core indicators will be used to monitor global environmental benefits and will be updated for reporting to the GEF prior to MTR and TE. Note that the project team is responsible for updating the indicator status. The updated monitoring data should be shared with MTR/TE consultants prior to required evaluation missions, so these can be used for subsequent ground truthing. The methodologies to be used in data collection have been defined by the GEF and are available on the GEF website.

Independent Mid-term Review (MTR): An independent mid-term review process will begin after the second PIR has been submitted to the GEF, and the MTR report will be submitted to the GEF in the same year as the 3rd PIR. The MTR findings and responses outlined in the management response will be incorporated as recommendations for enhanced implementation during the final half of the project?s duration. The terms of reference, the review process and the MTR report will follow the standard templates and guidance prepared by the UNEP IEO for GEF-financed projects.

The evaluation will be independent, impartial and rigorous. The consultants that will be hired to undertake the assignment will be independent from organizations that were involved in designing, executing, or advising on the project to be evaluated. Equally, the evaluators should not be in a position where there may be the possibility of future contracts regarding the project under review.

The GEF Operational Focal Points and other stakeholders will be actively involved and consulted during the evaluation process.

The final MTR report will be publicly available in English, will be cleared by UNEP-GEF, and approved by the PSC. A management response to MTR recommendations will be posted within six weeks of the MTR report?s completion.

Terminal Evaluation (TE): An independent terminal evaluation (TE) will take place upon completion of all major project outputs and activities. The terminal evaluation process will begin six months before operational closure of the project allowing the evaluation mission to proceed while the project team is still in place, yet ensuring the project is close enough to completion for the evaluation team to reach conclusions on key aspects such as project sustainability. The Project Manager will remain on contract until the TE report and management response have been finalized. The terms of reference, the evaluation process and the final TE report will follow the standard templates and guidance prepared by the UNEP IEO for GEF-financed projects.

The evaluation will be independent, impartial and rigorous. The consultants that will be hired to undertake the assignment will be independent from organizations that were involved in designing, executing or advising on the project to be evaluated. Equally, the evaluators should not be in a position where there may be the possibility of future contracts regarding the project being evaluated.

The GEF Operational Focal Points and other stakeholders will be actively involved and consulted during the terminal evaluation process.

The final TE report will be cleared by the UNEP-GEF and will be approved by the PSC.

Final Report: The project?s terminal PIR along with the terminal evaluation (TE) report and corresponding management response will serve as the final project report package. The final project report package shall be discussed with the PSC during an end-of-project review meeting to discuss lesson learned and opportunities for scaling up.

Agreement on intellectual property rights and use of logo on the project?s deliverables and disclosure of information**:** To accord proper acknowledgement to the GEF for providing grant funding, the GEF logo will appear together with the UNEP logo on all promotional materials, other written materials like publications developed by the project, and project hardware. Any citation on publications regarding projects funded by the GEF will also accord proper acknowledgement to the GEF.

Monitoring and Evaluation Plan and Budget:

Table 5. Monitoring and Evaluation Plan and Budget

GEF M&E requirements	Responsible Parties	Responsible Party for the budget	Indicative costs to be charged to the Project Budget (US$)		Time frame
			GEF grant	Co-financing	
Inception Workshop	Project Manager Implementing Partner	OSS	30,000	20,000	Within two months of months of the First Disbursement
Inception Report	Project Manager Implementing Partner	OSS	None	None	Within one month from inception workshop
Standard UNEP monitoring and reporting	PCU Implementing Partner UNEP GEF	OSS	None	None	Quarterly, annually
Monitoring of indicators in project results framework	PCU Implementing Partner	OSS	None	None	Annually
GEF Project Implementation Report (PIR)	Project Manager Implementing Partner UNEP-GEF team	OSS	None	None	Annually
Lessons learned and knowledge generation	Project Manager	OSS	None	None	At mid-point and closure.
Project Steering Committee meetings	Project Steering Committee Project Manager Implementing Partner	OSS	15,000 per PSC meeting = 60,000	40,000	At minimum annually
Mid-term GEF Core indicators	Project Manager	OSS	None	None	Before mid-term review mission takes place.

GEF M&E requirements	Responsible Parties	Responsible Party for the budget	Indicative costs to be charged to the Project Budget (US$)		Time frame
			GEF grant	Co-financing	
Independent Mid-term Review (MTR) and management response	Implementing Partner, PCU and UNEP-GEF team	UNEP	25,000	10,000	Between 2nd and 3rd PIR.
Terminal GEF Core indicators	Project Manager	OSS	None	None	Before terminal evaluation mission takes place
Independent Terminal Evaluation (TE)	Implementing Partner, PCU and UNEP-GEF team	UNEP	30,000	10,000	At least three months before operational closure
Audit	UNEP to monitor this is done by external auditor booked by the PMU	UNEP	Part of Project Management Costs: 3750 per audit= 15,000	10,000	Annually
	TOTAL indicative COST Excluding project team staff time, and UNEP staff and travel expenses		USD 160,000	USD 90,000	

[1] Excluding project team staff time and UNEP staff time and travel expenses.

10. Benefits

Describe the socioeconomic benefits to be delivered by the project at the national and local levels, as appropriate. How do these benefits translate in supporting the achievement of global environment benefits (GEF Trust Fund) or adaptation benefits (LDCF/SCCF)?

The **economic costs and benefits** factoring projected water stress, health impact and costs, and related cost to the governments, economic growth, production line, and the households. Private vs. public sector

ownership of water resource management, control of water by private or the public sector (potential impact to the indigenous people or the poor, the other marginalized people).

An analysis of water-related tax, subsidies, penalties, etc. (e.g., do mining companies get government subsidies for bringing jobs to the communities? With this support, do they over exploit and contaminate water (economic externality), which causes net-economic and environmental loss to the larger communities and populations (in terms of health, social cohesion-related costs)?

Social cohesion issue: (cattle herders vs. farmers, landowners vs. landless, cost of water). Short-term and long-term impact to women and girls, boys, disabled for increasingly challenging access to water (including gender-based violence and impact to girls? education, etc.)

Labor and working conditions: If the workers are to be hired for boreholes, nanofiltration treatment systems, and sand dams, etc. Boreholes are planned to be deep. Safety measures for the communities and the workers with proper OSH measures will be required.

Construction of boreholes: ensure that the rural and local communities around the new boreholes get benefits from boreholes in their vicinities.

Capture traditional, women, and indigenous knowledge and perspectives on water management, efficiency, recycling, etc.

Women champions, water ambassadors for effective communication to local population on water efficiency, importance, health, pollution, etc. Bring women or religious leaders to encourage women?s empowerment, birth control, impact of population to water stress.

Citizen scientists: establish the indicators and collect data at the pilot sites using stratified sampling and simple app created for this specific purpose. The data can be continuously collected beyond the project period by OSS for continuous monitoring of trends and policy implication.

(i) selected women and men (educated and trained women and men) to monitor water quality, quantity (piezometric),

(ii) (ii) some open-ended questions on changes in their quality of lives (e.g., number of hours spent for water fetching, gender-based violence caused by the water-related stress (this can be collected by women both literate and illiterate, rural and urban, indigenous people, people in poverty, disabilities, etc.) on their innovative water management approaches).

11. Environmental and Social Safeguard (ESS) Risks

Provide information on the identified environmental and social risks and potential impacts associated with the project/program based on your organization's ESS systems and procedures

Overall Project/Program Risk Classification*

PIF	CEO Endorsement/Approval	MTR	TE
Medium/Moderate	Medium/Moderate		

Measures to address identified risks and impacts

Elaborate on the types and risk classifications/ratings of any identified environmental and social risks and impacts (considering the GEF ESS Minimum Standards) and any measures undertaken as well as planned management measures to address these risks during implementation.

Supporting Documents

Upload available ESS supporting documents.

Title	Module	Submitted
SMAS UNEP SRIF_CEO endorsement 22112022 FINAL 1rev	CEO Endorsement ESS	
UNEP SRIF_PIF_V2_rev1 12 10_final	Project PIF ESS	

ANNEX A: PROJECT RESULTS FRAMEWORK (either copy and paste here the framework from the Agency document, or provide reference to the page in the project document where the framework could be found).

Project Objective: Foster multi-country cooperation and institutional capacity for the protection and sustainable management of the transboundary Senegalo-Mauritanian aquifer system and its dependent ecosystems in order to improve water and food security, and resilience to climate change.						
Component 1: Improving the understanding of the status and functioning of the Senegal- Mauritanian Aquifer System (SMAS), and of its interactions with the Senegal and Gambia rivers.						
Outcome level indicators	**Baseline**	**Indicator**	**Mid Term Target**	**End of Project Target**	**Means of verification**	**Assumptions**
Outcome 1: Improved shared knowledge of the current status and potentialities of the SMAS, of its dependent ecosystems and of its interactions with surface waters, reinforces transboundary cooperation and enables joint priority setting.	Countries sharing the aquifer system lack the knowledge and the scientific tools required to provide the reliable and harmonized information on the aquifer, needed for the sustainable management of SMAS water resources and for the identification of priority issues of transboundary concern.	1.1 Improved Shared scientific knowledge and regional model and regional Database established at project mid-term.	Conceptual Model of the Aquifer System developed and adopted by all four beneficiary countries.	Common Regional Database and harmonized monitoring protocols established including gender data/issues.	Minutes of the SC Meeting adopting the aquifer?s Conceptual Model, and the Harmonized Monitoring Protocols	Joint scientific work facilitates countries? decisions.
		1.2 The four (4) Countries endorse the Transboundary Diagnostic Analysis (TDA) of the Senegalo-Mauritanian Aquifer System at project mid-term	The 4 Countries endorse the regional TDA.	NA	TDA document endorsed by the SC.	

Activity 1.1: Collect baseline sex-disaggregated data to be included in the Database and in the monitoring protocols of all four beneficiary countries. Analysis should include the current gender and equality context (to identify issues of exclusion) as well as the projected impacts of any intervention on members of the community (women and men, boys and girls, elderly, young and people with disabilities).	**Baseline**: Currently, limited capacities exist for sex-disaggregated data collection and management	**Indicator**: % of shared scientific knowledge and groundwater management tools established in the four beneficiary countries that **include gender-disaggregated data**	50% of countries sharing the aquifer system have gender sensitive knowledge and scientific tools.	100% of countries sharing the aquifer system have gender sensitive knowledge and scientific tools.	Evidence of database with gender disaggregated data	**Activity 1.1**: Collect baseline sex-disaggregated data to be included in the Database and in the monitoring protocols of all four beneficiary countries. Analysis should include the current gender and equality context (to identify issues of exclusion) as well as the projected impacts of any intervention on members of the community (women and men, boys and girls, elderly, young and people with disabilities).
Outputs: 1.1.1. Regionally harmonized groundwater management tools (Database; GIS; aquifer?s hydrogeological and transport conceptual model including water balance; monitoring network design and protocols), and data sharing mechanism. 1.1.2 Regional and national level diagnostic assessment (Transboundary Diagnostic Analysis (TDA)) identifying SMAS?s challenges and opportunities and trans- boundary issues of concern, jointly developed by the countries sharing the aquifer, with consideration of future climatic scenarios, ecosystems health, and socio- economic aspects, including gender.						
Component 2: Developing a regional Strategic Action Program (SAP) for the Senegalo-Mauritanian aquifer system and facilitating conjunctive surface and groundwater management						

Outcome level indicators	Baseline	Indicator	Mid Term Target	End of Project Target	Means of verification	Assumptions
Outcome 2.1: Strategic Action Program (SAP) developed and endorsed by the participating countries enables the sustainable management of the transboundary SMAS and meets Core Indicator 7 target.	Countries do not possess planning tools for reversing transboundary degradation trends, and for the efficient and coherent allocation of water resources in general and groundwater resources in particular at the SMAS scale.	2.1 The SAP endorsed by the 4 countries at ministerial level by the end of the project 2.2 Number of shared water ecosystems under new cooperative management	NA	Based on the TDA findings, and on the aquifer?s conceptual model, 4 countries agree on, and endorse at the ministerial level a Strategic Action Program indicating the priority legal, legislative institutional reforms, and the investments necessary for the sustainable exploitation of the SMAS **include gender-disaggregated data.** Core Indicator 7 is fully met.	Letters of endorsement of the SAP signed by relevant ministers in all four countries.	Joint work on the definition of the SAP strengthens countries? commitment to coordinated action.
Output 2.1.1. The Strategic Action Program for the sustainable management of the transboundary SMAS, developed and submitted for countries? endorsement at ministerial level. Output 2.1.2. Partners? and donors roundtable organized for resource mobilization for the implementation of SAP						

Outcome 2.2: Countries informed and prepared to consider overall options for regional governance framework/s for the conjunctive management of their surface and groundwater resources.	At present, groundwater is not included in the mandate of existing river basin organizations (OMVS, OMVG) and lack the capacity to implement conjunctive surface and groundwater management (Level 1).	2.2 Level of progress made in developing and uptake of the options analysis.	Draft transboundary governance options on conjunctive management of surface and groundwater developed together with the countries, OMVS, and OMVG, presented and debated with the RWG for final validation (Level 2).	Countries? representatives in the SC endorse the options report (Level 3).	Minutes of the relevant SC meeting	Countries and basin organizations committed to adopts conjunctive surface and groundwater management
Activity 2.1.1 Plan and operationalize stakeholder engagement so that women and girls? voices inform the design of investment projects and community development projects.	**Baseline**: 0	% and # of stakeholders involved in SAP development and negotiations meetings and consultations who represent women?s groups	Women?s groups represent at least at least 10% of participants and are present in all SAP development and negotiations, 40% of women?s group report satisfaction in regard to meaningful participation	Women?s groups represent at least at least 35% of participants and are present in all SAP development and negotiations, 90% of women?s group report satisfaction in regard to meaningful participation	Reports SAP development and negotiations meetings with participant list, Key informal interviews	
Output 2.2.1. Governance options for the conjunctive surface and groundwater management in the Senegal and the Gambia river basins developed and submitted for countries? consideration						
Component 3: Piloting the implementation of groundwater-based adaptation measures to mitigate the impacts of climate change and related hazards						
Outcome level indicators	**Baseline**	**Indicator**	**Mid Term Target**	**End of Project Target**	**Means of verification**	**Assumptions**

Outcome 3.1: The successful joint implementation of small-scale demonstration measures strengthens transboundary cooperation and feeds into the SAP formulation process, and meets Core indicators 1,3,4 targets.	Faced by growing demand for high quality water, countries lack the capacity for preventing and managing conflicting water uses and users at the local, national and transboundary levels.	3.1: Number and scope of the pilot projects informing the strategic planning 3.2: Terrestrial protected areas under improved management for conservation and sustainable use (core indicator 1) 3.3: Area of land restored (core indicator 3) 3.4: Areas of landscapes under improved practices (core indicator 4)	Experiences being gained through the implementation of pilot projects feed into the SAP development process.	At least four on the ground pilot projects implemented, integrating gender issues; targets of core indicators 1,3, and 4 fully met. 3.2: 16,000 hectares 3.3: 4,636.7 hectares 3.4: 61,213 hectares	Pilot Projects reports approved by the SC.	Countries fully support the implementation of the pilots involving women?s.

Outcome 3.2: Participation of women and vulnerable peoples in the implementation of small-scale pilot projects enables equal access to, and control of water resources, and meets core Indicator 11 targets for the targeted population in the Basin -	**Baseline:** 0	% and # of stakeholders involved in the implementation of small-scale pilot projects who represent vulnerable groups; improved level of employment opportunities created by the project through the implementation of the pilot projects.	Vulnerable groups represent at least 10% of participants and are present in all in the implementation processes	**Target**: Vulnerable groups represent at least 25% of participants and are present in all in the implementation processes	Mean of verification: Reports from stakeholders meetings with participant list	Countries fully support the implementation of the pilots involving women?s.
Output 3.1.1. Small pilots demonstrating, in a transboundary context, ways to address major concerns such as the need for improved water use efficiency in agriculture, for improved water use efficiency in agriculture, for climate change adaptation, and for expanded water resources availability						
Component 4: Capacity development, Communication and knowledge management						
Outcome level indicators	**Baseline**	**Indicator**	**Mid Term Target**	**End of Project Target**	**Means of verification**	**Assumptions**

Outcome 4.1: Stakeholders? enhanced knowledge and capacity, and women empowerment facilitate coordinated action for the sustainable management of the SMAS.	Improving the present limited institutional capacity in groundwater resources management at the national and regional levels, and empowering women, will require science-based needs assessments, and a massive training, communication and institutional strengthening effort.	4.1 Number of persons receiving training and participating to dissemination events, and of Experience Notes	NA	At least 500 gender balanced participants to training modules and dissemination events At least 4 Experience Notes published	Reports of training modules reports and events, and published Experience Notes.	Effective and gender sensitive stakeholder?s engagement plan developed during project inception.
Activity 4.1: assess men and women?s scientific needs for meaningful participation in the platform and conduct trainings -	**Baseline**: Limited knowledge of the SMAS countries? institutional capacity in groundwater resources management	**Indicator**: % of stakeholders involved in the project, comprising men and women who have received trainings; Evidence that training workshops have been organized in ways suitable for women?s schedules and needs, childcare for example.		At least 500 gender balanced participants to training modules and have their capacity built and their knowledge enhanced on coordinating actions for the sustainable management of the SMAS.	workshops with participant list Pre and Post-training surveys	

Output 4.1.1 Regional information and data exchange platform for conjunctive water resources management established

Output 4.1.2. Communication and dissemination plan prepared and endorsed

Output 4.1.3. Based on a need assessment, capacity building modules (in Database, GIS, Modeling, TDA/SAP, groundwater resources monitoring, collection of sex- disaggregated water data, etc.) organized for member countries and basin organizations.

Output 4.1.4 Project results and lessons learned disseminated at the local, national, and regional levels through ad hoc interactive learning events.

Output 4.1.5. Project visibility improved by establishment of a project website, and lessons learned shared for broader adoption through cooperation with IW: LEARN, including participation to IWCs, and production of Experience Notes.

ANNEX B: RESPONSES TO PROJECT REVIEWS (from GEF Secretariat and GEF Agencies, and Responses to Comments from Council at work program inclusion and the Convention Secretariat and STAP at PIF).

STAP	RESPONSE
As with many such projects, the overall approach is to foster cooperation via the TDA/SAP in the expectation that this will lead to improved environmental and socio-economic outcomes. Perhaps if the objective were reversed to begin with ?improve water and food security?? this might put greater emphasis on tangible results, with the increase in cooperation as the mechanism.	This is an IW foundational project, that is the first step of a process that will help countries to achieve a shared science-based knowledge of the resource and of the current degradation trends and their causes and of future threats (TDA), that will allow them to commit to the implementation of a set of agreed upon priority strategic actions to reverse degradation, and to improve water security in the aquifer?s region (SAP). These are the quite tangible results expected in all foundational projects.
The planned activities are fairly standard in terms of the TDA/SAP process, several (undefined) pilot projects and knowledge management (platform, trainings, etc.). Combined, they meet the objective of fostering multi-country cooperation and capacity. Less certain is whether these components will result in improved water and food security and resilience to climate change as the mechanisms to make this happen are vague.	See above. Pilots have been identified during PPG, and describe in the PD.
Impacts of climate change and adaptation and resilience are mentioned throughout the project; however, data is lacking to show specifically how the project area will be impacted and how measure supported through this project will effectively assist people in adapting to future impacts of climate change. For example, ?adaptation actions? will take place as part of the pilot	A more detailed description of the climate scenario is provided under the section ?Background and context?. The project will provide, through the pilots, demonstrations on how sustainable groundwater use will increase resilience. The SAP will include policy reforms and investments to upscale these practices and improve resilience at the regional level.

projects but these are as of yet undefined so it?s not clear what those actions will be and how they will provide adaptation benefits.	
What is missing from the TOC are the underlying assumptions and causal pathways including the mechanisms that will lead to these impacts. STAP recommends strengthening these aspects prior to CEO endorsement.	The ToC has been revised accordingly.
GEF trust fund: will the proposed incremental activities lead to the delivery of global environmental benefits?	The project will create an enabling environment, in terms of knowledge and of transboundary consensus and cooperation, indispensable for the implementation of coordinated remedial and mitigation actions.
In the case of this shared aquifer, the benefits that would accrue from improved management and a reduction in the loss of water and an improvement in quality are regional.	Under the IW Focal Area, the establishment of transboundary cooperation in the management of shared waterbodies is considered a global environmental benefit. This is particularly true, and difficult to achieve, when dealing with groundwater, an invisible resource.
This project refers to the many prior and ongoing activities related to transboundary water management of this aquafer. Lacking, however, are specific results from these projects or lessons learned that could feed into this proposed effort and indicate how it will build on prior efforts or how these lessons informed the development of the TOC.	The PD, under the section on the Baseline Scenario, provides a detailed description of the ongoing relevant activities in the region, and of the results achieved. In particular the section presents the role and complementarity of the project with respect of the Regional Working Group overall effort to build the transboundary governance of the aquifer.
GEF SECRETARIAT	
The PPG phase will need to evaluate and take stock of the available information and develop a strategy on how the project will proceed to achieve its outputs on models.	In addition to the response provided during PIF clearance, emphasis has been placed in PD on the conceptual nature of the models.
Scope of pilots: 2 pilots of 250 K would be very different than a small grants type mechanism.	The number and budget of pilots has been substantially increased, as well as the beneficiary population.

Additional responses to STAP comments

1.IW GEBs, in terms of increased transboundary cooperation and long-term sustainability of the resources are described in section 1.8, while benefits in terms of adaptation are explained in in the above table.

2.Lessons learned:

The Senegal Mauritanian Aquifer project is builds on previous and ongoing interventions in the region, including efforts by the OSS and other organizations. Lessons learned from these interventions have informed the design and implementation of the project.

One of relevant project is the Integrated Transboundary Water Resources Management in the Niger Basin (ITTAS) project, which is also being implemented by the OSS. One of the key lessons learned from the ITTAS project is the importance of effective stakeholder engagement and participation. The project has highlighted the need for meaningful engagement with all stakeholders, including local communities, civil society organizations, and government agencies, throughout the planning and implementation process. This has helped to build trust and support for the project and ensure that it is better aligned with the needs and priorities of local communities. Another lesson learned from the ITTAS project is the importance of developing strong institutional frameworks for transboundary cooperation. The project has helped to establish the Niger Basin Authority, which is responsible for overseeing the implementation of the basin-wide water resources management plan and promoting cooperation among the different countries in the basin.

More specifically, lessons learnt are:
? Where River basin overlaps Aquifer System at transboundary level, Conjunctive Management is the most;
? Strengthening cooperation among riparian countries, some of which are involved either for surface water or for groundwater, or both at the same time
? In the World, few transboundary aquifer systems benefit the TDA/SAP process. The Conjunctive Management approach is the best way to develop an integrated TDA/SAP and to benefit well to the transboundary Aquifer system

Other lessons learned are provided (page 39):

? involving local communities in the management of natural resources is both feasible and beneficial and can have positive impacts on biodiversity and livelihoods;
? in order to build a relationship based on trust, a project must move slowly and carefully. Confidence can only be gained through proving assertions with action, and such results take time.

? local community adhesion to sustainable resource use is proportional to the benefits they will reap from it;
? local stakeholders often have a longstanding relationship with an ecosystem. Although at times their explanations of certain phenomena may seem farfetched, scientific arrogance should be avoided. Patiently drawing out the experience of observant locals can be highly rewarding;
•local knowledge should be formalised through scientific investigation. Monitoring and participatory research increase awareness and local capacity

GEF Council Members	
Comment by Annette Windmeisser, GEF Council Member, Head of Climate Finance Division, German Federal Ministry for Economic Cooperation and Development, , made on 1/7/2022 Germany approves the following PIF in the work program but asks that the following comments are taken into account: Suggestions for improvement to be made during the drafting of the final project proposal:	
The approach in the project appears to be unique for a transboundary aquifer for which no transboundary organisation has yet been mandated and could serve as a role model. Therefore, we recommend a connection to the Pan-African Groundwater Programme of the African Council of Water Ministers (APAGroP) as well as to the regional organisation ECOWAS and to gain experience and make it available for similar contexts.	- Indeed, this is a unique approach for a transboundary Aquifer and in fact the relatively recent development of the Ministerial declaration establishing the regional working group of the BASM has provided a foundational framework for transboundary cooperation among the beneficiary countries of the Senegalo Mauritanian Basin. The leadership of OMVS and OMVG has been very much welcome and provides a solid reassurance of future coordination and synergies. OMVS has been proposing to host the Secretariat of the RWG of the BASM and this GEF project will be working with and through the RWG. In this context, this project foresees to reinforce the RWG by establishing a donor coordination roundtable where the synergies and connections with other initiatives (such as APADroP, ECOWAS and others) will be the focus. OSS is currently conducting a project with AMCOW and is undertaking another initiative with ECOWAS. These two institutions will be kept informed of the ongoing process of this project for their better involvement when the project is executed.

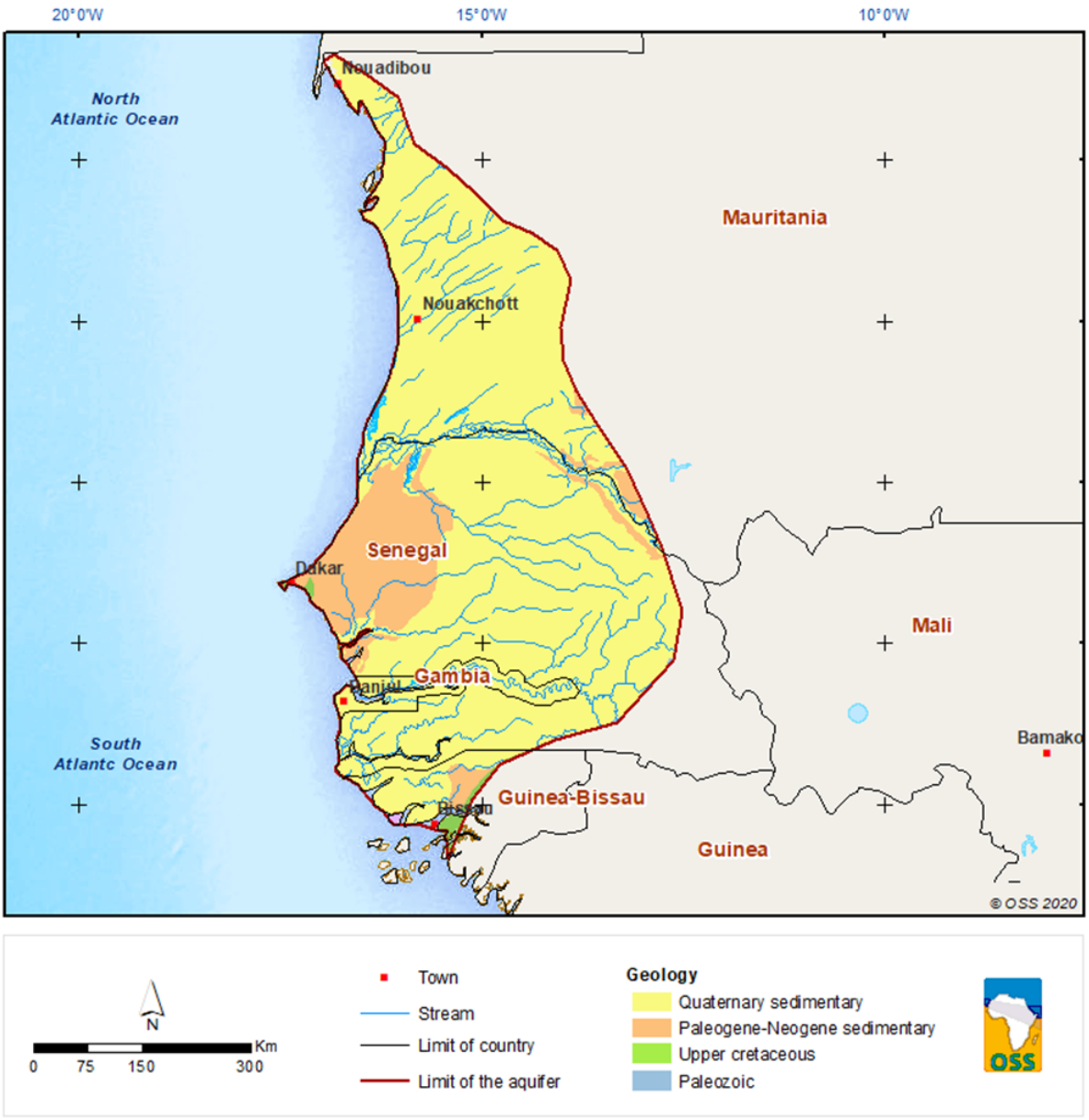
? In the long term, consideration should already be given to how the aquifer can be managed across borders. An extension of the mandate and capacities of the river basin organisations OMVS and OMVG would be conceivable. With the OMVS, a training on the integration of groundwater into the management of OMVS was already carried out in 2019.	- Yes, this is very much at the core of the objectives of the Regional Working Group of the BASM (attached the Ministerial Declaration) which has been mandated by the Ministries in the Declaration:? The Regional Working Group (RWG) is an intergovernmental mechanism which mandate is to provide a framework for consultation, coordination and decision making among the States in the basin for concerted transboundary management of the Senegalo-Mauritanian Aquifer Basin (SMAB) ?. This project will contribute to the reflection and development of options for governance structures of the Aquifer Basin as part of the SAP development process, which again will be closely coordinated with and through the RWG of the BASM. The facilitators of the RWG include UNECE, Geneva water hub and IGRAC/UNESCO.
? In addition, it should be ensured that the OSS has the expertise to carry out such a project. Technical advice may need to be provided.	OSS has longstanding scientific and technical experience in a spectrum of groundwater related issues (Knowledge improvement, development of management tools, establishment of consultation mechanism or cooperation framework, etc.), a large network of experts at its disposal to complement and advise?.. OSS has specific programs for shared aquifers and has successfully implemented similar projects in North Africa (North Western Sahara Aquifer System - SASS - shared by Algeria, Libya and Tunisia (1999-2013) and in West Africa (Iullemeden Aquifer System - shared by Mali, Niger and Nigeria (2004-2009)); then Niger basin - Iullemeden-Taoudeni/Tanezrouft Aquifer System (Niger basin-ITTAS (2018-ongoing) shared by Algeria, Benin, Burkina Faso, Mali, Mauritania, Niger and Nigeria) and in East Africa, in the IGAD zone. The staff that will be involved in the project is highly qualified and experienced in implementing this kind of project.
? Exploring an aquifer requires a high level of technical expertise. Therefore, we recommend the involvement of local and international research institutions.	Involvement of local and international research institutions is foreseen not only under the BASM RWG but is part of the OSS network of scientific support. Universities and national research institutions will be solicited. IGRAC is partner of the project.

ANNEX C: Status of Utilization of Project Preparation Grant (PPG). (Provide detailed funding amount of the PPG activities financing status in the table below:

Project Preparation Activities Implemented	GEFTF Amount (USD)		
	Budgeted Amount (USD)	**Amount spent To date (USD)**	**Amount available (USD)**
Staff & Personnel (Including Consultants)			
PPG Coordinator for drafting TORs, executing, monitoring and coordinating the PPG development	25 000.00	25 000.00	
Local consultant - National Coordinators (4/1 per participating country)	40 000.00	38 668.62	1 331.38
Expert - Environmental safeguard and risk assessment, monitoring, socio-economic and gender	20 000.00	6 056.05	13 943.95
Sub-total	**85 000.00**	**69 724.67**	**15 275.33**
Travel			
PPG soft launch, Meeting with the Regional Working Group	5 000.00	3 736.43	1 263.57
Regional validation workshop of the project document	20 000.00	20 000.00	0.00
Sub-total	**25 000.00**	**23 736.43**	**1 263.57**
Lead PPG Consultant	40 000.00	33 617.33	6382.67
Sub-total	**40 000.00**	**33 617.33**	**6382.67**
TOTAL	**150 000.00**	**127 078.43**	**22 921.57**

ANNEX D: Project Map(s) and Coordinates

Please attach the geographical location of the project area, if possible.



Hydrogeological framework of the Senegal-Mauritanian Aquifer System

Source of Data: Aquastat, FAO (2011).

ANNEX E: Project Budget Table

Please attach a project budget table.

UNEP Budget Line			Unit	Quantity	Unit Cost	TOTAL	Comp.1	Comp 2	Comp 3	Comp.4	5Project Manag	M&E	Total	Expenditure by calendar year					Reponsible
														Year 1*	Year 2*	Year 3*	Year 4*	Total	
10	**PERSONNEL COMPONENT**																		
	1100	**Project personnel**																	
	1101	Regional Manager [85% technical + 15% administrative tasks]	H/M	36	6000	216000	45900	45900	45900	45900	32400		216000	54000	54000	54000	54000	216000	OSS
	1102	Hydrogeologist (technical assistant - Grouwdwater expert) (1/3 of complet time)	H/M	12	5000	60000	15000	15000	15000	15000			60000	15000	15000	15000	15000	60000	OSS
	1104	Technical (Scientific) assistant	H/M	30	2500	75000	18750	18750	18750	18750			75000	18750	18750	18750	18750	75000	OSS
	1103	Regional Working Group liaison officer and pilots Coordinator (PRC) [90 % technical + 10% administrative tasks]	H/M	24	5000	120000	27000	27000	27000	27000	12000		120000	30000	30000	30000	30000	120000	OMVS/ OMVG
	1199	**Sub-total**				**471000**	**106650**	**106650**	**106650**	**106650**	**44400**	**0**	**471000**	**117750**	**117750**	**117750**	**117750**	**471000**	
	1200	**Consultants**																	
		International / Regional Consultants																	
	1201	Transboundary Diagnostic Analysis (TDA)	M/M	2	8000	16000	16000						16000	8000	8000			16000	OSS
	1202	Social & Economical aspects	M/M	2	8000	16000	16000						16000	8000	8000			16000	OSS
	1203	Environmental aspects	M/M	2	8000	16000	16000						16000	8000	8000			16000	OSS
	1204	Climate change	M/M	2	8000	16000	16000						16000	8000	8000			16000	OSS
	1205	Legal, Institutional and policy aspects	M/M	2	8000	16000	16000						16000	8000	8000			16000	OSS
	1206	Communication, Awareness & participartory Management	M/M	2	8000	16000	16000						16000		8000	8000		16000	OSS
	1207	Data collection	M/M	1	20000	20000	20000						20000	20000				20000	OSS
	1208	Data base & GIS	M/M	1	22000	22000	22000						22000	11000	11000			22000	OSS
	1209	Modelling	M/M	1	54000	54000	54000						54000	27000	27000			54000	OSS
	1210	SAP Formulation	M/M	2	8000	16000	16000						16000			8000	8000	16000	OSS
	1211	Gender specialist, including time spent on various activities outlined in Gender Action Plan	M/M	1	30000	30000	4000	4000	20000	2000			30000	10000	10000	5000	5000	30000	
	1212	Final/Global synthesis Report	M/M	1	8000	8000	8000						8000				8000	8000	
	1299	**Sub-total**				**246000**	**220000**	**4000**	**20000**	**2000**	**0**	**0**	**246000**	**108000**	**96000**	**21000**	**21000**	**246000**	

UNEP Budget Line			Unit	Quantity	Unit Cost	TOTAL	Comp.1	Comp 2	Comp 3	Comp.4	5Project Manag	M&E	Total	Expenditure by calendar year					Reponsible
														Year 1*	Year 2*	Year 3*	Year 4*	Total	
		National Consultants																	
	1213	Transboundary Diagnostic Analysis	M/M	2	4000	8000	8000						8000	8000				8000	OSS
	1214	Social & Economical aspects	M/M	2	4000	8000	8000						8000	8000				8000	OSS
	1215	Environmental aspects	M/M	2	4000	8000	8000						8000	8000				8000	OSS
	1216	Climate change	M/M	2	4000	8000	8000						8000	8000				8000	OSS
	1217	Legal, Institutional and policy aspects	M/M	2	4000	8000	8000						8000	8000				8000	OSS
	1219	Communication, Awareness & participatory Management	M/M	2	4000	8000	8000						8000		4000	4000		8000	OSS
		Sub-Total				**48000**	**48000**	**0**	**0**	**0**	**0**	**0**	**48000**	**40000**	**4000**	**4000**		**48000**	
	1300	**National focal point / Coordinator**																	
	1301	National Coordinator	M/M	144	150	21600	5400	5400	5400	5400			21600	5400	5400	5400	5400	21600	
		Sub-Total				**21600**	**5400**	**5400**	**5400**	**5400**	**0**	**0**	**21600**	**5400**	**5400**	**5400**	**5400**	**21600**	
	1400	**Administrative Support**																	
	1401	Secretary		36	1500	54000	13500	13500	13500	13500			54000	13500	13500	13500	13500	54000	OSS
	1500	**Sub-total**				**54000**	**13500**	**13500**	**13500**	**13500**	**0**	**0**	**54000**	**13500**	**13500**	**13500**	**13500**	**54000**	
	1500	**Travel on official business**																	
	1501	Travels/Missions/ DSA	lump sum	5	60000	300000	30000	30000	210000	30000			300000	75000	75000	75000	75000	300000	OSS
	1699	**Sub-total**				**300000**	**30000**	**30000**	**210000**	**30000**	**0**	**0**	**300000**	**75000**	**75000**	**75000**	**75000**	**300000**	
1999	**Component total**					**1140600**	**423550**	**159550**	**355550**	**157550**	**44400**	**0**	**1140600**	**359650**	**311650**	**236650**	**232650**	**1140600**	
20	**SUB-CONTRACT COMPONENT**																		
	2100	**PILOT PROJECTS DEMONSTRATION:** Sub-contracts (MOUs/LOAs for supporting organizations)																	
	2101	Pilot site Gambia	Pilot site	1	135000	135000			135000				135000		67500	67500		135000	Country
	2102	Pilot site Guinée Bissau	Pilot site	1	135000	135000			135000				135000		67500	67500		135000	Country

UNEP Budget Line			Unit	Quantity	Unit Cost	TOTAL	Comp.1	Comp 2	Comp 3	Comp.4	5Project Manag	M&E	Total	Expenditure by calendar year					Reponsible
														Year 1*	Year 2*	Year 3*	Year 4*	Total	
	2103	Pilot site Mauritanie	Pilot site	1	135000	135000			135000				135000		67500	67500		135000	Country
	2104	Pilot site Sénégal	Pilot site	1	135000	135000			135000				135000		67500	67500		135000	Country
	2105	*- Stakeholder engagement, consultations, survey, data collection and analysis, monitoring and evaluation; - Capacity building training programs	Pilot sites	1	60000	60000			60000				60000	20000	20000	10000	10000	60000	
	2199	**Sub-total**				**600000**	**0**	**0**	**600000**	**0**	**0**	**0**	**600000**	**20000**	**290000**	**280000**	**10000**	**600000**	
	2200	**WATER GOVERNANCE:** Sub-contracts (MOUs/LOAs for cooperating agencies)																	
	2201	Promoting UN Conventions																	
		2201a. Legal Interantional Consultant	M/M	1,5	10000	15000		15000					15000	7500	7500			15000	OSS
		2201b. National Workshop	Workshop	4	5000	20000		20000					20000	20000				20000	OSS
		2201c. Regional Workshop	Workshop	1	20000	20000		20000					20000		20000			20000	OSS
	2202	Governance options for integrating surface and groundwater management																	
		2202a. Legal International Consultant	M/M	1,5	10000	15000		15000					15000		7500	7500		15000	OSS
		2202b. National Workshop	Workshop	4	5000	20000		20000					20000		20000			20000	OSS
		2202c. Regional Workshop	Workshop	1	20000	20000		20000					20000			20000		20000	OSS
		Countries support for implement agreed option in strengthen conjunctive management of surface and groundwaters																	
	2203	2203a. Legal International Consultant	M/M	1,5	10000	15000		15000					15000			15000		15000	OSS
		2203b. National Writeshops	Workshop	4	5000	20000		20000					20000			20000		20000	OSS
		2203c. Regional Workshop	Workshop	1	20000	20000		20000					20000			20000		20000	OSS
	2204	Governance options for integrating surface and groundwater management																	
		2204a. Policy/Legal International Consultant	M/M	1,5	10000	15000		15000					15000			7500	7500	15000	OSS

UNEP Budget Line			Unit	Quantity	Unit Cost	TOTAL	Comp.1	Comp 2	Comp 3	Comp.4	5Project Manag	M&E	Total	Expenditure by calendar year					Reponsible
														Year 1*	Year 2*	Year 3*	Year 4*	Total	
		2204b. National Policy Action	Action	4	5000	20000		20000					20000			10000	10000	20000	OSS
		2204c. Regional Policy Action	Action	1	20000	20000		20000					20000				20000	20000	OSS
	2299	**Sub-total**				**220000**	**0**	**220000**	**0**	**0**	**0**	**0**	**220000**	**27500**	**55000**	**100000**	**37500**	**220000**	
	2300	**Sub-contracts (for commercial purposes)**																	
	2301	Sub-contracts for local activities notably on gender aspects	lump sum	1	6000	6000			6000				6000		3000	3000		6000	OSS
	2399	**Sub-total**				**6000**	**0**	**0**	**6000**	**0**	**0**	**0**	**6000**	**0**	**3000**	**3000**	**0**	**6000**	
2999	**Component total**					**826000**	**0**	**220000**	**606000**	**0**	**0**	**0**	**826000**	**47500**	**348000**	**383000**	**47500**	**826000**	
30	**CAPACITY BUILDING/WORKSHOPS/MEETINGS COMPONENT**																		
	3100	**Group training Workshops**																	
	3101	TDA/SAP process	workshop	1	25000	25000	25000						25000	25000				25000	OSS
	3102	Data Base & GIS	workshop	2	25000	50000	50000						50000	25000	25000			50000	OSS
	3103	Modelling	workshop	2	25000	50000	50000						50000	25000	25000			50000	OSS
	3104	Water resources governance	workshop	1	25000	25000		25000					25000			25000		25000	OSS
		Sub-total				**150000**	**125000**	**25000**	**0**	**0**	**0**	**0**	**150000**	**75000**	**50000**	**25000**	**0**	**150000**	
	3200	**National Meetings/Workshops**																	
	3201	National transboundary risks (TDA)	workshop	4	3000	12000	12000						12000	12000				12000	OSS
	3202	Social & Economical aspects	workshop	4	3000	12000	12000						12000	12000				12000	OSS
	3203	Environmental & Climate Change aspects	workshop	4	3000	12000	12000						12000	12000				12000	OSS
	3204	Legal & Institutional aspects	workshop	4	3000	12000	12000						12000	12000				12000	OSS
	3205	Policy Elements Development	workshop	4	3000	12000	12000						12000		12000			12000	OSS
	3206	Awareness, Communication, Intersections of Gender and Water	workshop	4	3000	12000				12000			12000		12000			12000	OSS
	3207	National Inter-Ministerial Committee	Team	4	5000	20000	20000						20000	10000	10000			20000	OSS
	3208	National team for NAP (National Action Plan)	Team	4	3000	12000		12000					12000	6000	6000			12000	OSS
	3209	National workshops on NAP	workshop	4	3000	12000		12000					12000		12000			12000	OSS
	3210	National team for PAS	Team	4	3000	12000		12000					12000			6000	6000	12000	OSS

UNEP Budget Line			Unit	Quantity	Unit Cost	TOTAL	Comp.1	Comp 2	Comp 3	Comp.4	5Project Manag	M&E	Total	Expenditure by calendar year					Reponsible
														Year 1*	Year 2*	Year 3*	Year 4*	Total	
	3211	National workshops on PAS	workshop	4	3000	12000		12000					12000				12000	12000	OSS
	3299	**Sub-total**				**140000**	**80000**	**48000**	**0**	**12000**	**0**	**0**	**140000**	**64000**	**52000**	**6000**	**18000**	**140000**	
	3300	**Regional Meetings/Workshops**																	
	3301	Regional transboundary risks (TDA)	workshop	1	20000	20000	20000						20000		20000			20000	OSS
	3302	Social & Economical aspects	workshop	1	20000	20000	20000						20000		20000			20000	OSS
	3303	Environmental & Climate Change aspects	workshop	1	20000	20000	20000						20000		20000			20000	OSS
	3304	Legal & Institutional aspects	workshop	1	20000	20000	20000						20000		20000			20000	OSS
	3305	Policy Elements Development	workshop	1	20000	20000		20000					20000		20000			20000	OSS
	3306	Plan d'Action Regional	workshop	1	20000	20000		20000					20000		20000			20000	OSS
	3307	Programme d'Actions Stratégique (PAS)	workshop	1	20000	20000		20000					20000			20000		20000	OSS
	3308	Communication, Awareness & participartory Management, Including gender	workshop	1	20000	20000				20000			20000			20000		20000	OSS
	3309	Ministerial meeting: Adoption of PAS	Meeting	1	30000	30000		30000					30000				30000	30000	OSS
	3310	Donors round table / Table ronde	Conference	1	30000	30000		30000					30000				30000	30000	OSS
	3311	Validation workshop of the Database	workshop	1	20000	20000	20000						20000		20000			20000	OSS
	3312	Validation workshop of the regional model	workshop	1	20000	20000	20000						20000		20000			20000	OSS
	3399	**Sub-total**				**260000**	**120000**	**120000**	**0**	**20000**	**0**	**0**	**260000**	**0**	**160000**	**40000**	**60000**	**260000**	
3999	**Component total**					**550000**	**325000**	**193000**	**0**	**32000**	**0**	**0**	**550000**	**139000**	**262000**	**71000**	**78000**	**550000**	
40	**EQUIPMENT AND PREMISES COMPONENT**																		
	4100	Expendable equipment																	
	4101	Computer Softwares (Countries, OSS & Institutions): Modelling, GIS	lump sum	1	50000	50000				50000			50000	25000	25000	0	0	50000	OSS
	4199	**Sub-total**				**50000**	**0**	**0**	**0**	**50000**	**0**	**0**	**50000**	**25000**	**25000**	**0**	**0**	**50000**	
	4200	Non-expendable equipment																	
	4201	Computer Hardware (Countries)	Computer	4	2250	9000	0	0	0	9000			9000	9000	0	0	0	9000	OSS

UNEP Budget Line			Unit	Quantity	Unit Cost	TOTAL	Comp.1	Comp 2	Comp 3	Comp.4	5Project Manag	M&E	Total	Expenditure by calendar year					Reponsible
														Year 1*	Year 2*	Year 3*	Year 4*	Total	
	4202	Computer Hardware (OSS)	Computer	1	2200	2200	0	0	0	2200			2200	2200	0	0	0	2200	OSS
	4203	Computer Hardware (Regional Coord.-OMVS/OMVG)	Computer	1	2200	2200	0	0	0	2200			2200	2200	0	0	0	2200	OMVS/ OMVG
	4299	**Sub-total**				**13400**	**0**	**0**	**0**	**13400**	**0**	**0**	**13400**	**13400**	**0**	**0**	**0**	**13400**	
4999	**Component total**					**63400**	**0**	**0**	**0**	**63400**	**0**	**0**	**63400**	**38400**	**25000**	**0**	**0**	**63400**	
						81400													
50	**MISCELLANEOUS COMPONENT**																		
	5100	**Promotion of Project Highlights and Achievements & Sundry**																	
	5101	Preparation of communication/ dissemination tools (brochures, posters, Flach disk, Video, etc.); Data exchange platform, etc.	lump sum	1	20000	20000				20000			20000	5000	5000	5000	5000	20000	OSS
	5102	Editing reports	lump sum	1	17000	17000				17000			17000			8500	8500	17000	OSS
	5103	Transboundary Learning mechanisms & Sharing experiences	workshop	2	20000	40000				40000			40000			20000	20000	40000	OSS
	5104	Participation in international meetings and other relevant forums, promotion of the project	lump sum	6	11500	69000				69000			69000	9000	20000	20000	20000	69000	OSS
	5105	Translations/Interpretation	lump sum	1	23400	23400				23400			23400	5850	5850	5850	5850	23400	OSS
	5199	**Sub-total**				**169400**	**0**	**0**	**0**	**169400**	**0**	**0**	**169400**	**19850**	**30850**	**59350**	**59350**	**169400**	
	5500	**Monitoring and Evaluation (M&E)**																	
	5501	Monitoring and Evaluation missions (MTE&TE)	Mission	2	27500	55000	13750	13750	13750	13750		55000	55000		25000		30000	55000	OSS
	5502	Yearly OSS external **audit** of the project	Mission	4	3750	15000	3750	3750	3750	3750		**15000**	**15000**	3750	3750	3750	3750	15000	OSS
	5599	**Sub-total**				**70000**	**17500**	**17500**	**17500**	**17500**	**0**	**70000**	**70000**	**3750**	**28750**	**3750**	**33750**	**70000**	
5999	**Component total**					**239400**	**17500**	**17500**	**17500**	**186900**	**0**	**70000**	**239400**	**23600**	**59600**	**63100**	**93100**	**239400**	
60	**PROJECT MANAGEMENT UNIT**																		
	6100	**Activity Implementation Framework**																	
	6101	Inception workshop	workshop	1	30000	30000	7500	7500	7500	7500		**30000**	30000	30000				30000	OSS
	6102	Scientifc Committee Meetings	workshop	4	15000	60000	15000	15000	15000	15000			60000	15000	15000	15000	15000	60000	OSS

UNEP Budget Line			Unit	Quantity	Unit Cost	TOTAL	Comp.1	Comp 2	Comp 3	Comp.4	5Project Manag	M&E	Total	Expenditure by calendar year					Reponsible
														Year 1*	Year 2*	Year 3*	Year 4*	Total	
	61032	Steering Committee Meetings	workshop	4	15000	60000	15000	15000	15000	15000		60000	60000	15000	15000	15000	15000	60000	OSS
		Sub-Total				**150000**	**37500**	**37500**	**37500**	**37500**	**0**	**90000**	**150000**	**60000**	**30000**	**30000**	**30000**	**150000**	
	6200	**Supervision, Monitoring & Evaluation**																	
	6201	Final/Global study presentation	workshop	1	25000	25000			25000				25000				25000	25000	OSS
	6202	Support and supervision missions in the countries	mission	1	50000	50000			50000				50000	12500	12500	12500	12500	50000	OSS
		Sub-Total				**75000**	**0**	**0**	**75000**	**0**	**0**	**0**	**75000**	**12500**	**12500**	**12500**	**37500**	**75000**	
	6300	**Project Management**																	
		Regional Manager [15% administrative tasks]									(32400)								OSS
		Regional Working Group liaison officer and pilots Coordinator (PRC) [10% administrative tasks]									(12000)								OMVS/ OMVG
	6301	OSS Operating costs: Internet, telephone, office supplies,....	M	48	800	38400					38400		**38400**	9600	9600	9600	9600	38400	OSS
	6302	Office Supplies (Countries)	lump sum	12	750	9000					9000		9000	2250	2250	2250	2250	9000	OSS
	6303	Office Supplies (OSS - Project Coordination)	lump sum	3	3000	9000					9000		9000	2250	2250	2250	2250	9000	OSS
	6304	Financial controller (part-time)	M/M	6	2000	12000					12000		**12000**	3000	3000	3000	3000	12000	OSS
	6305	Accountant (part-time)	M/M	6	2000	12000					12000		**12000**	3000	3000	3000	3000	12000	OSS
	6306	Admin & financial activities: Procurement, fixed assets monitoring (part-time)	M/M	6	2000	12000					12000		**12000**	3000	3000	3000	3000	12000	OSS
	6307	Communication, dissemination & Promotion (OSS Website)	M/M	6	2200	13200					13200		**13200**	3300	3300	3300	3300	13200	OSS
		Sub-Total				**105600**	**0**	**0**	**0**	**0**	**105600**	**0**	**105600**	**26400**	**26400**	**26400**	**26400**	**105600**	
	Component total					**330600**	**37500**	**37500**	**112500**	**37500**	**105600**	**90000**	**330600**	**98900**	**68900**	**68900**	**93900**	**330600**	
99	**GRAND TOTAL**					**3150000**	**803550**	**627550**	**1091550**	**477350**	**150000**	**160000**	**3150000**	**707050**	**1075150**	**822650**	**545150**	**3150000**	

ANNEX F: (For NGI only) Termsheet

Instructions. Please submit an finalized termsheet in this section. The NGI Program Call for Proposals provided a template in Annex A of the Call for Proposals that can be used by the Agency. Agencies can use their own termsheets but must add sections on Currency Risk, Co-financing Ratio and Financial Additionality as defined in the template provided in Annex A of the Call for proposals. Termsheets submitted at CEO endorsement stage should include final terms and conditions of the financing.

ANNEX G: (For NGI only) Reflows

Instructions. Please submit a reflows table as provided in Annex B of the NGI Program Call for Proposals and the Trustee excel sheet for reflows (as provided by the Secretariat or the Trustee) in the Document Section of the CEO endorsement. The Agencys is required to quantify any expected financial return/gains/interests earned on non-grant instruments that will be transferred to the GEF Trust Fund as noted in the Guidelines on the Project and Program Cycle Policy. Partner Agencies will be required to comply with the reflows procedures established in their respective Financial Procedures Agreement with the GEF Trustee. Agencies are welcomed to provide assumptions that explain expected financial reflow schedules.

ANNEX H: (For NGI only) Agency Capacity to generate reflows

Instructions. The GEF Agency submitting the CEO endorsement request is required to respond to any questions raised as part of the PIF review process that required clarifications on the Agency Capacity to manage reflows. This Annex seeks to demonstrate Agencies? capacity and eligibility to administer NGI resources as established in the Guidelines on the Project and Program Cycle Policy, GEF/C.52/Inf.06/Rev.01, June 9, 2017 (Annex 5).