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NBI Technical Reports: Wetlands and Biodiversity Series

South Sudan Wetlands Governance and Management Profile

WRM/WBS-2022-11

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Document Sheet

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The purpose of the technical report series is to support informed stakeholder dialogue and decision making in order to achieve sustainable socio-economic development through equitable utilization of, and benefit from, the shared Nile Basin water resources.

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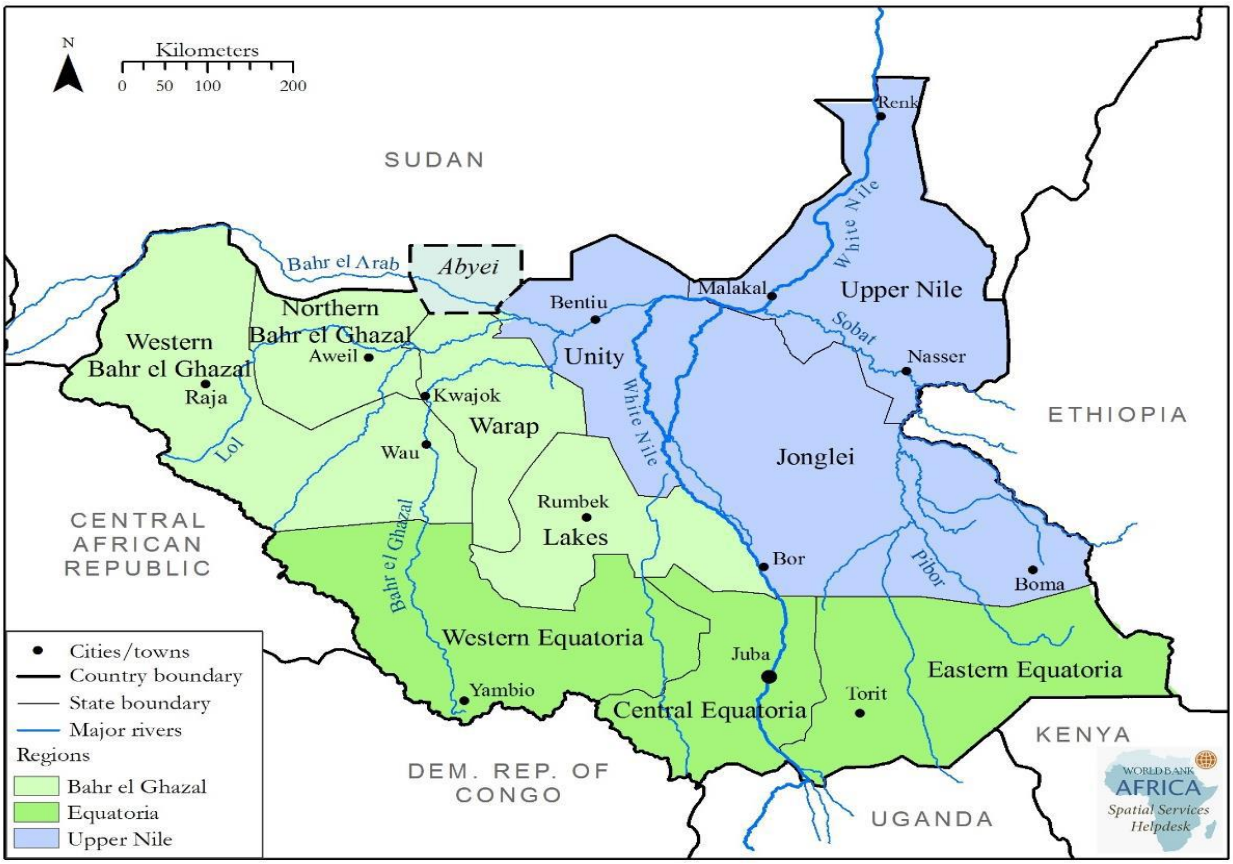
1.0 ABOUT SOUTH SUDAN

1.1 Geography and Administration

South Sudan is located in north-eastern Africa and it is bounded on the north by Sudan; on the east by Ethiopia; on the south by Kenya, Uganda and the Democratic Republic of the Congo; and on the west by the Central African Republic. It has an area of about 644,330 km² (FAO, 2015), representing around 30% of pre July 9, 2011 Sudan. Its capital is Juba and the system of governance is a decentralised one, constituted by national and state levels; in addition to county, payam and boma as local levels (Map 1:1).

Map 1:1 South Sudan



Data source: AICD 2008; RWDB 1982.

1.2 Demography

With a population of 11.3 million in 2013, South Sudan has a rather low population density of 18 inhabitants/km² (FAO, 2015); and predominantly rural. Nevertheless, the country is experiencing a high rate of urban growth (Map 1:2).

1.3 Plant and animal life

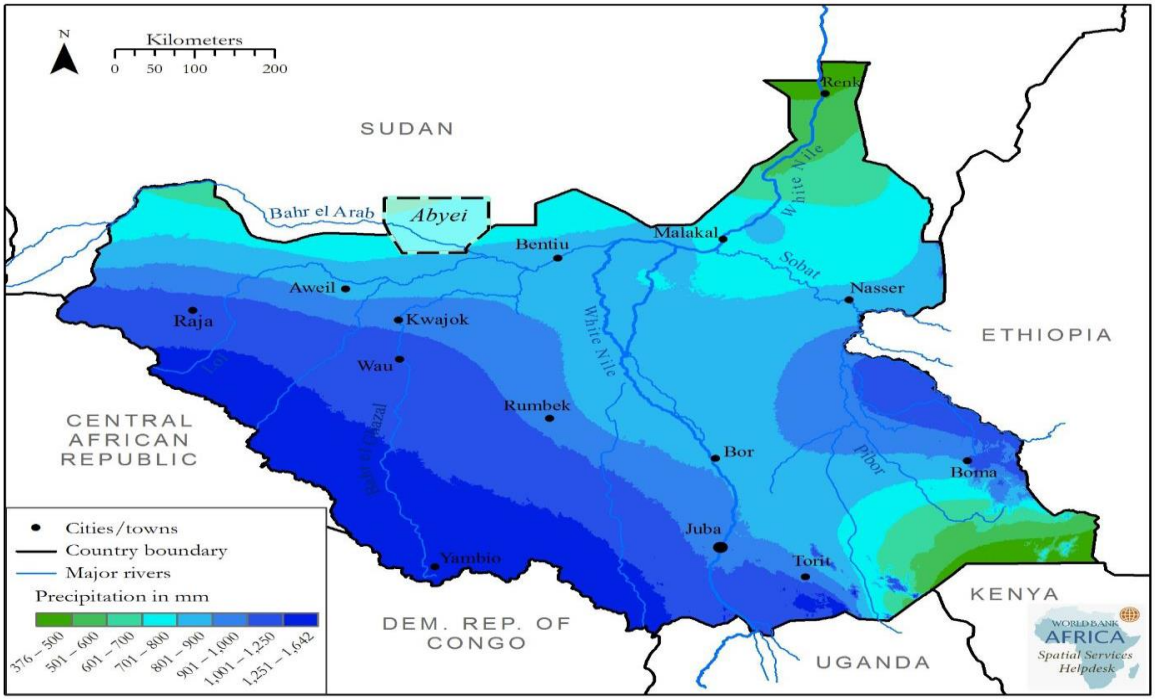
South Sudan is rich in biodiversity, which includes swamplands; lush savannas (including Acacia trees, shrubs, grassland, inland floodplains, etc); woodlands; rainforests[1]; and special areas of mountainous vegetation that are home to many species of wildlife and that support a large number of livestock.

South Sudan shows promising potential for a lucrative tourism industry, as it is known for its scenic beauty and diverse array of wildlife and vegetation, most of which have been gazetted as national parks and game reserves.

1.4 Climate

South Sudan has a tropical climate with distinct wet and dry seasons, more or less a unimodal rainfall pattern with strong seasonal and annual variations. The average annual rainfall is around 900 mm/year (more or less in the central, northeastern and northwestern dry sub-humid zones); and ranges between about 500 mm in the southern semi-arid areas of Eastern Equatoria and northern Upper Nile to around 1,500 mm/year in the moist sub-humid zones (the southwestern areas, covering more or less parts of Western Bahr el-Ghazal, Western/Central Equatoria, the Imatong Range, northeastern areas of Eastern Equatoria and southeastern areas of Jonglei). Potential evaporation decreases from a maximum of 2 400 mm/year in the north to 1 400 mm/year in the south; and annual variations in precipitation often make cultivation without irrigation risky.

Map 1.4.1 Distribution of Average Annual Rainfall in South Sudan



Areas of South Sudan experience two rainfall patterns:

- Greater Equatoria region (mainly Western and Central Equatoria) has a bimodal rainfall pattern. The first occurs from April to June, and the second from August to November. This pattern creates a long wet season, a short dry period (December to March), and long agriculture growing seasons (280–300 days).

- Other areas have a unimodal rainfall pattern. These areas have a wet season (typically May to October) and a dry period (November to April). Their annual growing season is relatively short (130–150 days).

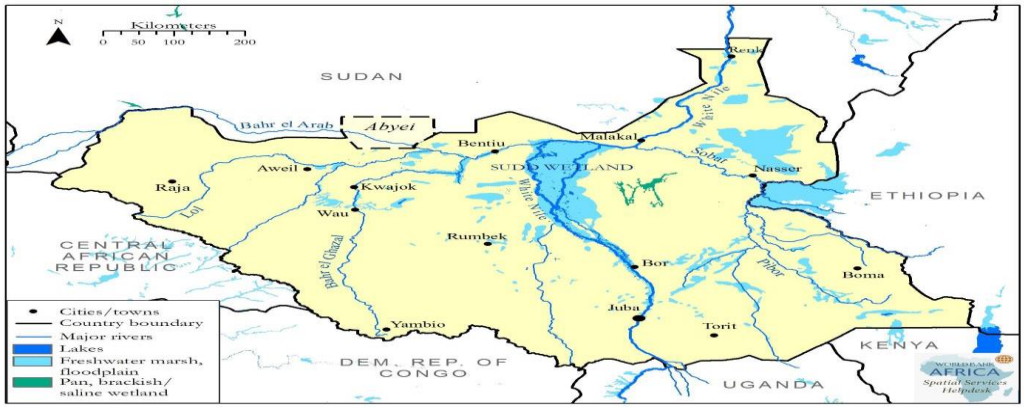
1.5 Surface Water Systems

About 97.5% of South Sudan lies in the Nile basin, while 20% of the Nile basin is within South Sudan. The main feature of South Sudan is the White Nile, flowing through arable plains with gentler slope and characterized by wider floodplains. Its three tributaries of Bahr el-Jebel, Bahr el-Ghazal and River Sobat, extend to catchment areas 1) southward up to the Equatorial Lakes Plateau; 2) westward (to Central African Republic) and southwest (up to the water divide with DR Congo); and 3) eastward to the south-western Ethiopian highlands and north-eastern Uganda respectively. The White Nile and its tributaries are important transportation links. The White Nile, Bahr el-Jebel and the Bahr el-Ghazal to a greater extent are navigable throughout the year. The Sobat system and the tributaries of Bahr el-Ghazal can be seasonally navigated.

As the gradient of the terrain is very mild, volume of additional water that arrives during the rainy season cannot be accommodated by the rivers. As a result, almost all the plains become inundated, creating waterlogged swampy and marshy areas, some of which are permanent with enormous varieties of aquatic vegetation that are known as the Sudd wetlands.

Apart from the Nile river system, the dominant physical feature, which is seemingly exhibits the fact that all streams and rivers in South Sudan drain either into or toward: Also, surface water in South Sudan, include the Rift Valley watersheds/basins, such as River Kibish, in the far south-eastern corner, at the border with Ethiopia and Kenya, covering 2.5% (FAO, 2015) of the country, draining toward Lake Turkana.

1.5.1 Surface Water System of South Sudan



Data source: WWF/RWDB 1982; ESA 2008.

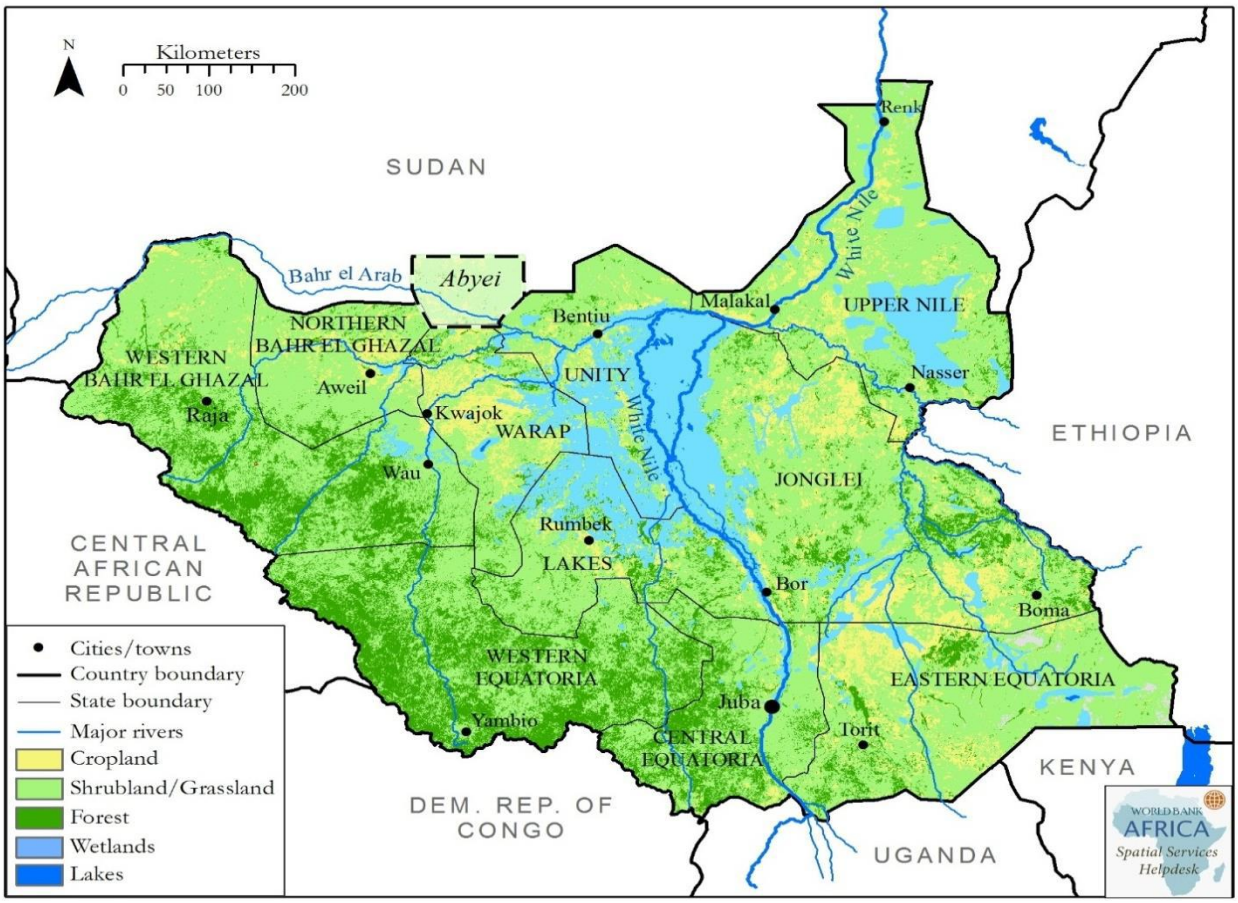
1.6 Land Cover and Land Use

The distribution of basic land cover types (cropland, scrubland, grassland, forests, wetlands, and lakes) is shown in (map 1.3). Most of the country is covered with natural and semi natural vegetation with a variable tree density, generally high in the southwest and low in the southeast and north, while wetlands are dominated by grasslands, aquatic vegetation, and open water.

A large part of South Sudan is covered by wetlands, usually grouped together and called the Sudd. In addition to feed for livestock, the vast forested areas provide timber, fuel wood, charcoal, and a large list of non-timber forest products (NTFPs) including food plants, medicines, and bush meat.

The dominant land uses are rain-fed farming and livestock keeping. Livestock raising is practiced almost everywhere in the country, but with better grass quality and lower livestock parasite occurrence it is higher in the dryer areas.

Map 1.6 Land Cover of South Sudan



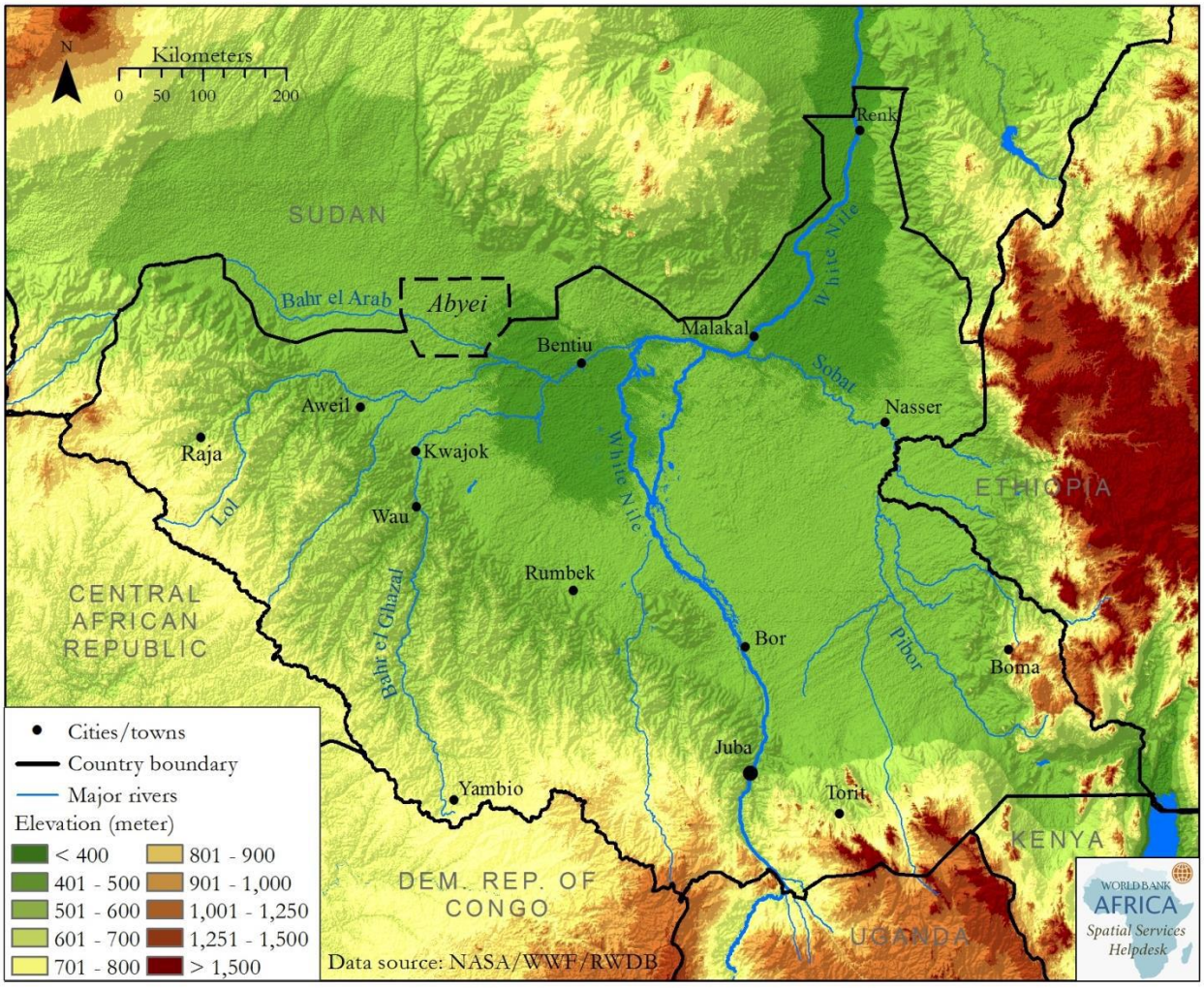
Data source: ESA 2008; GLWD 2013.

2.0 WETLANDS OF SOUTH SUDAN

2.1 National Wetlands

When high river discharges coincide with the peak of rainfall, water spills over the riverbanks, spreading into large areas, which are relatively flat and lower than the banks, creating wetlands whose area is approximately 30,000 km2 or 3 million ha, of which 1.4 million ha is seasonal and the remainder is permanent. Because only part of river discharges entering the area flow out, the region was termed *Sudd*(barrier/blockage in Arabic), Machar Marshes and among others. These wetlands are important environmental assets of the country and they provide important livelihood support to rural population and miscellaneous environmental services.

Map 1.4.2 Topography of South Sudan



Data source: NASA 2000; WWF/RWBD 1982

Wetlands may be simply defined as areas where land and water meet and intermingle. The term encompasses a wide range of environments including areas of open water, such as lakes and rivers; vegetation areas that are permanently or seasonally inundated, such as swamps and riverine floodplains; andareas of water saturation such as bogs and mires. The water within wetlands may be fresh, brackish or salty, and may be static or flowing.

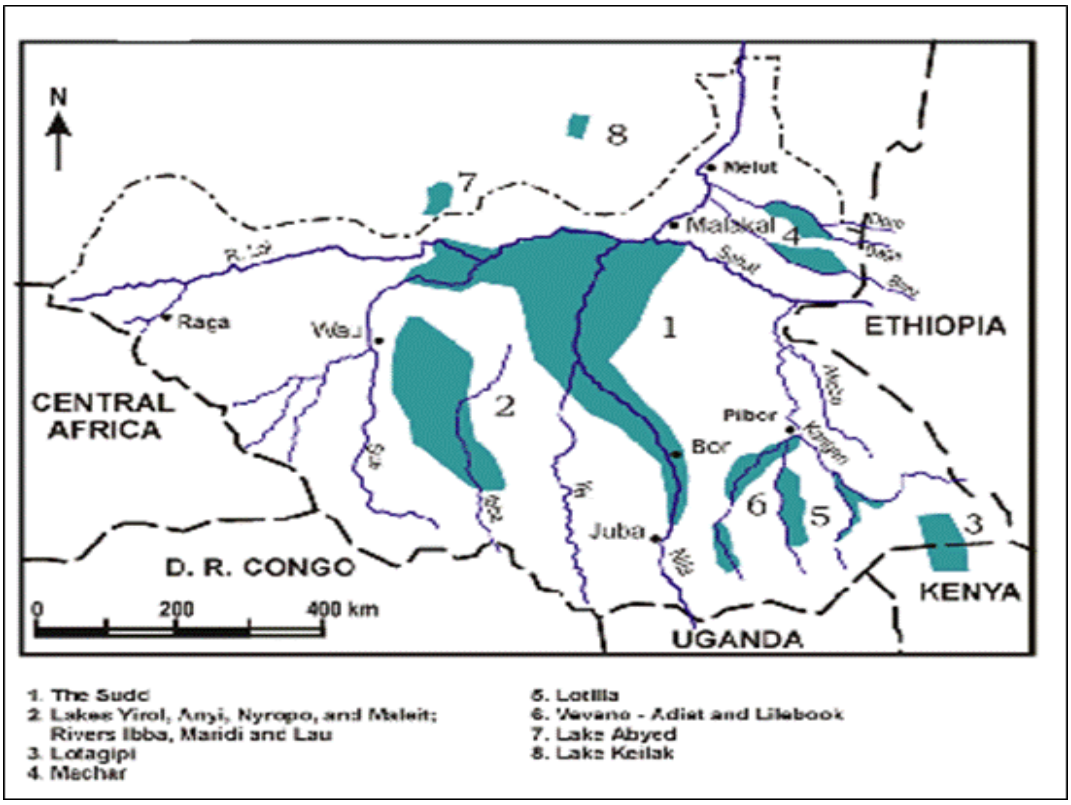


Figure 1: South Sudan River Systems(Source: The Information Retrieval Group (IRG) at the Polytechnic School of the Autónoma University of Madrid,2007, in the South Sudan Preliminary Water Information Assessment Study by AbdinSalih, June **2010)**

South Sudan Wetlands covermore than 128,866 km^2 of the country area(20%of the total land area) these wetlands are extensive, ranging from vast tropical papyrus or grassland swamps to swamp forests, permanent swamps, marshes and seasonal flood plains.

Permanent wetlands and swamps of South Sudan make up approximately estimates 32,216.5 km2 (5 % of the total area of South Sudan), while a much greater area, both north and south, is seasonally flooded with about 64,433 km2 (10%of the total area of South Sudan) . The largest wetland is the Sudd, which is formed by the White Nile in very flat topography between the towns of Bor and Malakal. Covering more than 30,000 km^2, the Sudd flood plains is the second largest wetland in Africa and was designated as a Ramsar Site in 2006.

South Sudan wetlands offer a considerable socio-economic livelihood opportunities for agricultural, pastoral and fishing communities in the area, the flood plains are also a rich habitat

for flora and fauna such as fish, mammals, birds, reptiles, amphibians and other rare species. The wetlands are essentially undeveloped and represent a safe haven for wildlife, including migratory birds. Hydrological and ecological functions of these wetlands such as water quality improvement and food provision both contribute to ensuring ecological and socio-cultural stability in the region.

2.2.1 Wetlands of South Sudan

Hydrologically, these wetlands fall under the following river and lake drainage basins:

1. Bahr el – Jebel Basin
2. Bahr el – Ghazal Basin
3. Sobat River Basin
4. White Nile River Basin
5. Baro Basin
6. Akobo Basin
7. Pibor Basin
8. Jur River Sub-basin

River Achwa Basin: This basin, which is drained by the Achwa River and its tributaries (Moroto, Awer, Pager, Agogo Rivers) is located in northern Uganda and extends into South Sudan. Considerable areas of wetlands fringe and cover the Agogo River, which passes close to the town of Pader. There are also large areas of wetlands along the Nyimur River, which crosses the Uganda-South Sudan border to discharge into the White Nile in South Sudan.

Kidepo Basin: This hydrological basin extends through the districts of Lamwo, Kitgum and Kaabong and drains into the White Nile in South Sudan through the Kidepo and Narus Rivers. The area is semi-arid but there are some seasonal wetlands along the Lamwo-Kitgum district border and in Kaabong District in the upper reaches of the Kidepo River.

The Sudd is a Ramsar site, giving it the status of a wetland of global importance and obligating the government to protect and manage this resource effectively. There are many other wetland systems throughout South Sudan, some quite extensive. Those that are in national parks, game preserves, or forest preserves are protected by the government.

South Sudan possesses large areas of land underlaid by rich aquifers. These water-bearing formations are recharged by seasonal rainfall and rivers. Groundwater is an important source for water supply for the country, and its development has been the basis for the rapid expansion of access to improved water supply, especially in rural areas. Knowledge of groundwater, including the location, hydrogeology, depth, extent, yield, and other characteristics and estimates of resources potential of major groundwater basins, is, however, very limited and insufficient to support sustainable development. Groundwater mapping, investigations, and assessments are therefore major priorities.

South Sudan's main groundwater resource is in the Umm Ruwaba sedimentary formation. In other parts groundwater may be available in fractured and weathered zones of the basement complex. These basements are recharged by seasonal rainfall and river flooding. But the extent,

availability, and safe yields of the Umm Ruwaba aquifer as well as of fractured and weathered rock formations are currently unknown.
The relationship between the Umm Ruwaba formation and the overlaying surface water, particularly in the swamps zones, is poorly understood at present. Although many hydrogeological maps were developed within the last decades for the Sudan as a whole, a long-term program for more detailed studies may be needed in South Sudan for identifying the locations, extent, and hydrogeological characteristics of these formations. Studies are needed to determine water quality, recharge and discharge sources and characteristics, and the safe groundwater yields in time and space for various uses.

Access to water often is a source of conflict among communities. This, as well as seasonal floods, in some instances leads to displacement and migration of people beyond their territories, including to the neighboring countries.

2.2 Trans-boundary Regional Significance Wetlands of South Sudan

2.2.1 The Main Trans-boundary/Significance Wetland Systems

The Sudd wetland is located in the lower reaches of Bahr el Jebel in South Sudan. The Sudd is one of the largest tropical wetlands in the world and covers approximately 57,000 km^2. But the size varies based on the river flows from its catchment and rainfall (IRG 2007). The largest areas of the Sudd found along the Bahr el Ghazal, where the Bahr el Jebel and Bahr el Zeraf in the Upper Nile and Jongolei come together. The Southernmost limit of the permanent wetland in the Sudd is Bor town, which is also the wettest (USAID 2014). The ecosystems that compose the Sudd wetland include open waters, submerged vegetation, floating fringe vegetation, seasonally inundated woodlands, rain-fed and river-fed grasslands and flood plain scrubland (IRG 2007). About 50 percent of the 2.9 billion cubic metres (BCM) of water flows into the Sudd wetland is lost through evaporation.

The sudd functions as a giant hydrological regulator of the entire Nile River Basin System. The central core of the Sudd swamp is dominated by papyrus sedge (*Cyperus papyrus*) which is bordered by cattails (*Typhadominguensis*), the dominant vegetation that covers about 75 percent of the total swamp. The Sudd is an important habitat for biodiversity and was declared a Ramsar site number 1622 on June 5, 2006. The Sudd is also listed as an Important Bird Area (IBA) by Birdlife International with over 470 documented species. There are over 350 plant species that have been identified in the Sudd region, only one endemic plant species has been recorded, the swamp grass (*Suddiasagitifolia*), belonging to the genus Poaceae. The papyrus sedge (*Cyperus papyrus*) threatened elsewhere by pollution and flood control flourishes in the pristine Sudd wetlands (IRG 2007). Important plant species in the Sudd also include papyrus sedge (*Cyperus papyrus*), the hippo grass (*Vossia cuspidate*), cattails (*Typha specie*) located in the permanent swamps that surround the deep open waters. These wetlands are important habitats for the endangered shoebill stork. *Echinochloastagnina*, *E. pyramidalis* and *Oryzalongistimanta* surround the seasonally flooded grasslands. At the edge of the wetland is the grass species, *Hyparrheniarufa*.

Photo 1: Bird Species in the Wetland

The Sudd and other permanent swamps are important habitant for invertebrate zooplankton (abundant and high species diversity), but the zoobenthos comprise mainly Oligochaetes. About 100 species of fish have been recorded from the Sudd; 31 siluroids, 16 characoids, 14 cyprinoids, 11 mormyrids, 8 cichlids and 7 cyprinodontids. Many species leave the rivers and move onto flood plains to spawn as the flood rises, and return to the permanent water courses when the flood recedes (Howell et al.1988; Hughes and Hughes 1992). The most numerous species are; *Alestesdentex, Auchenoglanisbiscutatus, Chelaethiopsbibie, Citharinus. Distichodusrostratus, Eutropisnniloticus, Heterotisniloticus, Hydrocynusforskalli, Labeoniloticus, Latesniloticus, Micralestesocutidens, Mormyrunscashive, Oreochromisnilotics, Synodontisfrontosus, Aplocheilichthysspp, Epiplatys*spp., *Gymnarchusniloticus, and Polyoterusbichir* which are associated with the Papyrus and Typha swamps.

Frogs are abundant and there are several snakes' species in the swamps; *Crocodylusniloticus* is also widespread. The Sudd is important for migratory birds and has a high diversity of avifauna such as *Anasacuta, A.clypeata, A.crecca, A.penelope, A.querquedula, Anthuscervinus, Circus macrourus, C.pygargus, Glareolanordmanni, Larusfuscus, Limosa, Philomachuspugnax, Tringaglareola, T. nebularia, T. ochropus* and *T. stagnatilis*. Numerous weavers, warblers, flycatchers (including *Alseonaxaquatica*), kingfishers, ducks, herons, ibises, egrets, stocks (including *Balaenicepsrex*), kites, crows, and vultures (such as *Necrosyrtesmonachus*) are also present. large mammals found in this type of wetland include; *Alcelaphusbuselaphus, Damaliscuskorrigum, D.lunatus, Hippopotamus amphibious, Hippotragusequinus, Kobusellipsiprymnus, K.megaceros, Loxodonta Africana, Pantherapardus, Redunca*, and *Synceruscaffer*.

3.0 POLICY AND LEGAL FRAMEWORK

South Sudan National Institutional, policy and legal frameworks for management of the water resources and associated sectors/sub-sectors had progressed well under the Government of Southern Sudan (GoSS). Some policies, including in the sectors of water and environment were thus defined even before the independence.

Structures mandated for management, utilisation, service delivery and conservation in specific sectors and sub-sectors of natural resources exist.The relevant entities include ministries and institutions responsible for land, water resources, forestry, wildlife conservation, environment, petroleum, mining, rural development, etc.

3.1 Policy Framework

3.1.1 The National Environment Policy

The Environment Policy (2015) : under the National Ministry of Environment, is ensuring the protection, conservation and sustainable use of the natural resources without compromising the tenets of inter-generational equity.

Policy Note pertaining to Legal and Institutional Framework (2010) updating the 2017 GoSS Forest Policy Framework , National Ministry of Environment and Forestry maintained:

a) Sustainable management of forest resources,
b) As forests play a vital role in climate mitigation and preservation of biodiversity, watersheds and wildlife: It focuses on issues relating to improvements in forest governance including decentralization, engagement of local communities, the involvement of the private sector, and the importance of strategies for protection of forest-related environmental services such as climate, biodiversity, water and wildlife.

3.1.2 The National Water Policy

2007 GoSS Water Policy : under the National Ministry of Water Resources and Irrigation (MWRI), aims at:

1) Improved users' participation in the water sector
2) Water must be a lever for peace and not a source of conflict".
3) Builds on local experience while taking into account regional and international best practices, incl. the World Summit on Sustainable Development (2002), which recommended the development of national plans for integrated water resources management (IWRM).
4) It distinguishes water resources management (WRM) from water supply and sanitation.
5) Water resources planning shall involve all relevant stakeholders and will be undertaken on the basis of natural hydrological boundaries.
6) Government to develop a financing strategy in the long term where private sector investments are encouraged.
7) Trans-boundary water resources management and development

Water, Sanitation, and Hygiene (WASH) Sector Strategic Framework (2011), Ministry of Water Resources and Irrigation aims to:

a) To operationalize the Policy and ensure its implementation through effective and technically sound strategic approaches, improved capacity and involvement of all stakeholders.
b) It distinguishes Water Resources Management from Water Supply and Sanitation Services.
c) It recommends the establishment of a Water Council as an advisory body and a Water Resources Management Authority; and WASH Services Board, to enforce regulatory functions.

Irrigation Development Master Plan (IDMP), 2015 of the Ministry of Water Resources and Irrigation: is the IWRM national framework for South Sudan for the Assessment, allocation, management, and development of water resources "to support agricultural production and productivity without jeopardizing the needs of other sectors and stakeholders"

Comprehensive Agriculture Master Plan (CAMP), 2015 under the Ministry of Agriculture and Food security in collaboration with Ministries of Water Resources and Irrigation and Ministry of Animal Resources and Fisheries,

- Defined planning space for forestry, crop, livestock and fisheries subsectors under development themes of reconstruction and recovery; food and nutrition security; economic growth and livelihood improvement; agriculture sector transformation; and institutional development in short, medium and long term up 2040.
- IDMP strategic goals are set and defined in consistent with CAMP development themes.

3.1.3 Other Policies

1. *National policy for the conservation and management of wetland resources*
2. The South Sudan Vision 2040 (See Attached)

3.2 Legal Framework

3.2.1 The National Constitution of South Sudan

2011 Transitional Constitution of the South Sudan in its article (37), paragraph (2), (b); Lists water among the natural resources that the government must "protect and ensure its sustainable management and utilization", together with land, petroleum, minerals, fauna and flora.

41. (1) Every person or community shall have the right to a clean and healthyenvironment.(2) Every person shall have the obligation to protect the environment for the benefitof present and future generations.(3) Every person shall have the right to have the environment protected for thebenefit of present and future generations, through appropriate legislative actionand other measures that:(a) prevent pollution and ecological degradation;(b) promote conservation; and(c) secure ecologically sustainable development and use of natural resourceswhile promoting rational economic and social development so as toprotect genetic stability and bio-diversity.(4)

All levels of government shall promote energy policies that will ensure that thebasic needs of the people are met while protecting and preserving theenvironment.

3.2.2 The Water Act

Draft Water Bill, 2015: Stipulates under CHAPTER 6 - WATER RESOURCES PLANNING AND PROTECTION (Article 52, a) that "where, in the opinion of Water Resources Management Authority (WRMA) or the Basin Water Board or the Catchment/Sub-Catchment Committees it is desirable that water use in respect of one or more water resources, within a specific geographic area be rationalized or reviewed so as to:

i. Achieve a sustainable allocation of water from a water resource which is under stress;
ii. Achieve equity in allocations;
iii. Promote beneficial use of water in the public interest;
iv. Facilitate efficient management of water resources; or
v. Protect the ecosystem and water resource quality.

The WRMA or Basin Water Boards or the Catchment/Sub-Catchment Committees may issue a notice requiring all water users, including permit holders, to apply or reapply for permits for one or more types of water use.

3.2.3 The Land Act

Draft Land Policy (February 2013) under South Sudan Land Commission stated that, **1)** Water being the most essential of the land-based natural resources of the country, it has given significant consideration to the water sector in its statements and strategies.

2) It encourages the sustainable management of land-based resources used in common such as forests, wetland, pasture lands and water resources, through collaborative planning and management initiatives.

3.3.4 Other Legislations

1. The National Environment Bill, 2015
2. The Local Government Act

4.0 INSTITUTIONAL FRAMEWORK

4.1 Wetlands Management Department

The Ministry of Environment is the lead institution for environment and biodiversity protection inSouth Sudan. Its priority work programme includes the development of a policyand regulatory framework for wetlands and biodiversity management, capacitybuilding and strengthening of partnership with stakeholders (particularly for thejustice and legislative institutions that contribute to delay legal and policyreviews, acceding to and implementing MEAs and environmental audit andassessment.

The Ministry of Environment has established various Directorates including**Directorate of Wetlands and Biodiversity** whose main functions is to ensure that thewetlands, biodiversity and any natural features in South Sudan are protected andensure their sustainable use.**The Directorate of Climate Change and Meteorology** that develops and implementprogrammes to address issues of climate change and coordinate theimplementation of South Sudan's obligations under the United Nations FrameworkConvention on Climate Change (UNFCCC).

Investment Promotion Act 2009, which provides for the promotion and facilitation of investment in the country. It requires investors to observe and implementenvironment friendly corporate rules and regulations to preserve the water and riverbanks, flora and fauna and ecosystem biodiversity; redeem or repair the land to thenatural status after use or expiry of mining activities; be responsible for solid wastemanagement and disposal of waste and toxic substances, and; ensure responsiblemanagement of clean air and clean water (ponds, rivers, streams andswamps/wetlands). Failure to design and implement environmentally friendly rulesand regulations is an offence inviting fines, damages payment and removal ofwaste where applicable. But as stated earlier, the Ministry has been hampered indischarging its obligations by among others lack of capacity and inadequate legislative foundation.

4.2 Other Relevant Institutions

1. The National Environment Management Authority (NEMA)
2. Districts and Lower Local Governments
3. Private sector and civil society
4. Multi-stakeholder platforms

5.0 WETLANDS-RELATED INTERNATIONAL TREATIES TO WHICH THE COUNTRY IS A SIGNATORY

5.1 The Ramsar Convention

At the international level, the country joined the United Nations Convention on Biological Diversity in 2014. In addition, theSudd wetlands have been declared a wetland of internationalimportance under the Ramsar Convention onWetlands, which entered into force in South Sudan on10 October 2013. The Ramsar Convention stipulates "the conservation and wise use of all wetlands throughlocal and national actions and international cooperation,as a contribution towards achieving sustainable development
throughout the world" (Ramsar, 1971).

5.1.1 South Sudan's Participation in the Ramsar Convention

South Sudan participated in the 13th Meeting of the Conference of the Contracting Parties to the Ramsar Convention on Wetlands (COP13) which took place in Dubai, United Arab Emirates, from 21-29 October 2018. COP13 under the theme, "Wetlands for a Sustainable Urban Future".

Agenda items included: progress on the 2016-2024 strategic plan; regional initiatives; status of existing Ramsar sites; guidance on identifying Ramsar sites for global climate change regulation; restoration of degraded peatlands; cultural values, indigenous peoples and local communities, and climate change mitigation and adaptation; sustainable urbanization; and wetlands in specific areas and habitat types.

South Sudan also participated in the 12th Meeting of the Conference of the Contracting Parties to the Ramsar Convention on Wetlands (COP12) held in Punta del Este, Uruguay, from 1 to 9 June 2015.

South Sudan has so far developed two reports on the national implementation of the Ramsar convention on wetlands.

5.1.2 Ramsar Centre for Eastern Africa

5.2 Other International agreements

Seven international conventions focus on biodiversity and wetlands related issues: the Convention on Biological Diversity (year of entry into force: 1993), the Convention on Conservation of Migratory Species, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (1975), the International Treaty on Plant Genetic Resources for Food and Agriculture (2004, the World Heritage Convention (1972) and the International Plant Protection Convention (1952). Each of these conventions works to implement actions at the national, regional and international level in order to reach shared goals of conservation and sustainable use. In meeting their objectives, the conventions have developed a number of complementary approaches (site, species, genetic resources and/or ecosystem-based) and operational tools.

South Sudan is signatory to the Montreal Protocol to the Vienna Convention on Substances that Deplete the Ozone Layer, the United Nations Framework Convention on Climate Change (UNFCCC), the Kyoto Protocol to the UNFCCC, the International Plant Protection Convention (IPPC), the Conventionon Biological Diversity (CBD), and the UN Convention to Combat Desertification.

The country had begun working on a number of commitments to international environmental agreements
prior to the resumption of conflict in 2013, including its First National Communication to the UNFCCC, a
National Adaptation Programme of Action, the National Adaptation Plan, and the National Biodiversity Strategy and Action Plan (UNEP, 2016). In 2015, South Sudan submitted its Intended Nationally Determined Contributions (INDCs) to the UNFCCC and its Fifth National Report to the Convention on Biological Diversity and a draft National Biodiversity Strategy and action plan.

6.0 MAIN CHALLENGES AND OPPORTUNITIES

6.1 Main challenges

6.1.1 Destruction of wetlands

Oil pollution is a very serious risk, particularly in wetlands. From various persons who managed to visit the oil exploitation sites in Abyei, Unity State and Upper Nile State, it was understood that oil pollution around these sites is visible (see also Cooper &Catterson, 2007 and GoSS, 2010). However, these sites were then under the control of the Khartoum Government and the Government of Southern Sudan generally had no access and no control. It was therefore impossible to monitor the level of respect paid to the environment by the oil companies. Cooper and Catterson (2007) state: "*The areas in Unity and Upper Nile currently yielding petroleum are dotted with small ponds created near the well heads to hold the "produced water" that typically comes out of the ground from the oil wells. Produced water is produced with the oil, often with high concentrations of chemicals, minerals or mixed with oil, and frequently at high temperatures. The high amounts of the contaminants (salts or chlorides, hydrocarbons, well treatment chemicals, oil separation and water treatment chemicals) can reach toxic concentrations that will pollute the surrounding areas or waters if dispersed directly into them (Exxon Mobil 2000). They are currently being stockpiled in man-made ponds adjacent to the drilling sites where the expectation is that they will be disposed of by evaporation over time."*

6.2 Other Challenges

1. Overexploitation
2. Erosion of cultural values
3. Other challenges

7. KEY WETLAND MANAGEMENT ACTIVITIES AND ACHIEVEMENTS

1. Carrying out biodiversity assessment and total economic valuation
2. Preparing and operating and maintaining a National Wetlands Information System
3. Information dissemination and awareness raising on wetlands
4. Demarcating wetland boundaries
5. Carrying out wetland restoration
6. Preparing wetland management plans
7. Creation of an Environment Protection Force
8. Compliance monitoring and enforcement

8. PAST AND ONGOING WETLAND PROGRAMS AND PROJECTS

1. The Nile Transboundary Environmental Action Plan (NTEAP)
2. Extending Wetlands Protected Areas through Community Based Conservation Initiatives.
3. Preparation of the South Sudan Wetlands Atlas
4. National Wetlands Management Project

ONE RIVER
ONE PEOPLE
ONE VISION

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