



Republic of South Sudan



NILE BASIN INITIATIVE
INITIATIVE DU BASSIN DU NIL

SUDD WETLANDS MANAGEMENT STRATEGY 2022-2050

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giz Deutsche Gesellschaft
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Zusammenarbeit (GIZ) GmbH

On behalf of:



Federal Ministry
for the Environment, Nature Conservation
and Nuclear Safety

of the Federal Republic of Germany



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There is a growing awareness of the need to improve the lives of people with mental health problems. The Department of Health (1999) has set out a vision of a new mental health system, which will be based on the following principles:

- (i) people with mental health problems should be treated as individuals, with their own needs and wishes;
- (ii) people with mental health problems should be given the opportunity to participate in decisions about their care and treatment;
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FOREWORD

Dear Reader,

It gives me great pleasure to welcome you to the updated Nile Basin Initiative (NBI) Wetland Management Strategy (WMS) 2022. This Strategy is expected to continue fostering the sustainable management and utilization of the Nile Basin's wetlands; subsequently preserving and enhancing their environmental and socio-economic functions. The WMS will serve as a guide to national, transboundary and basin-wide efforts.

The updated WMS has benefited from the experience of implementing the 2013 original Strategy; and is therefore informed by extensive socio-economic assessments and ecological baseline studies on wetlands in different parts within the Nile Basin. These include an inventory and mapping of the Nile Basin's Wetlands, piloted trans-boundary wetland management plans, and implementation of key international conventions and agreements together with international best practices.

Furthermore, the Strategy builds heavily on previous studies carried out under NBI as well as an examination and systematic review of Nile Basin riparian countries' related legal and policy documents.

The guiding principles and approaches to strengthen trans-boundary cooperative wetlands management put forward by this Strategy are based on the rules, principles, and approaches of international, regional, basin-wide, as well as sub-basin experiences and lessons learned. Alignment of trans-boundary wetland management with national requirements was also ensured.

The updated WMS presents an operational definition and different classifications of wetlands; describes Nile Basin wetlands and their significance; highlights Nile Basin wetlands functions and values; justifies the applicability of the worldwide accepted principles and approaches (ecosystem-based approach; wise use, nature-based solutions approach; ecosystem-based adaptation approach and NBI's Environmental and Social policy principles) within the Nile Basin context; defines strategic outcomes together with their corresponding priority outputs; and lays down the respective implementation plan.

I expect that the updated Strategy will support the Nile Basin countries' efforts to reduce the rapid degradation of wetlands in the region, regulate and guide multiple developments in order to diminish existing pressures in a way that restores the Basin wetlands adaptive potential and therefore strengthens the overall resilience of the Basin's hydrological system. Once adopted, the updated WMS will bring about significant positive effects on water quality and quantity, with substantial laudable and tangible impacts on the livelihoods of local communities and their overall socio-economic development potential.

It is my hope that collaborative endeavors and proactive measures will be in place shortly so that the strategic means towards achieving sustainable management and conservation of wetlands are fully undertaken. The updated WMS will play a vital role in decreasing poverty, maintaining precious ecosystems and rich biodiversity, increasing rural development, maintaining pollution, stabilizing hydro-power, and limiting displacement of people - thus significantly contributing to the NBI Shared Vision and 10-Year Strategy (2017-2027).

I commend the Nile Basin Secretariat for developing this Strategy and thank the Government of the Federal Republic of Germany through the International Climate Initiative (BMU-IKI) for supporting the development process.

I call upon all Nile Basin countries to mobilize necessary resources to move forward with this Wetland Management Strategy.

Sincerely,



Hon. Josephine Joseph Lagu
Chairperson, Nile Council of Ministers (Nile COM),
Acting Minister of Water Resources and Irrigation;
and Minister of Agriculture and Food Security
Republic of South Sudan

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The development and finalization of this Sudd Wetlands Monograph and Management Plan was made possible by the Nile basin Initiative Secretariat (NBI) with support from the Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ) (German International Cooperation), on behalf of the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) under the International Climate Initiative (ICI). Technical support was through a team of experts led by HYDROC GmbH.

Valuable contributions were made by the South Sudanese Stakeholders through the South Sudan Wetlands Working Group – during different face to face and online meetings organized for this purpose. The implementation team benefited from the guidance of Mr. Francis Wajo, Directorate of Water Resources Management, Ministry of Water Resources and Irrigation, NBI Nile-Tac and Chair Person of the Working Group; as well as Mr. Thomas Jang Kan, Directorate of Water Resources Management, Ministry of Water Resources and Irrigation; Mr. Paul L. Demitry, Deputy Director for Biodiversity, Ministry of Environment and Forestry; and Mr. John Ater, Ministry of Environment and Forestry focal point for the Ramsar Convention - all members of the South Sudan Wetlands Working Group.

Our sincere appreciation also to the colleagues from the Ministry of Livestock and Fisheries, Ministry of Transport, Ministry of Wildlife Conservation and Tourism, Ministry of Agriculture and Food Security; and Directorate of Climate Change, Ministry of Environment and Forestry of South Sudan who have supported the development process of the Sudd Monograph and Management Action Plan. The consultations and validation process also benefited from inputs by colleagues from the University of Juba, the South Sudan representative of the Nile basin Discourse (NBD); as well as other actors from civil society.

Finally, our gratitude to Mr. Leonard Akwany, Regional Wetlands Expert, NBI for leading the development of the Sudd Wetlands Monograph and Management Plan, as well as to Dr. Juan Carlos Sanchez, Wetlands Advisor and Dr. Malte Grossmann, Head of the Transboundary Water Cooperation in the Nile basin Project, both from GIZ, for their contributions and guidance throughout the development and finalization of this flagship management instrument for South Sudan.



22/09/2022

Mr. Francis Wajo
Nile TAC Chair

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1. INTRODUCTION

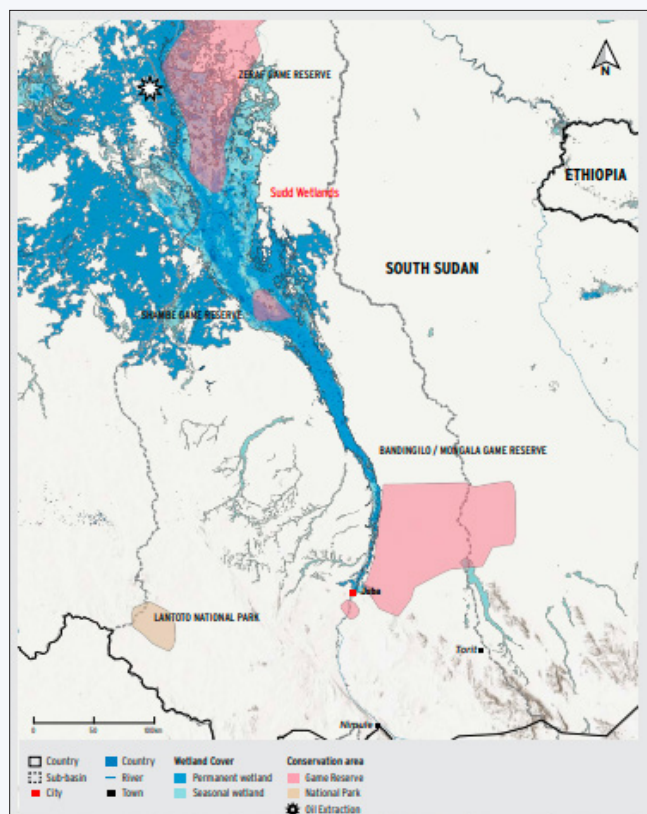
1.1 The Sudd Wetland

The Sudd wetland is the largest tropical wetland in the world, covering a vast area of seasonal and permanent wetlands in the central and northern parts of South Sudan. The Sudd consists of permanent wetlands, and seasonal wetlands created in the wet season (April to October) by flooding of land from rainfall and bursting of banks of the Nile and its tributaries. The Sudd wetlands, which are largely pristine, are dominated by papyrus, reeds and seasonally flooded grasslands.

The wetland area is mostly flat, sloping gently to the north with a gradient of 0.1m/km (Riak, 2006). Elevation in the Sudd ranges from an elevation of 380m-450m (Ramsar, 2019). The south most point of the Sudd is on the Bahr El jebel at Juba. From Juba to Bor, the Bahr El Jebel River meanders from side to side through an incised trough. Downstream of Bor, the river flows in various meandering river stretches, channels and lagoons. At the peak of the high low season, which occurs from October to December (Sutcliffe & Parks, 1999), the river bursts its banks and spills water into a massive floodplain.

The exact area of the Sudd is unknown as it expands and shrinks seasonally and from year to year depending on the flow of the Bahr El Jebel (White Nile) and rainfall over the Sudd area, but it is estimated to have a maximum size of about 60,000 km² (MEF, 2018).

The Sudd wetlands are of major socio-economic, cultural, scientific and biological importance for the South Sudan and the whole Nile Region. Over 350 plant species, 100 mammalian species, 470 bird species, 100 fish species, an unknown number of reptilian and amphibian species, and 120 species of insects inhabit the Sudd. The Sudd is comprised of several ecosystems, ranging from open waters with submerged vegetation; to emergent and surface-floating fringe vegetation;



river-fed seasonally flooded grassland (toic); rainfed, seasonally flooded grassland; seasonally inundated woodland; and floodplain scrubland. Permanent swamp vegetation is dominated by *Cyperus papyrus*, *Typha domingensis*, *Phragmites karka*, and *Vossia cuspidata*.

The Sudd has one of the largest populations of large mammals in Africa. Several species of migratory mammals depend on the Sudd for their dry-season grazing, including the white-eared kob, tiang, elephant, mongalla gazelle, and zebra. Other mammals of important conservation status that inhabit the Sudd include the Nile lechwe, Thomson's gazelle, sitatunga, waterbuck, and reedbuck. Three protected areas – Shambe National Park, Fanyikang Game Reserve, and Zeraf Game Reserve – are located within the Sudd.

The Sudd floodplains are also globally outstanding for their large populations of water birds. The site is believed to hold over 80% of the world's population of

the shoebill stork (*Balaeniceps rex*) and is probably also important for the ferruginous duck (*Aythya nyroca*) and passing lesser kestrel (*Falco naumanni*). Birds that visit the wetlands in large numbers (from hundreds of thousands to over a million individuals) include the glossy ibis, marabou stork, African open bill, cattle egret, and spurwinged goose.

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 migrate 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 genera of fish in the Sudd are *Alestesdentex*, *Auchenoglanisbiscutatus*, *Chelaethiopsbibie*, *Citharinus*, *Distichodusrostratus*, *Eutropisniloticus*, *Heterotisniloticus*, *Hydrocynusforskali*, *Labeoniloticus*, *Latesniloticus*, *Micralestesocutidens*, *Mormyruncashive*, *Oreochromisnilotics*, *Synodontisfrontosus*, *Aplocheilichthysspp*, *Epiplatysspp.*, *Gymnarchusniloticus*, and *Polyoterusbichir*. Frogs are abundant and there are several snakes' species in the swamps.

The Sudd and surrounding areas are heavily utilized for grazing, and to a lesser extent crop production. They are also used for human settlement and contain urban areas like Bor, Shambe, Rumbek and Malakal towns. The seasonal grasslands of the Sudd (toic) are an important pasture resource and supports livelihoods based on animal husbandry. Most of the tribes living within the Sudd (mainly the Dinka, Nuer, Shilluk and Anyuak) are nomadic and move with their large herds of cattle in response to the annual discharge of Bahr el Jebel and rainfall. Fishing is the second most important livelihood occupation of the inhabitants of the wetlands especially the Shilluk and Nuer. Subsistence hunting is another activity by the Nilotes of the Sudd catchment. Crop production is not an important occupation of the nilotes though some subsistence agriculture is carried out in raised areas during the wet season. The area

under crops is about 4% of the total area of the Sudd. Agricultural potential of the area is vast but largely undeveloped (MEF, 2018). Other uses of the Sudd are drinking water supply, harvesting building materials, harvesting of medicinal products, cultural sites (sacred places), navigation, climate regulation and wildlife habitat.

1.2 The Sudd under increasing pressure

Although large areas of the Sudd are still considered to be pristine, pressure on this unique environmental asset has been rising in recent years from a multiplicity of sources, most of them manmade. The leading pressures on the Sudd include the settlement of returnees in the Sudd by UN agencies leading to deforestation and general environmental degradation of the lands immediately surrounding the settlements; uncontrolled construction of dykes and conversion of wetlands to agricultural land; poor environmental sanitation in Juba and the other large towns leading to pollution from municipal liquid and solid wastes; high stocking density of cattle leading to decline of communal pastures; and poaching of wildlife. These activities are causing alteration, fragmentation and destruction of the natural Sudd habitats decline in biodiversity and ecosystem goods and services. This trend needs to be stemmed immediately before it becomes serious and irreversible.

Climate change adds another dimension to the continuing destruction of wetlands and creates a greater imperative for their protection and sustainable management. Climate change in the Sudd region has manifested as a warming trend in temperature, shifting rain patterns, increase inter-annual variability in rainfall, and increased frequency of extreme events (floods and droughts). The most recent flood event of 2020/2021 led to very widespread flooding in the Sudd, and to the loss of about 796,000 livestock in eight states (FAO, 2021¹).

Under the above circumstances, strategic planning that seeks to increase resilience to impacts of climate change and strike a balance between socio-economic development and wetland conservation is necessary.

1.3 About the Sudd Management Strategy

The report presents the Sudd Management Strategy which has been designed to meet the above need for strategic planning. The Sudd Management Strategy sets a vision for the Sudd and presents a set of strategic actions needed to achieve the vision over a long planning horizon. The Strategy has drawn upon, structured and scaled up planning initiatives in the Sudd at local and national levels. It will serve as a tool for promoting wetland protection and socio-economic development based on the sustainable exploitation of the Sudd natural resources.

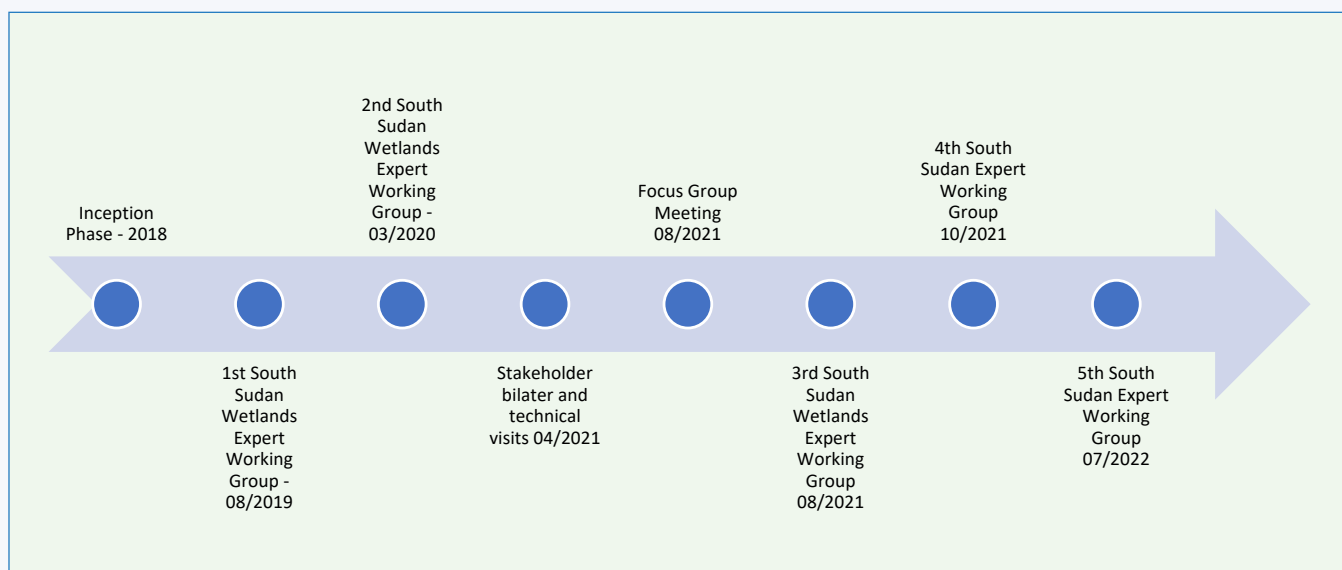
1.4 The preparatory process

The planning process was both participatory and interactive, and involved interaction with a wide range of stakeholders including national ministries, state and county departments, universities and research institutions, civil society organizations, community-based organisations, UN agencies, International NGOs,

and regional organisations. The methods used to engage with the different groups included consultative reviews, field surveys, public consultations and workshops.

The development process followed the steps for development of an action plan for a Ramsar Site as guided by the Ramsar Convention Secretariat Handbook No. 18. As part of the process of development of the Wetland Management Strategy, the Wetlands Expert was formed and played an important role in reviewing the outputs of several studies that were being conducted in the Sudd. They studies were included (a) The Economics of Ecosystems and Biodiversity (TEEB) Study for Sudd and Machar Marshes; (b) Baseline Studies for the Sudd – Sudd Diagnostic Analysis Study, Sudd Eco-hydrological study, Sudd Options Study, and Sudd Wetland Management Study); (c) Nile Basin Wet(Peat)lands Carbon Study; and (d) Machar Marshes Eco-Hydrology Study.

The Wetlands Expert Working Group, which was formed in 2019, became the driving group for development of the Sudd Wetlands Management Strategy. The Figure below shows the sequential consultative process that was followed in development of the Sudd Management Strategy over a 5 years period (2018 to 2022).





2. POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK FOR WETLAND MANAGEMENT IN SOUTH SUDAN



2.1 National policy and legal framework

South Sudan does not have a dedicated policy of law on wetland management. The main elements of the existing policy and legal management of wetlands are outlined below.

2.2.1 The National Environment Policy 2015

The strategic goal of the National Environment Policy 2015 to 2025 is to ensure the protection, conservation and sustainable use of the natural resources of South Sudan, which include wetlands, without compromising the tenets of inter-generational equity. The policy will pursue and facilitate the development of laws, regulations and guidelines to ensure sustainable management of the environment as well as the prudent utilization of natural resources. The policy also provides guidance on the implementation and enforcement of international, regional and domestic environmental laws. The policy contains ten chapters including

« The Draft Environment Protection Bill, 2015 if passed will be an important piece of legislation for wetland management. »

chapters on climate change, management of resources, corporate social and environmental responsibilities and environmental planning.

2.2.2. The Draft Environmental Protection Bill 2015

The Draft Environment Protection Bill, 2015 if passed will be an important piece of legislation for wetland management. Among other things, the bill provides for environmental and social impact assessments for certain types of projects and development activities; and introduces a requirement for environmental audits. The bill further provides for the establishment of environmental standards for air quality, water quality, effluent discharge, odor, noise and vibration, soil quality; for management of environment of water

courses, mountainous areas, waste management, control of pollution, environmental restoration order and so on. Since the bill has not been passed, these provisions have not taken effect.

2.2.3 The Environmental Protection Act, 2001

The Environmental Protection Act of 2001 was passed before South Sudan became independent and is no longer legally binding in South Sudan. However, it remains an important piece of legislation that provides guidance on ensuring environmental conservation in the country, especially given that the Environmental Protection Bill of 2015 has not been passed into law. Its principal objectives were to: (i) protect the environment in its holistic definition for the realization of sustainable development; (ii) improve the environment while ensuring sustainable exploitation of natural resources; and (iii) create a link between environmental and developmental issues, and to empower concerned national authorities and organs to assume an effective role in environmental protection. Section III of the Act outlined general policies and principles for the protection of the environment. Article 17 of the Act required that any individual intending to implement any project likely to have a negative impact on the environment should present an Environmental Impact Assessment (EIA) statement for approval by relevant government authorities.

2.2.4 The National Water Policy 2007

The Water Policy (2007) outlines South Sudan's vision for the water sector, and establishes guiding principles and objectives for water management. Among the key principles enshrined in the policy is the recognition that water has social, economic and ecological value in all its competing uses. With respect to transboundary water management, the Water Policy recognizes the transboundary nature of the Nile waters and commits South Sudan to fulfilling its international obligations on the Nile while protecting the right of the people of

South Sudan to an equitable share of the benefits of the management and development of the shared Nile water resources. The policy proposes to introduce effluent discharge permits to, among other things, protect ecosystems and conserve biodiversity in areas such as the Sudd Wetlands.

2.2.5 Draft Water Bill (2015)

A draft Water Bill was prepared in 2015 to provide a legal tool for implementing the water policy. The Bill has 22 chapters arranged under four main sections, namely Preliminary Provisions, Water Resources Management, Water Supply and Sanitation, and General Provisions. Under Chapter 7, the Bill makes it a mandatory requirement to obtain a water permit for any works that will drain or use any wetland, marsh or swamp. A permit is also required under the Bill for disposal of any liquid or solid waste into any water source or water body, including wetlands.

2.2.6 The Land Act, 2009

One of the key objectives of the Land Act is to promote a land management system to protect and preserve the environment and ecology for the sustainable development of South Sudan. The Act also provides for fair and prompt compensation to any person whose right of occupancy, ownership or recognized long standing occupancy of customary use of land is revoked or otherwise interfered with by the Government. The Land Act requires that the government consults local communities and consider their views in decisions about community land.

2.2.7 South Sudan's Second Nationally Determined Contributions, 2021

A Nationally Determined Contribution (NDC), is a climate action plan to cut emissions and adapt to climate impacts. Each Party to the Paris Agreement is required to establish an NDC and update it every five years. South Sudan's NDC proposes to improve

the management of wetlands as a measure to adapt to impacts of climate change. The NDC recognizes the Sudd as an environmental asset that is important for regulating the weather patterns in the Sahel, the Horn of Africa and the greater East Africa region. The NDC also points out that the Sudd acts as a barrier to the southward encroachment of the Sahara desert and, therefore, that its preservation and management will make a significant contribution to buffering against the impacts of climate change within the region. The Second NDC will support the development of wetland inventory and promote measures for sustainable management of wetlands for improved carbon sequestration. It will also support conservation and management of biodiversity and ecosystems by promoting biodiversity mapping; reducing the deforestation rate by introducing alternate sources of energy and livelihood; and developing policies for effective waste management to prevent discharge of untreated waste into water bodies.

« A Nationally Determined Contribution (NDC), is a climate action plan to cut emissions and adapt to climate impacts. Each Party to the Paris Agreement is required to establish an NDC and update it every five years. South Sudan's NDC proposes to improve the management of wetlands as a measure to adapt to impacts of climate change. »

2.2.8 First National Adaptation Plan for Climate Change, 2021

The NAP process is intended to facilitate the coordinated and structured identification of key adaptation issues, gaps, priorities and resource requirements for more effective planning, implementation and monitoring of adaptation to climate change in South Sudan. The NAP establishes a common understanding of climate change challenges for all stakeholders, as well as common priorities to overcome these challenges so

that all stakeholders are working in concert. The NAP process recognizes that relying solely on national-level measures will be insufficient to address transboundary impacts and therefore supports evidence-based planning of water use from the Nile that is equitable and fair to all stakeholders. In addition, South Sudan's adaptation planning takes into consideration the NBI's Climate Change Strategy (2013) for synergies that can be exploited, including the following areas, which are included in the NBI strategy: (a) strengthening the knowledge base to enhance common understanding of climate risks and its impacts on water resources, ecosystems, and the socio-economic system of the Nile Basin; (b) promoting scalable low-carbon development through enhanced transboundary cooperation in areas such as the protection of wetlands as well as clean energy use and development; and (c) coordination of NBI activities with national and subnational climate change programmes in South Sudan.

2.2.9 National Biodiversity Strategy and Action Plan (2018-2027)

The National Biodiversity Strategy and Action Plan (NBSAP) of South Sudan is a statement of the intention of the Government and people of the country to integrate biodiversity concerns into public (national and subnational), private, and community policies, plans, programmes and projects. The preparation of the NBSAP is a requirement under the United Nations Convention on Biological Diversity (CBD) to which South Sudan acceded in 2014. The Vision of NBSAP is to establish a strong framework for biodiversity conservation that contributes to economic prosperity and enhanced quality of life while the goal is to develop and maintain an operational framework for conservation of biodiversity; sustainable use of biodiversity; fair and equitable sharing of the benefits arising from their utilisation. The NBSAP has 24 targets which include reducing by a half the rate of loss of natural habitats (forests, wetlands, water resources catchments); developing national collaborative resource

management programs for protected areas, wetlands and water resources catchments; and developing and implementing programmes for restoration of degraded wetlands, including the Sudd.

« The National Biodiversity Strategy and Action Plan (NBSAP) of South Sudan is a statement of the intention of the Government and people of the country to integrate biodiversity concerns into public (national and subnational), private, and community policies, plans, programmes and projects. »

2.2.10 Other policies

Other important policies and legislation include the Agricultural Policy 2012; Fisheries Policy 2012; Forestry Policy 2013; National Land Policy 2015; Petroleum Act 2012; and Aquaculture Development Bill, 2019.

2.2 Regional and international policy and legal framework

Multilateral agreements related to wetlands and the environment to which South Sudan is a party are outlined below.

2.2.1 Ramsar Convention on Wetlands of International Importance, 1971

This is the most relevant international agreement to the Sudd wetland. The Convention was ratified by South Sudan in 2013. It provides guidelines for sustainable use, management and governance of wetlands and a framework for international action and cooperation for the conservation and wise use of these areas and their resources. Most relevant to this plan is the call for international cooperation between contracting parties and individual countries to formulate national policies on wetlands.

2.2.2 United Nations Framework Convention on Climate Change (UNFCCC), 1994

The UNFCCC entered into force on 21 March 1994. Today, it has near-universal membership. The 197 countries, which includes South Sudan, which have ratified the Convention are called Parties to the Convention. The ultimate aim of the UNFCCC is to preventing human interference with the climate system.

2.2.3 Paris Climate Accords, 2015

In 2016 South Sudan agreed to an ambitious programme of climate change mitigation and adaptation under the UN Framework Convention on Climate Change. The agreement calls on states to develop Nationally Determined Contributions (NDCs) to address climate change, with nature-based solutions as a key component, including from wetlands. These have a critical role in both adaptation and mitigation through carbon storage and sequestration, particularly in peatlands. Through this plan, South Sudan is encouraged to prioritise inclusion of the Sudd wetland conservation and management in their NDCs. However, in spite of the increased recognition on safeguarding wetlands as key natural climate buffers in landscapes, very few climate initiatives have identified the need to protect, restore and sustainably manage these ecosystems.

2.2.4 Convention on Biological Diversity (CBD), 1992

The CBD prioritises the protection of ecosystems such as wetlands, which are species-rich and are important for endemic and threatened species and obligates states to develop national strategies, plans or programs for conservation and sustainable use of biological diversity and to integrate them into sectoral or cross-sectoral plans, programs and policies. This makes the CBD relevant and justifies the rationale for the development of this Plan for sustainable management of biodiversity within the Sudd wetland ecosystem. South Sudan ratified the CBD in 2014.



2.2.5 East African Community (EAC) Treaty, 2000

Obligates parties to cooperate in matters of environment and natural resource management in their countries as well as those that are transboundary. It's Protocol on Environment and Natural Resources Management, 2006, obligates parties to harmonise, adopt and domesticate common policies, laws and frameworks to ensure that there is sustainable management and use of the wetlands resources within their borders and also ensure the same for the transboundary resources.

2.3 Institutional Framework for wetlands management in South Sudan

The main institutions for management of the Sudd are outlined below.

2.3.1 Ministry of Environment and Forestry (MEF)

The MEF is the lead agency for the environment, forestry and climate change sectors, and lead institution for management of the Sudd in South Sudan. MEF has several important agencies nested within it that include the Directorate of Wetland and Biodiversity, which is the main government agency responsible for wetlands management in South Sudan. The Directorate of Wetlands and Biodiversity is also responsible for preparing policies and strategies to promote the conservation and wise use of wetlands, and through which the international conventions on wetlands and biodiversity, to which South Sudan is a signatory, are domesticated. Within MEF is also the Directorate of Environmental Planning and Sustainable Development that is responsible, among

other things, for preparing the State of the Environment Report and the National Environmental Management Action Plan for South Sudan. The MEF also has the Directorate of Environmental Education and Information that is responsible for advocacy, awareness raising, and education and training on matters of the environment. The Ministry further has the Directorate of Climate Change and Meteorology which develops and implements programmes to address climate change issues and coordinates the implementation of South Sudan's obligations under the UNFCCC.

« The Ministry is also responsible for the development of policies, legislation and strategies related to agriculture, food security and plans for agricultural development and promotion of appropriate technologies, research and efficient extension services, while addressing environmental degradation through afforestation and management of natural resources within South Sudan. »

2.3.2 Ministry of Water Resources and Irrigation

This Ministry of Water Resources and Irrigation (MWRI) is the lead government institution for the water sector in South Sudan. Its key functions include: (a) developing and overseeing the implementation of policies, guidelines, plans and regulations concerning the management, development and conservation of water resources, including setting tariffs for water use; (b) developing and overseeing the implementation of national policy for development of urban and rural water supplies and sanitation; (c) overseeing the design, construction, and management of dams and other surface storage infrastructure for irrigation, human and animal consumption and hydroelectricity generation; (d) initiating the development and management of agricultural irrigation schemes; (e) protecting the Sudd

and other wetlands and the water resources of the country from pollution; (f) supporting capacity building of states and local governments to be able to perform functions vested in them by the constitution and government policy; and (g) carry out water resources monitoring and assessment, and water sector research. One of the Directorates of the Ministry is that of Policy and Regulation, which is responsible for coordination of transboundary water management issues.

2.3.3 Ministry of Wildlife Conservation and Tourism (MWCT)

The MWCT has been tasked by the Transitional Constitution with the responsibility of preserving South Sudan's rich heritage of natural flora and fauna habitats and unique ecosystems and biodiversity resources through responsible stewardship, conservation management and the promotion of nature-based tourism. The Ministry has the responsibility to oversee the mobilization and direction of significant investments at improving South Sudan's in-situ wildlife conservation, in particular the management and infrastructure for the country's national parks and other protected areas.

2.3.4 Ministry of Agriculture and Food Security

The MAFS is the lead government institution in the agriculture and food security sector. The ministry is mandated to transform agriculture from traditional subsistence farming to achieve food security through scientific, market oriented, competitive and profit table agriculture without compromising the sustainability of natural resources for future generations. The Ministry is also responsible for the development of policies, legislation and strategies related to agriculture, food security and plans for agricultural development and promotion of appropriate technologies, research and efficient extension services, while addressing environmental degradation through afforestation and management of natural resources within South Sudan.

The MAFS is now implementing a Comprehensive Agriculture Master Plan (CAMP) and the Irrigation Development Master Plan (IDMP) with more emphasis on means of reducing the risk and vulnerability of crops to seasonal and climate variability.

« The MAFS is the lead government institution in the agriculture and food security sector. The ministry is mandated to transform agriculture from traditional subsistence farming to achieve food security through scientific, market oriented, competitive and profit table agriculture without compromising the sustainability of natural resources for future generations. »

2.3.5 Ministry of Livestock, Animal Resources and Fisheries

This is the lead government institution in the livestock and fisheries sectors. The MARF's mandate is to sustainably increase livestock, fish production and market supply of meat, milk and fish, improve livelihood for South Sudan's livestock-keeping and fishing communities, and improve value addition and access to credit and regional and international markets for food security, poverty alleviation and socio-economic development. The Ministry promotes competitive, commercially oriented fisheries and livestock farming, and sustainable natural resource management.

2.3.6 Other Ministries

Other important ministries include the Ministry of Lands, Housing and Urban Development, Ministry of Petroleum; and Ministry of Humanitarian Affairs and Disaster Management.

2.3.7 Other stakeholder organisations

Besides government ministries and departments, there are a number of other stakeholders who are playing a role in the management of the country's wetlands. They include

- *Local government administrations* – state governments of Jonglei, Upper Nile, Unity, Lakes, Central Equatoria, Ruweng Administrative Area (Lake No)) and local communities;
- *Local and international civil society organizations* – Community Empowerment and Progress Organization; South Sudan Nature Conservation Organization; South Sudan Nile Basin Discourse Forum, Community Initiative for Sustainable Peace Organization (CISPO), South Sudan Women Entrepreneurship Organization; Horn of Africa Regional Environmental Network;
- *Universities and research institutions* – University of Juba - College of Natural Resources and Environmental Studies, Dr. John Garang University of Science and Technology; Upper Nile University and Sudd Institute)
- *International Organisations* – Wildlife Conservation Society (WCS); Wetlands International (WI); Niras International; International Union for Conservation of Nature (IUCN); Flora and Fauna International (FFI); Global Environmental Facility (GEF); Ramsar Secretariat.
- *UN agencies* – UNESCO South Sudan Office, UNEP, UNDP, UNIDO.
- *Regional Organisations* – Nile Basin Initiative (NBI); IGAD.

CHAPTER 3: THE SUDD WETLAND MANAGEMENT STRATEGY

3.1 Vision, Goal and Objectives

3.1.1 Approach

The vision and strategic objectives for the Sudd have been developed through a participatory and interactive process involving consultative reviews, public consultations and workshops and focus group discussions with state and non-state actors local, national and regional levels. The vision and strategic objectives provide clear, aspirational goals to be realized over a long time horizon from the implementation of a broad set of strategic actions spanning multiple sectors and requiring the input of multiple actors from local to international levels.

Involving stakeholders in the planning process was intended to create greater awareness of the issues surrounding the sustainable management of the Sudd wetlands, and obtain their buy in and commitment to implement the strategic measures identified under the strategy.

3.1.2 Vision

The vision statement is:

A sustainably managed Sudd wetland providing equitable opportunities and benefits for present and future generations of South Sudanese.

3.1.3 Goal

The goal of the strategy is:

To restore the Sudd wetland and ensure the sustenance of ecosystem services from the Sudd for the benefit of people.

3.1.4 Objectives

The objectives of the strategy are fourfold:

1. To promote conservation of the Sudd wetland ecosystem.
2. To build climate resilience and apply nature-based solutions to the sustainable management of the wetland, water and environmental resources of the Sudd landscape.
3. To support investments and water resources development to catalyze economic development through application of green and blue economy approaches.
4. To strengthen governance structures for the management of the Sudd wetland.

The main motivator for the Strategy is the desire to protect the Sudd, which is a unique environmental asset of international significance. The Sudd and adjacent ecosystems support some of the largest migrations of mammals in the world. The Sudd is also home to millions of water fowl. But the Sudd is also a natural resource with enormous potential to drive socio-economic development, alleviate poverty, create jobs, improve food security and catalyze the economic transformation of the country to a prosperous nation. Thus, a second motivator for the Strategy is the desire to support sustainable socio-economic development. Both motivators are important: one without the other (environmental protection or socio-economic development alone) is not sustainable in the long run. A third motivator is the desire to enhance governance systems so as to ensure the success of conservation and investment activities. Good policies and laws, and strong and well-resourced institutions, are needed to deliver public services and implement programs, including the Strategy.

3.2 Theory Of Change

A theory of change (ToC) is a graphical image showing why a particular way of working will be effective, and demonstrates how change happens in the short, medium and long term to achieve the intended impact. The Theory of Change for the Sudd Management Strategy is shown in the figure below. The planned long-term impact of the Strategy is the vision statement above.

3.3 Strategic Directions

The Vision and Goals of the Strategy 2023-2050 will be achieved through actions organized under thematic

areas termed ‘Strategic Directions’. Four Strategic Directions have been defined that correspond to the four objectives of the Strategy. They are:

- Strategic Direction 1: Wetland conservation and management
- Strategic Direction 2: Sustainable watershed and environmental management
- Strategic Direction 3: Investment and socio-economic development
- Strategic Direction 4: Wetlands governance



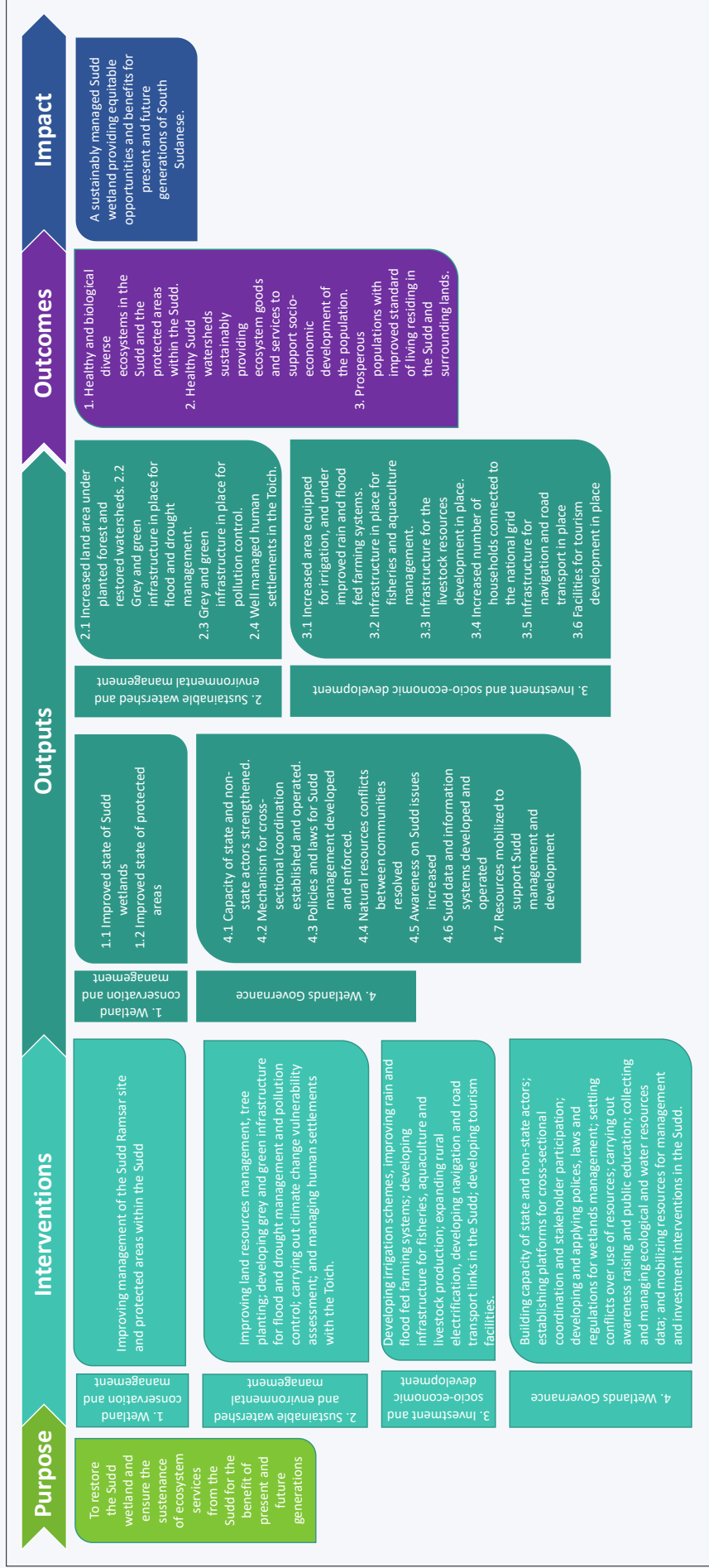


Figure 4: The Theory of Change of the Sudd Management Strategy

3.4 Strategic Actions

Under each Strategic Direction is a list of interventions need to meet the aspirations of the Strategy. The strategic actions are listed in the Table below.

Table 1: Strategic Actions of the Strategy

STRATEGIC DIRECTION	STRATEGIC ACTIONS
Strategic Direction 1: Wetland conservation and management Objective 1: To promote conservation of the Sudd wetland ecosystem.	1.1 Carrying out Sudd ecological assessments and monitoring, and preparing periodical State of Sudd Ecosystem reports
	1.2 Promoting sustainable wetland management practices
	1.3 Protected areas management and conservation
	1.4 Peatlands management and climate mitigation
	1.5 Aquatic weed management
	1.6 Conducting sudd research
	1.7 Refinement and enforcement of environmental flows for the Sudd wetland and tributary rivers
Strategic Direction 1: To build climate resilience and apply nature-based solutions to the sustainable management of the wetland, water and environmental resources of the Sudd landscape. Objective 2: To promote integrated water resources management in the Sudd and its immediate catchment	2.1 Land resources management
	2.2 Afforestation and reforestation in the sudd and immediate catchments
	2.3 Restoration of degraded river banks and lake shores
	2.4 Climate change vulnerability analysis
	2.5 Floods and disaster risk management; flood risk mapping and land use zoning; multipurpose water storage for flood buffering; flood defenses, dykes, flood control through non-structural measures, etc.
	2.6 Wastewater management and water pollution control
	2.7 Solid waste management and plastics pollution
	2.8 Storm water management in urban areas
	2.9 Management of industrial pollution in urban areas
	2.10 Management of oil pollution in oil fields
	2.11 Population growth and management of human settlements in the Toich area
	2.12 Groundwater potential assessment and development
Strategic Direction 3: Investment and socio-economic development Objective 3: To support investments and water resources development to catalyze economic development through application of green and blue economy approaches.	3.1 Small scale and large-scale irrigation development
	3.2 Improving rainfed and flood recession agriculture
	3.3 Fisheries and aquaculture resources development and management
	3.4 Livestock production and rangeland management
	3.5 Supporting alternative livelihoods
	3.6 Water supply and sanitation
	3.7 Multi-purpose water storage development combined green and grey infrastructure
	3.8 Development of renewable energy and rural electrification
	3.9 Navigation development
	3.10 Jonglei canal project
	3.11 Road and dike development
	3.12 Tourism development
Strategic Direction 4: Wetlands governance Objective 4: To strengthening governance structures for the management of the Sudd wetland.	4.1 Land use policies, management plans and landuse zoning
	4.2 Capacity building of actors involved with wetland management
	4.3 Strengthening coordination between multisector management entities
	4.4 Gender mainstreaming
	4.5 Development of the legal and policy framework for wetland management
	4.6 Strengthenin g transboundary water cooperation over the Sudd
	4.7 Conflict management and resolution (inter-community conflicts over natural resources)
	4.8 Establishing and operating wetlands and water resource monitoring networks
	4.9 Establishing and operating sudd data and information system
	4.10 Development and enforcement of water abstraction regulations
	4.11 Development of enforcement of effluent discharge standards
	4.12 Resource Mobilisation for Sudd Management
	4.13 Awareness creation, public education, stakeholder participation and communication
	4.14 Review and update of the Sudd Strategic Management Plan
	4.15 Preparation and implementation of strategic action plans for implementation of the Sudd Strategic Management Plan
	4.16 Monitoring and evaluation

3.5 Specific interventions

The context for each Strategic Action, and proposed specific measures under the Strategic Actions, are outlined in the sections below.

3.6 Strategic Direction 1: Wetland Conservation And Management

3.6.1: Strategic Action 1.1: Carrying out Sudd ecological assessment and monitoring, and preparing periodical State of Sudd Ecosystem reports

Challenges:

- Lack of funding
- Insecurity making access to areas in the Sudd difficult
- Inaccessibility due to vast area size
- Limited capacity(technical experts) to carry out technical work
- Lack of political will
- Limited awareness
- Top bottom approach
- Lack of stakeholder involvement
- Lack of proper coordination among all concern stakeholders (civil society, local community, CBOs, NGOs, etc.)
- Lack of facilities and equipment for management and conservation activities
- Delay of Policies and legal framework in the Ministry of Justice

Opportunities and measures already in place:

Policy and legal provisions already in place include draft Sudd wetland management frameworks; Sudd gazetted as a UNESCO World Natural Heritage Site (UNESCO); Sudd designated as a Ramsar site of international importance. National policies already in place include: National Environment policy 2015, Wildlife

Conservation Act 2003/2012; Drafted water resources bill 2012; Land Act 2009; Constitution of Republic of South Sudan; National Biodiversity and Strategic Action Plan (NBSAP); 5th National Report to the Convention on Biological Diversity; 6th National Report to the Convention on Biological Diversity; National Determine Contribution (NDC) in place; Sudd Rapid assessment report of the sudd ecosystem; aerial wildlife survey carried out by WCS in 2009/2010; National Adaptation Plan of Action (NAPA); State of the Environment outlook report 2006; Resource Mobilization Strategy developed.

Other opportunities include: relative peace prevailing; infrastructure development (roads construction) ongoing; institutional training and capacity building (workshops, research, conferences) ongoing; creation of awareness at national and state levels; coordination of stakeholders; stakeholder participation in decision making

Planned/proposed measures to be actioned

- Conducting periodical biodiversity surveys and prepare state of ecosystem reports for the Sudd and protected areas in the Sudd.
- Carrying out wetlands mapping and inventory of selected sub-systems.
- Carry out socioeconomic survey on the livelihood of the communities
- Production of periodic reports
- Monitoring and evaluation

3.6.2: Strategic Action 1.2: Promoting sustainable wetland management practices

Challenges:

- Lack of restoration of degraded wetlands
- Introduction of dredging machines (River Naam)
- Population growth
- Conflicts over grazing land



- Oil and mining explorations
- Anticipated resumption of the excavation of Jonglei canal
- Proliferation arms and weapons in the hands of the local community
- Poaching and illegal trade of wildlife
- Deforestation
- Uncontrolled burning of bushes
- Soil erosion
- Over fishing
- Unsustainable agricultural practices

Opportunities and measures already in place:

Policy and legal provisions already in place include Drafted Sudd wetland management frameworks; National Biodiversity and Strategic Action Plan (NBSAP); 5th National Report to the Convention on Biological Diversity; 6th National Report to the Convention on Biological Diversity; National Determine Contribution (NDC); Sudd Rapid assessment report of the sudd ecosystem; National Adaptation Plan of Action

(NAPA); State of the Environment outlook report 2006; and Aerial Survey Report of WCS 2009/2010.

Planned/proposed measures to be actioned

- Carrying out wetland education, introduction of wetlands theme in to educational curriculums preparing school education packages.
- Wildlife law enforcement
- Enforcement of ESIA regulations
- Capacity building of ESIA practitioners
- Public awareness on wetlands
- Promote restoration of wetlands
- Implementing conflict mitigation measures
- Sustainable management of oil and mining operations
- Continuing disarmament programs
- Promote reforestation
- Controlled burning of bushes
- Sustainable fishing
- Sustainable agricultural practices

3.6.3: Strategic Action 1.3: Protected areas management and conservation

Challenges: Encroachment into protected areas as a result of population growth is putting significant pressure on protected areas. Increased access to guns as a result of the ongoing conflict has also led to uncontrolled hunting which accounts for a considerable loss of wildlife. Currently there is limited ability for control of these challenges through enforcement. Additional challenges include oil and mining explorations, deforestation, uncontrolled burning of bushes, and unsustainable agricultural practices

Opportunities and measures already in place:

The development of a National Biodiversity Strategy & Action Plan is being supported by GEF and implemented by UNEP. The UNDP is involved with protected area network management and building capacity in post-conflict South Sudan. The Swedish government has launched an initiative for the transboundary protection of wildlife of the Boma- Gambella-Badinglo landscape. This is an effort at transboundary conservation on migratory wildlife species. There is also capacity development in reducing illegal wildlife trade and improving protected area management effectiveness in South Sudan.

Opportunities:

Planned/proposed measures to be actioned:

The capacities of national, sub-national, state, local institutions and communities for effective environmental governance, natural resources management, conflict and disaster risk reduction should be enhanced.

Awareness raising needs to be carried out on the importance and value of protected areas as it relates to how it can be utilized to advance sustainable livelihoods.

Other possible measures are:

- Preparation of conservation area management plans.
- Control of poaching activities
- Strengthening security in protected areas to allow for tourism.
- Training communities in co-management of protected areas.
- Expanding the tourism sector, and using a portion of the income generated to fund conservation efforts in protected areas.



3.6.4: Strategic Action 1.4: Peatlands management and climate mitigation

Challenges: The Sudd contains significant peat stocks that form a major carbon sink and are respectively a major asset for limiting climate change. The peat stocks are vulnerable to drying conditions, as only under wet conditions they remain intact, while drying out leads to their decomposition and release of carbon into the atmosphere.

Several activities in the Sudd or in upstream areas can have an adverse impact on the peat stocks and respectively on potential carbon releases. Aspects include:

- Dikes, cutting off floodplain area
- Conversion into agriculture with respective changes to soil water content
- Upstream dam construction leading to changed runoff patterns and potentially less saturated soil conditions
- Upstream land use change leading to changed runoff patterns and potentially less saturated soil conditions
- Upstream change of release from Lake Victoria with respectively changing runoff patterns
- Upstream increase in water use (less Nile River flow) that would generally reduce flooding and as such less saturated soil conditions.

Measures already in place: An environmental policy framework and environmental bill that regulate the exploitation of Natural resources is in place.

South Sudan's national determined contributions (NDC) are based on a cross-sectoral consultative process involving multiple stakeholders and its revision is being supported by the Global Environment Facility (GEF) and implemented by UNEP on an ongoing basis.

Opportunities: There is opportunity in recognizing the existence of peatlands and the carbon stock that is associated with these peatlands. The information

can be used to promote further soil organic carbon research with the possibility of utilizing this as carbon offsetting and trading. This can drive actions towards climate change mitigation and adaptation by effectively managing and maintaining peat stocks.

Planned/proposed measures to be actioned: To avoid any further loss of peatlands, it is important to raise public awareness on the importance of peatlands and include peatland preservation into national planning.

- Restoration of degraded wetlands
- Controlling activities that could expose peat

3.6.5: Strategic Action 1.5: Aquatic weed invasion and alien species

Challenges: The Sudd is vulnerable to the effects of invasive species. Alien invasive species are a threat to biodiversity once they spread, displacing indigenous fauna and flora which may have more benefits in terms of livelihoods and maintenance of the ecological integrity of ecosystems.

In South Sudan, the water hyacinth in the Nile River ecosystem and especially the Sudd is a threat to fisheries resources as well as water quality. With fishing being an important source of food and income for the communities living in the Sudd region, this will have a direct effect on their livelihood if not controlled.

There is an overall lack of knowledge, capacity and awareness on how to manage and monitor invasive species. There is a subsequent lack of information available on the nature and extent of invasive species. The impacts it might have on the Sudd are therefore also still poorly understood. Little effort has been made to ensure the management thereof.

Measures already in place: None.

Opportunities: Harvesting the water hyacinth for industrial use can serve as a means of environmental control. Water hyacinth can also be used as a substrate

for biogas production and is suitable for bio-cleaning of industrial wastewater.

Planned/proposed measures to be actioned:

- Control of the spread of alien species
- Water week management through mechanical and biological control mechanisms.

3.6.6: Strategic Action 1.6: Conducting sudd research

Challenges:

- Lack of funds
- Insecurity
- Inaccessibility due to vast area size
- Limited capacity(technical experts) to conduct research

Opportunities and measures already in place:

There is already individual research being conducted under the Sudd institute and in South Sudan Universities – Upper Nile and Juba universities – which provides opportunity for expanding the research. There is also relative peace prevailing, and infrastructure development (roads construction) which improve the accessibility of Sudd to researchers

Planned/proposed measures to be actioned:

- Identification of priority areas of research on the Sudd
- Development and implementation of research programs on the Sudd wetlands
- Publishing and disseminating research findings, and conducting science-policy dialogues.
- Create awareness on Sudd issues at National and state level

3.6.7: Strategic Action 1.7: Refinement and enforcement of environmental flows for the Sudd wetland and tributary rivers

Challenges:

- Inadequate hydrological, water quality and sediment data and non-functional water resources monitoring networks
- Inadequate data on aquatic biodiversity

Opportunities and measures already in place: None

Planned/proposed measures to be actioned:

- Carrying out field surveys of Sudd aquatic biodiversity
- Setting up hydrological monitoring network in the Sudd and collecting
- Redetermination of refined environmental flow for the Sudd.

3.7 Strategic Direction 2: Sustainable watershed and environmental management

3.7.1: Strategic Action 2.1: Land resources management

Challenges: Land use management is still a major challenge largely due to the absence of a clear land policy and consistent land laws. Stakeholder requirements across various sectors (oil, agricultural, fisheries, transport, smallholders, grazing, etc.) have been partly complementing and partly conflicting. All stakeholders need to be taken on board, especially smallholders who do not have a concentrated voice. Development will have to be done on a step-by-step basis.

Measures already in place: None.

Opportunities: There is opportunity in taking an all-inclusive approach with stakeholders, to ensure holistic- and sustainable development, to ensure potentially damaging activities (oil) are carried out in an environmentally safe manner.

Planned/proposed measures to be actioned: It is important that the government makes itself clear in

terms of the policy that shall influence the question of the land ownership. South Sudan should clearly define whether land belongs to the government or the people. This basic definition will lay the foundation for a strong Land Act and land policy that will propel economic growth. It will also allow for clear demarcation and zonation of land use areas. Improved land use planning and management can also be brought about through better monitoring and enforcement.

- Supporting land use planning and zoning
- Supporting the development of policies, laws and regulations on land use and land resources management

3.7.2: Strategic Action 2.2: Afforestation and reforestation in the sudd and immediate catchments

Challenges: A large portion of the South Sudanese population are dependent on emergency relief food from external sources. Otherwise, they are obligated to live off the land, where the Sudd wetland is used to maintain the bulk of their needs. This includes burning of the surrounding woodlands for fuel wood and charcoal, clearing natural land for subsistence agriculture, using fires as a hunting aid and burning dry grass to stimulate re-growth. Climatic conditions and traditional behavior of local rural population further promotes wildfires. Currently, these resources are essentially considered as ‘free resources’ that can be used without limitation, resulting in accelerating depletion with deforestation, erosion and climate change as side effects.

The increasing loss of biodiversity due to over-exploitation of wooded areas around the Sudd has detrimental effects on the wetland itself, which is vital to sustain the livelihoods of the people living around it. Serious intervention is required to ensure that the biodiversity that sustains the wetland is maintained and used in a sustainable manner.

Measures already in place: The post conflict

environment assessment (PCEA) from UNEP is an environmental initiative that covers environmental capacity building and sustainable forestry.

There is an ongoing NDC tree planting project focusing on afforestation and reforestation that is being supported by the Green Climate Fund (GCF) and executed by FAO.

Opportunities: Raising awareness from a holistic perspective on the importance of woodlands and the impact of fires and further providing simple training on alternative methods to sustain livelihoods has the potential to greatly advance conservation efforts. There is also the potential to combine this with agricultural extension services.

Planned/proposed measures to be actioned: Raising awareness on the detrimental effect of deforestation and the impact of fires on biodiversity is crucial. It is also important to convey the value of planting trees to offset the damage caused by deforestation.

Provide training on alternative methods to sustain livelihoods that are more environmentally friendly. The development of an effective policy for charcoal and fuel wood management is needed.

- Reforestation in areas of degraded forests
- Promoting nature-based solutions to support watershed management.

3.7.3: Strategic Action 2.3: Restoration of degraded river banks and lake shores

Challenges: Areas adjacent to urban centers have degraded riverbanks due to sand and gold mining, and livestock activities, leading to soil erosion

Opportunities and measures already in place:

There is ongoing awareness creation by universities, and there are donors that are willing to support environmental management interventions and

research. There are opportunities to support projects from regional organisations such as IGAD, which is developing a transboundary project on rehabilitation of degraded landscapes

Planned/proposed measures to be actioned:

- Promoting sustainable mining of sand and gold
- Reforestation of the degraded river and lake banks

3.7.4: Strategic Action 2.4: Climate change vulnerability analysis

Challenges: South Sudan is vulnerable to climate change due to dependence of its population on climate sensitive natural resources. Floods and droughts are the most common natural hazards in the country. Most of the policies and strategies related to environmental management and agriculture do not include climate variability and change. The country has low adaptive capacity due to limited institutional and technical capacity, lack of appropriate technologies and lack of financial resources to support the implementation of interventions for adaptation to climate change. The institutional arrangements at the national, state and county levels are inadequate for effective coordination, planning and implementation.

Opportunities and measures already in place: Elements of the enabling policy framework that are already in place include the National Environment Policy, National Adaptation Plan (NAP), National Adaptation programmes of Actions (NAPA), Nationally Determined Contributions (NDCs) and the National Communications Policy. There are opportunities for capacity building in vulnerability analysis; and funding from UNDP and other agencies for vulnerability analysis.

Planned/proposed measures to be actioned:

- Mapping of climate hazards hotspots and develop risk maps
- Conduct comprehensive vulnerability assessment

3.7.5: Strategic Action 2.5: Floods and disaster risk management

Challenges: Flooding in the Sudd is a natural phenomenon and annually repeated cycle, and as such part of the natural dynamics of the area. Next to the regular annual flooding pattern, intra-annual flood cycles fluctuate over decades, leading to generally higher or lower flood levels and respectively long-term changes in the floodplain flood patterns. The main driver for the Sudd floods is Lake Victoria levels and respectively flows in the Victoria Nile and Bahr el Jebel. With a growing population in the area, and especially returnees settling without any knowledge of the local conditions, settlements are prone to flooding if developed in unsuitable locations. Dike construction efforts are often conducted in an unsustainable manner and with little consideration of holistic- or long-term consequences, and without coordination with state planning.

Opportunities and measures already in place: Various hydraulic models, flood maps as well as also local knowledge of flood risk is in place that could be utilized for avoiding developments in flood prone areas. Where developments are planned, these can be established in a flood safe manner. Nevertheless, this potential is not fully used, but people continue unsuitable developments in the floodplains. Policies for Integrated Risk Management and Disaster Risk Management have been developed by the Ministry of Humanitarian Affairs and Disaster Management (MHADM). In March of 2021, South Sudan was in the process of developing an early warning system aimed at monitoring and mitigating disasters. A disaster management team was dispatched to collect, compile and update existing information to help enhance capacity to respond to floods and other disasters. This process is ongoing

With the hydrology of the Equatorial Lakes and White Nile system well understood, hydrological/hydraulic models can be used to determine flood conditions,



flood extents, flooding depth and risk levels on a broad spatial scale in the Sudd. Based on such flood maps, risk areas can be identified and respectively development restrictions imposed in order to avoid settlements in floodplains. Forecasts can be used to determine impacts and potential for agriculture and grazing, in order to make best use of water availability.

Planned/proposed measures to be actioned:

Planning needs to be brought down to the local level to avoid unsuitable developments that result in high costs at a later stage. The required interventions include the following:

- Increased focus on reforestation and agro-forestry to reduce vulnerability to drought and floods.
- Continuous assessment/revising of flood patterns in the Sudd to support planning activities.
- Improvement of land use planning and management and carrying out land use zoning .
- Developing flood and drought forecasting and early warning systems.
- Identification of flood prone areas, and developing an early warning system for the flood prone areas.

- Carrying out coordinated development based on well-developed knowledge products to allow informed decision making.
- Creating an enabling environment where communities are able to adapt to the constantly changing environment to become more resilient against the subsequent disasters

3.7.6: Strategic Action 2.6: Wastewater management and water pollution control

Challenges: Due to increased urbanization and navigation, domestic- and industrial waste, wastewater and pollution is an increasing concern. Pollution of wetlands and eutrophication can occur in various ways including spillage during oil exploration, overuse of agrochemicals in large agricultural farms or point source pollution by raw sewage.

Measures already in place: The environmental policy and environment protection bill that is in place emphasizes the importance of carrying out environmental impact assessments (EIAs) in relation to any activity that may affect the environment.

Opportunities: With development of many areas of South Sudan in full swing, there is an opportunity for preventive actions and development of required waste and sewage networks and treatment facilities with consideration of future developments. As these measures are cost intensive, there is a chance to develop respective legislation and policies, ensuring that developers contribute to the development of sustainable systems.

Planned/proposed measures to be actioned:

- Raising awareness on the direct impacts of pollution on livelihoods and possibilities for avoiding pollution.
- Development and implementation of waste/sewage handling concepts.
- Implementation of “polluter pays” principles to avoid high public expenses.
- Development of water quality laboratory facilities

3.7.7: Strategic Action 2.7: Solid waste management and plastics pollution

Challenges: Solid waste and plastic pollution is a challenge in South Sudan due to poor waste management practices. There is no proper waste management system and institutions (municipalities) that are mandated to collect waste are weak with limited human, technical and financial capacity. The city and municipal authorities are collecting waste on a limited scale. There is low awareness raising and knowledge gap on waste management.

Opportunities and measures already in place:

JICA is working with the City Council of Juba to establish a sustainable solid waste management system. Utilization of urban waste can become a high value resource stream e.g. through production of briquettes or biogas, if the appropriate technologies are applied. There is also opportunity to leverage private sector participation in waste management and recycling as it is commercially viable.

Planned/proposed measures to be actioned:

- Promoting the three Rs in urban areas - reduce, reuse and recycle (3Rs)
- Strengthening the capacity of the municipal authorities in waste management.
- Strengthen regulatory frameworks on waste management.

3.7.8: Strategic Action 2.8: Storm water management in urban areas

Challenges: Uncontrolled and destructive flow of storm water is a common phenomenon in most of the cities in South Sudan due to poor limited or lacking drainage systems and poor urban planning. Storm water is not yet recognized as an important issue. Some residents in urban areas use storm water flows to disperse of domestic refuse, further compounding the problem.

Opportunities and measures already in place: None

Planned/proposed measures to be actioned:

- Construction of proper drainage system in urban areas
- Improved solid waste management by expanding collection and providing skips at collection points, and trucks to carry the skips to disposal sites.

3.7.9: Strategic Action 2.9: Oil exploitation

Challenges: Mineral exploitation in South Sudan is taking place without sufficient mitigation measures being in place to ensure the safeguarding of the environment. With oil reserves of South Sudan being located mostly in or near important biodiversity areas such as the Sudd, exploitation of oil can threaten the hydrology, water quality, wildlife and biodiversity if not managed correctly. Several serious issues are associated with oil exploration and extraction:

- Disruption of water flow patterns as a result of diking

- Wetland fragmentation due to the construction of roads and other infrastructure
- Contamination through human waste and oil
- Pollution leading to dying livestock and reduction in fish species as well as human health problems
- Combining economic progression with conservation through respective requirements for environmentally safe standards

Opportunities and measures already in place:

The environmental policy and environment protection bill that is in place emphasizes the importance of carrying out environmental impact assessments (EIAs) in relation to any activity that may affect the environment. The Petroleum Act 2012 provides for petroleum activities to be conducted in such manner as to ensure that a high level of health and safety is achieved, maintained and further developed. One of the goals of the South Sudan Development Plan (SSDP) is to strive for less dependence on oil by creating an enabling environment for economic development. This could provide opportunity to reduce on the harmful impacts on the environment from the petroleum sector.

There is opportunity to combine economic progression with environmental conservation through utilizing adequate technical measures. Development regulations can be set up in such a way to ensure environmental protection e.g., construction requirements and/or a portion of the oil revenues being generated can be utilized to offset the environmental damage being caused by funding sustainable development and environmental rehabilitation programs.

Planned/proposed measures to be actioned::

Environmental sustainability of economic development and related activities, including oil extraction, needs to be ensured. More emphasis should be placed on the implementation of environmental impact assessments (EIAs) and environmentally safe construction to ensure that infrastructure development takes place in an environmentally sustainable manner.

3.7.11: Strategic Action 2.10: Population growth and management of human settlements in the Toich area

Challenges: The human population in the Sudd has been significantly expanding in recent years due to high growth rates and influx of returnees after the civil war. This growth has exerted significant pressure on the natural resources, but also on the traditional communities, due to increased land use for homesteads, increased agriculture, and related human activities. Specifically, settlements and agricultural activities are now expanding into Toich areas, i.e., the seasonally flooded grasslands, which have traditionally been used for seasonal grazing, which are important seasonal flooding and wildlife areas, and in addition have been important for the lifecycle of fish. In some areas diking activities have started, cutting off floodplain area with respective impacts on the environment.

Growth of settlements and agricultural area is widely visible in the Sudd area. Dike construction activities are ongoing, driven by international organizations like WFP and with little involvement or control of the South Sudanese government or conduct of independent environmental impact assessments, assessments of downstream flooding impacts, or consideration of settlement restrictions and planning as alternatives to the current uncontrolled developments.

Opportunities and measures already in place:

With the population further growing, there is the opportunity for planned settlement developments and land use planning, maximizing benefits for ecosystem services and respective livelihoods, by taking a holistic approach for controlled development planning. In this way benefits of the floodplains can be maintained and impacts due to uncontrolled developments avoided.

Planned/proposed measures to be actioned:

Situational analysis of socioeconomic trends, development patterns and projections need to be conducted based on which holistic land use- and

development plans may be worked out, implemented and enforced. This will require works and stakeholder buy in on various levels, as well as education and enforcement on a broad scale.

3.7.12: Strategic Action 2.11: Groundwater potential assessment and development

Challenges: South Sudan is endowed with large amounts of ground water but there is lack of technical and financial capacity to utilize the ground water. The Water Policy and Water Bill do not explicitly talk about ground water or provide for groundwater management.

Opportunities and measures already in place: The Sudd basin is a transboundary aquifer that can be managed regionally and can attract the donor community to support any joint cooperative action on ground water management.

Planned/proposed measures to be actioned:

- Carrying out a national water resources potential determination that includes the delineation of groundwater aquifers and estimation of the groundwater potential of each aquifer
- Preparation of a ground water management, development and investment plan

3.8 Strategic Direction 3: Investment and Socio-Economic Development

3.8.1: Strategic Action 3.1: Small and large-scale irrigation development

Challenges: The population of South Sudan and specifically the Sudd region is pastoral, with agriculture playing a lesser role. With increasing population and settlements developing, food demand is increasing. Agriculture needs sufficient water supply but is threatened by flooding. The dynamic nature of the floodplain flooding patterns therefore requires significant planning and investments in dikes, haffirs and dams that allow for water storage, controlled

flooding and controlled agricultural production.

Opportunities and measures already in place:

Water availability is abundant in the Sudd and the flat area and soils are very suitable for agriculture. Nevertheless, the challenges that come with the dynamic flood conditions in the Sudd need to be addressed. This could be done by taking a holistic approach including flood management, while simple protection and diking of certain areas need to be avoided for livelihood- and environmental reasons. Watershed management practices are currently being put in place for agro-pastoralists to promote climate resilience. The overall objective is to contribute to strengthening resilience of pastoral and agro-pastoral communities, improving governance and conflict prevention, and reducing forced displacement and irregular migration in the region.

Planned/proposed measures to be actioned:

Sustainability and a holistic approach need to be taken for planning land conversion and large-scale agricultural developments, as significant traditional livelihoods are at stake and the traditional population may be adversely affected by such measures. Proposed measures include the following:

- Construction of rain and flood water harvesting facilities
- Creation of micro-credit schemes to enable farmers acquire appropriate technology to increase productivity, and add value to agricultural products.
- Providing facilities and training to reduce post-harvest losses in the crop production sectors.

3.8.2: Strategic Action 3.2: Improving rainfed and flood recession agriculture

Challenges:

- Climate change
- Financial constrain
- Insecurity

- Delay in passing of policy by Transitional National Legislative Assembly
- Lack of Human Recourse/Capacity
- Lack of gender equity
- Low level of awareness

Opportunities and measures already in place:

The following policies/strategies have been developed and will contribute to the enabling environment for irrigation development: the Comprehensive Agricultural master plan (CAMP), Irrigation Development Master Plan, Nation Adaptation Programs Of Action; Nationally Determine Contributions (NDCs); National Gender Policy; Aquaculture Policy; Water Policy; and Trade And Investment Policy. Other ongoing initiatives and opportunities that can be built on include the following: supplying farmers with agricultural tools and seeds; training of extension workers through farmers field schools; water availability; availability of national human resource; international and national NGOs offering services to farmers; and availability of water, land and suitable soils for agriculture in the Sudd.

Planned/proposed measures to be actioned:

- Organize farmer field schools to impart knowledge and skills to farmers on improved farming methods
- Providing facilities and training to reduce post-harvest losses in the crop production sector.

3.8.3: Strategic Action 3.3: Fisheries and aquaculture resources development and management

Challenges: In spite of development efforts during the past decade, the fisheries sector has remained predominantly traditional and subsistence due to inadequate investment, lack of knowledge and poor regulatory and governance processes. The major challenges related to fisheries and aquaculture include the following:

- Weak institutional capacity in terms of human

resources, logistics and coordination

- Inadequate information on the fishery sector
- Limited organization at the community level
- Limited harvest capacity due to basic fishing gears and techniques
- Lack of awareness
- Lack of political will
- Insecurity within the Sudd/ Toich
- Environmental Pollution
- Lack of financial support
- Lack of clean drinking water
- Lack of electricity and infrastructure development
- Under developed fishing processing industry
- Limited ability to transport fish products, due to a lack of motorized river transport and no road access during the rainy season
- High fish post-harvest losses resulting from improper handling throughout the fishery chain.
- Absence of fishery infrastructure such as market stalls, storage facilities, collection points and landing sites
- Short fishing season that limits the number of fish harvested for approximately six months per year.

Opportunities and measures already in place: The community empowerment for progress organization (CEPO) is empowering communities with awareness and training in fishing practices for sustainable livelihoods.

Planned/proposed measures to be actioned:

Ongoing awareness raising of sustainable fishing practices should be conducted. Create an enabling environment which includes funding, proper governance and capacity building for an improved fishing sector.

- Providing facilities and training to reduce post-harvest losses in the fisheries, aquaculture and crop production sectors.

- Training fisher folk in sustainable artisanal fishing methods

3.8.4: Strategic Action 3.4: Livestock production and rangeland management

Challenges: In spite of development efforts during the past decade, livestock and fisheries sectors have remained predominantly traditional due to inadequate investment, lack of knowledge and poor regulatory and governance processes. Key issues of the livestock sectors that have a direct influence on the Sudd wetland include:

- Low livestock productivity.
- Deforestation and environmental degradation.
- Internal conflicts related to land and pasture for cattle grazing
- Lack of easy access to areas for livestock production.
- Inadequate involvement of private sector in livestock development.
- Poor coordination and management by key institutions and stakeholders at every level.
- Poor management in key institutions.
- Lack of appropriate skills and relevant technical expertise.
- Inadequate investment, poor technology transfer and lack of research-based information.
- Cattle rustling
- Insecurity
- Limited water points for livestock and communities

Opportunities and measures already in place:

Availability of permanent and seasonal pastures, and adequate water for livestock constitute significant potential for meat production and export, which can lead to additional revenue generation. Existing policies which will support the efforts to develop the sector include the National Agricultural And Livestock Extension Policy (NALEP). There are also draft policy frameworks and strategic plans in place.

Planned/proposed measures to be actioned:

- Raising awareness on the destructive impacts of overgrazing.
- Introduction of improved livestock husbandry systems.
- Training livestock farmers on improved animal husbandry methods and keeping controlled numbers of cattle
- Advocacy for change in culture to bring down bride price and reduce the need for young men to engage in cattle raids.
- Market development to enhance community livelihoods.
- Improving rangeland management through seeding communal rangelands, fodder production, introducing closed areas where there has been overgrazing, etc.

3.8.5: Strategic Action 3.5: Supporting alternative livelihoods

Challenges:

1. Widespread poverty.
2. Degradation of the environment through such activities as charcoal burning
3. Insecurity/small arms in the hands of communities
4. Persistent lack of peace and stability
5. Low agricultural productivity
6. Lack of capital and access to credit
7. High price of food commodity and high inflation
8. Low level of political will to address pressing development issues.
9. Very low level of infrastructure development

Opportunities and measures already in place: None

Planned/proposed measures to be actioned:

- Conducting business skills development and entrepreneurship trainings.

- Capacity building in processing and value addition to crop and livestock products like juice, vegetables, cereals, milk, fish, beef, etc.
- Establishing micro-credit schemes to support entrepreneurs.

3.8.6: Strategic Action 3.6: Water supply and sanitation

Challenges:

- Low level of development of water supply and sanitation infrastructure
- Low proportion of the population that has access to sanitation (fecal matter treatment) facilities in both urban and rural areas. In urban areas, the limited existing waste stabilization lagoons cannot cope with wastewater flow volumes.
- Water pollution from solid waste.
- Effect of climate change on water availability
- Insecurity in water accessibility (inter-communal conflict)
- Low budgetary allocation to water supply and sanitation development.

Opportunities and measures already in place:

- There are existing policies and guidelines that provide targets for access levels to water supply and sanitation services.
- Ongoing construction of water supply systems, including in Juba City
- Sanitation policy document (Community-Led Total Sanitation (CLTS)) is in place
- There are multiple donors interest to support water supply and sanitation projects (JICA, EGYPT, UNICEF, IOM, etc.)
- Availability of human capacity
- Interest by academia to conduct research on water and sanitation.

Planned/proposed measures to be actioned:

- Carrying out service coverage mapping to determine the location of unserved populations.
- Developing and implementing an water supply and sanitation investment program targeting urban and rural communities in the Sudd region.

3.8.7: Strategic Action 3.7: Multi-purpose water storage development that combines green and grey infrastructure

Challenges:

- Lack of water storage facilities (small and large) for irrigation, hydropower production , agricultural irrigation, flood buffering, etc.
- Lack of investment funds to development of national storage capacity

Opportunities and measures already in place:

- Irrigation development master plan is in place
- Water policy in place.
- Availability of Human Resource

Planned/proposed measures to be actioned:

- Determination of suitable locations and construction of large storage reservoirs for multipurpose use.

3.8.8: Strategic Action 3.8: Development of renewable energy and rural electrification Upstream developments including hydropower development

Challenges: While several dams have been developed in the Equatorial Lakes region without conflict, there are challenges to be overcome by the riparian countries, especially considering large scale projects with transboundary effects. Apart from changing the water flow regime, which can negatively impact downstream ecosystems and biodiversity, several other issues are associated with upstream developments, which include:

- Potential negative impacts on downstream

environmental integrity and hydrological processes

- Potential negative social impacts on community livelihoods
- Potential change in erosion, sediment transport and sediment deposition patterns.
- Lack of institutional capacity for managing transboundary water issues is a shortcoming in most riparian countries and requires improvement.

Measures already in place: Feasibility studies on various potential hydropower dams upstream of the Sudd have been conducted. Water from Lake Victoria is released according to the “agreed curve”, which ensures mimicking natural outflow conditions and respectively maintaining the natural flooding and drying patterns in the Sudd.

Opportunities: The potential for hydropower development upstream the Sudd is quite substantial, and the future of South Sudan’s electricity generation could be dominated by hydropower. This will add an invaluable benefit to the livelihoods of the people of South Sudan. Release schedules can be designed to mimic natural flow conditions and respectively maintain downstream ecosystems.

Planned/proposed measures to be actioned:

Environmental conservation should be a main consideration in dam design. Institutional capacity should be developed to implement and monitor plans that mitigate environmental and social impacts arising from dam construction and operation to internationally accepted standards. Stream gauging and river flow monitoring of the Bahr el Jebel should be enhanced.

3.8.9: Strategic Action 3.9: Navigation development

Challenges: Water levels in the Sudd are constantly changing making navigation in the Sudd a major issue. Sediment transport and sediment deposition have increased significantly as a result of upstream deforestation. Dredging work is already taking place in canals and in inflow areas to the Sudd from the west. Further dredging and periodic maintenance of specific sections within the Sudd will likely be required to create a viable navigation network in the region. Without proper environmental controls (for example on the allowed level of canalization, sediment control, or dangerous goods risk management), there is a chance of the Sudd ecosystem functions changing, or retreating, which has the potential to impact on ecosystem services and livelihoods.



Measures already in place: A comprehensive river barge system feasibility study has been conducted that provides recommendations of proposed channel upgrades to achieve a full-scale river barge transportation system in an environmentally sustainable manner.

Opportunities: An improved navigation sector will be able to support broader human development requirements in the form of catering to commercial parties (e.g., the oil sector, fishing sector, trade and exports), providing opportunity to livelihoods associated to increased trade, and creating access to the Sudd, thereby aiding and diversifying livelihoods in the Sudd and the entire country. In addition, income generated from improved transport may be used to improve sustainable development. A further advantage of opening up a transport network in the Sudd, is that it will give access to more studies in the area which has been mostly inaccessible up to now.

Planned/proposed measures to be actioned: An environmental impact assessment needs to show that the negative impacts are outweighed by the socioeconomic benefits, especially for local communities and people most affected by the negative environmental impacts associated with dredging and developing a navigation network in the Sudd.

It is important to first obtain the detailed information required for a dredging management plan to ensure that dredging operations are efficiently implemented and taking place in an environmentally sustainable manner.

Improved institutional capacity to facilitate navigation development and enforce regulations that address environmental concerns are a further requirement.

- Dredging of river courses
- Improvement of navigation along waterways by dredging, installing navigation aids, improving port facilities, etc.

3.8.10: Strategic Action 3.10: Jonglei canal project

Challenges: The effect of further dam projects and other related development schemes like construction of the Jonglei Canal or dikes along the River Nile may have enormous impact on the Sudd wetland and downstream countries of Sudan and Egypt. Given the size and extent of the Sudd, it has a major effect on regional weather conditions, especially related to evaporation rates, as a large portion of available water in the Sudd is lost. The Jonglei Canal Project, which is currently not pursued any further, can potentially reduce wet and dry seasonal flows by 20% and 10% respectively, thus impacting the wetland's ecology and consequently its inhabitants. Draining part of the Sudd would thus have major impacts on wildlife, livestock and fish as feed supply and spawning areas would be decreased significantly due to reduced flooding. It would also have a significant effect on regional climate, groundwater recharge, sedimentation, and water quality.

Measures already in place: In 2008, discussions to continue the work were resumed. However, since the independence of South Sudan in 2011, there have not been any further discussions or agreements made to resume the project. However, the debate on the project was recently rekindled with the delivery of earth excavation machinery to Unity State or dredging of Bahr El Ghazal-Naam River.

Opportunities: If planned thoroughly and e.g., applying a dynamic schedule, the Jonglei Canal could provide water to larger areas of South Sudan that otherwise suffer from dry summers. Instead of bypassing water to downstream users, waters could be used in-country, e.g., for irrigation purposes. Next to the direct benefits, there may be secondary benefits like increased water availability for adjacent communities during the dry season.

Planned/proposed measures to be actioned: None. Project has been put on hold pending thorough environmental and social assessments.

3.8.11: Strategic Action 3.11: Road and dike development

Challenges: Roads and dikes in South Sudan and particularly the Sudd region face challenges based on availability of construction materials as well as environmental conditions. As for construction material, only black cotton as well as clayey subsoil is available locally, but no base coarse or wearing coarse material is available. Further challenges are present due to flooding, for which roads have to be sufficiently elevated as well as strong rainfall events that lead to erosion and softening up of surfaces.

With the ground softening up during the wet season, deformations due to high axle loads and surface erosion is a common problem. Where better standard roads shall be implemented, construction materials need to be hauled over long distances from the south, from outside the Sudd area. Road maintenance in the past has shown to be challenging as well, while good maintenance would need to be essential for keeping the soil-based roads and dikes in a good shape.

Measures already in place: Road and dike construction efforts are currently being carried out by international aid projects following their own agendas and with insufficient long term planning horizons. Especially maintenance is not sufficiently considered, so that e.g., the roads built in the Sudd floodplains in 2004-2006 have completely.

Opportunities: Roads and dikes may be constructed considering a holistic approach that serves flood security, opening up areas for development in a controlled manner, and as such are able to steer where what development happens. If suitably constructed roads can be used year-round, and if maintenance is considered right at road planning stage and budgeting, assets may be maintained functioning over several years. At the same time careful considerations need to be made and calculations conducted to understand the impacts of cutting off parts of the floodplain

areas, especially also where cumulative effects may be expected.

Planned/proposed measures to be actioned: Especially maintenance and awareness on the proper use of road- and dike assets needs to be conveyed to the local population to ensure lifetimes of capital assets are elongated beyond a few years. Planning for new assets needs to take a holistic approach as transport infrastructure is significantly influencing future developments of settlement areas, livelihoods and markets.

- Constructing rural roads to link production areas with markets.
- Construction of dikes and canals

3.8.12: Strategic Action 3.12: Tourism development

Challenges: Tourism in South Sudan has collapsed as a result of the civil war, continuing conflicts, and respectively non-existent tourism infrastructure. Investments in tourism require stable conditions and respective planning security as a pre-requirement for long term developments.

Measures already in place: The Ministry of wildlife conservation and tourism has a national work plan in place that lists the outputs required to address the challenges that are hampering the work of the Ministry and need to be addressed for smooth implementation of its policies and work plans.

Opportunities: The tourism potential in South Sudan is high with attractive landscapes and wildlife. Tourism development would need to start off as adventure tourism, based on which developments can be taken and infrastructure be developed further. Tourism would generate revenues and in addition promote natural conservation and improved livelihoods, as exactly these aspects carry high touristic value for attracting visitors.

Planned/proposed measures to be actioned:

Safety, infrastructure, and ease of access are pre-requirements for developing tourism. Tourism development respectively has to take place on various levels, including first of all national security, easy access to the country without entry restrictions, etc. The private sector will then take place of individual developments for which nevertheless policies and guidelines will be required. Key actions include upgrading the national airport to attract flights.

3.9 Strategic Direction 4: Wetlands Governance

3.9.1: Strategic Action 4.1: Capacity building of actors involved in wetland management

Challenges: There is a general lack of capacity for the management of wetlands including the capacity to enforce legislation. Understanding of wetland benefits and opportunities from a holistic perspective is limited. This includes a lack of formal training and education of the technical and scientific personnel within the region needed for effective wetland management. Further, limited salaries are not attractive to high quality staff. A key factor behind the situation is the low budgetary allocation to training and human resource development.

Opportunities and measures already in place: Wetlands research and capacity building is currently being driven by the Norwegian agency for development cooperation together with the University of Juba (UoJ). The GEF is supporting capacity support for accession to and implementation of the Nagoya protocol. There is high interest of development partners to support capacity building, which can be tapped into to advance wetland management.

Planned/proposed measures to be actioned: Capacity building gaps should be identified, and plans should be developed. Key staff members should be identified for wetland specific training and from there further on to broader levels. Capacity building

programs should be established to ensure long term commitments of staff to their roles/positions. Capacity building should be extended to the strengthening the capacity of institutions.

3.9.2: Strategic Action 4.2: Cross-sectoral coordination and stakeholder participation

Challenges: There are various stakeholder/sector related entities that are currently working towards achieving a certain goal but are working in isolation. In many cases these different entities have mutual interests or are working towards the same goal, but there are no clear coordination mechanisms that can bring them together.

Opportunities and measures already in place: Various coordination approaches have been started but are often not formalized. The South Sudan Wetlands Expert Working Group was established and has been in operation since 2019.

Planned/proposed measures to be actioned:

- Establishing and operating mechanisms for cross-sectoral coordination between key ministries and national agencies involved in Sudd wetlands management.
- Establishing and operating inclusive platforms for multi-stakeholder engagement processes.
- Carrying out institutional reform to eliminate fragmentation of functions, and streamline roles and functions of ministries, departments and agencies.

3.9.3: Strategic Action 4.3: Gender mainstreaming

Challenges:

- There are existing cultures and customs that block the implementation of gender mainstreaming policies and perpetuate gender disparities. There is

- There is a high level of illiteracy and lack of education among women.
- There are family instabilities and widespread poverty in the society leading to high rates of family breakdown.

Opportunities and measures already in place:

- There are rules and bills passed by the parliament giving women at least 35% representation in public bodies
- There is a Ministry responsible for gender and social welfare at both state and national levels
- Through the revitalized Peace Agreement of 2018, female Vice President has been appointed for the first time in the country.
- There are regional and international organizations that supports women and girls development
- There is a national policy supporting girl child education.

Planned/proposed measures to be actioned:

- Conducting gender analysis on all projects and programs initiated under the Sudd Management Strategy
- Involving women, youth groups, elderly and other vulnerable groups in project design and decision making processes
- Making adequate budget allocation for gender mainstreaming actions under projects and programs
- Training of staff of stakeholder institutions on gender mainstreaming.
- Awareness raising amongst local communicates on gender issues

3.9.4: Strategic Action 4.4: Developing and enforcing the policy and legal framework for wetland management

Challenges: South Sudan does not currently have a wetland policy in place or legislation that specifically addresses wetland issues. Although there are some

legislations that are relevant to various wetland issues, it is only covered from the perspective of water resources in general. Enforcement is also either limited or not coordinated in a cross-sectoral manner. Sudd Ramsar site does not have a management plan that would have facilitated its management.

Other weaknesses in the current governance framework for wetland management include the following:

- An incomplete legal framework (wetlands are not being addressed specifically)
- Existing policy and legal framework is not elaborate enough to sufficiently cover wetland management
- Lack of capacity to monitor wetland development and resource use
- Unclear institutional roles and responsibilities
- Lack of coordination between sectors
- Lack of funding

Measures already in place: National Ministry of Environment and Forestry plans to develop a national wetland policy for South Sudan. There is great interest from international NGOs and UN agencies to conserve the Sudd. Their resources, knowledge and experiences can be tapped in improving the governance framework for wetlands in South Sudan.

Planned/proposed measures to be actioned: The main interventions are to develop the Sudd wetland management plan, support the development of policies, laws and regulations in wetlands and water resources management, train staff at national, state and county levels on the policy and legal framework, train and equip enforcement officers, train magistrates, judges and police officers on the new polices and laws, carry out awareness raising on the wetland related polices and laws targeting the general public and selected stakeholder groups, and supporting enforcement activities, among other things, through adequate budget allocations.



3.9.5: Strategic Action 4.5: Strengthening transboundary water cooperation over the Sudd

Challenges:

- There is conflict of interest among the NBI member states over the use of Nile waters.
- Lack of policies in South Sudan to address wetlands transboundary issues.
- Lack of clear institutional framework for transboundary water management in South Sudan.

Opportunities and measures already in place:

- South Sudan is a member of Nile Basin Initiative, which is a portfolio for cooperation on the management and development of the Nile River.
- There is already a regional transboundary wetland working group
- There is a Regional Wetland Management Strategy at NBI level (for cross-border wetlands, and wetlands of transboundary significance)
- South Sudan is a signatory to the Ramsar convention

Planned/proposed measures to be actioned:

- To engage with other Nile countries on the sustainable management of the Sudd through the NBI platform
- To continue working the Ramsar Convention Secretariat in the management of the Sudd.
- To develop a transboundary water management policy for South Sudan
- To develop an institutional framework for transboundary water management in South Sudan

3.9.6: Strategic Action 4.6: Conflict management and resolution of inter-community conflicts over access to natural resources

Challenges: Historically, the civil war has put the Sudd under considerable pressure, mainly related to land-use change, particularly urbanization and agricultural expansion. The influx of people with their livestock who were seeking refuge in the Sudd subsequently resulted in overgrazing, overfishing, overharvesting, deforestation, uncontrolled infrastructure development such as irrigation schemes and extended urbanization. There is

also insecurity resulting from inter-communal conflicts that lead to internal displacement of communities.

Opportunities and measures already in place:

The international fund for agricultural development (IFAD) has approved an investment to support the South Sudan Livelihoods and Resilience Project (SSLRP). USAID and the Global Environment Facility (GEF), through UNDP, are funding a large conservation project on biodiversity conservation implemented by the Wildlife Conservation Society (WCS). This project will also look into land use planning as a tool to minimize conflicts between different forms of land use, and land use planning processes.

Planned/proposed measures to be actioned:

- Conduct studies to analyses and establishing the causes and driving factors for conflicts.
- Create awareness and carry out capacity building through community conferences, radio talk shows and cultural festivals.
- Develop dialogue and forgiveness conferences as well as peace building initiatives for policy and decision makers (including community outreach visits and sports for peace events).
- Conflict mapping and analysis should be done through research, using questionnaires and focus group discussions.
- Establish reconciliation programs between different communities with the formation of peace committees in the communities. These committees can assist with conflict mitigation and peace building to avoid revenge tendencies.
- Building capacity of wetlands and water ministry officials as well as local communities in conflict management, conflict prevention, peacemaking, mediation, dialogue, negotiation and reconciliation

3.9.7: Strategic Action 4.7: Establishing and operating wetlands and water resource monitoring networks

Challenges: The Sudd has regional significance for

attenuating flows of the White Nile and its tributaries, reducing flood peaks and supporting dry-season river flows, thereby minimizing the seasonal variation in the flow of the White Nile. More research and monitoring data is required to understand and come up with sufficient strategies to manage this vast and complex system in a sustainable way. Challenges however exist in monitoring station setup and station maintenance, as well as data collection and data management. As an example, the University of Juba has been attempting to study the ecology of the Sudd wetlands, but with the inaccessibility of the Sudd, the study has been diverted to other wetlands. Other include the lack of funding for establishing field stations, and deploying technical staff; and lack of appropriate field equipment, include land and water transport vessels.

Opportunities and Measures already in place:

Various information is available on the Sudd. This starts with early descriptions of the entire system, as well as water level and flow timeseries from a significant number of stations throughout the Sudd region, as available in Hursts “Nile basin Volumes”. Data collection starts from the 1890es, with increasing station numbers during the first half of the last century, but a rapid deterioration of the monitoring system following independence and especially with the onset of the civil war in South Sudan. While also later various studies have been conducted, a wetlands inventory, which summarizes existing knowledge on the Nile basin wetlands including the Sudd has been developed with support from GIZ and implementation by the NBI. Further, dedicated environmental flows studies have been conducted as part of NBIs Coarse environmental flows assessment study, and the University of Juba has been attempting to study the ecology of the Sudd wetlands, but with the inaccessibility of the Sudd, the study has been diverted to other wetlands. The man and biosphere (MAB) programme which is funded and executed by UNESCO aims to establish a scientific basis for the improvement of relationships between people and their environments. The Ministry of Environment

and Forestry approached UNESCO to initiate the process for the nomination of the Sudd wetland as first biosphere reserve from South Sudan.

Planned/proposed measures to be actioned: A number of measures can be implemented to improve the knowledge required for effective wetland management in South Sudan, which includes:

- Development of a sustained monitoring system including station definition, setup, data collection, data processing and -storage, station maintenance and making data available for dissemination. This will include the installation of hydrological, hydrometeorological and water quality monitoring stations
- Development of a sustained data management system.
- Awareness raising and training on wetlands conservation and management for staff of institutional agencies.
- Wetlands valuation for advocacy on the value of wetlands.
- Wetlands education to be incorporated into the national school curriculum.

While knowledge is one part of the solution, a solid regulatory base with clear directives is required that ensure the effective implementation of sustainable wetland management measures which are based on available knowledge. South Sudan has not yet finalized the development of its Water Act and as a result the directorates that are responsible for water resource management still lack clear mandates, regulatory frameworks, funding and essential human resources and capacity. From a national standpoint, serious considerations and commitments should be made to get this in place. It is also important that wetland management should be incorporated into national planning processes to allow for budgeting.

Next to the technical development of required functions, maintenance of existing systems (monitoring systems, data management systems), as well as regular quality

checking and data evaluation is important to allow for up-to-date studies for knowledge generation.

3.9.8: Strategic Action 4.8: Establishing and operating sudd data and information system

Challenges:

- There is little data on the sudd wetlands.
- Much of the data is dated
- The data is not well organized into a proper database.
- There is limited capacity for operation and maintenance of data and information management systems.

Measures already in place:

- There is ongoing inventory in the Sudd that was started by NBI
- Sudd wetlands Rapid assessment report was launched during 2022 world Environment Day commemoration

Planned/proposed measures to be actioned:

- Develop a data management system to assess and monitor changes in the sudd
- Train staff of the Ministry of Environment and Forestry in operation of the data management system.
- Create an awareness program for the community to understand what the benefits of conserving Sudd wetlands

3.9.9: Strategic Action 4.9: Development and enforcement of water abstraction regulations

Challenges:

- Lack of funds
- Water bill is still under development; hence there is no law in place that provides for water resources regulation
- Limited capacity for water regulation

- Low awareness in the public on water regulation
- Community might resist enforcement of water abstraction regulations

Opportunities and measures already in place:

- There is opportunity to develop partnership with regional bodies i.e. NBI to support regulatory activities
- There is ongoing institutional capacity building supported by World Bank that could extend to water resources regulation.
- There is a draft water bill under process that would provide a legal basis for regulation.

Planned/proposed measures to be actioned:

- Supporting the processes for passing the water Bill into law.
- Developing regulations (on water abstractions and diversions) for operationalizing the new Water Act
- Conducting training for staff of the Ministry of Water Resources and Irrigation on development and operation of a water resources regulation system.
- Awareness raising among the members of the judiciary and police on the new act
- Awareness raising on water use sectors (agriculture, municipal water supply, hydropower, aquaculture, livestock, industry, services) and private/commercial water users on water resources regulation

3.9.10: Strategic Action 4.10: Development and enforcement of effluent discharge standards

Challenges:

- Lack of effluent discharge standards
- The water bill, which would provide a legal basis for effluent discharge regulation has not been passed.
- Weak capacity for developing and enforcement of laws
- Limited capacity for water regulation
- Low funding for regulatory activities

- Low awareness in the public on water regulation

Opportunities and measures already in place:

There is a water bill in place that provides for regulation of wastewater discharges. The Water Sector Steering Committee is in place, The Natural Resources Work Group is in place, and the WASH Sector Group is in place. These working groups can provide an opportunity for coordinating efforts at water sector regulation. There is opportunity to partner with neighbouring countries through platforms such as IGAD, EAC and NBI, and learn from their experiences in setting up national regulation systems. There is opportunity to obtain technical and financial support from UN agencies like UNEP to develop a regulatory system for wastewater discharge.

Planned/proposed measures to be actioned:

- Supporting the processes for passing the water Bill into law.
- Developing regulations (of effluent discharge) for operationalizing the new Water Act
- Conducting training for staff of the Ministry of Water Resources and Irrigation on development and operation of a water resources regulation system.
- Awareness raising among the members of the judiciary and police on the new Act and effluent discharge regulation
- Awareness raising on water use sectors (municipal water supply and industry) and private/commercial water users on wastewater discharge regulation

3.9.11: Strategic Action 4.11: Resource Mobilization for Sudd Management

Challenges:

- Lack of investment and management plan for the Sudd.
- Low budgetary allocations to wetlands management measures
- Low political will for wetland management

Opportunities and measures already in place:

South Sudan is member of several regional organisations including IGAD, EAC and NBI through which there could be opportunities for accessing grant financing to implement aspects of the Sudd Management Strategy. Being a UNESCO World Natural Heritage Site and RAMSAR site gives the Sudd a profile through which it could seek for resources from development partners.

Planned/proposed measures to be actioned:

- Mobilise seed funding for the Strategy from the government of South Sudan.
- Develop resource mobilization strategy
- Carrying out resource mobilization for implementation of the management strategy.

3.9.12: Strategic Action 4.12: Awareness creation, public education and communication

Challenges:

- Lack of funding for awareness activities
- Lack of communication and public education materials
- Poor road infrastructure making it difficult to reach communities for awareness raising.

Opportunities and measures already in place: None.

Planned/proposed measures to be actioned:

- Development of a strategy for communication and awareness raising on the Sudd.
- Design and production of Information, Education and Communication (IEC) materials
- Preparing information packs for schools
- Carrying out awareness campaigns on different forum.

3.9.13: Strategic Action 4.13: Review and update of the Sudd Strategic Management Strategy

Planned/proposed measures to be actioned:

- Organize review of the Sudd Management Strategy every five years and adjust it to capture emerging issues and other developments in the sectors within and outside the country.

3.9.14: Strategic Action 4.14: Preparation and implementation of strategic action plans for implementation of the Sudd Strategic Management Plan

Planned/proposed measures to be actioned:

- Organise the preparation of detailed and costed Strategic Action Plans for implementation of the Strategy
- Mobilise resources for implementation of the Strategic Action Plans under Strategic Action 4.11

3.9.15: Strategic Action 4.15: Monitoring and evaluation

Planned/proposed measures to be actioned:

- Develop a monitoring and evaluation framework and plan for the Sudd Management Strategy. The M&E framework spells out the monitoring and evaluation tools that will be used, the timing of monitoring and evaluation events, and responsibilities for monitoring and evaluation.
- Implement the monitoring and evaluation plan, and use the findings in reporting on progress of implementing the Sudd Management Strategy, and in review of the Strategy.

CHAPTER 4: IMPLEMENTATION ARRANGEMENTS



4.1 Strategic Action Plans

Strategic Action Plans with costed activities covering 5 years, will be the main tool for implementation of the Sudd Management Strategy. The Strategic Action Plan will be prepared collaboratively in a process involving multiple stakeholders at local to national levels.

The Strategic Action Plans may be complemented by Investment and Management Programmes through which priority projects for investments and infrastructure development as well as wetland conservation and management are identified, fully prepared, serviced with investment finance and implemented.

4.2 Prioritization

The development of the Sudd Management Strategy has been driven by enthusiasm to preserve the Sudd – a critical national environmental asset of transboundary significance. But the exercise has exposed deep systemic weaknesses in the governance system in South Sudan with implications for the plans for the Sudd. There appears to be limited funds available for government programming, which seriously affects the ability of government ministries and agencies to perform key functions, set policies and standards; initiation of legislation; carry out regulation and licensing; carry out planning and budgeting; carry out capacity building, and embark on service delivery.

« The development of the Sudd Management Strategy has been driven by enthusiasm to preserve the Sudd - a critical national environmental asset of transboundary significance. But the exercise has exposed deep systemic weaknesses in the governance system in South Sudan with implications for the plans for the Sudd.. »

Resource constraints arise from multiple causes, including security challenges, and heavy dependence on a single revenue stream – oil. Top political priority appears to be focused on maintaining the fragile national peace, with all other problems being of secondary importance. Corruption compounds these challenges by diverting already meagre resources away from government programming.

In the above circumstances, it would be well advised to keep ambition levels at implementation stage at a moderate level. Thus, while the Sudd Management Strategy has been prepared with an assumption of no limitations, at Strategic Action preparation stage, careful prioritization will be necessary to prepare a scope of activities that can realistically be attained.

4.3 National lead agency

It is necessary to have a clear national lead agency for the Sudd Management Strategy. The lead agency is proposed to be the Ministry of Environment and Forestry (MEF) for reasons that the Sudd is a wetland, and management of wetlands falls in the domain of MEF. Because of transboundary nature of the Sudd and the potential impacts of its management being felt across international boundaries, it is proposed for the Ministry of Water Resources and Irrigation to be a co-leader of the Strategy Management Strategy

4.4 Moving from planning to implementation

To move from planning to implementation, there will need to be a transition from a project-type activity, to mainstreamed activity within the national lead and co-lead agencies. Any agreed collaboration mechanism for implementation of the Strategy should also be mainstreamed, and not remain at project level.

Each of the stakeholder ministries that participated in the development of the Sudd Management Strategy should retain responsibility for implementing components that fall under its mandate. The Ministry of Environment and Forestry will be responsible for implementing those aspects of the Strategy that fall under its mandate, and coordinate other ministries in implementing their components of the Management Strategy. For successful implementation, all ministries need to mainstream components of the Sudd Strategy in their sectoral medium term plans and investment plans.

4.5 Resource mobilization

To demonstrate commitment to the Sudd Management Strategy, the Government of South Sudan needs to provide the seed funding for the Strategy. The government, through the medium term budgets of the stakeholder ministries, could commit funding for some soft components like coordination meetings, training/capacity building, institutional capacity development, awareness raising, and monitoring and evaluation.

Multiple approaches shall be used to mobilize resources from other sources, including:

1. Letting each ministry raise resources through its medium term and annual plans, with support of its sectoral donors and development partners;
2. Allowing the Wetlands Expert Working Group to collectively package projects and programmes and market and mobilize resources for their implementation; and

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3. Approach regional project preparation facilities like NELSAP/ENREO, NEPAD-IPPF, African Water Facility and GCF to support investment project identification and preparation.

4.6 Immediate steps

The immediate steps after completion of the Sudd Management Strategy are the following:

1. Holding of a special consultation for political leaders and elders in the country – leaders of constituencies in the Sudd, members of parliament sitting on sectoral committees relevant to water, wetlands, environment and natural resources;

ministers of relevant sectors, and elders like cultural and religious leaders. This special consultation will be organized jointly by the Ministry of Water Resources and Irrigation, and Ministry of Environment and Forestry. The Management Strategy will be updated to reflect the contributions of the political leaders and elders.

2. Official and formal handover of the Sudd Management Strategy by the Ministry of Water Resources and Irrigation to the Ministry of Environment and Forestry.
3. Organizing a joint official launch of the Sudd Management Strategy by the Ministry of Environment and Forestry, and Ministry of Water Resources and Irrigation. Donors are to be in attendance.
4. Holding a working session of the National Wetlands Expert Working Group to prepare the first Strategic Action Plan and package of investment projects and priority management interventions.
5. Mobilising resources internally from the ministries, and externally from donors, to finance the implementation of the Strategic Action Plan and Investment/Management Programme.





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