



The Republic of South Sudan

FIRST NATIONAL ADAPTATION PLAN **for Climate Change** REPUBLIC OF SOUTH SUDAN





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The NAP-GSP is managed jointly by UNDP and UN-Environment and funded by the Global Environment Facility. The NAP-GSP provides technical expertise and guidance on the national adaptation plan (NAP) process, training and opportunities for knowledge exchange on NAPs. As part of the NAP-GSP, UNDP has provided one-on-one support to 28 least developed countries for advancing their NAP process. Learn more [@globalsupportprogramme.org](https://globalsupportprogramme.org) and [@undp.org](https://undp.org)

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ACRONYMS

AfDB	African Development Bank
AU	African Union
BDC	Boma Development Committee
CAMP	Comprehensive Agriculture Master Plan 2015-2040
CBO	Community-Based Organization
CDD	Consecutive dry days
CDMS	Climate Data Management System
CEDAW	Convention on the Elimination of All Forms of Discrimination Against Women
CHW	Community health worker
CMIP	Coupled Model Intercomparison Project
CPA	Comprehensive Peace Agreement
CVRA	Climate vulnerability and risk assessment
DoM	Department of Meteorology
DRR	Disaster Risk Reduction
EAC	East African Community
EbA	Ecosystem-Based Adaptation
FAO	Food and Agriculture Organization
FEWSNET	Famine Early Warning Systems Network
GCF	Green Climate Fund
GCM	General Circulation Model
GEDSI	Gender Equality, Disability, and Social Inclusion
GEF	Global Environment Facility
GHA	Greater Horn of Africa
GHG	greenhouse gas
HDI	Human Development Index
IDMP	Irrigation Development Master Plan 2015-2040
IDP	Internally-displaced person (People)
IGAD	Intergovernmental Authority on Development
INC	Initial National Communication (to the UNFCCC)
IOM	International Organizations for Migration
IPCC	Intergovernmental Panel on Climate Change
ITCZ	Inter Tropical Convergence Zone
LEG	Least Developed Countries Expert Working Group
LGA	Local Government Act
LGB	Local Government Board
MAFS	Ministry of Agriculture and Food Security

MARF	Ministry of Animal Resources and Fisheries
MERL	Monitoring, evaluation, reporting, and learning
MGCSW	Ministry of Gender, Child, and Social Welfare
MHADM	Ministry of Humanitarian Affairs and Disaster Management
MWRI	Ministry of Irrigation and Water Resources
MoED	Ministry of Electricity and Dams
MoEF	Ministry of Environment and Forestry
MoFAIC	Ministry of Foreign Affairs and International Cooperation
MoFP	Ministry of Finance and Planning
MoGEI	Ministry of General Education and Instruction
MoT	Ministry of Transport
MPM	Ministry of Petroleum and Mining
MWCT	Ministry of Wildlife Conservation and Tourism
NALEP	National Agriculture and Livestock Extension Policy
NAP	National Adaptation Plan
NAPA	National Adaptation Programme of Action
NAP-GSP	National Adaptation Plan Global Support Programme
NBI	Nile Basin Initiative
NBSAP	National Biodiversity Strategy and Action Plan 2018-2027
NDA	National Designated Authority (to the GCF)
NDC	Nationally Determined Contribution (to the Paris Agreement)
NDS	National Development Strategy 2018-2021
NGP	National Gender Policy
PDC	Payam Development Committee
PWD	People (Person) With Disabilities
RCP	Representative Concentration Pathway
RRC	Relief and Rehabilitation Commission
R-TGNU	Revitalized Transitional Government of National Unity
SDG	Sustainable Development Goals
SNDC	Second Nationally Determined Contribution (to the Paris Agreement)
SSDP	South Sudan Development Plan 2011-2016
SSMD	South Sudan Meteorological Department
SSRRC	South Sudan Relief and Rehabilitation Commission
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change



UNOCHA	United Nations Office for the Coordination of Humanitarian Affairs
USAID	United States Agency for International Development
WASH	Water, sanitation, and hygiene
WIGOS	WMO Integrated Global Observing System
WIS	WMO Information System
WMO	World Meteorological Organization

FOREWORD

South Sudan is the world's youngest country, born from a struggle for freedom and self-determination. As a new country, we have experienced challenges in building a nation and assembling the accoutrements necessary for progressive governance in the best interests of the nation of South Sudan. We have experienced further challenges and "growing pains" as internal conflict and divisions have threatened to derail our common vision of a prosperous and vibrant South Sudan. However, many of these troubles are behind us, as we move cautiously and hopefully forward from the 2018 Peace Agreement and the formation of the Transitional Government of National Unity in 2020.

Moving forward, our country and our people will face new challenges. One of the most significant of these is climate change. Our country is founded in part on principles of environmental sustainability and the knowledge that our natural environment nurtures us and supports our lives and livelihoods. The Transitional Constitution states that the people of South Sudan "...are conscious of the need to manage our natural resources sustainably and efficiently for the benefit of the present and future generations...". Part of this is understanding that climatic conditions are an important determinant shaping the potential and prosperity of our great nation. However, through no fault of our own, our climate is changing, and will continue to change in the future. Though the people of South Sudan have made virtually no contributions to the global threat of a warming atmosphere, its effects have had an enormous impact on our economy and society. Therefore, it is imperative that all South Sudanese take a proactive stance in addressing and adapting to climate change and building resilience.

This first National Adaptation Plan (NAP) embodies South Sudan's commitment to overcome these challenges. Over the next five years, the first NAP will guide our efforts from a national level, down to our communities and households. The NAP consists of three priority pillars:

1. Building climate resilient communities;
2. Building a climate resilient economy and development trajectory; and
3. Building a climate-resilient environment and ecosystems

These pillars will be reached through coordinated action and the commitment of government and non-government stakeholders. The pillars will be operationalized through programmes of action implemented by ministries in the national government as well as subnational governments. The NAP process includes supporting actions to strengthen climate governance in order to effectively achieve the priority pillars. The NAP, spearheaded by the Ministry of Environment and Forestry (MoEF), envisages a transformation in governance to mainstream climate change considerations in government policies, plans, and programmes. It also paves the way for scaled-up international support.

South Sudan is one of the most vulnerable countries in the world to climate change. However, with concerted effort, the people of South Sudan will be united in their efforts to build resilience to climate change and to safeguard our future. As Minister of Environment and Forestry, it is my great honor to introduce this landmark achievement. On behalf of the Government of South Sudan, I hereby invite all South Sudanese, along with our international partners, to join together to implement this plan.



Hon. Josephine Napwon Cosmas
Minister of Environment and Forestry
Republic of South Sudan



PREFACE

Climate change is among the greatest challenges of our time, representing a particularly pernicious threat to the people of South Sudan. The prevalence of poverty, low levels of education and persistent food insecurity, leave our country and its people extremely vulnerable to the physical processes and impacts of climate change. Up to 95 percent of our population, more than 11 million people, depend on climate-sensitive sectors, including agriculture, forestry resources and fisheries for their livelihoods. We have experienced firsthand the ravages of climate change. For example, the East African drought of 2011, which resulted in famine and loss of life for our people, and massive flooding in July-August 2014 that resulted in the deaths and displacement of more than 40,000 people. Recent issues include heavy rainfall and flooding that cut off accessibility, increased water-borne diseases and the prevalence of malaria and typhoid fever, washed away houses, lead to displacement, and damaged crops and farmland. The impacts of climate change are not limited to one sector or one geographical area; they affect all facets of life and every corner of the country.

If left unaddressed, the impacts of climate change could undo the hard-fought gains our country has achieved in terms of building peace and unity. For example, climate change is likely to lead to longer dry seasons and an increased prevalence of drought. This may exacerbate the factors that drive conflicts over access to resources. We do, however, have the choice to anticipate and address these conditions before they arise through planning processes informed by the best available science.

South Sudan's National Environment Policy (NEP) (2015-2025) calls for the formulation of a national strategy for climate change adaptation as well as support for efforts to reduce community vulnerability and variability to climate change. This first NAP fulfills these mandates and provides a comprehensive framework for building resilience across all segments of our society. This is reflected in the vision of the first NAP, which is to mainstream adaptation planning within South Sudan's development planning across different government line ministries and climate resilient communities and ensure climate-centric development for long term resilience and interruption of the poverty cycle. The processes outlined in this document will allow our country to move forward together to confront the challenges of climate change. We shall do this in an inclusive manner that is sensitive to the unique challenges and burdens carried by women, and which works equitably to advance overall gender equality. Our approach to building resilience will be attentive to people with disabilities, internally displaced people, refugees, and all groups and people that have been marginalized by socioeconomic processes or political conflicts. We do this because of our dream of an inclusive and prosperous country for all South Sudanese.

I take pride in the work carried out by the Department of Climate Change to formulate this first NAP, and it is my honour to write these introductory remarks and endorse this first NAP for the Republic of South Sudan. This document, and the process that it represents, is the first step on the road to a prosperous and climate-resilient future for all South Sudanese.



Hon. Joseph Africano Bartel
Undersecretary of Environment
Republic of South Sudan

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The government of South Sudan expresses its deep gratitude to national ministries and agencies, development partners, non-governmental organizations (NGO's), academia, private sectors and all stakeholders for their contributions to the development of South Sudan's first NAP.

Our gratitude is extended to the Global Support Programme on National Adaptation Plans (NAP-GSP), jointly managed by the United Nations Development

Programme (UNDP) and United Nations Environment Programme (UNEP) and funded by the Global Environment Facility (GEF), for providing financial and technical support for the preparation of the first NAP, with special thanks to UNDP for leading the support. We would also like to acknowledge with appreciation the technical contribution made by the UNEP regional Office and the World Meteorological Organization (WMO).



Mr. Payai Manyok John
Deputy Director for Climate Change and UNFCCC National Focal Point for South Sudan
Ministry of Environment and Forestry
Republic of South Sudan



EXECUTIVE SUMMARY



Floods and droughts are a part of life in South Sudan due to natural climatic variability. Over generations, the people of South Sudan have developed strategies to address these hazards. However, there are indications that anthropogenic global warming is contributing to change in South Sudan's climate and that these changes will only increase in the future. These changes take the form of sudden shocks, such as extreme rainfall and flooding, and longer-term stressors, which include gradual increases in temperature and changes to seasonal precipitation patterns and averages. These processes have already had negative socio-economic impacts on the people of South Sudan in terms of increased crop losses, loss of pasture lands and water resources for livestock, reduction of critical habitats for biodiversity in wetlands and forests, reduction in river flows and adverse impacts on key habitats in wetland ecosystems.

In response to these challenges, the Government of South Sudan has initiated its NAP process. This document, South Sudan's first NAP for climate change, is a landmark achievement in the country's response to climate change. The first NAP represents an important milestone in establishing a coordinated approach to building adaptive capacity and resilience to better manage the challenges the country faces, including changing environmental conditions associated with climate change and global warming. The first NAP also follows guidelines introduced by the United Nations Framework Convention on Climate Change (UNFCCC) in 2019. According to the UNFCCC, NAPs have two primary objectives:

- To reduce vulnerability to the impacts of climate change by building adaptive capacity and resilience; and
- To facilitate the integration of climate change adaptation into relevant new and existing policies, programmes, and activities and in particular, development planning processes and strategies, within all relevant sectors and at different levels, as appropriate.

The vision of the NAP is to mainstream adaptation planning within South Sudan's development planning across different government line ministries and climate resilient communities. This will ensure climate-centric development for long term resilience and interruption of the poverty cycle. The mandate of the NAP is to build leadership and ensure stakeholder participation to fulfill South Sudan's commitment to the UNFCCC and to operationalize climate change adaptation at all levels. The NAP will play a number of key roles for South Sudan, including the following:

- Provide a roadmap of the steps needed to mainstream climate change adaptation into planning and budgeting at national, state and local levels.
- Identify actions that are needed to create enabling conditions for scaled up access to international climate finance from both public and private sources.
- Provide a baseline and starting point for climate change adaptation in South Sudan by consolidating all relevant information on the physical processes and impacts of climate change to establish a common understanding for all stakeholders.
- Provide a common and coherent articulation of adaptation priorities to guide and coordinate all stakeholders, including government agencies, non-governmental organizations (NGOs), development partners, civil society organizations and the private sector, along the same pathway to a resilient and climate-adapted South Sudan. This includes providing a framework for determining and fulfilling South Sudan's international commitments with respect to climate change adaptation.

Given that climate change is a cross-cutting issue, the NAP process in South Sudan will involve a wide range of government and non-government stakeholders at all levels of government. The NAP prioritizes nine sectors:



1. agriculture, livestock and fisheries
2. disaster risk reduction
3. energy
4. environment, ecosystems and biodiversity conservation
5. health
6. human settlements
7. tourism and recreation
8. industry, infrastructure and transportation
9. water resources

The legal and administrative context for the NAP is described in [Chapter 2](#). The mandate for the NAP is embedded in the Transitional Constitution of 2011 which guarantees all South Sudanese communities the right to a clean and healthy environment, stating that every individual is obligated to conserve the environment for the benefit of present and future generations.

The NAP process will be led by the MoEF. Horizontal coordination among national level lines and coordinating ministries will include roles and responsibilities for a range of agencies and a permanent coordination mechanism including a national Climate Change Working Group. Supporting Thematic Working Groups will be also be established. The NAP process will guide efforts to mainstream climate change adaptation considerations into day-to-day processes of governance for key agencies; to this end [Chapter 2](#) includes a five-year programme with indicative benchmarks to support mainstreaming.

The impacts of climate change are the result of the interaction of physical processes (e.g. increasing temperatures, changing patterns of rainfall) and human systems. The vulnerability of people, places and things to changing environmental conditions associated with climate change is shaped by a variety of non-climate factors. Therefore, reducing vulnerability and increasing resilience to climate shocks and stressors must address these non-climate drivers.

[Chapter 3](#) of the NAP provides an overview of economic, social, political, environmental and cultural characteristics in South Sudan that influence both vulnerability and adaptive capacity. These conditions are described so that climate-change adaptation-plans and programmes take into consideration the country's socioeconomic development trajectory and anticipate future hazards and threats to that trajectory. Special focus is placed on South Sudan's

wealth of economic diversity, which can serve as an important resource for building resilience, and which provides locally-appropriate entry points for policies and programmes, as well as channels for dissemination of information about climate hazards.

Gender considerations are also highlighted, as there is a feedback loop between gender inequality and climate-change vulnerability. On the one hand, women and girls are more vulnerable to climate shocks and stressors in South Sudan for a variety of social and cultural reasons. On the other hand, because the impacts of climate change often fall disproportionately on the shoulders of women and girls, they can exacerbate already existing inequalities. For these reasons, South Sudan's first NAP prioritises gender-sensitive and equitable approaches to building resilience. It understands that special measures and attention are needed to address socially-differentiated vulnerabilities.

[Chapter 4](#) presents the scientific evidence-base for South Sudan's adaptation response. There is a significant degree of uncertainty concerning the future trajectory and manifestations of global warming in South Sudan. To be effective, climate-change planning must rely on the best-available scientific data and information. Global project financiers, such as the Green Climate Fund, require that the projects they finance be predicated on a sound scientific basis and understanding of the physical processes and impacts of climate change, the climate rationale. At the same time, developing a rigorous climate rationale on an ad hoc basis for policies and project development processes is beyond the capacity and remit for most government- and non-government agencies. [Chapter 4](#) therefore addresses the science for all stakeholders in South Sudan and establishes a common language and understanding of the observed and projected impacts the country will face into the future.

To ensure maximum effectiveness and country ownership, the NAP is aligned with national and sectoral planning processes and priorities, as described in [Chapter 5](#). This chapter describes how the NAP builds on previous government-led adaptation efforts in South Sudan, including the National Adaptation Programme of Action (NAPA) (2016), and the NAP's alignment with the country's Nationally Determined Contribution to the Paris Agreement (NDC). In addition, this chapter provides an analysis

of the goals and priorities outlined in South Sudan's Vision (2040) and its National Development Strategy (2018-2021). This analysis looks at the priority measures described in these documents, in the context of changing climatic conditions, to identify potential climate threats that could undermine the country's progress towards its goals and its overall development trajectory.

To address these vulnerabilities, the NAP outlines entry points for action to be taken in building the resilience of South Sudan's development trajectory. The chapter also includes links to a range of cross-cutting and sectoral-development strategies and policies. It is envisaged that in the future, as line agencies develop their long-term strategies and implementation plans, they will incorporate the priorities identified through the NAP process, and that they will also draw on the evidence base that is presented in the NAP to support climate resilience at the sectoral level.

As noted above, the NAP addresses nine priority sectors. For each of these sectors, the NAP includes sectoral programmes to address priority vulnerabilities. These sectoral programmes contain priorities drawn from existing climate change documents (e.g. NAPA, NDC) which have been validated by relevant stakeholders during the NAP formulation process. The programmes also contain recommended actions that were formulated to address sectoral vulnerabilities that emerged during the NAP formulation. These programmes represent South Sudan's current adaptation priorities and should be used as the basis for all climate change adaptation projects formulated over the next five years. They should also provide guidance to development partners, national

and international NGOs and multilateral development banks as they plan their activities in South Sudan over the same timeframe.

[Chapter 6](#) provides several short-term priorities that should be addressed by the Government of South Sudan and its partners over the 2020-2023 time frame. These actions have been identified to address gaps that currently exist with respect to human awareness and capacity, and governance and institutional mechanisms. Addressing these short-term actions will strengthen the NAP process and will enhance the ability of all stakeholders in South Sudan to build their own resilience and adaptive capacity. It is envisaged that these actions will be addressed with support from development partners utilizing existing climate finance, including support available through the Green Climate Fund's Readiness Support Programme. There is currently at least one project in preparation which intends to access these funds.

This first NAP should be considered a living document, to be modified and expanded as necessary. The NAP is intended to be presented to the UNFCCC, and to guide adaptation in South Sudan from 2021-2025. The final chapter of the NAP outlines the next steps which should be carried out to further enhance the NAP process. This includes developing a communication plan, a monitoring and evaluation plan and a detailed implementation plan to achieve the priorities described in the sectoral adaptation programmes. The NAP process is intended to be iterative and so it is expected that in 2024 the government will evaluate progress of the first NAP, and begin the process of formulating the second NAP.



Chapter 1: Introduction



1.1 SOUTH SUDAN'S CONTEXT OF VULNERABILITY

Floods and droughts are a part of life in South Sudan due to natural climatic variability. Over generations, the people of South Sudan have developed strategies to address these hazards. However, there are undeniable indications that anthropogenic global warming is contributing to changes in South Sudan's climate and that these changes will only increase in the future. These changes take the form of sudden shocks, such as extreme rainfall and flooding, and longer-term stressors, which include gradual increases in temperature and changes to seasonal precipitation patterns and averages.¹ These processes have already had negative socio-economic impacts on the people of South Sudan in terms of increased crop losses, loss of pasture lands and water resources for livestock, reduction of critical habitats for biodiversity in wetlands and forests, reduction in river flows, and adverse impacts on key habitats in wetland ecosystems.

A recent assessment by the African Development Bank (AfDB) projects that South Sudan may face losses to its gross domestic product (GDP) by up to as much as 10 percent higher than the next most exposed region (India) (BRACED, 2017). South Sudan has experienced increasing temperature trends over vast regions of the country, rising by an average of .4°C per decade between the late 1960s to 2000s. By 2060, anthropogenic climate change is likely to lead to an increase in average temperatures in South Sudan by up to 1.5°C over and above 2020 values (USAID, 2019). Such rates of increase make South Sudan one of the most vulnerable countries in the world to the impacts of climate variability and change. In 2017 the country was ranked as 5th most vulnerable to climate change globally.²

Changes in rainfall patterns and total annual rainfall amounts are expected but these are less certain than changes in temperature. Despite the uncertainty surrounding changes in rainfall parameters, it is extremely likely that increasing temperatures will have significant consequences for water resources, agriculture, natural resource management, human health, biodiversity and infrastructure. South Sudan is also likely to experience changes in the frequency and/or severity of extreme climate events, such as heat waves, droughts, and floods. Overall it is expected that if significant actions are not taken, climate change will reduce crop and livestock production, increase poverty, increase conflict, reduce peoples' income and livelihoods, reduce wildlife habitats and furthermore, increase the incidence of pests and diseases while reducing the ability of ecosystems to sustain livelihoods. All of these factors have a high potential to slow the economic development of South Sudan.

In short, climate change poses multiple threats that have the potential to derail South Sudan's development and peace-building trajectory. There is a clear imperative to establish a comprehensive response to climate change that empowers South Sudan and its people to thrive and grow into the future. This first NAP represents the first step in establishing this response.

1.2 GOALS, OBJECTIVES AND OUTCOMES OF THE NAP PROCESS

Building on NAPA,³ the NAP development process was established under the UNFCCC in 2010 as part of the Cancun Adaptation Framework. Whereas NAPA was designed to facilitate the identification of

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- 1 Throughout this document the term "shock" will be used to refer to sudden onset events, while "stressor" is used to refer to ongoing processes of change that take place over longer periods of time. The use of these terms is consistent with the international lexicon used to describe climate change processes.
 - 2 See 2017 Verisk Maplecroft Climate Change Vulnerability Index Summary: <https://reliefweb.int/sites/reliefweb.int/files/resources/verisk%20index.pdf>
 - 3 South Sudan's NAPA was approved in 2016 and, in keeping with the intended function of NAPAs, includes recommended actions to address the country's most pressing climate vulnerabilities.



the most urgent climate vulnerabilities and to guide action over the short term, the NAP process enables parties to the UNFCCC to formulate and implement NAPs as a means of identifying medium- and long-term adaptation needs and to develop and implement strategies and programmes to address those needs. It is a continuous, progressive, and iterative process that follows a country-driven, gender-sensitive, participatory and fully transparent approach. The objectives of the NAP process are as follows:⁴

- To reduce vulnerability to the impacts of climate change by building adaptive capacity and resilience; and
- To facilitate the integration of climate change adaptation, in a coherent manner, into relevant new and existing policies, programmes, and activities, in particular development planning processes and strategies, within all relevant sectors and at different levels, as appropriate.

In practical terms, these objectives cover not only specific projects and programmes aimed at decreasing vulnerability, but also a broader evolution of governance so that climate change considerations are mainstreamed⁵ into day-to-day processes of governance at all levels. In this way, climate change mainstreaming is viewed as a principle of good governance, similar to transparency and accountability. Mainstreaming helps to ensure that public sector investments continue to provide benefits amidst changing climatic conditions, and that the government is taking steps to promote the safety and well-being of all South Sudanese people in the face of emerging hazards.

The NAP process in South Sudan will facilitate the coordinated and structured identification of key adaptation issues, gaps, priorities and resource requirements for more effective planning, implementation and monitoring of adaptation in South Sudan. The NAP establishes a common understanding of climate change challenges for all stakeholders, as well as a common language and priorities to overcome these challenges so that all stakeholders are working in concert. The NAP process will also build on South Sudan's NDCs and other national and in-

ternational efforts to enhance resilience to climate change and disasters. South Sudan recognizes that establishing synergies and linkages, where possible, between the NAP and these other key processes is essential to:

- Contributing to achieving the Global Goal on Adaptation (GGA) by reducing vulnerability through integrating adaptation considerations into all relevant plans, policies, and strategies, and prioritizing and planning for adaptation;
- Ensuring that the adaptation component of the NDC becomes a strategic and ambitious vehicle for capturing, reporting and updating commitments and progress; and
- Aligning long-term national development priorities with the Sustainable Development Goals (SDGs) framework and 2030 Agenda.

1.3 SOUTH SUDAN'S NAP PROCESS

The Government of South Sudan launched its NAP process in 2016. The launch involved technical consultations with link ministries and a stakeholder workshop to endorse the NAP concept, chaired by ministry undersecretaries. From 2016-2020, the Department of Climate Change (the lead agency for the NAP) has participated in several capacity development and planning workshops implemented by the UNDP and UNEP and the NAP Global Support Programme (NAP-GSP). Through these processes the NAP has gradually taken shape. The NAP builds on previous efforts to establish a national response to climate change, including (NAPA), which was issued in 2016, the country's first Nationally Determined Contribution (NDC) to the Paris Agreement, issued in 2015, and the First State of the Environment and Outlook Report, which was published in 2018.

Work on the present document began in late 2019, when the Government of South Sudan partnered with NAP-GSP to formulate the first NAP based on guidance received from the UNFCCC and the Least Developed Countries Expert Working Group (LEG). This guidance included a general outline of key NAP contents and was intended to assist least developed countries (LDCs) in completing an initial NAP for sub-

4 UNFCCC decision 5/CP.17, paragraph 1

5 Throughout this document, mainstreaming refers to the incorporation of climate change adaptation considerations into day-to-day processes of governance at national, sectoral, and subnational levels. This includes incorporation into planning, budgeting and regulatory frameworks.

mission to the UNFCCC by the end of 2020. This informal deadline was motivated by the fact that 2020 was the target year for scaled-up financial support from developed countries to support developing countries' responses to climate change.⁶ Since one of the functions of an NAP is to provide a blueprint for channeling international financial support for adaptation into developing countries, not having a NAP in place is perceived to be a disadvantage.

This initial document was prepared from January to August 2020 with consultations taking place between March and August 2020. Consultations were conducted at national and subnational levels. At subnational level, Northern Bahr el Ghazal state and Upper Nile state were selected for consultations. Consultations targeted stakeholders from various national and state ministries. Consultations were also conducted with civil society and NGO representatives, local leaders, academicians and researchers and private sector stakeholders. Multi-stakeholder consultations and engagements included key informant interviews (KII) and focus group discussions (FGD) with 3-4 individuals.⁷ An extensive desktop review was employed to compile and analyse data and information relating to the physical processes and impacts of climate change. The entire NAP stocktaking, consultation and drafting process was conducted under the guidance of the Deputy Director for Climate Change, who serves as the UNFCCC focal point within the Ministry of Environment and Forestry. Technical and material support was provided by the NAP Global Support Programme (implemented jointly by UNDP and UNEP) and the UNDP Country Office for South Sudan. The final draft of the first NAP was validated through a series of five validation workshops in September 2020.

The initial NAP includes the following contents following the UNFCCC/LEG guidance:

- National circumstances (geographic, environmental, economic, and social);
- Vision and goal for adaptation;
- Rationale for conducting climate change adaptation in South Sudan;
- An overview of climate impacts, vulnerabilities, and risks;

- Relevant regulatory frameworks and institutional arrangements for climate change adaptation; and
- A set of priority adaptation programmes corresponding to the nine sectors prioritised by the Government of South Sudan.

Though this initial NAP is based on extensive research and consultations with a wide range of stakeholders, the Government of South Sudan recognizes that additional work is needed to fully energize and operationalize its NAP process. It is envisaged that additional work will be conducted over the period 2020-2022 to strengthen the NAP process. It is expected that this work will be supported by UNEP and other partners, and will be supported with readiness and other funds available through the Green Climate Fund (GCF) and other partners. With this in mind, this initial NAP provides extensive recommendations to strengthen the NAP process during this near-term period. These recommendations appear in each chapter of the initial NAP and are collated into a programme of short-term priority actions described in Chapter 6.

It should be noted that the development of this first NAP has been affected significantly by the global Coronavirus crisis that emerged in early 2020. Due to this situation and the Government of South Sudan's precautionary responses to the pandemic, most of the in-person stakeholder consultations that were scheduled had to be cancelled. In addition, the Coronavirus emergency has also affected the delivery of technical assistance from development partners aimed at supporting the formulation of this NAP. However, in consideration of the Government of South Sudan's priority to have the initial NAP completed by the end of 2020, the MoEF has determined to exert all reasonable effort to complete this document as quickly as possible.

6 In 2009 at COP15 in Copenhagen, in decision 2/CP.15, developed countries decided to commit to a goal of mobilizing jointly US\$100 billion a year by 2020 to address the needs of developing countries.

7 FGD participants were limited due to Covid-19 safeguards against large gatherings.



1.4 VISION AND GUIDING PRINCIPLES OF THE NAP PROCESS

The vision of the NAP is to mainstream adaptation planning within South Sudan's development planning across different government line ministries and climate resilient communities, and ensuring climate-centric development for long term resilience and interruption of the poverty cycle. The mandate of the NAP is to build leadership and ensure stakeholder participation to fulfill South Sudan's commitment to the UNFCCC, and to operationalize climate change adaptation at all levels.

The NAP process shall follow a number of guiding principles to ensure that it is consistent with the values and ideals of the government and people of South Sudan. These principles have been determined through an extensive process of stakeholder consultation and include the following:

- Integration and adaptation of needs from multiple sectors and pursuit of complementary activities that contribute to South Sudan's social and economic development trajectory and goals;
- Alignment of actions that should advance South Sudan's peace building processes;
- Promotion of gender equality and equity in a manner consistent with South Sudan's National Gender Policy and that women playing a leading role in adaptation planning and implementation at all levels is actively ensured;
- Paying special attention to groups that are most vulnerable to climate change impacts, including farmers, pastoralists, internally-displaced people (IDPs), and female-headed households;⁸
- Contribution to the further development of legislative and regulatory frameworks in South Sudan;
- South Sudan's adaptation response to climate change should promote livelihood diversification and provide co-benefits that are consistent with South Sudan's other development priorities;
- The promotion of capacity building of human, institutional, technical, and financial resources which should be incorporated into the design of projects and programmes for adaptation;
- Promotion of long-term research on climate change adaptation, including the collection of

baseline information and the fostering of research capabilities within South Sudan;

- Full integration of indigenous knowledge into South Sudan's adaptation response;
- Consideration of land tenure issues; and
- The NAP process should be fully owned and driven by the people of South Sudan.

1.5 FUNCTIONS OF THE NAP

Although the NAP process has been designed for all developing countries, and although the UNFCCC and Least Developed Countries Expert Working Group has released guidance on NAP coverage, the process is intended to be completely country driven. This means that each country's NAP will have roles and functions specific to that country. In the case of South Sudan, the functions of the NAP are as follows:

- To provide a roadmap of the steps needed to mainstream climate change adaptation into planning and budgeting at national, state, and local levels;
- To identify actions that are needed to create enabling conditions for scaled up access to international climate finance from both public and private sources;
- To provide a baseline and starting point for climate change adaptation in South Sudan by consolidating all relevant information on the physical processes and impacts of climate change and establish a common understanding for all stakeholders;
- To provide a structure so that traditional systems of governance and community organization can be incorporated into formal processes of adaptation-planning and implementation; and
- To provide a common and coherent articulation of adaptation priorities to guide and coordinate all stakeholders, including government agencies, NGOs, development partners, civil society organizations, and the private sector, along the same pathway to a resilient and climate-adapted South Sudan. This includes providing a framework for determining and fulfilling South Sudan's international commitments with respect to climate change adaptation.

⁸ It should be noted that this list is not exhaustive and will likely be expanded to include additional groups as the NAP process progresses.

The NAP will:

- Guide effective facilitation and institutional coordination around climate change adaptation planning and coordination
- Serve as a tool for implementation of climate change adaptation in South Sudan;
- Ensure effective institutional coordination and help to ensure complementarities and synergies between line ministries that are part of South Sudan's climate change adaptation response
- Guide the process of accelerating resource mobilization for adaptation and guide mainstreaming into the National Development Strategy
- Deliver effective long-lasting adaptation outcomes for climate change affected populations in South Sudan and ensure integration of climate change within all priority sectors
- Help South Sudan meet its obligations under the UNFCCC and help the country to align its national priorities with sustainable development objectives

The NAP includes nine priority sectors. These sectors are described throughout this document and the adaptation measures that emerge from the NAP process will focus on these sectors:

- Agriculture, livestock, and fisheries
- Disaster risk reduction
- Energy
- Environment, ecosystems and biodiversity conservation
- Health
- Human settlements
- Tourism and recreation
- Industry, infrastructure and transportation
- Water resources

1.6 OVERVIEW OF NAP CONTENTS

This initial NAP contains seven chapters and appendices as describe below.

Chapter 2 Legal and Administrative Context for South Sudan's NAP: This chapter describes the legal basis for the NAP, including the mandate for the NAP and its linkages to South Sudan's broader economic and social development strategies. There is clear evidence that an essential prerequisite for effective implementation of NAPs is a legal mandate that

empowers government stakeholders (e.g. line ministries and subnational governments) to incorporate guidance from the NAP into day-to-day processes of governance, such as planning, budgeting, personnel decisions and regulatory frameworks. Therefore, this chapter proposes legal arrangements to encourage buy-in from government stakeholders at national and subnational levels to ensure that the priorities described in the NAP are implemented. This chapter also proposes institutional and administrative arrangements for NAP implementation, including a high-level inter-ministerial steering mechanism and subsidiary technical working groups. The chapter also presents considerations for ensuring buy-in from sectoral stakeholders and a mechanism for facilitating mainstreaming of the NAP into sectoral processes. Also within Chapter 2 are potential entry points for integrating guidance from the NAP into the annual planning and budgeting cycle.

Chapter 3 National Circumstances: Chapter 3 provides general background information about socio-economic, political, environmental and cultural conditions in South Sudan. This information is important for adaptation planning because these systems interact with the physical processes of climate change described in Chapter 4 to produce impacts. The chapter describes some of the challenges that South Sudan faces as a post-conflict LDC and how these characteristics shape vulnerability to climate change and adaptive capacity in the country. This information is also important because the NAP process should be consistent with the specific national and local conditions in South Sudan and should be consistent with the aspirations of the South Sudanese people. The chapter also describes the unique cultural richness of South Sudan as a potential entry point for community-led climate change adaptation.

Chapter 4 Rationale for Conducting Climate Adaptation in South Sudan: This chapter provides the evidence base for climate change adaptation planning, policy/regulatory formulation, and project design, by consolidating information on the physical processes of climate change, and their impacts. The chapter also provides information on observed changes in physical parameters (e.g. observed temperature increases, observed changes in the timing and amount of precipitation) as well as information on projected changes into the future, based on the most recent projections available. It also describes capacity gaps and needs within the South Sudan Meteorological



Department (SSMD) and recommendations for addressing these gaps. Lastly, the chapter describes potential impacts in each of the NAP priority sectors.

Chapter 5 National Adaptation Plan Alignment with Existing Strategic, Legal, and Regulatory Frameworks: Described in chapter 5 are the regulatory and institutional frameworks and arrangements that are relevant to the formulation and implementation of the NAP. The chapter describes the steps South Sudan has already taken in developing its response to climate change, as well as additional strategies, plans and policies that are directly and indirectly related to formulating a comprehensive NAP. The chapter provides brief information on NAPA, the Initial National Communication (INC) to the UNFCCC, and the NDC to the Paris Agreement. The chapter also describes non-climate change policies and plans of relevance to the NAP process and entry points so that the NAP process can be aligned with existing policies and processes.

Chapter 6 Climate Change Adaptation Priorities: Chapter 6 presents two separate action matrices. The first covers recommended actions for implementation over the short-term period from 2020 to 2022. These actions are intended to strengthen

South Sudan's NAP process and include mostly soft measures for capacity development, awareness raising, improving institutional capacities, enhancing data, information, and knowledge management, and for strengthening vertical and horizontal coordination for climate change adaptation. The second matrix lays out priority adaptation programmes for each of the eight priority sectors. These adaptation priorities consist of two sets of actions: 1) those derived from other Government of South Sudan policies and strategies related to climate adaptation; and 2) actions that were determined through the review and consultative processes conducted for this NAP. This set of actions corresponds to barriers, gaps and needs, as well as recommendations from various stakeholders.

Chapter 7 Next Steps for South Sudan's NAP Process. This concluding chapter provides a short description of next steps to build on the first NAP. These next steps include the development of a financing strategy, the formulation of a monitoring, evaluation, and learning (MEL) framework, compiling of a communication strategy for the NAP and other relevant actions. These steps will be completed in the near term (2020-2022) along with the full suite of short-term actions described in Chapter 6.

Chapter 2: Legal and Administrative Context for South Sudan's National Adaptation Plan



2.1 INTRODUCTION

This chapter describes the legal basis for the NAP, including the mandate for the NAP and its linkages to South Sudan's existing institutional administrative system. There is clear evidence that an essential prerequisite for the effective implementation of NAPs is a legal mandate that empowers government stakeholders (e.g. line ministries and subnational governments) to incorporate guidance from the NAP into day-to-day processes of governance, such as planning, budgeting, personnel decisions, and regulatory frameworks. As such, this chapter proposes legal arrangements to encourage buy-in from government stakeholders at national and subnational levels to ensure that the priorities described in the NAP are implemented. This chapter also proposes institutional and administrative arrangements for NAP implementation, including a high-level inter-ministerial steering mechanism and a technical working group. The chapter also presents considerations for ensuring buy-in from sectoral stakeholders and a mechanism for facilitating mainstreaming of the NAP into sectoral processes. The chapter also presents potential entry points for integrating guidance from the NAP into the annual planning and budgeting cycle.

2.2 LEGAL BASIS AND MANDATE FOR THE NAP

The mandate to establish South Sudan's NAP process is derived from several key documents, including the country's organic laws as well as international treaties. This mandate firmly establishes the NAP process as a priority of the entire government, regardless of political orientation. This mandate allows for the NAP to recommend roles and responsibilities for various stakeholders in planning and implementing South Sudan's adaptation response to climate change. The following paragraphs provide further details on the legal basis for the NAP.

Transitional Constitution of 2011

The implicit mandate and legal basis for initiating the NAP process is rooted in the Transitional Constitution which directs the government of South Sudan at all levels to ensure sustainable development as a way of protecting the environment for the benefit of both present and future generations, through sound legislative action and other policies. The Transitional Constitution asserts that the people of South Sudan "...are conscious of the need to manage our natural resources sustainably and efficiently for the benefit of the present and future generations and to eradicate poverty and attain the MDGs (Millennium Development Goals)."⁹ Particularly, articles 41 (1), (2) and (3) offer all South Sudanese communities the right to a clean and healthy environment, stating that every individual is obligated to conserve the environment for the benefit of present and future generations. It also states that every person has the right to have the environment protected through appropriate legislative strategies and other policies that prevent pollution and ecological degradation, promote conservation, safe and sound ecologically sustainable development and the use of natural resources while promoting balanced economic and social development so as to safeguard genetic stability and biodiversity. These provisions within the Transitional Constitution provide broad support and sanction for the NAP process.

National Environment Policy (2015-2025) and South Sudan National Draft Environmental Protection Bill (2012)

These were designed to offer strategic direction and coordination on climate change response concerns in South Sudan, including climate change adaptation and mitigation. The National Environment Policy calls for the development of a national strategy for climate change adaptation and mitigation, the formulation of a climate change policy for South Sudan, and support for efforts to reduce community vulnerability to climate variability and change. The NAP will

9 The NAP also interprets this as a mandate for addressing the Sustainable Development Goals, as they are the successor to the Millennium Development Goals.

serve as the country's national strategy and action plan for climate change adaptation and will provide a framework and specific steps for addressing vulnerability. The South Sudan National Environment Policy (2015-2025)/South Sudan National Environmental Bill (2012) contains four key observations that underscore the need for a coordinated approach to climate change adaptation, which the NAP will provide.

1. It recognizes the need for enacting legislation and regulations on the management of the environment and climate change. The NAP process will facilitate efforts to advance national climate change legislation and will provide support to national line agencies, their subnational counterparts and communities, with respect to establishing regulatory frameworks that are conducive to adaptation and resilience building.
2. It defines the responsibilities at different levels of governance including those of private sector institutions. The NAP process will build on these existing roles to incorporate climate change responsibilities where appropriate.
3. It emphasizes the importance of ensuring that environmental legal frameworks developed at different levels of government are consistent with each other and have sound environmental management. In keeping with this observation, through the NAP process, the Government of South Sudan will establish coherent arrangements for the coordination of climate change adaptation planning and implementation from the national, through the state and county, and down to the payam and boma levels.
4. Finally, it recommends that all legal frameworks developed in South Sudan are consistent with the international agreements that South Sudan is party to, including the UNFCCC, the Paris Agreement and the Agenda for Sustainable Development.

These four observations provide guiding considerations for the NAP and have been incorporated into the guiding principles for the NAP (section 1.4). Each of these observations will also inform the NAP process as it evolves in coming years.

UNFCCC/Paris Agreement:

South Sudan ratified the Paris Agreement on 22 April 2016. The Agreement requires all parties to put

forward their best efforts through nationally developed contributions. In the case of South Sudan, this covers both adaptation and mitigation. The country's signature on the Paris Agreement therefore supports the mandate to initiate the NAP process.

2.3 ADMINISTRATIVE ARRANGEMENTS

This section describes the administrative and institutional arrangements for the NAP process.

2.3.1 Lead Agency: Ministry of Environment and Forestry (MoEF)

MoEF serves as the lead agency responsible for addressing the challenges of climate change over the medium and long term. MoEF plays a coordination and implementation role and serves as the national focal point to the UNFCCC and the National Designated Authority (NDA) to the GCF. MoFP will serve as the lead agency to coordinate the formulation and implementation of the NAP.

MoEF has several important agencies nested within it that are relevant to formulating and implementing South Sudan's response to climate change. These include:

- 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. This directorate is most relevant to climate change adaptation and is mandated to i) undertake institutional capacity development; ii) strengthen partnerships and collaborations with all national and subnational stakeholders to address climate change; iii) develop national response strategies to climate change; and iv) strengthen the national capacity of meteorological services.
- The Directorate of Environmental Planning and Sustainable Development is responsible for i) undertaking capacity development; ii) developing the National Environmental Strategic Plan; iii) undertaking research and development; iv) preparing the State of the Environment in South Sudan reports; v) strengthening partnerships and collaboration with stakeholders, vi) preparing the National Environmental Management Action Plan for South Sudan; vii) coordinating South Sudan's multilateral environmental



agreements and viii) preparing the budget for the Ministry.

- The Directorate of Environmental Education and Information comprises the Department of Information and the Department of Education. These departments are responsible for advocacy, awareness raising, and education and training, and will have roles in the NAP process commiserate with these functions.

2.3.2 Interagency (horizontal) coordination

Horizontal coordination will be operationalized through the structures described below:

The Climate Change Working Group (CCWG) was established in 2019. It is “...the essential stakeholder body and mechanism for ensuring the technical review of proposals...and alignment with national priorities and policies.”(MoEF, 2019). The network provides a forum for approximately 80 members from line ministries, development partners, NGOs, research and academic institutions and private sector stakeholders to actively participate, exchange ideas and discuss lessons learned and best practices on how to improve their work in response to climate change. The Department of Climate Change within the MoEF serves as the secretariat and chair of the CCWG. The group meets on a quarterly basis and plays a substantial role in facilitating information and resource sharing among government ministries at national and state level and with international NGOs and development partners engaged in climate change issues. The network strives to increase the resilience of the most vulnerable populations in South Sudan by ensuring a better coordination of climate change responses and work.

However, the roles and responsibilities of the CCWG, with respect to the NAP, have yet to be defined and formalized. One of the primary objectives over the near term (2020-2022) is to formalize and make permanent the ad-hoc consultative and coordination processes that were utilized for the formulation of the NAPA, NDC and INC (to the UNFCCC) To this end, the MoEF is currently working with UNEP to define the roles and responsibilities of the CCWG with respect to overseeing the NAP process, and also determining the roles and responsibilities of priority ministries in the NAP process. It is expected that this work will be completed by early 2021. It is envisaged that the CCWG will serve as the high-level steering and coordination mechanism for the NAP process,

and that the CCWG will facilitate interagency coordination as well. It is expected that the need for interagency coordination on climate change issues will increase significantly in the future, as priority sector ministries and agencies build their own internal capacity to address climate change.

The Government of South Sudan is in the process of formalizing thematic working groups (TWGs) to conduct the technical aspects of NAP formulation and implementation (e.g. conducting sectoral and subnational vulnerability assessments and providing recommendations for mainstreaming of climate change into sectoral planning, budgeting, and regulatory frameworks). Previously TWGs had been established to support NAPAs formulation of the NAP. TWGs will build on these groups. Over the short term (2020-2022) it is expected that development partners will support capacity building efforts for these TWGs, and the groups will be legally gazetted by early 2021. It is also expected that terms of references will be developed for the TWGs over the short-term period. The TWGs are expected to meet at least three times per year. The composition of these groups is described in Appendix A.

As the CCWG and TWGs will be composed mainly of government officials, there will be a need to establish effective mechanisms to engage non-government stakeholders and ensure that they are meaningfully engaged in the planning and implementation of South Sudan’s adaptation response. To facilitate this engagement, over the short term (2020-2022) the NAP process will establish two engagement mechanisms:

1. **Community Based Organization (CBO)/NGO Advisory Committee and Forum.** The advisory committee will consist of a fixed number of representatives from various organizations who will provide inputs to the NAP process. A larger forum will invite membership from international, national, and subnational organizations and will provide an arena for sharing knowledge and experiences, for coordinating action and for establishing synergistic partnerships between members. The charter/terms of reference for the advisory committee will ensure that membership and participation is representative of South Sudan’s entire society, and will include elders, faith leaders, livelihood groups (e.g. farmers, cattle herders), and other groups.

Questions regarding the scope of the advisory committees, including frequency of meeting and selection procedures, will be determined over the short-term period.

2. **Private Sector Advisory Committee and Forum.** These bodies will function similarly to the analogue bodies for CBOs/NGOs, but will also serve as an entry point for activities aimed at capacitating the private sector, catalysing private sector investment in adaptation, introducing adaptation technologies, and catalysing a greater role for the private sector in financing adaptation and resilience building measures in South Sudan.

Both of these mechanisms will have permanent full-membership representatives on the CCWG. Over the short-term period, the MoEF will identify partners and financing sources (e.g. GCF readiness funds) to capacitate these committees and to empower them to function effectively. In addition, the NAP process will establish a third forum for members of academic and research institutions to advise on scientific and knowledge management aspects relevant to the NAP process.

Climate Change Finance Interministerial Steering Committee. The MoEF proposed the establishment of the Climate Change Finance Interministerial Steering Committee during the process of establishing the institutional arrangements for the GCF National Designated Authority and the no-objection procedure. It is expected that the Interministerial Steering Committee will coordinate matters related to financing of climate change projects and programmes. Currently the Committee does not exist, but over the short-term period the Government of South Sudan will prioritize establishing and capacitating the Committee.

2.3.3 Vertical coordination for climate change adaptation

South Sudan's governance structure includes a fairly high degree of decentralization, with states, counties, payam, and boma¹⁰ having some autonomy¹¹. This means that these local government units will

play a significant role in planning and implementation for South Sudan's NAP process. However, in many cases, subnational governments are still in the process of being organized, and in general, there are significant gaps across a wide range of technical competencies needed for effective governance and public service provision. This is particularly true for climate change; while some subnational stakeholders may be aware of some concepts related to climate change, there is little, if any, official recognition of climate change as a priority for action, and climate change considerations have not been incorporated in any meaningful manner in the apparatuses of government at subnational level. Currently there is no process for developing subnational adaptation or disaster management plans. There are no state level plans for disaster risk reduction or climate change adaptation, and for the most part, state governments have not begun to tackle planning for either climate change adaptation or disaster risk reduction.

At the same time, subnational levels of government are dependent on the national government for financial and technical support. This means that in order to advance adaptation at subnational levels, a robust programme of technical capacity development, along with technical guidance with respect to planning and budgeting, will need to be established and implemented at national and subnational levels, because there is interaction between national and state level agencies when it comes to developing regulations, plans, and budgets (see below). As part of the NAP process, the MoEF will coordinate a capacity development programme to be implemented by state ministries of local government, which are responsible for coordinating capacity building at lower administrative levels.

With respect to sectoral planning, each state has line agencies (state ministries) for most sectors, that operate somewhat independently from their national counterparts. However, new sectoral regulations are developed at national level and then disseminated to the state level ministries. This means that mainstreaming of climate change into regulatory frameworks at state level will be initiated by the national

10 South Sudan has five administrative levels: National, State, County, Payam, and Boma. The lowest level, Boma, comprise one or more self-governing village units.

11 It should be noted here that constitutional reform is ongoing, and there are uncertainties as to the ultimate outcome with respect to governance and the distribution of powers between different levels of government. However, as the NAP process progresses, it will strive to align with government reform processes.



level line ministries, and so in the short term (2020-2022), MoEF will coordinate with the priority sector line ministries at national level to establish sectoral programmes for mainstreaming and institutional strengthening.

As noted in section 2.5, the NAP process envisages a strong role for stakeholders at the boma, payam, and county levels, especially with respect to identifying vulnerabilities and designing and implementing adaptation measures. It is envisaged that this will take place through Payam Development Committees (PDCs) (see section 2.4). However, these measures will require financial support, and in most cases the counties, boma, and payam cannot generate sufficient revenue to support these measures, as much of government at local level is funded through central government transfers and counties in general have weak capacity for revenue mobilization.

For budgets, branch directorates of state ministries prepare draft budgets. These are in turn submitted to the state line ministries, who aggregate the county budgets and submit them to the state Ministries of Finance (MoF). The state level MoF reviews the submissions, compiles the budgets, and then submits the budget to the national level MoF. After compiling and examining all state submissions, the MoF then develops the national budget and disburses the funds to the state level.

Thus, in order to ensure that local level adaptation initiatives can be incorporated into budget and subsequently funded, MoFP will provide technical support to the national MoF in developing the relevant budgeting directives and guidance for local government units. This technical assistance will include the development of procedures for screening investments against climate risks and other relevant information and tools.

2.4 KEY STAKEHOLDERS

This section describes the key stakeholders in the NAP process and their roles and responsibilities. Information about national level ministries for priority sectors is described below.

The Ministry of Humanitarian Affairs and Disaster Management (MHADM): The MHADM is responsible for coordinating humanitarian assistance to the needy, responding to disasters, reducing the risk

to hazards and directing disaster risk management programmes in order to save lives, restore dignity, sustain hope for development and promote resilient communities to manage hazards and disasters in South Sudan. The MHADM is responsible for the establishment of a policy/legal and institutional framework for humanitarian assistance. The MHADM also monitors, assesses, updates and disseminates disaster related information to the country and various stakeholders. This includes promotion of a culture of disaster awareness and building the capacity for disaster risk reduction at all levels of government. The Ministry has been working to undertake climate change vulnerability assessment and responding to climatic disasters such as flooding in South Sudan, together with international organizations and state governments, making it a significant stakeholder in the NAP processes. The MHADM is currently in the process of developing a national Disaster Management Policy and implementation plan, which will be used to guide both national and subnational disaster management activities when these are approved by the Cabinet.

The MHADM is also linked with an international organization through the South Sudan Relief and Rehabilitation Commission (SSRRC), a government agency under the umbrella of the MHADM. The SSRRC coordinates vulnerability-related assessments with international partners such as the International Organization for Migration (IOM), the United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA) and other international organizations. The SSRRC works together with the Inter Agency Rapid Flood Assessment. For example, REACH recently started flood vulnerability mapping in South Sudan with the coordination of the national MHADM and the state Relief and Rehabilitation Commission (RRC). The RRC has a structure at state level and county level called the RRC County Director. Vulnerability and risk assessments carried out by these partners have high potential to inform the NAP process; to maximize this potential over the short-term time frame, the MoEF will work with the MHADM to explore possibilities for establishing uniform procedures and indicators for vulnerability and risk assessments for the purposes of standardization. This will enable the MoEF to aggregate the various local and regional assessments.

The Ministry of Gender, Child, and Social Welfare (MGCSW): The MGCSW is delegated to promote

gender equality and safeguard the rights and welfare of women, children, persons with disabilities (PWDs) and other vulnerable groups. The scope of the mandate covers gender and women's empowerment, and child and social welfare functions. The MGCSW is in charge of formulation and implementation of policies and legislation for promotion of gender equality, women's empowerment and social protection and welfare in South Sudan. The MGCSW has five directorates: Gender, Child Welfare, Social Welfare, Administration, and Research and Planning. The Directorates of Gender will be an important stakeholder in the mainstreaming of gender into the South Sudan NAP. Specific roles for MGCSW will include:

- Coordinating with the Department of Climate Change and academic and research institutions to develop a research programme focusing on socially differentiated impacts of climate change, including gender differentiated impacts, as well as decision support information for government and non-government stakeholders based on research findings;
- Providing capacity development programmes and leadership training on gender and climate change issues at the request of the Department of Climate Change;
- Coordinating with the Department of Climate Change to provide input to the design of vulnerability and risk assessments to ensure that gender and social equity considerations are incorporated; and
- Developing screening tools and guidance for ensuring that Gender Equality, Disability and Social Inclusion (GEDSI) considerations are adequately incorporated into projects and programmes.

The Ministry of Agriculture and Food Security (MAFS): The MAFS is responsible for ensuring household food security and increased agricultural productivity through diversification and improvement of commercial agricultural activities. 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 Compre-

hensive Agriculture Master Plan (CAMP, described in Chapter 5) and irrigation scheme development programmes with more emphasis on means of reducing the risk and vulnerability of crops to seasonal and climate variability. The MAFS will serve as the co-lead agency for implementation of the agriculture, livestock, and fisheries sectoral programme.

The Ministry of Animal Resources and Fisheries (MARF): The MARF's mandate is to increase production of livestock and fisheries commodities, ensure sustainable increase of livestock, fish production and market supply of meat, milk and fish. The Ministry works to improve the livelihood of South Sudan's livestock-keeping and fishing communities and ensure food security by promoting competitive, commercially oriented fisheries and livestock farming through creation of an enabling environment and sustainable natural resource management. The MARF and the MAFS are implementing the National Agriculture and Livestock Extension Policy (NALEP), 2011, as part of the effort to promote conservation, agriculture and livestock practices that reduce the impact of climate change. The MARF will play a key role as the co-lead agency for implementation of the agriculture, livestock, and fisheries sectoral programme.

The Ministry of Finance and Planning (MoFP): The MoFP plays an important role in ensuring mobilization of public resources for the whole government and is further charged with overseeing how these resources are accounted for. The MoFP is also tasked with the responsibility of achieving economic transformation combined with emerging economies and to formulate sound economic policies that lead to sustainable economic growth and development. It has the power to guide national development and economic policies in a way that determines where public and private finances are spent. The MoFP is a principle member of the Climate Change Finance Inter-Ministerial Steering Committee and a guarantor to all grants from the development partners such as GCF for the implementation of climate change and environmental initiatives in South Sudan. The MoFP is tasked with the mandate to monitor and track climate-related project expenditures in their public budget system.

The 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. However, the Ministry has not yet developed an institutional framework to respond to climate change, ecosystem and wildlife conservation strategies and plan in the face of climate change. The MWCT will be the lead agency for the Tourism and Recreation sectoral programmes. In addition, it is envisaged that over the next five years, significant investments may be made in improving South Sudan's in-situ wildlife conservation, in particular the management and infrastructure for the country's national parks and other protected areas. As a result, synergies between wildlife conservation and climate change adaptation will emerge. Therefore, coordination between the MWCT, MoFP, MoEF and development partners should be prioritized to ensure that climate change considerations are adequately integrated into these investments.

The Ministry of Electricity and Dams (MoED): The MoED is responsible for promoting the expansion of the electrical grid in South Sudan. This includes encouraging the development of renewable and non-renewable energy resources and generation facilities, including hydroelectric power stations. The MoED is mandated to lead the formulation of necessary legislation and regulation for the management of generation and distribution infrastructure (including environmental and social impact assessment), as well as the development and implementation of policies and strategies on power generation and distribution. The MoED has a directorate that supports climate change mitigation, specifically the Directorate of Renewable Energies. Under the NAP the responsibilities of this directorate may be expanded to include adaptation and resilience building for the nation's energy grid. The MoED will serve as the lead agency for the energy sectoral programme.

Ministry of Water Resources and Irrigation (MWRI): The MWRI is responsible for managing and developing the water resources of South Sudan and oversees the implementation of policies, guidelines and the development of master plans and regulations for water resource development. The agency is also responsible for water conservation and is tasked with integrating water resource management to enhance water availability and accessibility for the

South Sudanese people. The Ministry is composed of directorates that implement adaptation-measuring projects for water management in response to climate variability and change and collect climatological and meteorological data essential for water resources conservation and management. The most significant directorates include the Directorate of Hydrology and Survey, Directorate of Water Resources Management and the Directorate of Irrigation and Drainage. The MWRI will be the lead agency in implementing the water resources sector adaptation programme.

Ministry of Foreign Affairs and International Cooperation (MoFAIC): The MoFAIC will play a key role in implementing South Sudan's NAP by coordinating the mobilization of international resources in coordination with the Aid Coordination unit in the Ministry of Finance and Planning. The MoFAIC will also take the lead in strengthening existing – and establishing new – bilateral and multilateral relations with development partners and donors to scale up financing for the projects and programmes prioritized through the NAP process. The MoFAIC will also facilitate multi-country approaches to addressing the challenges of climate change by fostering partnerships with regional entities and neighbouring countries to address the issues identified in the section on Transnational Considerations in Climate Change Adaptation Planning (Chapter 3, below).

Ministry of Petroleum and Mining (MPM): The MPM is delegated by the South Sudan Transitional Constitution to negotiate all oil contracts for the exploration and development of oil, and to ensure that they are consistent with its principles, policies, and guidelines. The MPM also initiates legislation, rules and regulations regarding the petroleum and mining sector, manages the relations of the government with petroleum and gas companies operating in South Sudan and formulates strategies and programmes for the development and management of the petroleum, gas and mining sectors, while consulting with local communities, to ensure that all petroleum, gas and mining projects are subjected to environmental and social impact assessment. The MPM also signs contracts on behalf of the government upon the approval of the Environmental and Social Impact Assessment (ESIA) by the MoEF.

Ministry of Transport (MoT): The SSMD is housed within the MoT, but it is primarily concerned with

providing data and information to inform aviation, rather than informing the country's climate change response. In the future, the SSMD will be merged with the Department of Meteorology (DoM) under the MoEF. The combined SSMD/DoM will play a pivotal role in South Sudan's adaptation response to climate change by providing the data and information required for evidence-based planning and decision making. Due to the civil war, the SSMD operates under several crippling constraints, including inadequate funding, outdated equipment and untrained staff, and so it is unable to provide basic weather and climate information to the public. Prior to the start of the second Sudanese civil war in 1983, southern Sudan had just over 40 meteorological stations which generated data that was available to the public. However, all but five of these were destroyed and only three of these were still functional as of 2018. Additional records are kept by international organizations and individual farmers, but there is no way to collate, analyze, or share the data with the public. Priority actions to improve the capabilities of the SSMD with respect to supporting the NAP process are described in Chapter 4.

State Ministries of Local Government and Law Enforcement: These ministries are responsible for developing sectoral policies to guide the functional organization of local government councils in order to harmonize state and local government plans and programmes. They also develop state frameworks for effective coordination of local government council affairs between the state ministries and local authorities and between local authorities and local community institutions.

The Local Government Board (LGB): The LGB is primarily responsible for maintaining law and order in the county. The LGB is also responsible for executing government policies and programmes at the local level and is responsible for the delivery of a range of services to communities including planning, housing, community development, environmental protection, recreation, and amenity services. The LGB also has a strong role in preparing local government bills. Given that South Sudan is a new country, the LGB also is very influential in guiding the development of emerging institutions at subnational level. For the NAP process, the LGB will play a leading role in mainstreaming climate change adaptation and risk reduction considerations into subnational processes of governance.

Boma and Payam Development Committees (BDC and PDC): Under the Local Government Act (LGA), citizens at the boma and payam levels are entitled to organize themselves into development committees with the objective of identifying and implementing community-based development projects (Idris, 2017). Though the Government of South Sudan has encouraged committees to form BDCs and PDCs in the past, financial resources to support project implementation, as well as technical training for committee members has been lacking. Working across government agencies and with development partners, the NAP process will seek to reinvigorate BDCs and PDCs on a tiered basis throughout the country. These BDCs and PDCs will serve as an entry point for conducting vulnerability assessments and developing community-driven adaptation initiatives. The NAP process will also support the establishment of a domestic climate change and resilience fund, which will eventually provide financial support to BDC- and PDC-initiated adaptation and resilience building projects.

Each of the national agencies described above currently have significant gaps in terms of addressing climate change. Significant support will be required to build human and institutional capacities, establish the requisite knowledge base, review and strengthen regulatory frameworks, identify sectoral vulnerabilities and design and implement adaptation programmes. The initial NAP therefore proposes a five-year mainstreaming programme for the priority sector agencies as illustrated in table 1 (below). It is envisaged that the Department of Climate Change will provide technical and coordination support to national-level agencies responsible for the priority sectors identified in this NAP. The plan involves identification of sectoral mainstreaming teams which will be embedded in the priority agencies and which will work closely with the Department of Climate Change and MoFP to facilitate institutional and human capacity strengthening, regulatory review and modification, project development, and mainstreaming of climate change considerations into sectoral planning and budgeting processes. It is also expected that the specific activities in this plan will be supported by development partners. Some of these activities will be implemented through the UNEP-implementation NAP support project, which is expected to begin implementation in 2021.



Table 1 Sectoral Mainstreaming Implementation Programme

Stage	Timeframe	Indicative activities	Lead agency	Support/Financing
1 Awareness raising; demonstrating importance and relevance of the NAP process; establishing ownership and buy-in among key stakeholders	Years 1-2	<p>Preliminary analysis on key sectoral vulnerabilities</p> <p>Development of informational products and presentations</p> <p>Conduct initial meetings with relevant agencies</p> <p>Identify climate change champions within agencies and among non-government stakeholders</p>	MoEF	Government of South Sudan and development partners such as UNDP and UNEP
2 Establishing sectoral agency climate change teams	Year 1	<p>Develop terms of reference for priority sector agency mainstreaming teams</p> <p>Identify focal points and support teams for agencies responsible for NAP priority sectors</p> <p>Develop mainstreaming plans</p>	MoEF	Government of South Sudan and with additional funding from GCF
3 Identifying and addressing institutional and capacity development needs	Years 1-2	<p>Provide technical assistance to mainstreaming teams to conduct sectoral institutional and capacity assessments to support mainstreaming of climate change agreements (CCAs) into sectoral processes</p> <p>Formulate and implement capacity and institutional strengthening programme</p>	MoEF	Government of South Sudan, GCF, development partners
4 Identifying and addressing data and information gaps	Years 1-3	<p>Conduct review of existing data and information as well as knowledge management systems for climate change and disaster risk reduction and identify gaps and needs</p> <p>Formulate and execute knowledge management plan to strengthen sectoral evidence base and formal linkages to sectoral decision-making processes</p> <p>Conduct sectoral vulnerability and risk assessments</p>	MoEF	Government of South Sudan and SSMD in the Ministry of Transport

Stage	Timeframe	Indicative activities	Lead agency	Support/Financing
5 Identifying key priorities for adaptation and vulnerability reduction	Years 2-3	Use vulnerability and risk assessments to identify potential adaptation measures Sectoral mainstreaming teams review best practices for potential adaptation measures and pare long list to shortlist through consultative processes and by using multi-criteria analysis	MoEF	Government of South Sudan and GCF funding
6 Developing specific measures and identifying resource requirements	Years 3-4	Provide technical support to develop project fiches and concept notes Conduct consultations with development partners to identify potential accredited entities and implementation partners Provide technical support to develop full projects	MoEF, MoEP	Government of South Sudan; development partners
7 Identifying legal and regulatory entry points	year 2-3	Provide technical support to sectoral mainstreaming teams who review sectoral legal and regulatory frameworks to identify entry points for relevant regulations related to climate change adaptation. Develop a plan and timeline to introduce new regulations Draft new regulations and guidance for affected stakeholders	MoEF	Government of South Sudan and GCF additional funding
8 Full integration of climate change into sectoral planning, budgeting, and regulatory processes	year 4-5	Incorporate climate change considerations into sectoral plans and budgets	MoEF, MoEP	Government of South Sudan , GCF and development partners



2.5 GENDER CONSIDERATIONS

It is of paramount importance that the NAP process be conducted in compliance with the Bill of Rights within the Transitional Constitution of the Republic of South Sudan 2011 (Article 16). Regarding gender considerations, the Transitional Constitution guarantees the rights of women to equal pay and property ownership and South Sudan has taken steps to develop its normative framework in line with international standards. The first NAP has been formulated to be consistent with these existing directives to promote equality between women and men. Additionally, the NAP process will be carried out in compliance with South Sudan's commitments to various international instruments such as the Universal Declaration of Human Rights and the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW), and Sustainable Development Goal 5: Gender Equality. South Sudan's National Gender Policy (2013) and the UNFCCC highlight the need to address gender inequality and a full gender integration programme. This is particularly vital within the realm of climate change, given the disparate impact it has on women (Mai *et al*, 2018).

Incorporating gender considerations into South Sudan's adaptation response is particularly important because women and men are likely to be affected by climate change differently. This is due to gender inequalities of economic, political, and social opportunities, such as formal employment, access to credit and technologies, and education and public participation. There are differing gender dynamics across South Sudan. Women in South Sudan are particularly vulnerable to the adverse impacts of climate change, which could partly be attributed to extreme poverty and sociocultural factors, including land tenure insecurity, that can limit women's capacity to adequately respond to climate change. In traditional households in South Sudan, women are usually the primary food providers for their families. Despite their critical role in management of natural resources, women have limited property rights that ensure their access to land and forests. Women have comparatively fewer employment opportunities in the collection, production and sale of timber, wood, charcoal, and other forest products. The gender disparity in access to and utilization of natural resources from forests and elsewhere is a major contributor to the rising poverty among women. All of these conditions combine to make women particularly vulnerable to the impacts of climate change.

In order to ensure a gender-responsive approach, the NAP will examine and address the gender norms, roles and inequalities; and vigorously promote gender equality. This means that gender will be considered at all stages of the NAP implementation, monitoring and evaluation, and at different levels of the decision-making process. To monitor progress and to capture lessons learned, technical monitoring and evaluation (M&E) parameters will be proposed and used to determine whether gender is being adequately reflected in climate change adaptation plans, programmes, and projects.

However, South Sudan as a new state is only now developing the institutional mechanisms for governance, and this includes promoting gender equity and equality. Hence the NAP process will draw on international best practices for mainstreaming gender and social equity considerations into public policy and implementation. As such, the NAP process will have the important co-benefit of serving as a demonstration and example for other public policy processes in South Sudan.

2.6 KEY ISSUES TO RESOLVE WITH RESPECT TO THE LEGAL AND INSTITUTIONAL FRAMEWORK FOR THE NAP

This section provides an overview of key issues identified that should be prioritized over the short term (2020-2022) to strengthen South Sudan's NAP process. These priorities may be addressed through dedicated NAP support facilities (e.g. GCF NAP Readiness grants), or through direct technical assistance from bi- and multilateral development partners.

- South Sudan has not yet developed a specific climate change strategy or policy. As noted in the INC to the UNFCCC, "[...] it is critical that a climate change policy and plan is developed, as this will enable South Sudan to put in place high level institutional and coordination mechanisms to enhance the intersectoral adaptation response to climate change, as well as a technical institutional framework to guide policy and the functional implementation of the legal obligations of the Government of South Sudan regarding climate change." (INC:183).
- A significant issue is a general lack of interagency coordination. This can cause duplication of

work between line ministries. Adaptation currently consists of ad hoc reactive interventions and fragmented and uncoordinated approaches to adaptation that may ultimately undermine resilience. In particular, the roles and responsibilities of the CCWG should be specified and formalized.

- This lack of coordination is also true vertically, as there are currently few, if any, arrangements for coordination between national, state, and county levels. There is also little, if any, capacity in most states and counties for addressing climate change issues. While subnational officials are aware of climate change, institutional structures and capacities at subnational level have not yet been established to empower action.
- In addition to institutional arrangements, action is needed to improve human capacities in relevant government agencies to enhance cross-sectoral and vertical coordination for climate change adaptation. Many key agencies lack climate change focal points or operational units, and where these do exist, they generally do not operate at full capacity due to financial and human resource constraints.
- Climate change adaptation considerations are not sufficiently integrated into government planning and budgeting at national, sectoral, or subnational levels. As a new country, South Sudan is creating new policies, strategies, and legal and regulatory frameworks, but in most cases they do not explicitly or effectively incorporate

climate change considerations. Mainstreaming of climate change into planning and budgeting requires a range of actions including capacity development, creation of tools, methodologies, guidance, and changes to government agency regulations and procedures that will empower these government actors to integrate climate change into planning and budgeting processes. There is also a need to incorporate new climate change adaptation policy mechanisms or provisions into existing and upcoming policies to enable the sectors to become resilient to climate change induced floods and droughts.

- Most agencies do not have budget line items for climate change adaptation and mitigation.
- There is a lack of regulatory mechanisms and incentives that promote climate change adaptation, the achievement of sustainable development and the minimization of greenhouse gas (GHG) emissions in all sectors and industries.
- There is a general need for increased engagement with the academic and research community as well as NGOs and Civil Society Organizations (CSOs) with respect to data collection, information production, knowledge management, and other supporting functions, for effective adaptation planning and implementation.

Measures to address these priorities are included in the matrix of short-term priority programmes included in Chapter 6.



Chapter 3: National Circumstances



3.1 INTRODUCTION

The purpose of this chapter is to provide general background information about socio-economic, political, environmental, and cultural conditions in South Sudan. This information is important for adaptation planning because these systems interact with the physical processes of climate change described in Chapter 4 to produce impacts. The chapter describes some of the challenges that South Sudan faces as a post-conflict LDC and how these characteristics shape vulnerability to climate change and adaptive capacity in the country. This information is also important because the NAP process should be aligned with the specific national and local conditions in South Sudan and should be consistent with the aspirations of the South Sudanese people. The chapter also describes the unique cultural richness of South Sudan as a potential entry point for community-led climate change adaptation.

3.2 GEOGRAPHIC CHARACTERISTICS OF SOUTH SUDAN

South Sudan is a landlocked country located in the tropical zone of Eastern Africa between 3N-13N and

24E-36E. It is bordered by Ethiopia to the east, Kenya to the southeast, Uganda to the south, the Democratic Republic of Congo (DRC) to the southwest, the Central African Republic (CAR) to the West, and Sudan to the North. The country is approximately 650,000 km² and is situated almost entirely in the Nile River Basin, receiving water from the highlands of CAR, DRC, Ethiopia, and Uganda.

South Sudan is divided into three regions, which correspond to historical provinces dating back to when South Sudan was still part of Sudan. These regions are Bhar el Ghazal in the northwest, Equatoria in the south, and the Greater Upper Nile in the northeast. These regions have no formal administrative significance but still serve as an important spatial reference point for data and information that predates the founding of the country. The largest settlements are Juba, the capital (526,000), Wau (233,000), and Malakal (147,450). The country comprises ten states: i) Northern Bahr el Ghazal; ii) Western Bahr el Ghazal; iii) Lakes; iv) Warrap; v) Western Equatoria; vi) Central Equatoria; vii) Eastern Equatoria; viii) Jonglei; ix) Unity; and x) Upper Nile.

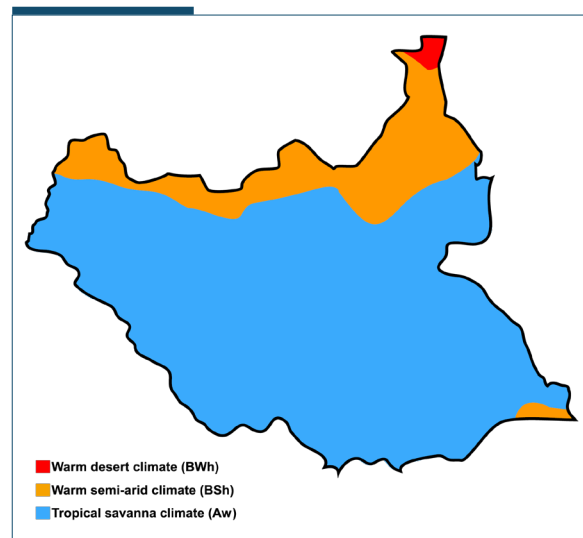


Figure 1: Map of South Sudan



South Sudan is rich in natural resources and has an abundance of fertile agricultural areas with abundant water, as the country is bisected by the White Nile river and the many plains and plateaus are drained by its several tributaries. The Sudd wetland in the central part of the country covers around 100,000 km² and comprises lakes, marshes, and extensive floodplains. The Ironstone Plateau rises between the Nile and Congo watersheds and is characterized by numerous inselbergs. Found in the southern part of the country are the Imatong Mountains, rising to a height of 3,187m at Mount Kinyeti, the highest point in South Sudan. The country's climate ranges from warm desert climate (BWh) in the extreme north of the country to warm semi-arid (BSh) as one travels to the south, with tropical savanna (Aw) covering most of the country.

Figure 2: Main climate zones of South Sudan



The population of South Sudan is approximately 13 million and is growing rapidly at a rate of greater than 3.5 percent (UNEP and MoE, 2018). Approximately 70 percent of the population is under the age of thirty and approximately 50 percent are under the age of eighteen. This increases the population dependency ratio, which has been linked to deepened poverty as it constrains the resources available to the working population. Although the country has one of the lowest population densities in Sub-Saharan Africa (less than 13 people/km²), the age structure of the population indicates that it will continue to grow rapidly well into the future. The population is not evenly distributed across the country; Jonglei is the most populous area with 16 percent of the total population, and Western Bahr el Ghazal is the least populous area, with only 4 percent of the total. The highest population densities are found along the Nile and its tributaries. Currently, food security is among the most pressing issues in South Sudan. In the future, the country will have to work hard to ensure that sufficient food is available for the growing population. This challenge is made more difficult by changing climate conditions (see Chapter 4), as increasing temperatures, increased and more intense flooding and droughts, and seasonal variability will threaten agricultural productivity. Therefore, South Sudan's approaches to improve food security and agricultural productivity will need to take these aspects of climate change into consideration. Failure to do so will leave the country at increased risk of humanitarian catastrophe.

3.3 ECONOMIC CONTEXT OF SOUTH SUDAN

South Sudan is an LDC and is currently one of the poorest and most underdeveloped countries on the planet. There is a general lack of road infrastructure and less than 1 percent of the population has access to on-grid electricity (UNEP and MoE, 2018). The Ministry of Finance and Planning estimates that since the independence of South Sudan, the per capita Gross National Income (GNI) in US dollars has fallen by around 70 percent (UNEP and MoE, 2018). These developmental deficits contribute significantly to climate change vulnerability and undermine adaptive capacity.

South Sudan is the most oil-dependent country on earth, with 98 percent of its GDP and 60 percent of the government budget coming from petroleum sales. However, it is estimated that the country's oil

reserves will be depleted by approximately 2035 (MoEF, 2018a). The high dependency on petroleum and its associated price volatility means that South Sudan is highly vulnerable to external shocks. The Government of South Sudan has recognized the importance of diversifying the economy away from its over-reliance on the petroleum sector and investing in agriculture, mining, forestry and manufacturing, and developing more extensive regional linkages. In terms of its NAP process, this situation presents both an imperative and an opportunity. The imperative is that strategies, plans, and investments in these additional sectors must incorporate climate change considerations, including climate change risks, in order to ensure their long-term sustainability and economic and financial viability. At the same time, the Government of South Sudan has the opportunity to incorporate these climate change considerations at the earliest stages of sectoral development, which means that with careful planning and execution, climate change adaptation can be mainstreamed into sectoral strategies, policies, plans, regulatory and investment frameworks as they are being formulated, thus leading to climate-resilient development pathways. Thus, as the NAP process matures, attention should be given to the function the NAP can play in terms of guiding the mainstreaming of resilience and climate change into efforts to enhance the role of the aforementioned sectors in the economic development of the country.

The most obvious target for diversification is the agriculture sector, which is currently the second largest sector of the economy. Approximately 90 percent of the land in South Sudan is arable, but only around 5 percent is currently in use for crops. Agricultural development has been viewed as an alternative driver of growth which would have the co-benefits of improving food insecurity while reducing household poverty. The country also has the potential for significant returns on investment in cattle rearing, dairy products, poultry, meat processing and fisheries. In most cases it would be expected that private sector investment would contribute to the expansion of these sub-sectors, but the private sector in South Sudan is significantly underdeveloped. The private sector faces significant constraints that affect competitiveness with imports and their ability to access export markets, including power shortages, high labour costs, lack of access to credit and foreign exchange and poor transport infrastructure. All of these conditions create barriers to enhancing the private sector's role in climate change adaptation.



3.4 POLITICAL AND ADMINISTRATIVE CONTEXT OF SOUTH SUDAN

South Sudan became independent on 9 July 2011 after 98.8 percent of South Sudanese voted in favour of independence in a nationwide referendum. The referendum ended a six-year transition period which began with the signing of the Comprehensive Peace Agreement (CPA) by the Government of Sudan and the Sudanese Peoples' Liberation Movement, ending a long civil war which raged at varying intensities for half a century and claimed more than three million lives. Following independence, South Sudan was formally admitted into the United Nations General Assembly as the 193rd member state on 14 July 2011, and into the African Union as the 45th member state on 15 August 2011.

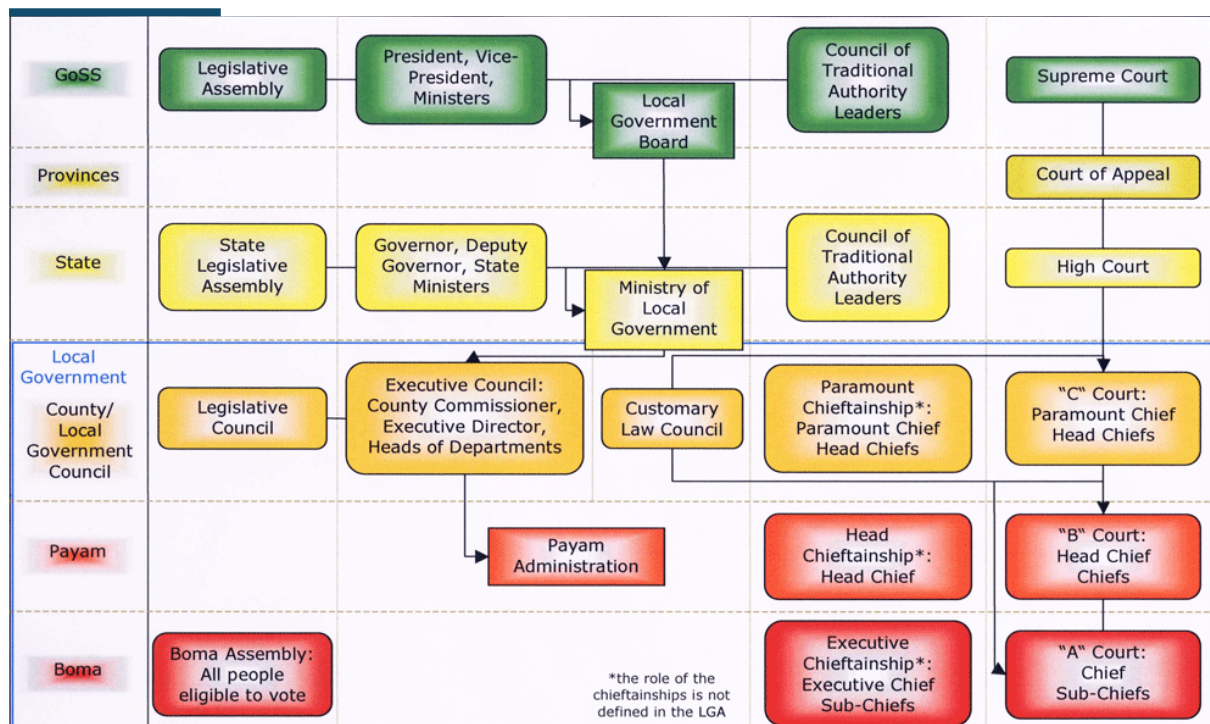
On the day of independence, the Government promulgated the Transitional Constitution (effective 9 July 2011), which entrusts all levels of government in the country to promote democratic principles and political pluralism, with the ultimate goal of national reconciliation, healing, harmony, and peaceful co-existence (MoFP, 2018). South Sudan is a presidential republic with the president serving as chief of state and head of government and with three branches of government, namely the legislative, executive and

judicial branches. The cabinet consists of a National Council of Ministers which are appointed by the president and approved by the legislature.

Administratively, South Sudan is divided into three levels of government: national, state, and local. There are currently 10 states in South Sudan. Local governments consist of counties in rural areas and cities and towns in urban areas. In both cases there is an executive (counties are headed by a commissioner and cities/towns are headed by a mayor). Both have legislative councils with up to 35 members directly elected through universal suffrage. County executive officers are appointed by state governors. Counties are further divided into payam and boma, the lowest level of local government. Payam and boma is the main domain where traditional leaders perform their administrative and customary functions. Cities are divided further into payams and administered by the city council, headed by the mayor.

At state level, state line ministries are connected to their national counterparts and work in close collaboration with the national agency. Further down at the county level there are directorates (e.g. county agriculture directorate) that serve as branch offices of the national level agencies.

Figure 3: Structure of government administration in South Sudan



ple of subsidiarity¹² and aims at promoting peace, reconciliation, and peaceful coexistence among the various communities within South Sudan. The LGA also prioritizes gender mainstreaming in local government and acknowledges the importance of incorporating traditional authorities and customary law in local systems of governance and government. The LGA also tasks local governments with creating and promoting a safe and healthful environment, and delegates to Local Government Councils the responsibility for land administration and environmental management. This means that partial responsibility for climate change adaptation and resilience building falls to local governments.

However, there are a number of issues at subnational level that hinder climate change adaptation. Firstly, the LGA is unclear about the role of the states in government as it does not fully define the specific service delivery functions that are assigned to local governments or how sub-county institutions can be formed (Idris, 2017). In many cases there are few existing mechanisms of formal government at local level, and there is a widespread lack of administrative capacity where formal government entities exist. A second issue is that there is weak and inadequate coordination between the central government and states. Related to this are challenges with respect to resource allocation and accountability.

Outside of government at local level, people in general do not have a good understanding of the concept of climate change. This is not because people do not understand the environment and their connection to it, but rather because there are no locally-appropriate sources of information that address climate change in a way that connects with local peoples' lived experiences. There are few, if any, vulnerability assessments that have been conducted at local levels, and so currently there is an insufficient evidence base for planning and implementation of climate change adaptation and disaster risk reduction measures. There is a significant need for capacity development for developing and implementing community-based adaptation plans to respond to priorities that have been identified in the Second Nationally Determined Contribution (MoEF, 2021).

Additionally, subnational governments are dependent on the national government for financial support. Therefore in the coming years the Government of South Sudan will need to establish a mechanism whereby local governments can identify adaptation priorities and then relay these up to the national government to be incorporated into the relevant budget categories.

BOX 1 TRANSNATIONAL CONSIDERATIONS IN CLIMATE CHANGE ADAPTATION PLANNING

South Sudan is a member of the African Union (AU), the East African Community (EAC), the Intergovernmental Authority on Development (IGAD, an 8-country trade bloc with members from the Horn of Africa, Nile Valley, and Great Lakes region) and the Nile Basin Initiative (NBI), a regional body of nine countries working collaboratively to address water issues in the Nile Basin. Each of these regional forums provides opportunities for coordination and knowledge-sharing on a variety of issues that will likely be influenced by climate change in the future. Issues of key concern include the following:

Nile River: As noted above, the White Nile river bisects South Sudan and approximately 96 percent of South Sudan's territory is in the Nile drainage basin. Water from the Nile is a critical factor in expanding agricultural development in South Sudan. The Nile is a transboundary resource, and as a mid-stream country, South Sudan has neighbours both upstream and downstream. Although management of the Nile is governed by treaties signed in 1929 and 1959, South Sudan's independence, as well as growing competition over water resources due to development as well as climate change. These processes threaten to complicate basin-wide management as upstream countries have little input in the management of the river (Farah and Opanga, 2016). The NBI's Climate Change Strategy (2013) notes that the Basin is highly vulnerable to the impacts of climate change due to a number of factors, and that communities located in the Nile Basin

¹² The principle of subsidiarity is that political and administrative issues should be the responsibility of the lowest level of government, with adequate levels of competency to address the issues. The principle of subsidiarity is meant to ensure that the government is as close to the people as possible.



BOX 1 TRANSNATIONAL CONSIDERATIONS IN CLIMATE CHANGE ADAPTATION PLANNING, CONT.

have limited ability to cope with the negative impacts of climate variability. The strategy further notes that the socioeconomic consequences of climate change will exacerbate existing challenges with respect to management of agriculture, fisheries, and livestock, with strong implications for food security and economic growth. It is understood that relying solely on national-level measures will be insufficient to address transboundary impacts.

South Sudan's adaptation planning process should incorporate these considerations and support evidence-based planning of water use from the Nile that is equitable and fair to all stakeholders. In addition, South Sudan's adaptation planning should consider the NBI's Climate Change Strategy (2013) for synergies that can be exploited, including the following areas, which are included in the NBI strategy:

- Strengthen 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. This includes improving information on climate risks, impacts and vulnerabilities in the Nile Basin and making it available to decision makers. As the Government of South Sudan seeks to enhance its hydrometeorological monitoring and analysis capabilities, consideration should be given to data compatibility with other countries and regional research and data-sharing partnerships. This would not only improve regional research but would provide excellent opportunities for the development of research capabilities within South Sudan;
- Promote 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
- Coordination of NBI activities with national and subnational climate change programmes in South Sudan.

Transboundary wildlife conservation: A second transboundary issue where the NAP can guide international coordination and cooperation is with respect to the management of transboundary wildlife and protected areas. As described in the National Biodiversity Strategy and Action Plan (NBSAP), 2018-2027 (see Chapter 5 for additional details), South Sudan has several protected areas that lie at the border of neighbouring countries, with wildlife migrating across those borders. South Sudan has signed memorandums of understanding with Uganda for transboundary Peace Park management in four protected areas and there are plans to reach similar agreements with Ethiopia, Kenya, the Central African Republic, and the Democratic Republic of the Congo. These relationships serve to build trust between South Sudan and its neighbours. They also provide an opportunity for the design and implementation of synergistic bilateral and regional investments in capacity development to incorporate climate change considerations into protected area management, as well as other measures to ensure that protected areas are themselves protected against climate change impacts, and that the wildlife and ecosystems resources that dwell within them can adapt naturally and continue to thrive in the midst of changing climatic conditions.

Transboundary migration and refugee issues: It was estimated in 2019 that more than one-third of South Sudan's population, or 4.4 million people, are displaced, creating one of the world's most dire refugee situations (USAID, 2019). In addition, South Sudan also hosts nearly a quarter of a million refugees who have fled violence in Sudan. Though most of these refugees are directly related to violent conflicts, as noted elsewhere, in many cases climate stresses and extreme events play an indirect role as a driver of the conflicts that force people from their homes. However, the relationship between climate events and climate change and migration in the context of South Sudan and its region is not well understood.

In general, research indicates that though climate sometimes is a contributing factor in driving migration, it is rarely the only, or most important, factor (Brzoska and Frolich, 2015). However, as the physical processes of climate change become more intense and impacts are increasingly manifested, the research community, development partners and governments are recognizing that climate change will almost certainly generate higher rates of migration and displacement, and that migration will become a de facto adaptation strategy for many people (McLeman, 2019). As these pressures increase, additional tensions will likely emerge between neighbouring countries that serve as sources and sinks for migrants, complicating relations between states. Moving forward, the Government of South Sudan should anticipate the emergence of these issues and therefore seek to enhance understanding of potential climate-driven migration scenarios. This will allow the government to work closely with neighbouring states to formulate comprehensive regional plans and policies for mitigating migratory pressures, and effectively and efficiently addressing migration issues when they emerge.

3.5 ENVIRONMENTAL CONTEXT OF SOUTH SUDAN

South Sudan is rich in biodiversity and biological resources with economic, social, and conservation value. The country's forests and wetlands are particularly important for climate change adaptation and mitigation and can function as major assets in South Sudan's response to climate change. However, there are significant threats due to weak environmental regulations, poor development planning, and fragility resulting from conflict, instability, and insecurity.

Environment-livelihood connections: Due to the population's high dependency on primary sector activity (farming, pastoralism and fishing), the natural environment is an important factor in shaping both socio-economic livelihood potential and vulnerabilities to climate and environmental change. Patterns of livelihoods are shaped by specific regional environmental conditions. The country is divided into seven agro-ecological zones based on livelihood patterns, physical geography, agro-ecology, and market access. These include:

- Greenbelt
- Ironstone plateau
- Hills and mountains
- Arid pastoral
- Nile and Sobat rivers
- Western flood plains
- Eastern flood plains

The impacts of climate change in South Sudan will be partially shaped by the differences between these zones and will vary from zone to zone. Therefore, knowledge of these impacts as well as the lifeways and customary systems and knowledge associated with each of these agro-ecological zones will be important for planning South Sudan's response to climate change. In addition, these regional variations underscore the importance of empowering and capacitating subnational actors so that communities can lead bottom-up processes of adaptation to climate change. Therefore, in determining vulnerabilities for key sectors (e.g. agriculture, livestock, fisheries, ecosystems and biodiversity conservation, human settlements, tourism and recreation, and water resources), the NAP process should consider regional characteristics and risks.

Forests: Approximately 30 percent of the country is covered by forests, while shrubs account for about 39 percent (MoFP, 2018b). The country has diverse natural forests and woodlands, with dense forests located in Greater Equatoria, Greater Bahr el Ghazal, and the Upper Nile. However, much of the data that existed on forests, including their economic potential, was lost during the civil war. While the forests of South Sudan provide multiple benefits for both climate change adaptation and mitigation, they face multiple threats. Extraction of timber is leading to severe deforestation, and encroachment for agriculture is also a major threat at lower altitudes in the lowland forest zone (MoFP, 2018b). In addition, approximately 99 percent of the population of South Sudan depends on forests as their source of energy in the form of fuel wood and charcoal, and the production of charcoal is a major driver in the current unprecedented decline in forest cover. Forests provide important ecosystem services, including the provision and maintenance of water resources, flood mitigation, and food provision. Climate change, combined with the aforementioned human pressures, poses a significant threat to these ecosystem services, and so the NAP prioritizes addressing these issues over the short-, medium-, and long-term time horizons.

Wetlands: Over 5 percent of the country is covered by permanent wetlands and floodplains, with a network of seasonally variable wetlands interfacing multiple small flood plains. These wetlands are extremely important for the ecosystem services they provide and also economically, for their potential to draw ecotourists to the country. Most notably, the Sudd wetland is located in the lower reaches of the Bahr el Jebel region. The Sudd is one of the largest tropical wetlands in the world and contains a large diversity of ecosystems. In the climate change adaptation context, the Sudd is an important natural asset because of the ecological services it provides, as well as its role in regulating the entire Nile basin (MoFP, 2018b).

3.6 SOCIAL CONTEXT OF SOUTH SUDAN

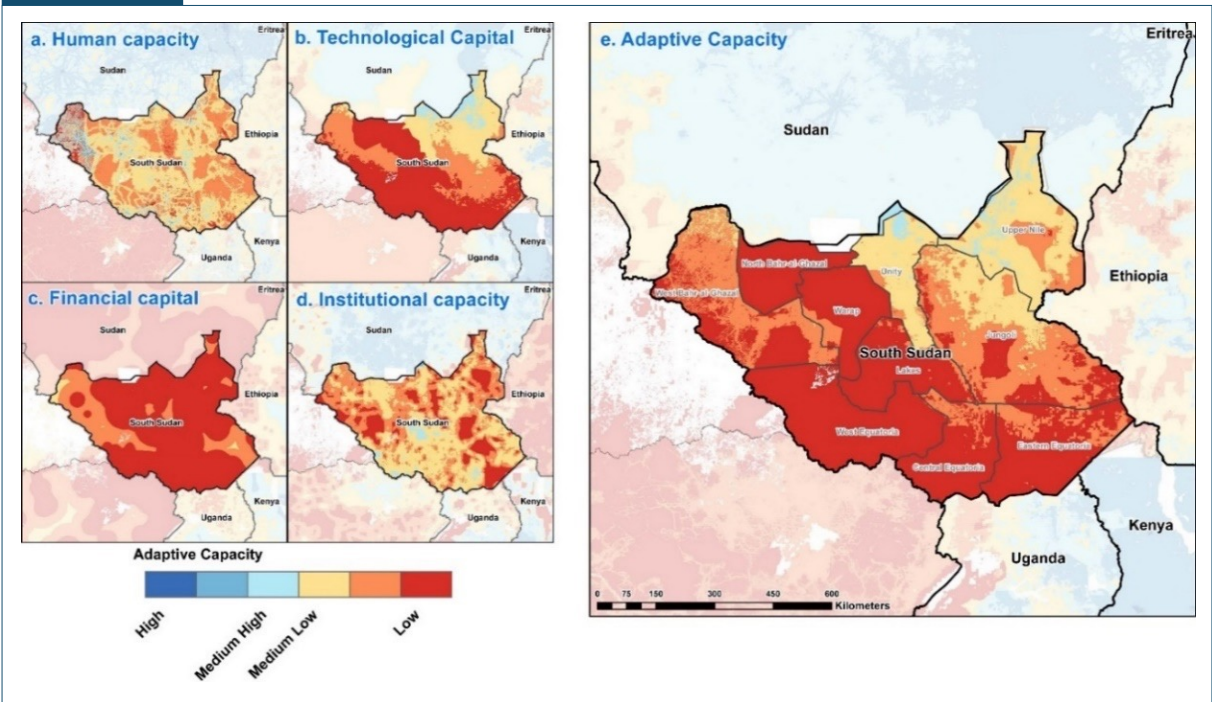
Climate vulnerabilities are also shaped by social factors and trajectories. Social conditions are important in shaping the sensitivity and adaptive capacity of communities, households and individuals to climate shocks and stressors. Sensitivity refers to characteristics of people, places, and things that make them



more or less susceptible to harm from climate shocks and stressors.¹³ Adaptive capacity refers to the ability of people, places, and things to take actions to make themselves more resilient to climate impacts, and to reduce the harm they experience from shocks and stressors.¹⁴ Sensitivity and adaptive capacity are major components influencing vulnerability to climate shocks and stressors. Reducing sensitivity and increasing adaptive capacity are common approaches to adapting to climate change. Figure 4 (below) shows ratings for several characteristics of adaptive capacity, including human capacity, technological capacity, financial capital, and institutional capacity. These maps indicate significant and wide-ranging adaptive capacity gaps throughout the country, with the southern portion of the country faring the worst.

In most cases, policies, programmes and projects that address social issues improve either, or both, sensitivity and adaptive capacity. Adaptation planning processes in South Sudan should therefore establish coordination mechanisms to identify and take advantage of opportunities to decrease vulnerability by improving social conditions. In general, this is important because in most cases, climate change adaptation involves addressing factors that create vulnerabilities rather than the physical processes of climate change themselves. For example, in addressing increasing temperatures and droughts, the government will most likely have no control over the temperature trajectory over the long run or the frequency and intensity of drought. However, the government and non-government stakeholders can address the factors that make communities, house-

Figure 4: FAO Spatial Adaptive Capacity Indicators: Human capacity (a), Technological Capacity (b), Financial Capital (c), Institutional Capacity (d) and Combined Adaptive Capacity (e).¹⁵



13 The Intergovernmental Panel on Climate Change (IPCC) defines sensitivity as “...the degree to which a system or species is affected, either adversely or beneficially, by climate variability or change. The effect may be direct (e.g. a change in crop yield in response to a change in the mean, range, or variability of temperature) or indirect (e.g., damages caused by an increase in the frequency of coastal flooding due to sea level rise).

14 The IPCC defines adaptive capacity as “...the ability of systems, institutions, humans, and other organisms to adjust to potential damage, to take advantage of opportunities, or to respond to consequences”.

15 FAO, Sub-Saharan Africa: impacts and adaptations (ClimAfrica) project, Work Package 4 (WP4)

holds, and individuals vulnerable to drought, thereby enhancing resilience.

A major factor contributing to vulnerability is the incidence of poverty. Poverty tends to increase sensitivity to climate change impacts and decrease adaptive capacity. According to analysis from the World Bank, incidence of poverty increased from 44.7 percent in 2011 to 65.9 percent in 2015 (UNEP, 2018), and in 2014 South Sudan's human development index (HDI) ranking was 169th of 188 countries tracked. Between 2010 and 2014 the HDI declined by an annual average of about .15 percent (UNEP, 2018). Poverty is lower in urban areas (24.4 percent) compared to rural areas (55.4 percent) (UNEP, 2018).

The level of poverty is evidenced in the country's startling vital rates. Infant mortality is 105 per 1000; despite progress this rate is still the 9th highest in the world, while the maternal mortality rate is the highest in the world, with 1 in 7 women dying during childbirth or pregnancy (BRACED, 2017; MoFP, 2018). Just over a quarter of children under the age of 5 are moderately or severely (12 percent) underweight. Although health indicators are improving, the average life expectancy in South Sudan is still only 55 years (UNEP, 2018). Approximately 7.5 million South Sudanese are considered food insecure. Food insecurity and health issues increase sensitivity to climate change impacts.

Education and access to information also affect both sensitivity and adaptive capacity. There are a number of issues related to education in South Sudan that increase overall vulnerability to climate shocks and stresses. Overall, the country's literacy rate is

under 30 percent, and average levels of education are low. South Sudan has the world's highest rate of school absenteeism, and it is estimated that at least 2.2 million school-aged children are out of school, with thousands more at risk of dropping out (MoGEI and UNESCO, 2018). Educational possibilities and outcomes are also shaped by gender: girls are more likely than boys to be excluded from education, and in some parts of the country, over 75 percent of primary-aged girls are not in school (MoGEI and UNESCO, 2018). At least one in three schools has been damaged, destroyed, occupied or closed.

Internet use is very low; in 2010 there were seven internet users for every 100 people. By 2014 this number had climbed to 16, while the number of mobile phone subscriptions rose from 14.4 to 24.5 per 100 over the same period (UNEP, 2018). While access to internet and cellular services will no doubt increase in the future, current low levels of use should be considered in the NAP process and in all adaptation measures that aim to increase awareness among the general population and disseminate information of one kind or another.

These factors suggest at least two conclusions. The first is that investments in climate change adaptation should include social development co-benefits as well as integration of the SDGs. The second conclusion is that as South Sudan continues to make investments and receive international support in improving socioeconomic conditions (including investments in health, education, social and gender equity and equality), care should be taken to ensure that climate change considerations are incorporated into these investments.

BOX 2 ETHNIC DIVERSITY AND ITS CONTRIBUTION TO THE NAP PROCESS

South Sudan is home to tremendous cultural diversity, with no less than 64 major ethnic groups speaking at least 50 different indigenous languages. The people of South Sudan are differentiated primarily through ancestry, family clans, linguistic characteristics, migration routes and political histories. The ten largest groups account for 80 percent of the total population. Each tribe has distinctive social and livelihood systems, cultural traditions and sense of identity. Though the functions of customary officials vary from place to place, chiefs have an important role in settling disputes, collecting taxes, allocating food aid, mobilizing the community in collective actions, and in enforcing regulations in the use and protection of natural resources (UNEP, 2018).

Under the Local Government Act of 2009, chiefs also serve as intermediaries between the government and the community. Customary law is considered to be the predominant source of jurisprudence in South Sudan as about 90 percent of everyday criminal and civil cases are handled by traditional chiefs and leaders under



BOX 2 ETHNIC DIVERSITY AND ITS CONTRIBUTION TO THE NAP PROCESS, CONT.

customary law. As noted in the State of the Environment report, "...importantly, the holders of traditional knowledge play a role in upholding cultural norms related to protecting and equitably using environmental resources. Such regulations include, for example, the responsibility of fishers to return small fish to the water and rules about the use of forest fires and protecting certain wildlife tree species."

This ethnic and cultural diversity brings both challenges and opportunities. Among the challenges are that some groups consider their traditional leaders to be more legitimate than local government officials. In addition, as noted in the INC (to the UNFCCC) (MoFP, 2018: 43), "...competing tribal interests continue to make strong parochial demands on public appointments and resources..." which the government cannot meet, and so this has led to perceptions of marginalization among the less powerful ethnic groups, placing further strain on the country's fragile social order. In addition, the majority of South Sudanese customary law systems are in stark contrast to international human rights laws with respect to rights granted to women and children. South Sudan's recent history has also served to erode the influence of customary systems, and in many areas of South Sudan, war and ongoing conflict have undermined chiefly authority. During hostilities, warring sides installed new, sympathetic chiefs in the areas they controlled, undermining the existing chiefs and the legitimacy of the institution (Idris, 2017).

At the same time, the country's cultural diversity can serve as an asset for building resilience to climate change and disasters. Droughts, floods, and water scarcity have posed challenges to South Sudanese communities since time immemorial. As a result, communities have devised means to stay resilient in the midst of threats to resources (MoFP, 2018a). These locally-appropriate resilience strategies will play an important role in the country's response to climate change. As part of the NAP process, the Government of South Sudan will work to inventory these local approaches, identify their enabling conditions and provide resources to strengthen and scale up local responses. This bottom-up approach will form an important complement to nationally-led programmes and initiatives.

Moreover, the role of customary officials, in managing natural resources and mobilizing the community in collective actions, are potential entry points for supporting and empowering locally-led adaptation processes. These leaders can also serve as the conduit for a two-way channel of communication and coordination between communities and higher levels of government, providing information about local vulnerabilities and needs on the one hand, and helping to localize information about climate shocks and stressors for local communities on the other hand.

Chiefs and traditional leaders clearly should play a role in climate change adaptation in South Sudan, but there is a lack of legal definition and clarity about the roles of chiefs and traditional authorities. Under the Transitional Constitution and the Local Government Act, the precise position and role of chiefs is not defined, potentially leading to conflict. There are different levels of chief, and it has not yet been clarified the exact level of authority granted to the different types of chief. Over the short-term period (2020-2022), the NAP process will clearly define the roles of traditional authorities with respect to climate change adaptation and disaster risk reduction, and provide guidance and capacity building to traditional leaders to empower them to play a strong role in community resilience building.

While the country's cultural diversity is a resource for building resilience, the NAP process recognizes that cultural practices contribute to the shaping of climate change impacts. For example, the flooding that now occurs on an almost annual basis causes large areas of pasture and cropland to be submerged, affecting food supplies. Flooding also causes pastoralists to move their herds or shift patterns of transhumance, which can bring communities into conflict with one another. There is also the risk that climate change will disturb weather patterns that traditionally inform the pastoral calendar, thus altering decision making processes. Therefore, the NAP process will include research on the nexus between traditional practices and resource management systems, changing climate parameters to determine potential vulnerabilities and inform the proactive development of local risk management measures.

3.7 GENDER ISSUES AND CONTEXT

Gender has an important influence in determining how men and women access and use natural resources, public goods and services, information, and political and economic power. Following this principle, gender can also shape how different people are affected by climate change, as well as their ability to adapt to climate change impacts. There are significant gender differences in South Sudan, starting from the rate of poverty, which is around 59 percent for female headed households, as opposed to 48 percent for male-headed households. Overall, male headed households have more assets than female headed households (Mai *et al*, 2018).

There is significant inequality in terms of educational opportunities. The literacy rate for men is low at 40 percent, but for women it stands at 16 percent. 87 percent of women have no formal education, and so women are disadvantaged when it comes to formal employment; only 9 percent of women have paid jobs. With respect to health outcomes, women face conditions that make them more vulnerable to certain climate impacts. For example, the INC indicates that a loss in cattle and decline in milk production leads to a reduction in women's income from milk sales. Women play a dominant role in the agricultural sector in South Sudan. Up to 85 percent of women and youth depend on agriculture for livelihood sustenance. By some estimates the proportion of women engaged in cropping is 80 percent of the workforce. Furthermore, 80 percent of households working in agriculture are headed by women. Women also dominate the post-harvest handling of crops and are active in livestock rearing and fisheries as well¹⁶. The prominent role of women in agriculture is contrasted by a lack of customary rights to tenure and inheritance.

Customary systems in South Sudan tend to be patriarchal, with little, if any, participation in decision making processes for women, disadvantaging women with respect to inheritance and property rights. However, the Government of South Sudan has taken some steps to address gender inequality, for example, the Transitional Constitution stipulates that women should constitute at least 25 percent of decision-making institutions, however, in practice this has proven difficult to implement (Mai *et al*, 2018).

With respect to climate change, there is a feedback loop between climate change impacts and gender inequality. While gender inequalities tend to make women and girls more vulnerable to environmental degradation and climate change impacts, these impacts can also exacerbate gender inequalities, increasing the overall gap between women and men. For example, climate change and environmental degradation disproportionately affects women and girls because it forces them to spend more time and energy fetching water and firewood. This in turn leaves them with less time for income generating activities or for studies and self-development. According to research conducted by the Sudd Institute (Mai *et al*, 2018), women in South Sudan rely on natural resources like thatching grass and wild fruit, and climate change can damage or destroy these resources through increasingly severe and frequent droughts and floods. Their role in agricultural production also increases their sensitivity and exposure to climate shocks and stressors. Men are also affected, but they tend to be in a relatively better position to cope due to other sources of livelihood and assets, including goats, hunting, and fishing. This same research shows that households headed by females are more vulnerable to disaster and famines. For example, when there is a drought, women are often left behind to care for homesteads while men migrate with the livestock in search of fodder and livelihood opportunities. This can expose women disproportionately to hunger. However, understanding specifics about potential differential vulnerabilities to climate change is difficult because there is very little gender-disaggregated data in the country, and there have been few, if any, studies that examine how climate change affects women and men differently in South Sudan (BRACED, 2017, Mai *et al*, 2018). In general however, women are more likely to be affected by climate shocks as they depend more heavily on natural resources (water, firewood and agricultural resources (BRACED, 2017). Their overall lower social status and lower levels of access to public goods and services (e.g. schooling and lack of access to health care) undermines adaptive capacity, as does high levels of illiteracy among women and discriminatory/marginalizing practices such as early and forced marriage.

16 African Development Bank, "South Sudan: An Infrastructure Action Plan – A Programme for Sustained Strong Economic Growth", African Development Bank (AfDB) Group (2013), 163.



These considerations should be mainstreamed into the process of NAP formulation. Some potential entry points include:

- Prioritize technical capacity building within key government institutions to be able to mainstream climate change and gender equality and social inclusion measures. The Government of South Sudan can take stock of existing best practices and capacity development materials and adapt these for use in South Sudan in relatively short order;
- Design policies that equally empower women and men to become resilient to climate change impacts. This includes procedures to mandate equitable gender representation in planning and programme design processes;
- Build climate data infrastructure to inform gender equality and climate change policies and plans. This includes collecting sex-disaggregated data and establishing data collection procedures that are sensitive to, and account for, gender differences in the country; and
- Require that all climate change projects and programmes undertake an initial gender assessment and implement a gender action plan, including gender-specific activities (where appropriate), gender-mainstreamed monitoring, evaluation, learning, and reporting procedures. Projects and programmes should also include gender specialists in design and implementation, and budgets should provide the necessary resources for effective incorporation of gender into design and implementation processes.

3.8 POST-CONFLICT CONSIDERATIONS

Despite winning its independence from Sudan after a long struggle, the young nation of South Sudan has been troubled by internal violence which began in 2013. This internal conflict has resulted in thousands of deaths and hundreds of thousands, if not millions, being displaced internally. Although a peace treaty which included a power-sharing agreement between the government and rebel factions was signed in 2018, South Sudan is still rated as the 3rd most fragile state in the world after Yemen and Somalia. South Sudan was also ranked 3rd to last on

the Global Peace Index for 2019.¹⁷ This continuing conflict has largely stymied economic recovery and national reconciliation. An additional issue with respect to conflict relates to migration and movement of humans. After the civil war with Sudan concluded, there were many returnees to South Sudan and many IDPs. Many returnees and IDPs have ended up in urban areas and informal settlements, generally living in crowded and unsanitary conditions. This has also put increased pressure on environmental resources.

Though the country has made progress, especially though the Revitalized Transitional Government of National Unity (R-TGNU), peace building and conflict resolution are still important considerations and should be incorporated into government policies and programmes where possible and appropriate. At the same time, the connection between climate change and increasing conflict is not clear in South Sudan and elsewhere (BRACED, 2017). However, anecdotal evidence suggests that in South Sudan, conflict increases during time of drought and flooding (BRACED, 2017). According to some analyses, there is little evidence of climate change and variability directly causing conflict in South Sudan. However, climate change and variability can function as a threat or risk multiplier for conflict. In addition, there are some suggestions that there may be a correlation between severe droughts and floods and the incidence of cattle theft. There is widespread agreement on the need for additional research into the nexus between conflict and climate change in the country.

Therefore, the NAP will strive to align with and reinforce peace-building and conflict resolution processes in South Sudan and will prioritize supporting research on the connection between natural resource degradation, climate change processes, and conflict. The NAP process will incorporate lessons learned from UNEP's Climate Change and Security project and its previous activities in South Sudan to identify linkages between climate change processes and drivers of fragility and conflict (UNEP and EU 2019a, b, c). Several actions to strengthen policy, planning, and project development synergies between peacebuilding efforts and climate change

¹⁷ <https://fragilestatesindex.org/data/>. This index is calculated by the Institute for Economics and Peace and is measured by 23 qualitative and quantitative indicators under three categories: 1) level of safety and security in society; 2) domestic and international conflict; and 3) militarization.

adaptation will be conducted through the NAP process. This includes coordinating with the National Dialogue for Peace and Reconciliation. Specific entry points include:

- Using the NAP process to develop a strong evidence-based understanding of the potential role of climate change in undermining peace so that proactive measures can be taken. This will include an analysis of conflict and fragility drivers at the national and subnational levels, and will incorporate the most recent climate analysis and information and future projections from the IPCC AR6 and from other sources that build upon this work;
- Identifying policy entry points at the national, sectoral, and subnational levels through which climate change adaptation and peacebuilding considerations can be mainstreamed;
- Once the relationship between changing environmental conditions and conflicts are well understood, exploring the possibility of designing an early warning system that monitors climate conditions and processes that have been linked to conflicts over land and resources. Such a system, when triggered, could prompt government and other stakeholders to deploy conflict mitigation resources;
- Establishing screening tools for investment projects to ensure that they do not trigger or exacerbate conflicts between communities; and
- Developing common principles for resource-based conflict resolution and adjudication practices that all stakeholders agree on prior to the emergence of conflicts. If and when conflicts emerge, the agreed upon principles and protocols would then be utilized to bring about peaceful and amicable resolutions.

3.9 KEY ISSUES TO RESOLVE WITH RESPECT TO UNDERSTANDING THE NATIONAL CONTEXT AND CIRCUMSTANCES FOR CLIMATE CHANGE ADAPTATION IN SOUTH SUDAN

This section provides an overview of key issues identified that should be prioritized over the short term (2020-2022) to strengthen South Sudan's NAP process and overall response to climate change. These priorities may be addressed through dedicated

NAP support facilities (e.g. GCF and NAP readiness grants), or through direct technical assistance from bi- and multilateral development partners.

- An eventual goal of the NAP process in South Sudan is for sectoral development plans, strategies and investments to mainstream climate change considerations as part of standard procedures and practices. This mainstreaming should be viewed as a medium- to long-term process of organizational change for the agencies which begins with awareness raising and ensuring that the agency leadership understands the importance of, and is supportive of, building climate resilience. At the same time, since South Sudan is the world's newest country, many agencies are still being set up, and systems and procedures are still in the process of being established. This provides a unique entry point to incorporate climate change adaptation considerations as these systems are being developed. Therefore over the short-term, it will be important to track external assistance for governance and institutional strengthening from development partners to identify entry points for climate change adaptation, and coordinate with agencies and development partners to ensure that climate change considerations inform technical assistance packages.
- There are significant knowledge gaps with respect to the nexus between climate change, migration and conflict. At the same time, development partners and international NGOs, as well as domestic stakeholders, are implementing peace building and conflict resolution processes and projects. These processes and projects should incorporate climate change considerations and the government should support ongoing research to build an evidence base for future policies and programmes to build peace and prevent or mitigate conflicts over natural resources.
- Regional coordination on climate change adaptation issues should be improved. There are a number of short-term actions that would advance regional coordination, including:
 - Identifying entry points in national policies and strategies and implementing measures that are consistent with the Nile Basin Initiative's Climate Change Strategy;
 - Ensuring that investments in upgrading the hydrometeorological monitoring network and in data and information management



are aligned with regional considerations. This includes ensuring that data formats are interoperable and consistent with international best practices, and establishing data sharing partnerships and protocols with regional agencies and neighbouring countries;

- Building research partnerships with regional institutions and universities through memorandums of understanding (MoUs) and exchanges;
- Promoting bi- and multilateral management approaches to transboundary ecosystems, conservation areas, aquifers, and other natural resources; and
- Improving capacity for addressing transboundary climate issues at the Ministry of Foreign Affairs and International Cooperation (MFAIC), and developing a coordination mechanism between MFAIC and the Department of Climate Change.

- Clarify the roles and responsibilities for traditional leaders with respect to climate change adaptation at local level and align these with the overall improved institutional arrangements for vertical coordination recommended in Chapter 2. Proactively reach out to chiefs and build awareness and capacity so that they can serve as local focal points for resilience building and adaptation.
- Identify clear entry points for gender equity in the NAP process and for South Sudan's overall adaptation response. Prioritize technical capacity building within the Department of Climate Change and other agencies to improve integration of gender equity and equality into adaptation planning and implementation.

These recommendations are included in the matrix of short-term priority programmes included in Chapter 6.

Chapter 4: Rationale for Conducting Adaptation



4.1 INTRODUCTION

This chapter provides the climate science basis for climate change adaptation planning, policy and regulatory formulation, and project design by consolidating information on the physical processes of climate change and their impacts. The chapter provides information on observed changes in physical parameters (e.g., observed temperature increases, observed changes in the timing and amount of precipitation) as well as information on projected changes into the future based on the most recent projections available. Capacity gaps and needs within the South Sudan Meteorological Department and recommendations for addressing these gaps are also described. Lastly, the chapter describes potential impacts in each of the NAP priority sectors. It is expected that this chapter will be expanded and updated as South Sudan's NAP process progresses and so this chapter, like much of the rest of the first NAP, should be considered a living document.¹⁸

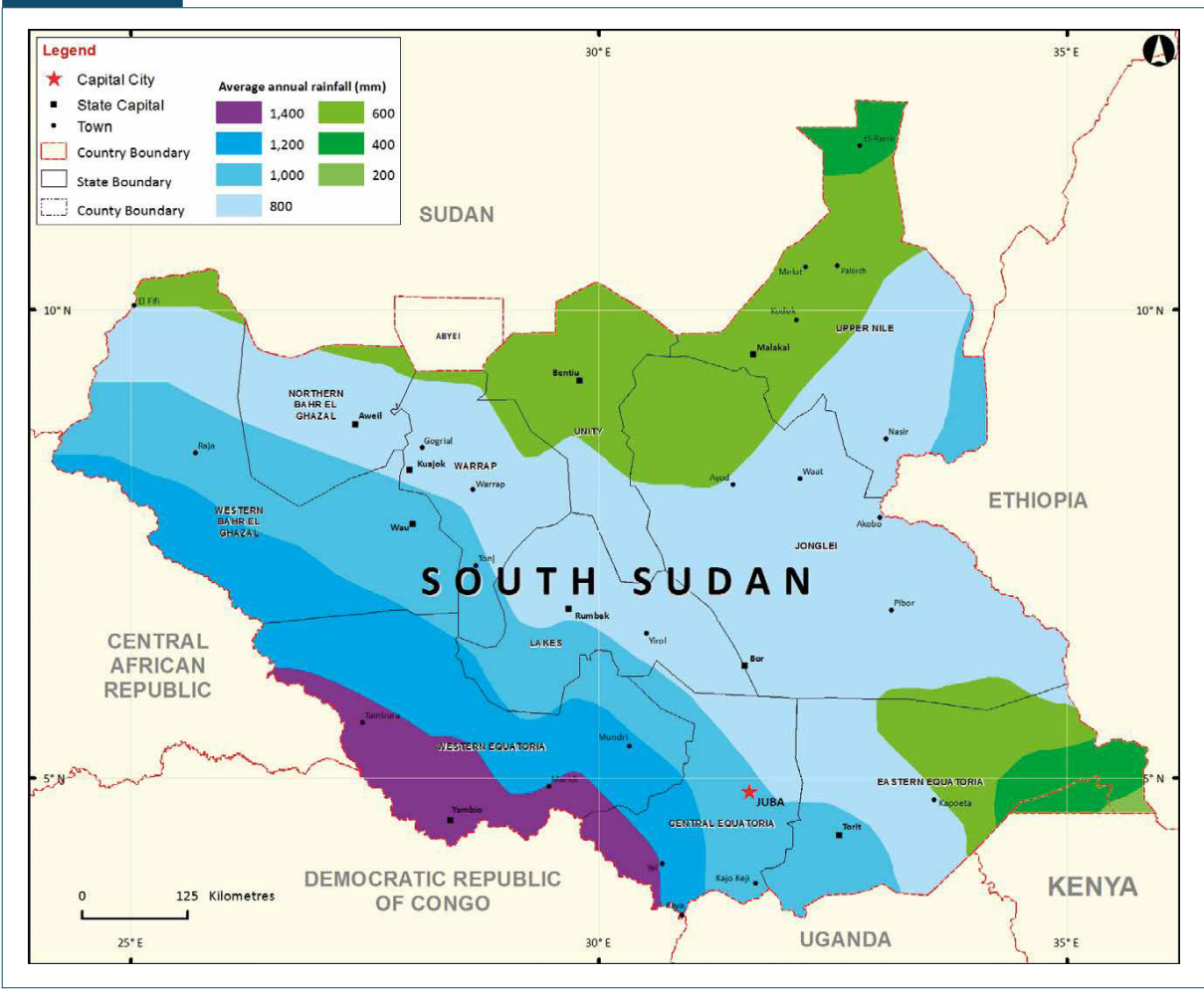
4.2 CLIMATE CONTEXT: GENERAL CLIMATE CHARACTERISTICS

The climate of South Sudan is tropical with two distinct rainy seasons and high humidity (AfDB 2018). Temperatures in the country range from hot and dry in the southeast near the border with Kenya and northeast near the border with Sudan, to temperate in the southern highlands. Average temperatures range between 18°C and 30°C (MoFA, 2018) and do not vary greatly with the change in season (Chen et al., 2013). The hottest month is generally March; the coldest is August (MoFA, 2018). In Malakal (9.5N, 31.6E), the highest maximum daily temperature is 39.1°C in April, while in Juba (4.9N, 31.6E) the highest maximum daily temperature is 37.9°C in February (Table 2).

Annual rainfall ranges from 200 mm in the southeast (Eastern Equatoria) to 1,200–2,200 mm in the forest area of Western Equatoria and the highland areas (MoFA, 2018). The north-eastern part of the country is drier and in general, precipitation increases towards the southwest (Figure 4). The driest parts of the country are the semi-arid areas of the south-eastern region, which are also the areas with the highest levels of food insecurity (USAID, 2019).

¹⁸ Some of the information presented in this chapter is derived from datasets collected while South Sudan was still part of Sudan, and some of the analyses cover areas beyond South Sudan's borders. In some cases, locations that are currently in Sudan are used as no equivalent cases for locations in South Sudan are currently available.

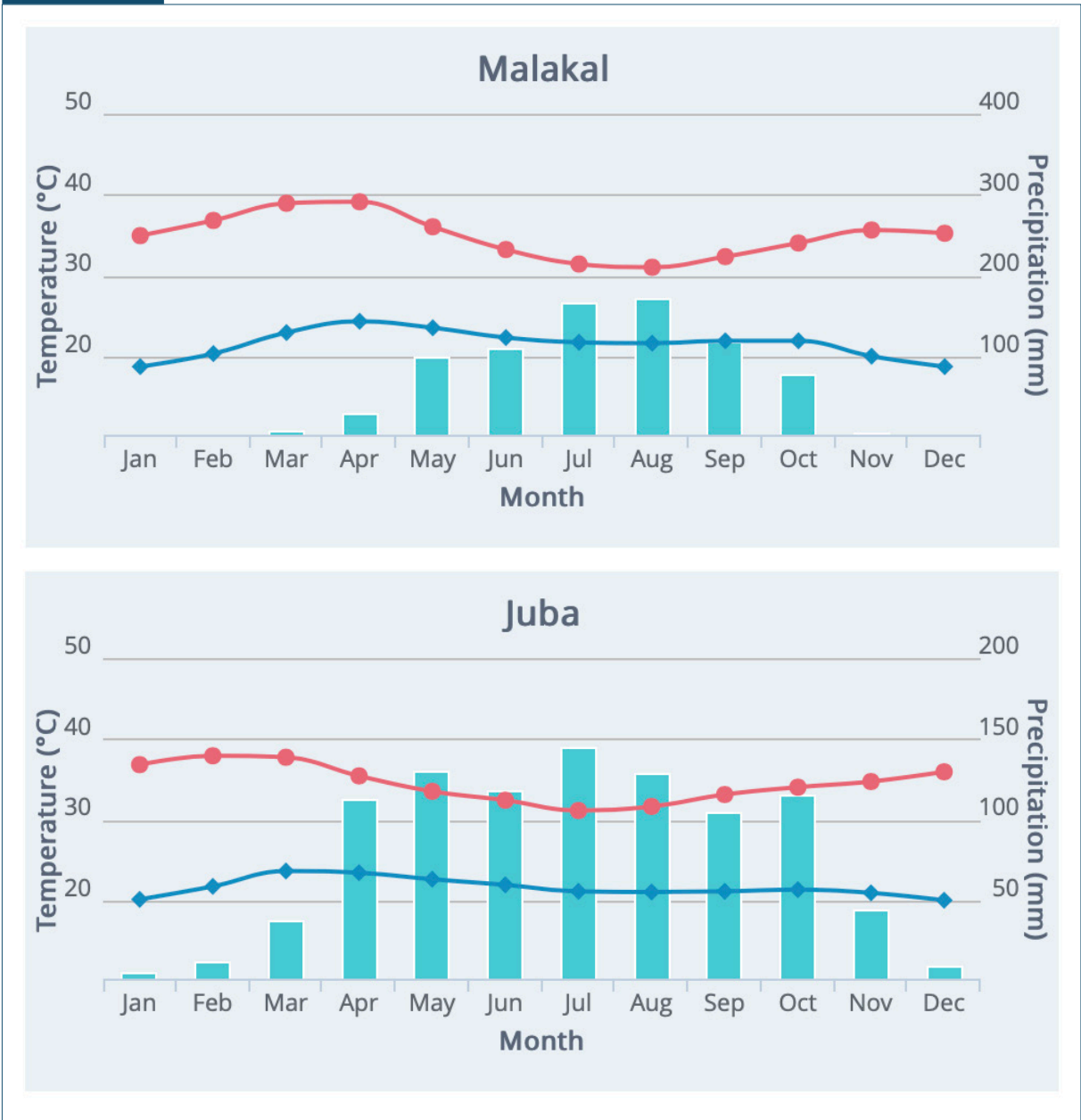
Figure 5: Average rainfall in South Sudan. Source: Republic of South Sudan, First State of the Environment Report



Rainfall patterns in South Sudan are seasonal. The longer wet season lasts from April to October, followed by a dry season from November to March (MoFA, 2018; Figure 2). Seasonal rainfall is driven by the annual migration of the Inter-Tropical Convergence Zone (ITCZ; Government of South Sudan,

2018) and typically, rainfall falls unevenly across the country. Most of the country experiences monsoons between June and September during its long rainy season. The extreme south region has a longer rainy season that extends from May to October with two distinct peaks occurring in May and July.

Figure 6: Regional Climographs. Annual pattern in rainfall and Temperature for Malakal (9.5N, 31.6E) and Juba (4.9N, 31.6E) cities in South Sudan. The red line in the graph indicates the maximum daily temperature; the blue line is the minimum daily temperature.



Distinct differences in seasonal rainfall are apparent in a comparison between Malakal in the northern part of the country and Juba in the South. Overall, Juba receives more rainfall annually (953 mm) as opposed to Malakal (770 mm), which begins in March and ends in November. (Figure 6). The dry season is particularly harsh in Malakal where on average, only one day with rainfall occurs each month (Table

1). Approximately 99 percent of the rainfall in Malakal occurs during the 7-month wet season in comparison to 89 percent over this same period in Juba.

The heavy rains that fall in August and September cause the Nile River and its tributaries to flood, though many parts of the country are prone to flooding during the wet season, including the states of

Jonglei, Unity, Upper Nile, Warrap and Northern Bahr el Ghazal, as well as parts of Western and Eastern Equatoria (MoFA, 2018). The amount of rainfall and the length of the rainy season has varied drastically from year to year (Chen et al. 2013). Historical precipitation has exhibited large annual variability that can shift from 50 percent below average rainfall in one year to 50 percent above average the next year (USAID, 2019). It should be noted that this background variability is not a result of anthropogenic global warming and climate change, but as is described below, climate change may be increasing the degree of annual variability.

4.3 CLIMATE CHANGE OVERVIEW: OBSERVED CHANGES

4.3.1 Changes in temperature

Globally, 2019 has been identified as the second warmest year in the instrumental record (Schmidt & Arndt, 2020). The combined global ocean and land temperatures were 0.95°C above the 1901-

2000 average (Schmidt & Arndt, 2020). The past six years (2014-2019) have been the six hottest years on record and the last decade has been the hottest decade in recorded history (Schmidt & Arndt, 2020).

Over the past 30 years, South Sudan has been among the most rapidly warming locations on the planet, with observed temperatures increasing as much as 0.4°C per decade (Funk et al., 2011). While warming has been detected since 1950, the rate of warming has increased significantly over the past three to four decades (USAID, 2019). It has been estimated that the observed warming between 1975 to 2009 was more than 1.3°C for South Sudan and more than 1°C within the extended Darfur region to the north (Funk et al., 2011). Annual temperatures anomalies are illustrated in Figure 7, which clearly shows that over the 40 years between 1978 and 2018, only two years were below the 1961-1990 average annual temperature.

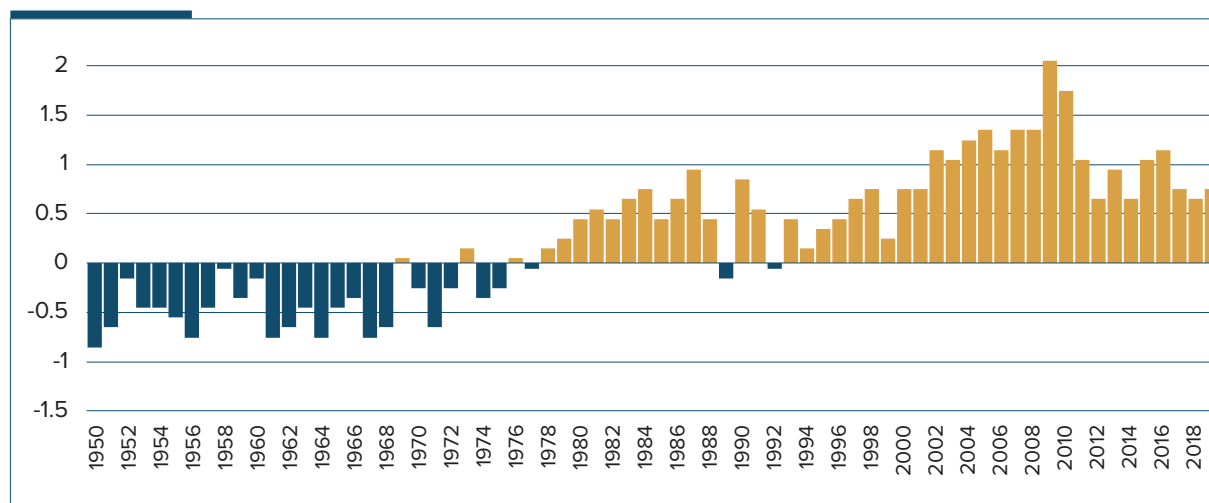
The rate of warming South Sudan is 2.5 times greater than the global average change in air temperature

Table 2: Mean climate characteristics for Malakal and Juba cities

	Malakal				Juba			
	Tmin (C°)	Tmax (C°)	Precip. (mm)	Precip. Days (n)	Tmin (C°)	Tmax (C°)	Precip. (mm)	Precip. Days (n)
Jan	18.7	34.9	0.0	0.4	20.1	36.8	5.1	1.4
Feb	20.3	36.8	0.4	1.3	21.7	37.9	11.0	2.0
Mar	22.9	38.9	6.7	3.0	23.6	37.7	36.7	6.6
Apr	24.3	39.1	26.9	4.5	23.4	35.4	111.5	11.6
May	23.5	36.0	97.4	8.7	22.6	33.5	129.9	12.4
Jun	22.3	33.2	107.8	9.8	21.9	32.4	117.8	10.3
Jul	21.7	31.4	163.9	11.7	21.1	31.1	144.7	13.0
Aug	21.6	31.0	170.2	11.8	21.0	31.6	127.5	11.5
Sep	21.9	32.3	117.8	6.7	21.1	33.1	103.7	8.6
Oct	21.9	34.0	75.6	4.3	21.3	34.0	114.5	10.4
Nov	20.0	35.6	3.6	0.3	20.9	34.7	43.1	6.5
Dec	18.7	35.2	0.0	0.0	20.0	35.9	8.2	1.9

Tmin is the mean minimum temperature; Tmax is the mean maximum temperature; Precip; Is the total average precipitation; Precip. Days. Is the average number of days where precipitation occurs; averages are calculated for observed data collected between 1971 to 2000 (WMO, 2020).

Figure 7: Annual temperature anomalies in South Sudan from 1960 to 2018 (base period 1961-1990). Data from CRU.CY.4.04 (Harris et al., 2020).



(Funk *et al.*, 2011). South Sudan is becoming drier and hotter, which is consistent with an increase in atmospheric circulation bringing dry subsiding air during the main rainy season (Funk *et al.*, 2011).

4.3.2 Changes in precipitation

According to the Famine Early Warning Network (FEWSNET, Funk *et al.*, 2011), much of South Sudan has experienced a 10–20 percent decrease in long rains since the mid-1970s. Funk *et al.*, (2011) has reported that summer rainfall decreased by 15-20 percent across parts of western Sudan and South Sudan between the mid-1970s and late-2000s. There is also evidence that seasonal rainfall patterns are shifting and the onset of the rainy season is now occurring one month later than previously (BRACED, 2018). Inter-annual rainfall variability in South Sudan has been linked to changes in Indian Ocean Sea surface temperatures (Chen *et al.*, 2013). In general, the driest years are associated with the warm (El Niño) phase of the El Niño Southern Oscillation Index, which influences inter-annual rainfall variability across the country (Chen *et al.*, 2013).

4.3.3 Extreme events

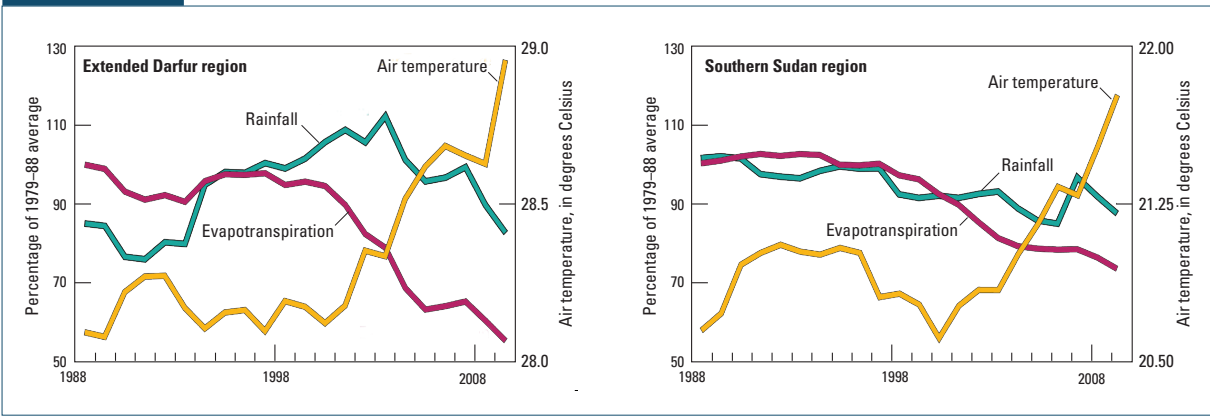
Climate extremes such as flooding and seasonal drought have been more frequent over the last 30-60 years in South Sudan (Shiferaw *et al.*, 2018).

Drought frequency has shown distinct spatial patterns over the Greater Horn of Africa (GHA) region during the past 52 years with high frequencies observed in parts of South Sudan (Gebremeskel Haile, 2020). Early- to mid-1970s, mid-1980s, early-1990s and early-2000s were reported as common drought years. These were among the driest years in the central region of Sudan, and some of the most severe famines of the past are associated with the worst multiple year droughts (Yagoub *et al.*, 2017).

There is a consensus that drought has become more frequent in recent decades (BRACED, 2018) and that increases in temperature appear to be amplifying the effects of drought (Funk *et al.*, 2011). Over the past 20 years, declines in evapotranspiration (Figure 3) are larger for the extended Darfur region (approximately -40 percent) and southern Sudan¹⁹ (approximately -28 percent) than the associated decreases in rainfall (approximately -10 percent). Generally, higher drought frequency and longer drought duration with higher intensity are distributed in parts of South Sudan. Consequently, these drought conditions have proved to be highly damaging to agricultural yield (Elagib, 2009 and Sulieman and Elagib, 2018).

¹⁹ At the time of the Funk *et al.* 2011 study, South Sudan was not yet independent from Sudan, therefore references to Southern Sudan encompass the areas of present-day South Sudan.

Figure 8: 20-year climate trends in rainfall, evaporation and temperature in Darfur (Sudan; left pane) and Southern Sudan (right pane), Source Funk *et al.*, 2011.



The frequency of flood events has increased over the last 60 years, with the last 30 years witnessing the highest number of floods (BRACED, 2018). These include increased incidence of flash floods, rivers overflowing or the bank bursting following a heavy rain (BRACED, 2018). The government declared the country a disaster zone in October 2013 after seven of South Sudan’s 10 states were heavily flooded. Between August and November 2013, floods affected around 150,000 people, destroying crops, property, and infrastructure (MoFA, 2018). Flooding from July to August 2014 resulted in deaths, displacement of more than 40,000 people, destruction of property and a widespread malaria epidemic. In September 2015, flooding displaced around 2,000-3,000 households (MoFA, 2018). There are indications that the intensifying flooding and droughts are directly linked to extreme rainfall events driven by changes in the climate (Chen *et al.*, 2013).

4.3.4 Climate change overview: projected changes

The Greater Horn of Africa (GHA) region is one of the most vulnerable regions to current and projected future changes in climate extremes (Shiferaw *et al.*, 2018). General Circulation Models (GCMs) indicate that the mean annual temperature in South Sudan is projected to increase by 1-1.5°C by 2060 from 2020 values (MoFA, 2018; USAID, 2018). In some areas and in some months these increases could be much higher (MoFA, 2018). By 2090, average temperatures are projected to increase by 3.3-3.6°C under a high emission scenario (RCP8.5) across the country (Table 2). Extreme heat days are also expected to increase with some regional variation. In the western city of Bor an estimated 24-58 extreme heat days per year are projected in 2090 compared with present day values (Table 3).

Table 3: Summary of projected climate changes in year 2090 in seven locations in South Sudan.

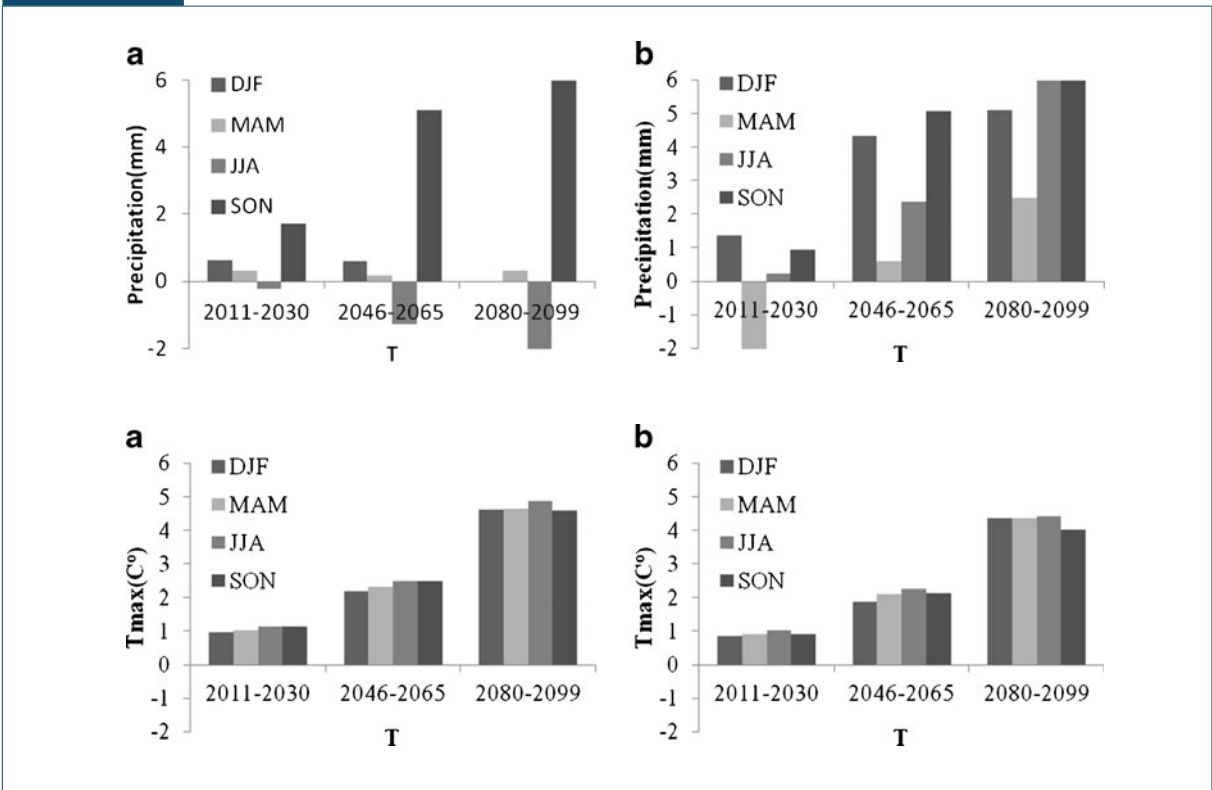
Location	Region	Avg. Increase in Temp (C°)	Total Increase in Precip (mm/yr)	Total Increase in Precip (%/yr)	Increase in Extreme Heat (days/yr)	Increase in Precip Days (days/yr)
Torit	Equatoria	1.5-3.3	78-244	7-22	20-55	1-4
Yambio	Equatoria	1.6-3.5	55-249	4-16	17-54	1-3
Yei	Equatoria	1.5-3.4	121-269	8-18	19-48	1-4
Aweil	Bahr el Ghazal	1.5-3.5	73-176	7-17	13-36	1-3
Rumbek	Bahr el Ghazal	1.7-3.6	54-123	5-12	23-58	1-3
Way	Bahr el Ghazal	1.5-3.3	51-177	4-15	17-47	1-3
Bor	Great Upper Nile	1.7-3.5	57-194	6-20	24-58	1-4
Sudd	Great Upper Nile	1.6-3.5	57-173	7-21	19-51	1-4

Data is based on the average of 21 climate models that have been downscaled. Data ranges are based on the 21-model average for both low (RCP4.5) and high (RCP8.5) emission scenarios (USAID, 2019).

The resulting warmer climate will amplify the effects of droughts in South Sudan, as with any observed warming of more than 1°C is equivalent to a further decrease of 10-20 percent in rainfall (Funk et al., 2011). Predictions from seven GCMs showed an increasing trend for maximum (Tmax) and minimum (Tmin) near-surface air temperatures in three future time periods (Chen et al., 2013). Both Tmax and Tmin were shown to increase for the three

future periods, i.e., 2011-2030, 2046-2065 and 2080-2099, as compared with the current climate (1961-1990) at a rate of 1.0-1.5 °C, 2.5-3.0°C and 4.5-5.5°C, respectively (Figure 8b,c). The higher temperature regime is projected to result in not only more extreme heat days, but longer heat waves (estimated at 5 to 32 days longer by 2085) and a decrease in cold spells (USAID, 2019).

Figure 9: Future temperature projections. Refer to text for details.



These graphs show the differences between the future periods (2011-2030, 2046-2065 and 2080-2099) and the current period (1961-1990) in Sudan, for a) Precipitation, b) Maximum air temperature (Tmax) and c) Minimum air temperature (Tmin), for four seasons, through calculating the mean ensemble of 7 GCMs (Chen *et al.*, 2013).

Projections of rainfall patterns are less certain than projections of temperature, with some models suggesting increases while others suggest decreases (USAID, 2019). Chen *et al.* (2013) identified an increasing trend in most seasons in South Sudan in the future except for the March, April and May (MAM) season during the 2011-2030 period (Figure 9a).

The average of 21-GCM models showed that annual rainfall increases at seven locations across the country as well as the number of extreme precipitation days per year (Table 3). Projected increases in rainfall vary regionally but are as high as +22 percent under a high emission scenario (Table 3). Other analyses suggest that for most locations seasonal rainfall is projected to decrease and that overall increases in

projected rainfall suggest the occurrence of fewer but more intense rainy days by the end of the century (Shiferaw *et al.*, 2018). Increases in the number of consecutive dry days (CDD) during summer months (July, August and September) range from a slight decrease over a few locations to an increasing pattern that dominates the entire region; and this pattern is most significant in South Sudan (Shiferaw *et al.*, 2018). In the Equatorial region, a large increase in the length of dry periods of up to eight days is projected by the end of the century in areas encompassing South Sudan that receive considerable amounts of rainfall during this season (Osima *et al.*, 2018).

From the above synthesis, it can be inferred that temperatures in South Sudan will continue to increase in the future, which will force the environment to become less hospitable to plants. Observed warming appears to be amplifying the effects of drought and when combined with decreases in rainfall in the June, July, August (JJA) period has the potential to reduce crop yields. Such climatic alterations and variability have inherent implications for land-use and land-cover over the entire region (Elgib, 2009).

BOX 3: EXTREME RAINFALL IN SOUTH SUDAN

Future projections of increased annual and/or seasonal rainfall may not necessarily mean a greater availability of potable water resources. Shifting rainfall patterns and more extreme events that bring larger amounts of rainfall over a shorter period can have damaging effects.

Elgib (2009) showed that a recent enhancement of the overall (annual) rainfall in South Sudan was driven by only a few very wet days that year. Sulieman and Elagib (2012) found that around 61 percent of the annual rainfall in El Gedaref, Sudan in 2009 was recorded during only seven days, each with a rainfall > 30 mm/day. Although rainfall of >30 mm/day is the least recurrent across the region (< 6 percent of the days) it contributes significantly to the total annual rainfall amount, about 28-42 percent (Salih et al., 2018). This kind of concentrated rainfall is less useful for rain-fed agriculture, compared to when the corresponding amount is distributed over a reasonably longer time. If severe rainfall (> 30 mm/day) coincides with the early stage of the growing season when the soil is dry and bare, it likely generates large overland flow (runoff), causing erosion of the fertile top layer of the soil (Sulieman and Elagib, 2012 and Elagib, 2009).

Precipitation (water availability) is by far the most critical parameter for the region and therefore, changes in frequency and intensity of precipitation will ultimately affect water availability and may lead to decreased agricultural production and potentially widespread food shortages (Shiferaw et al., 2018).

4.4 A NOTE ON CLIMATE MONITORING AND DATA AVAILABILITY IN SOUTH SUDAN

Climate monitoring in South Sudan is overseen by the South Sudan Meteorological Department (SSMD), a government institution within South Sudan Civil Aviation Authority. The South Sudan Civil Aviation Authority is organized under the Ministry of Transport, Roads and Bridges. The mission of the SSMD (2018 est.) is to provide timely, high quality and reliable meteorological information and early warning to help in disaster risk reduction efforts. SSMD relies on a national network of monitoring stations, but currently, only five functional synoptic meteorological stations are in operation (Modo, n.d.). These stations are located at Malakal, Juba, Renk, Raja and Wau. In the past there were seven stations but the stations at Benteiu and Rumbek were closed during the civil war in 1984.

In addition to these stations, nine Automatic Weather Stations were installed by FAO in 2009 but at present, only two are still operational. One aeronautical meteorological station is operational at Juba Airport; however, this station only operates 12 hours a day, reflecting the airport's opening hours. Meteorological data observed at this station include measurements of temperature, rainfall, cloud fraction and dew point.

SSMD has reported several gaps and barriers that are directly and indirectly relevant to the effectiveness of adaptation planning in South Sudan (Modo, n.d.), including:

- Inadequate physical infrastructure to support robust and comprehensive meteorological monitoring (e.g., office space, connectivity and electrical generation)
- Lack of comprehensive coverage for monitoring stations and a lack of up-to-date monitoring equipment suitable for conditions in South Sudan
- Lack of budget and technical capacity to implement required periodic maintenance for available instruments
- Lack of forecasting tools, including radar, satellite ground station, computers and modelling software
- Insufficient staff and lack of technical expertise with no opportunities or support for training and professional development
- Inadequate research support and partnerships with academic and research institutions. The central and eastern African climate system remains one of the most understudied areas in the world, in part due to the lack of weather records, lack of recognition of the importance of weather management systems, chronic under

investment and low levels of technical capacity (BRACED, 2017)

- Aid and humanitarian agencies rely on data and information from IGAD and FEWSNET, but it is rarely localized and is not translated into relevant information for stakeholders on the ground (BRACED, 2017)

The World Meteorological Organization facilitated a stakeholder-led assessment of South Sudan's hydrometeorological services capabilities in 2019. This assessment analysed functional capacities according to six categories: governance, basic systems, user interface, capacity development, provision, and application climate services and monitoring and evaluation of socio-economic benefits. The assessment concluded that South Sudan is deficient in all these categories.

Some of these issues will be addressed over the short- and medium-terms with support provided by donors and development partners for the NAP process (e.g., GCF Readiness resources). However, the Government of South Sudan will need to secure additional assistance to support the buildout of the national monitoring network and to make the capital improvements necessary to increase the capabilities of the SSMD.

4.5 SECTORAL BASELINES AND CURRENT AND FUTURE VULNERABILITIES

This section provides a general overview of baseline conditions as well as current and potential climate vulnerabilities and impacts for the nine sectors prioritized by the Government of South Sudan for the NAP process. This section is based on a thorough review of existing sources and consultations with sectoral stakeholders. Currently there are virtually no sector-specific assessments of climate impacts, vulnerabilities, or risks for South Sudan. This is a significant constraint on adaptation planning for the country. A detailed sectoral vulnerability and risk assessments is planned to be conducted from 2020-2022.

4.5.1 Agriculture, livestock and fisheries

Of all the sectors that are prioritized in South Sudan's NAP process, the agriculture sector is the most critical for economic and social development, while simultaneously being the most vulnerable to climate

change. The agriculture sector is key to the future of the country for several reasons. Given that most people depend on livestock and crops for survival, a healthy and resilient agriculture sector is critical for long-term peace and development. Therefore, incorporating climate change considerations into agriculture sector planning and investment indirectly contributes to peace and reconciliation in South Sudan. The agriculture sector also has tremendous potential for improved productivity; the country's fertile soil and abundant water resources allow for scaling up production. South Sudan was in fact once a net exporter of food thanks to these natural blessings. However, due to years of conflict, the country now imports as much as 50 percent of its food from Kenya and Uganda at an estimated annual cost in the range of \$200-300 million (UNEP, 2018).

Currently, productivity in the agriculture sector is extremely low. Major challenges include lack of inputs, poor land management leading to salinization, runoff, erosion and loss of fertility, absence of extension services and an absence of meteorological information. Moreover, despite the abundance of surface and (predicted) groundwater resources, low water availability is the biggest challenge for improving agricultural productivity, as most farmers are dependent on seasonal rains (Qureshi et al., 2018). Nevertheless, the government understands agriculture as a sector for strategic growth over the medium- to long-term and is proactively engaging investors to develop industrial farming.

The NAP process is important for the agriculture sector for two main reasons:

1. To identify current and future climate vulnerabilities and to take proactive measures to overcome them through investment projects, regulatory incentives, improved planning and climate-smart outreach and extension services.
2. To understand the impact that climate change can have on agriculture investments themselves, as well as the development trajectory of the agriculture sector and to take measures to climate proof and increase the resilience of all investments and to avoid maladaptation.

4.5.1.a Crop agriculture: A significant source of vulnerability to crop agriculture stems from the fact that it is mainly rain-fed and as rainfall becomes increasingly unpredictable and variable, it will have



increasing impacts on productivity and consequently, the livelihoods of farmers. For example, almost 70 percent of the variability in production of grain and cereal in South Sudan is due to variable rainfall. Sorghum, the most important crop in South Sudan (70 percent of cultivated area), is particularly vulnerable and recent research suggests that climate change may result in reductions of sorghum yields by 5-25 percent between now and 2050 (GoNMFA, 2018). Maize (27 percent of cultivated area) is also sensitive to variable rainfall patterns, particularly in dry periods with increased temperatures, while sorghum and millet are more resilient to projected climate changes (USAID, 2019).

Current and expected impacts on crop agriculture include:

- Increased evapotranspiration in plants and reduction of soil moisture, increasing the amount of water crops will need. At the same time, reduced rainfall in combination with increasing temperatures could make reliance on rain-fed agriculture no longer feasible in many parts of the country.
- Increased rainfall variability affecting the onset and length of the rainy season, have led to delayed planting and earlier harvesting, leading to a shortened growing season and reduced yields and/or crop failure. Seasonal patterns have become erratic and are expected to worsen in the future.
- Increased soil degradation due to wildfires and extreme meteorological conditions contributes to declining agricultural yields and diminution of long-term sustainability.
- Increased temperatures have biophysical impacts on many economically and nutritionally important plant species. Crops such as wheat and sorghum and maize reach their thermal maximum temperatures, thus producing lower yields.

4.5.1.b Livestock: South Sudan has among the largest livestock populations in Africa and livestock have a high cultural value in the country. This contributes to potential vulnerability as climate change threatens livestock and the pastoralist communities that depend on them due to the loss of pasture lands and reduced access to water resources. There is also a potential nexus between climate change impacts on livestock health and numbers and an increase in

intergroup strife, as conflict between different pastoralist communities seems to be exacerbated in times of drought and flooding.

The baseline conditions for animal husbandry create a development deficit that also contributes to climate vulnerabilities. Livestock is characterized by low calving percentages at 30 percent, high death rates for young stock (ranging from 15-40 percent) and adult death rates ranging from 5-10 percent per annum. It is likely that livestock will be further stressed, especially during critical reproductive and developmental life cycle phases, by the increased temperatures brought about by climate change, as well as an uptick in cattle diseases. The positive side to this is that general investments in improved animal husbandry should contribute to climate resilience, but additional measures are needed to address specific vulnerabilities.

Observed and expected impacts on livestock include:

- Increased potential for pest and disease outbreaks among crops and livestock due to changing temperature and precipitation considerations.
- Delay or shortening of the rainy season causing crop failure or reducing water resources, leading to decreased livestock health. At the same time, increased flooding due to more extreme rainfall events contributes to the loss of grazing areas for pastoralists, whereas more frequent and extended droughts lead to reduced access to water for livestock.
- The combination of drought and high temperatures contributes to wildfires that destroy grazing and agriculture habitats.
- It is expected that all climate change related impacts could intensify local conflicts over land use and resources between and amongst pastoralists and farmers.

4.5.1.c Fisheries: South Sudan's rivers, ponds and wetlands support mainly subsistence and artisanal activities and are important sources of protein for many South Sudanese. Approximately 17.3 percent of the population directly depends on fisheries (Government of South Sudan and UNEP, 2018). Commercial fishing is relatively small scale and Improvement of fisheries and the commercial sector is explicitly referred to as a priority in Vision 2040. It is estimated

that fish production suffers post-harvest losses of up to 60 percent due to the lack of cold storage and refrigerated transport (FAO, 2014) and poor roads limit the delivery of fish to markets further away from the Nile River. There is also significant potential for aquaculture development in some parts of the country and some development partner initiatives have focused on building village aquaculture ponds. For these initiatives to be successful, institutional capacity within the government needs to scale up.

Typical impacts of climate change on fisheries include:

- Reduced fish populations and aquatic diversity owing to reduced river flow and drying of wetlands
- Reduced aquatic diversity owing to increased water temperatures
- Decreased access to fishing sites during increased flooding
- Reduced rainfall could lead to the disappearance of some economically and nutritionally important migratory fish species

For example, according to consultations conducted for the Initial National Communication, fishermen in Nyamlel who fish on the Lol River reported that five of the 15 known fish species had disappeared from the river and the average size of the fish catch had also decreased.

4.5.2 Disaster risk reduction

Given its baseline environmental, political and economic conditions, South Sudan is already vulnerable to a wide range of disasters and natural hazards. These include drought and flooding. It is expected that climate change will exacerbate their intensity, frequency and duration. South Sudan declared its intention to implement the Sendai Framework for disaster risk reduction in the East African region along with Burundi, Kenya, Rwanda, Uganda and Tanzania on 31 May 2017. The country then began developing a disaster risk management policy to prevent and prepare for natural hazards. In the short-term, it will be important for the country to ensure coordination between climate change adaptation efforts and those aimed at reducing and managing disaster risks.

4.5.3 Environment, ecosystems and biodiversity conservation

Since the 1970s, forests in South Sudan have experienced pressure from degradation, uncontrolled fires, uncontrolled grazing and overharvesting. It is estimated that between 1973 and 2006 on average South Sudan lost 2 percent of its forests per year (MoFP, 2018b).

Additionally, prolonged periods of war have promoted poaching and endangering of wildlife and wildlife managers. During periods of armed conflict, civilian communities and combatants alike fed on wildlife and other natural resources for survival which in several areas resulted in uncontrolled hunting and over-exploitation during the extended periods of war. Combatants on all sides left anti-personnel and land mines and other unexploded ordnance in some of South Sudan's protected areas. This presents a hindrance for rehabilitation, research, tourism and other wildlife management activities. The war years also led to a general decline in the capacity of management and conservation personnel.

Though conservation management, South Sudan is recovering but there is still a long way to go. Currently conservation efforts are a low priority and so resources are lacking to implement a comprehensive program of biodiversity conservation. Additionally, there are unclear delineations of authority and responsibility with respect to forest governance between the states and the central government (MoFP, 2018b).

Future efforts to improve capacity and strengthen institutional capacities for ecosystem restoration and biodiversity conservation will create an important entry point for incorporating climate change considerations and for introducing, piloting and upscaling ecosystem-based adaptation (EbA). As noted in the guiding principles, the NAP process will prioritize EbA and recognize that ecosystems and biodiversity are crucial resources for resilience building and climate change adaptation. In this way, significant co-benefits between these two areas will be realized.

Potential impacts of climate change on ecosystems and biodiversity include:

- Increased evapotranspiration, combined with longer dry periods, which will lead to shrinking



wetlands, reducing their ability to provide critical ecosystem services

- Increased competition among users of non-timber forest products and other resources
- Reduction of habitats and spawning areas for fish in rivers
- Reduced food and fodder availability for wildlife
- Reduced forest density and diversity due to desertification. A hotter, drier climate with intermittent droughts may see a southward shift in the Sahel, leading to declines in tree density and tree species, limited growth and increased incidence of wildlife.
- Increased incidence of wildfires due to higher temperatures and changes to ecosystem composition that are more conducive to burning
- Combined with changing rainfall patterns, desertification may increase, particularly in the north and southeast of South Sudan and the Sahel shifting southward, leading to changing habitats.
- Changes cyclic and seasonal natural phenomena (phenological changes), including flowering and growing cycles, especially in critical habitats such as the Sudd wetland

USAID's Climate Vulnerability Profile for South Sudan (2019) provides an analysis of the Sudd, one of the largest freshwater ecosystems in the world, which is also the largest Ramsar Wetland of International Importance in the world. The Sudd is made up of channels and lagoons spread out across a shallow depression fed by the White Nile, rainfall and runoff from the surrounding catchment. It is part of the Jonglei Plains, which is a much larger ecosystem forming the largest area of intact savannah in Africa. The Sudd is being affected by changing temperature and hydrological conditions and so many of the impacts listed above have been observed or are expected to be observed in the Sudd.

In addition to the impacts on the ecosystem itself, there are indirect impacts on people. For example, people living in the area already suffer from poor access to water for household consumption and sanitation. These difficulties are exacerbated by the ongoing changes in the Sudd. Additionally, it has been suggested that the changing physical parameters may be conducive to increasing instances of malaria.

4.5.4 Energy

The energy sector is one of the most important for supporting the social and economic development of the country and for improving stability. Currently less than 1 percent of the population of South Sudan has access to on-the-grid electricity (UNEP, 2018). Currently, households in South Sudan rely predominantly on biomass to meet their energy needs, burning charcoal, grass, wood, cow dung and agricultural residues. These inefficient sources have well-documented health and environmental impacts and are not sustainable sources of energy for a growing population.

The lack of reliable energy is not only a constraint on the well-being and resilience of the South Sudanese population, but it is also a major obstacle to economic development and the growth of a thriving private sector, as more than 70 percent of businesses in the country rely on expensive diesel-powered generators to operate. When grid electricity is available to consumers, they must pay some of the highest electricity rates in the world.

Because the country is largely rural, the scattered population presents challenges for infrastructure design and service provision for electricity, but also opportunities to introduce new technologies for microgrids and distributed energy generation. Current facilities for transmitting electricity are highly inadequate and the infrastructure that exists is aging. There is a general lack of spare parts and facilities are inadequately maintained.

To address these issues, significant investments will need to be made in energy production over the short-, medium- and long-term. Much of this investment will be aimed at exploiting renewable energy resources, including South Sudan's abundant hydropower potential (e.g., the planned 1,080 MW Grand Fula hydropower project). However, investments in hydropower are potentially vulnerable to the impacts for climate change, including increasing erratic rainfall regimes that can reduce generating capacity when there is not enough rainfall and increase the siltation rate in hydropower station reservoirs. This decreases the lifespan of dams, or significantly increases maintenance costs. Additionally, increasing temperatures decrease the efficiency of power generation.

With respect to water availability for power generation, there is still a significant amount of uncertainty as to the impacts of climate change on aridity in the major river basins of Africa (Sridharan et al., 2019). In the face of this uncertainty, investment planning for large hydropower plants in the Nile Basin is often conducted under the assumption that future precipitation patterns will resemble historical trends. In many cases, studies for expanding energy systems are conducted in isolation from other water-reliant systems, such as agriculture, industry and domestic usage, all of which compete with the energy sector for the same resources (Ibid 2019). Therefore, there is a need to examine energy and water use together to assess electricity generation needs for the future in the context of dynamic processes (including climate change, urbanization and expansion of the agriculture sector). This context will continue to shape demand for water resources in the future.

Potential climate change related impacts relevant to the energy sector include:

- Continued deforestation for building materials and household use will increase the risk of drought, soil erosion and landslides.
- Variations in water availability due to climate change could affect the viability and long-term performance of investments in the electricity sector.
- Large investments in hydropower generation capacity that do not take into consideration future scenarios for water availability and stream flow risk leading to maladaptive outcomes, including an increase in conflicts over water resources between different sectors and stakeholders. In addition, there could be supply interruptions or substantial fluctuations in electricity costs, which will hamper social and economic development processes.

4.5.5 Human settlements

The extent of urbanization in South Sudan is currently much lower than the African average. However, the rate of urbanisation is increasing and it has been estimated that the percentage of the population living in rural areas will decline from 74 percent in 2020 to 34 percent by 2050 (MoEF, 2018a). Much of this is due to very high birth rates and the return of internally displaced people (IDPs) and the migration of returnees from neighbouring countries. This means that South Sudan's cities will need to plan for

a population influx. Unplanned growth in cities is a major contributor to climate change vulnerability.

At the same time, South Sudan's majority rural population faces several climate-related challenges. Many of these challenges are related to WASH. The provision of adequate sanitation and waste management facilities and services are significant challenges across the country. There are inadequate sewage systems. This means, liquid waste, grey water and sludge from kitchens, laundries, toilets and bathrooms generally flow untreated onto open ground or spaces. There is also widespread defecation in open spaces, bushes and backyards. Investments in sanitation are increasing and it is a priority for the government, but delivery of sanitation services lags population growth.

Investments in sanitation should consider the physical processes and impacts of climate change. Sewage systems are flooded with increasing frequency due to an upsurge in extreme rainfall events. This can lead to a variety of health issues and the contamination of water sources and the local environment. New investments in sanitation should be engineered in consideration of future rainfall projections and should be built so that they can be upgraded if future climate conditions require.

Solid and household waste management is also an issue. Only a small percentage of waste is collected and disposed of properly. Much of the balance is illegally dumped along riverbanks and stream beds or being burned in the open on roadsides and vacant spaces. These haphazard patterns of disposal can interact with increasingly frequent floods to contaminate watersheds and aquatic ecosystems. Increased rainfall and flooding can temporarily elevate the water table, which can be contaminated by unmanaged waste disposal sites.

Potential impacts of climate change on human settlements include:

- Increased potential for migration from rural to urban areas.
- Unplanned land conversion can compound climate change stressors and degrade ecosystems that provide important services. For example, the loss of green spaces (e.g., parks and public recreational spaces) due to poor urban



planning can exacerbate the urban heat island effect.²⁰

4.5.6 Industry, infrastructure and transportation

The infrastructure and transportation sectors are key to the economic and social development of South Sudan. The Initial National Communication to the UNFCCC notes, “the development of an efficient, effective and climate-resilient transport sector is [...] crucial for South Sudan in order to lower its overall costs of doing business and to increase its competitiveness”(9). Currently, there is no reliable road, rail, air, or water transport infrastructure in the country, and most roads that lead out of Juba are gravel. As a result, existing infrastructure is vulnerable to the impacts of climate change, especially heavy rain and flooding. Poorly developed and maintained infrastructure also leaves the population more vulnerable to disasters. Without adaptation, by directly impacting infrastructure, climate change will indirectly affect trade by disrupting markets upon which rural households are highly dependent.

Impacts include:

- Damage/destruction to infrastructure due to extreme events, especially flooding
- Increased potential for damage to infrastructure from extreme temperatures
- Flooding and landslide damage to transport infrastructure

4.5.7 Tourism and recreation

South Sudan has a wealth of natural wonders and cultural diversity, which can serve as the foundation to develop a vibrant tourism sector. Supporting the development of the tourism sector will help to diversify the economy away from overdependence on petroleum products. It will also create income and livelihood diversification opportunities for local communities.

The Boma-Jonglei plain hosts one of the world’s greatest seasonal mammal migrations, with 1.2 million white-eared kob, Mongalla gazelle, and tiang

rivaling the famous migration of the Serengeti between Kenya and Tanzania. Additionally, the Sudd wetlands is home to a large variety of rare and endangered bird species. South Sudan is also accessible to the European market via large hubs in Dubai, Addis Ababa and Nairobi. Thus, there is significant potential to leverage the country’s biodiversity and cultural assets to grow the tourism sector, especially as the 2018 peace agreement takes hold and the country continues to stabilize. However, since much of South Sudan’s growth potential in this sector is tied to nature-based tourism it is indirectly vulnerable to climate change as disruptions to ecosystems and biodiversity potentially diminish the drawing power of these resources.

Climate change is viewed as a major challenge to tourism. The Davos Declaration on Climate Change and Tourism emphasized that climate change, “must be considered the greatest challenge to the sustainability of tourism in the 21st century” (Agyeman 2019). South Sudan’s NAP process considers how climate change may negatively impact the emergence of the tourism sector in the country, and how the development of the tourism sector can be stimulated in such a way that it actively contributes to adaptive capacity and resilience at all levels, especially among local communities.

Potential negative consequences of climate change affecting tourism fall into two general categories. The first is through impacts on ecosystems and biodiversity, such as degraded landscapes, loss of endemism, disrupted migration, and other impacts, which reduce the overall attractiveness as a nature-based tourism destination. Studies conducted as part of programs to increase the resilience and adaptive capacity of environment and biodiversity sector (see section 4.5.3) will also benefit the tourism sector. However, additional work is needed to incorporate the results of these studies into tourism development and promotional strategies, and to develop approaches to tourism that anticipate these changes (e.g., climate-smart tourism development). The second category of negative consequences would be driven by climate change impacts on rural communities, which could lead to continued

20 The heat island effect refers to built up areas that are hotter than nearby rural areas. This is primarily driven by the conversion of land cover from surfaces that reflect more of the sun’s energy (e.g., trees) to those that absorb more energy and re-emit it as heat (e.g., streets, buildings). The annual mean air temperature of a city with 1 million people can be 1-3°C warmer than its surroundings. In the evening, this difference can be as high as 12°C. Heat islands affect communities by increasing health risks, increasing energy demand and air conditioning costs, and increasing air pollution and greenhouse gas emissions.

resource-based conflicts, thereby diminishing the potential for cultural tourism throughout the country.

While addressing these vulnerabilities, the NAP process also will support high-value, low-volume tourism as part of a broader portfolio of adaptation strategies. Examples from elsewhere on the African continent indicate that ecotourism around protected areas has potential to provide employment, revenue generation, livelihood diversification, sociocultural revitalization, and entrepreneurial opportunities, thereby reducing rural vulnerability to climate change.

To optimize these opportunities, the NAP process will support establishing enabling conditions for the growth of climate-smart nature-based and cultural tourism. This will include new/revised regulations to incentivize and de-risk tourism investments, capacity building and other support for community-based ecotourism (e.g., tour guiding, interpretation, cooking, hygiene, facility maintenance and cultural presentation).

Stimulating low-impact ecotourism as an alternative to larger-scale tourism will reduce the impacts on the natural environment (non-climate stressors), which will increase the resilience of these systems in the face of climate change. It is expected that this approach will also lead to scaled-up financing from international conservation agencies, who are eager to support biodiversity conservation and climate-smart resource stewardship, but currently have no entry points in South Sudan. Overall, the development of ecotourism will help rural communities and households diversify livelihoods away from a singular dependence on climate sensitive activities (e.g., subsistence farming and pastoralism).

Related to these points, South Sudan's Diagnostic Trade Integration Study, released in 2016, recommends delegating the right to grant concessions for services in national parks to legally constituted community organizations so they can lease these concessions to experienced tourism operators. Through the NAP process, the government will ensure that the enabling regulations governing concessions incorporates climate change considerations, and that a framework is in place to encourage interna-

tional operators to incorporate best practices for climate-smart tourism into their operations.

4.5.8 Health

Climate change has direct and indirect impacts on health and called, "the greatest threat to global health in the 21st century" (WHO, ND). Indirect impacts include stunting and malnutrition due to decreased food security and injuries and mental health issues resulting from increased disasters. These indirect issues are discussed in the relevant sectoral sections in this document. However, climate change also brings direct impacts on human health and have implications for the delivery of healthcare and therefore should be taken into consideration in health sector planning processes. For this reason, South Sudan has identified the health sector as a priority sector for its response to climate change. This is reflected by the inclusion of the health sector in the country's NDC and now the NAP.

Currently South Sudan has no analyses of the potential health impacts of climate change at the national or subnational levels. However, literature describes the relationship between changing climatic conditions and deteriorating health indicators. Overall, between 2030 and 2050, WHO expects climate change to cause an additional 250,000 deaths globally per year from malnutrition, malaria, diarrhoea and heat stress.²¹

WHO notes several general health impacts from climate change:²²

- Extreme heat contributes to deaths from cardiovascular and respiratory disease, especially among elderly people. South Sudan has been one of the most rapidly warming locations on the planet over the past 30 years. The rate of warming in the country is 2.5 times greater than the global average change in temperature. This means that these health impacts are likely to become increasingly significant in the future, especially when combined with South Sudan's reliance on subsistence agriculture and pastoralism. There are high levels of exposure due to the prevalence of outdoor activities.

21 <https://www.afro.who.int/health-topics/climate-change>

22 <https://www.who.int/news-room/fact-sheets/detail/climate-change-and-health>



- Floods increase water-borne diseases and create breeding grounds for disease carrying insects such as mosquitoes.
- Changes in climate are likely to lengthen the transmission seasons of important vector-borne diseases and to alter their geographic range.
- Changes in climate can cause mental health issues, especially among youth, those dependent on agriculture, and internally displaced people.

Increasing temperatures and heat waves also affect the amount of time that people can safely spend outdoors and increases dehydration and heat exhaustion. These impacts fall disproportionately on women, children and the elderly.

It is well known that climate change can cause environmental pollution that threatens human health. As Nhamo and Muchuru (2019) explain, “Accumulation of harmful chemicals in human bodies through air, food and water may lead to diseases such as cardiovascular diseases, cancers, and diabetes.” Areas with weak health infrastructure will be the least able to cope without assistance to prepare and respond.

Investments in improving the health infrastructure and service delivery in South Sudan will have adaptation co-benefits. However, as these investments are made, the Government of South Sudan should be sure to incorporate climate change observations and projections into planning processes. This includes developing context indicators and improving monitoring to support improved Early Warning Systems. Chapter 6 includes several suggested actions for building resilience in the health sector in South Sudan. These suggestions are based on a review of best practices from other Sub-Saharan Africa countries facing similar circumstances and challenges.

4.5.9 Water Resources

South Sudan’s water resources are unevenly distributed both spatially and temporally, given that water quantities can vary substantially between years depending on periodic flooding and drought events. Demand for water is low given the country’s small population, lack of irrigation infrastructure for agriculture, and lack of industrial development, but is expected to increase in the future in step with rapid population growth and economic development.

Increased pollution of water sources is also a growing stressor. Much of this stems from the lack of municipal wastewater and sewage infrastructure in urban areas, and industrial effluent running directly into water sources (Jubek et al., 2019). Overapplication of fertilizers and pesticides, as well as pollution from the oil industry are also threats to surface water and wetlands, particularly in Unity and Upper Nile states.

There is limited information on the hydrogeologic characteristics of the country’s aquifers and potential of South Sudan’s groundwater resources. It is believed that they are currently underutilized and can support a higher level of abstraction.

Changing rainfall patterns associated with anthropogenic climate change have already impacted surface water resources in South Sudan. In 2016, MoFP reported that over the preceding two decades, water flow in several perennial rivers along the border with the Central African Republic had become seasonal. Climate change will continue to affect water availability throughout the country, as the Sobat and Bahr el Ghazal river catchments volume varies significantly with the seasons. Research on the Equatorial lakes and Bahr El Ghazal sub-basins suggests that an increase in temperature of 2°C could cause the natural flow of the river to fall to 50 percent of the current average (GoNMFA, 2018).

Climate change impacts on water resources and follow-on effects may include:

- Droughts leading to potential drops in the water table, drier seasonal rivers and reduction of wetland size. Decreased recharge rates would have manifold impacts on the more than 60 percent of the population that relies on wells and boreholes to access water.
- Increased potential for conflict over limited water resources.
- Decreased surface water quality, especially during droughts and floods. Reduced rainfall and inflows can lead to water stagnating into ponds due to prolonged dry seasons. Decreasing quality of surface water levels and quality due to climate change would heavily impact the one-third of the population that relies on surface water for domestic use.
- Rivers dry up or change from perennial to seasonal flows due to higher evaporation from

increased temperatures. Decreased water flows can lead to increased sedimentation of watercourses and more congested irrigation channels.

- Reduced access to water for drinking and sanitation.

4.6 GENERAL RECOMMENDATIONS FOR SECTORS

This section provides an overview of key issues identified that should be prioritized over the short-term (2020-2022) to strengthen South Sudan's NAP process and overall response to climate change. These priorities may be addressed through dedicated NAP support facilities (e.g., GCF NAP Readiness support), or through direct technical assistance from bi- and multilateral development partners.

Recommendations:

- Develop standard methodologies based on international and industry best practice.
- Conduct sectoral vulnerability and risk assessments.
- Improve sector specific climate services by investing in improved climate information and delivery of information at sector-specific levels to improve decision-making and understanding of the impacts of climate change and variability.
- Coordinate with WMO to establish a plan to bring South Sudan's hydrometeorological monitoring and information services in line with standards and capacities recommended by the WMO Integrated Global Observing System (WIGOS) and Climate Data Management Systems Specifications.
- Develop a strategic plan to rebuild the hydrometeorological monitoring network and strengthen the scientific abilities of the meteorological services.

- Coordinate with regional and international research institutes and development partners to develop a set of downscaled future projections based on the most recent Coupled Model Inter-comparison Project (CMIP) products.
- Develop guidelines to incorporate climate change considerations and climate proofing practices into sectoral planning and large, sustainable investments.
- Improve agricultural extension services to raise awareness among farmers, fishers and pastoralists about projected climate change impacts and climate resilient livelihood practices.
- Ensure that climate change considerations are incorporated into agriculture and irrigation development strategies.
- Identify pathways to align the NAP and climate change adaptation planning with disaster management and disaster risk reduction planning.
- Identify opportunities to introduce ecosystem-based adaptation and build awareness and the requisite capacities to implement EbA measures. Ensure that EbA is incorporated into land, resource and watershed management strategies.
- Conduct research on how changing climate conditions are affecting the Sudd wetland and incorporate these findings into relevant management plans.
- Ensure that climate change projections and potential hydrological scenarios are incorporated into planning for large hydropower investments.

These recommendations are included in the matrix of short-term priority programs included in Chapter 6.



Chapter 5: National Adaptation Plan Alignment with Existing Strategic, Legal and Regulatory Frameworks



5.1 INTRODUCTION

This chapter describes the regulatory and institutional frameworks and arrangements that are relevant to the formulation and implementation of the NAP. The chapter opens with the steps South Sudan has taken in developing its response to climate change, as well as additional strategies, plans and policies that are directly and indirectly related to formulating a comprehensive NAP. The chapter provides brief information on the National Adaptation Programme of Action, the Initial National Communication to the UNFCCC, and the Nationally Determined Contribution to the Paris Agreement. The chapter also describes non-climate change policies and plans of relevance to the NAP process and entry points so that the NAP process can be aligned with existing policies and processes.

5.2 EXISTING PROGRESS

Since gaining its independence, South Sudan has joined the community of nations in prioritizing maintenance of the natural environment. The country has recognized that climate change poses one of the greatest threats to humanity. This is evidenced by South Sudan's embrace of international conventions and treaties, as well as the country's commitment to implement these international obligations. The present NAP builds on this ongoing commitment, and represents the most recent policy statement in a trajectory that includes the following milestones:

- South Sudan became a party to the Rio Conventions (UNFCCC, UN Convention on Biological Diversity, UN Convention to Combat Desertification) on 18 May 2014
- Signed the Paris Agreement on climate change in April 2016
- Published the National Adaptation Programme of Actions (NAPA) in 2016
- South Sudan's Intended Nationally Determined Contribution (INDC), was submitted to the UN Framework Convention on Climate Change

(UNFCCC) in November 2015 and revised in 2019-2020²³

- South Sudan joined the GEF in April 2013 and was to engage in working on GEF enabling activities (to fully qualify for funding from GEF), including a NAPA, National Biodiversity Strategy and Action Plan (NBSAP) and country self-assessment
- South Sudan is a partner to Reducing Emissions from Deforestation and Forests Degradation (REDD) and completed a REDD+ Country Needs Assessment in 2017

5.3 CLIMATE CHANGE PLANS AND POLICIES

This section describes existing and pipeline plans, policies and strategies related to climate to ensure that the NAP is aligned with South Sudan's overall response to climate change.

5.3.1 *National Adaptation Programme of Action (NAPA 2016):*

South Sudan developed its NAPA in 2016 through a consultative multi-stakeholder process that involved five thematic working groups. The objective of the NAPA is, "to communicate to the international community priority activities that will address South Sudan's urgent and immediate needs for adapting to the adverse impacts of climate change" (21). Specifically, the NAPA aimed to identify a list of potential adaptation activities, formulate priority adaptation project profiles, build capacity for adapting to longer-term climate change and variability, and raise public awareness on the urgency to adapt to the adverse effects of climate change.

The NAPA identifies five Priority Adaptation Projects across five thematic areas:

1. **Environment:** Reforestation and agroforestry to reduce vulnerability to droughts and floods

23 At the time of writing this NAP, the revised NDC was awaiting government approval.



2. **Water resources:** Sustainable management and conservation of wetlands in South Sudan
3. **Agriculture:** Climate-smart agricultural techniques to improve livelihoods and food security under changing climate patterns
4. **Disaster risk reduction:** Improved drought and flood early warning systems in South Sudan through a fortified hydro-meteorological monitoring network
5. **Policy and institutional framework:** Stronger institutional capacity of the Government of South Sudan to integrate climate change into national policies and planning processes

5.3.2 Second Nationally Determined Contribution (to the Paris Agreement; SNDC 2021)

South Sudan formulated its first NDC in 2015, and submitted its second NDC in 2021. The SNDC identified 14 sectors²⁴ and includes adaptation and mitigation strategies for each. The proposed sectoral strategies, if implemented, will move South Sudan onto an ambitious decarbonization pathway compatible with the Paris Agreement's goal of holding global temperature rise to well below 2C, with efforts to limit temperature rise to 1.5C above preindustrial levels. The strategies also promote climate resilient development.

The SNDC estimates that South Sudan will require a total of USD100 billion for the implementation of all NDC interventions and strategies over a period of 10 years. Of this, international investments of approximately USD93 billion will be required, while USD6.5-7 billion will be financed domestically by the Government of South Sudan. These are preliminary estimates and full-scale assessment of international finance needs must still be carried out; this will be a key priority of the NAP process.

As the NAP process evolves over the next five years, South Sudan's NDC commitments to climate change adaptation will be integrated into NAP planning, implementation, monitoring and learning, and financing. In South Sudan the NAP process serves to provide a comprehensive and overarching framework for the country's adaptation response to climate change. Future NDC adaptation commitments will be part of the overall NAP structure.

Short-term actions in the NAP will address a range of issues affecting the successful implementation of the country's NDC commitments. For example, a current weakness is that priority sectors lack NDC implementation plans that prioritize concrete adaptation (and mitigation) measures to achieve the NDC support goals. Many aspects of the NAP process, including sectoral vulnerability assessments, capacity building for sectoral officials, and support for strengthened mainstreaming of climate change into sectoral regulatory and planning frameworks and budgets will help to overcome this barrier, enabling South Sudan to achieve and scale up the ambition of its NDCs.

5.3.3 Initial National Communication to the UNFCCC (INC, 2018)

South Sudan's Ministry of Environment and Forestry in conjunction with UNEP and support from the Global Environment Facility (GEF) developed the INC. The INC "represents the commitment of the government and its people to address global warming and climate change, along with the strong belief that all countries must make an effort to greatly reduce greenhouse gas (GHG) emissions in order to avoid the dangerous and potentially catastrophic impacts of climate change" (iii). The INC identifies gaps and constraints relevant to the country's response to climate change, and those that related to adaptation have been incorporated into this initial NAP, as have any recommended actions for overcoming the gaps. For example, the INC notes that the main challenge in compiling the document was that data was insufficient and inaccurate for some sectors. As noted in Chapters 4 and 6, the NAP prescribes a variety of actions over the short- and medium-term to address this issue.

The INC further recommends that systems and structures, including international climate policy obligations and relevant policy, legal and institutional frameworks be established to ensure that adaptation measures are suitably coordinated.

Many of the short-term (2020-2022) recommendations included in this initial NAP will fulfil INC recommendations. Specific priorities and how they relate to the NAP process include:

24 i) Agriculture, livestock, and fisheries; ii) Infrastructure (construction and buildings); iii) Forestry; iv) Biodiversity, ecosystems and sustainable wetland management; v) electricity; vi) water; vii) waste; viii) Tourism and recreation; ix) Mining and quarrying; x) Transport; xi) Industry; xii) Petroleum, chemicals, and non-metallic mineral products; xiii) Health; xiv) Disaster risk management.

- **Formulate and implement climate change adaptation policies, legislation, strategies and plans:** The formulation of the initial NAP and initiation of the NAP process responds directly to this priority.
- **Establish clear mechanisms to address climate change adaptation in sectoral policies and regulations:** The initial NAP and the NAP process will establish sector-based technical working groups and will provide direct support to line agencies at the national level to mainstream climate change into sectoral policies and regulation.
- **Build the capacity of relevant institutions to work on climate change issues:** The actions prescribed for the initial NAP over the short-term (2020-2022) aim to build institutional capacity among national and subnational government agencies and community-based organizations (CBOs) at all levels.
- **Mainstream traditional adaptation measures and coping strategies in national planning:** The NAP process recognizes the importance of traditional knowledge and customary practices in improving resilience and adaptive capacity at the community level as one of its guiding principles. The initial NAP prescribes actions to catalyse engagement with traditional systems and supports creating formal mechanisms and roles for traditional leaders and systems.
- **Mobilize international climate funding for adaptation in South Sudan:** A significant part of the NAP process over the short-term (2020-2022) is to establish a financing plan to support priority actions identified through the NAP process. The initial NAP provides the essential evidence base and background information to inform the design of project proposals for international financiers (e.g., GCF, Adaptation Fund, etc.).
- **Harness the support of NGOs and civil society in adaptation work:** The initial NAP and the NAP process include actions to engage with NGOs and civil society and supports their full engagement in the NAP process. The initial NAP consolidates existing adaptation priorities and identifies additional priorities, creating a centralized database of adaptation needs. This aims to improve coordination between NGOs, donors and development partners. The initial NAP also encourages these stakeholders to work with appropriate lead agencies and MoFP

to address the priorities that have been identified.

5.4 OTHER DOCUMENTS AND POLICIES

This initial NAP and the subsequent NAP process are also aligned with other relevant strategies and policies, beginning with South Sudan's economic development policies and trajectory, as well as the strategic plans of the priority sector agencies. The NAP is also aligned with and reinforces the goals of international frameworks, including the Sendai Framework for Disaster Risk Reduction 2015-2030 and the Agenda for Sustainable Development (Agenda 2030), among others. Lastly, the initial NAP has been developed in consideration of policies for cross-cutting issues, including the *National Gender Policy*.

5.4.1 South Sudan Vision 2040: Toward Freedom, Equality, Justice, Peace and Prosperity for All (2011):

This document provides the long-term development vision for South Sudan and establishes the political, economic and social framework for development in the country. It is intended to be implemented through successive 5-year plans. Vision 2020 does not explicitly mention climate change, but that climate change could pose a threat to the achievement of some objectives under the strategy's seven pillars. The NAP process therefore serves to safeguard the progress envisaged by Vision 2040 against the threat of climate change.

5.4.2 National Development Strategy (NDS) 2018-2021

This is the second implementation plan for Vision 2040, following the *South Sudan Development Plan 2011-2013*, which was extended until 2016. As the implementation plan for Vision 2040, the NDS 2018-2021 adopts the seven pillars of Vision 2040. The objective of the NDS 2018-2021 is to "consolidate peace and stabilize the economy", and the three priority missions for the NDS are to establish conditions in which people feel like they can safely go back to their daily business, to stabilize prices for food, currency exchange and wages, and to improve the provision of basic services. Implementation of the NDS 2018-2021 will be primarily through sectoral line ministries. The NDS Secretariat housed in the Ministry of Finance and Planning supports imple-



mentation, collects updated implementation plans from the sectors, and checks them for consistency with the NDS.

The NDS 2018-2021 is operationalized through four clusters: governance, economic, social services and cross-cutting. Each cluster has several priority actions with indicators, a baseline and targets. Though there is no specific reference to climate change in the NDS 2018-2021, there are important entry points for climate change considerations to be mainstreamed into its implementation. This could create a pathway for the next NDS to more effectively mainstream climate change adaptation through the NAP process. These entry points are described in Table 4. As the NAP process evolves, it should be a high priority to identify channels to incorporate climate change considerations more effectively and explicitly into NDS formulation and implementation.

Table 4: NAP entry points in South Sudan's National Development Strategy 2018-2021

Cluster/outcome	Priority Measure	Threat	Opportunity	Entry Points
Governance: Relevant legal frameworks are reviewed, reforms are enacted, passed, assented to and implemented accordingly	Government institutions with updated legal frameworks improves from 50% to 70%	Policy, regulatory and legal frameworks that do not incorporate climate change considerations risk, contributing to economic and social development pathways that increase medium- and long-term vulnerabilities to climate change	As new legal and regulatory frameworks are established it presents a unique opportunity to mainstream climate change considerations into new policies, regulations, and legal frameworks	Review and incorporate best practices from other countries; establish sectoral task forces to oversee mainstreaming; develop awareness raising and capacity building materials for non-government stakeholders
Governance: Refugees and returnees are resettled; reconstruction and recovery services ensured	Percentage of displaced that are repatriated and resettled improves from 10% to 55%	Resettlement and repatriation efforts place people in positions of current or future climate vulnerability, undermining chances of recovering and risking ongoing and iterative crises	Incorporating climate change considerations into resettlement and repatriation will increase medium- and long-term resilience to climate shocks and stressors	Siting decisions for resettlement, vocational training, climate-smart agricultural techniques, climate-resilient building techniques and infrastructure

Cluster/outcome	Priority Measure	Threat	Opportunity	Entry Points
Governance: Institutional and human resources developed, enhanced, and ensured.	Civil servants with capacities required to function optimally improves from 35%-->55%	Without understanding the relevance of climate change for good governance, civil servants will be less likely to incorporate climate change considerations into planning and budgeting	Capacity development for civil servants provides an opportunity to incorporate relevant knowledge of climate change and adaptation and resilience building and improves ownership and buy-in for climate change adaptation	Civil servant training courses; mentoring programs; international exchanges; establishing appropriate information resources; twinning with other agencies
Economic: Economy is increasingly diversified; revenue mobilisation is intensified	Improve the ratio of non-oil GDP	Scaled-up investments in alternative sectors could potentially be maladaptive without considering changing climatic conditions	Incorporating climate change considerations in early stages reveals opportunities for investments in adaptation and resilience that will improve overall economic performance and reduce potential losses from climate change	Conduct sectoral and regional vulnerability assessments; determine value chain vulnerabilities; develop and incorporate future scenarios into planning; private sector outreach and capacity building on climate change; develop financial instruments for de-risking
Economic: Development of economic infrastructure is expedited	Feeder roads rehabilitated or constructed; construction of a major highway; food reserve depots built; number of developed or rehabilitated irrigation schemes; construction of urban water and sanitation facilities	Infrastructure designed without considering changing climate conditions will likely require increased maintenance costs and shorter operational lifespans	Adopting climate proofing regulations and design standards will ensure that infrastructure investments are resilient against future conditions, reducing maintenance and extending operational life. More resilient infrastructure will improve the competitiveness of South Sudan's important economic sectors and will enhance rural economic development.	Research best practices for climate proofing from other countries and regional development banks; incorporate climate proofing design standards into government tenders for infrastructure; develop awareness raising and capacity building for private sector engineering and construction; design, pilot and disseminate low-cost resilient housing designs; develop community guidance on climate-smart irrigation infrastructure and construction techniques



Cluster/outcome	Priority Measure	Threat	Opportunity	Entry Points
<p>Economic: Fast-track the development of legal, regulatory and institutional frameworks</p>	<p>Number of legal frameworks revised and submitted increases from 1% to 25%</p>	<p>Policy, regulatory and legal frameworks that do not incorporate climate change considerations risk contributing to economic and social development pathways that increase medium- and long-term vulnerabilities to climate change</p>	<p>As new legal and regulatory frameworks are established, it presents a unique opportunity to mainstream climate change considerations into new policies, regulations and legal frameworks</p>	<p>Review and incorporate best practices from other countries; establish sectoral task forces to oversee mainstreaming; develop awareness raising and capacity building materials for non-government stakeholders</p>
<p>Social Services: Adequate coverage and inclusive access to quality social services is provided</p>	<p>Access to inclusive and quality services improves from 44% to 60% of the population; percentage of human resources capacitated improves from 13.5% to 27%</p>	<p>Scaled up investments in social services without consideration of potential impacts of climate change can create new climate risks and liabilities, reducing or reversing the return on these investments and increasing vulnerability of at-risk populations</p>	<p>Incorporating climate change considerations into health, education, rural development and other social sector investments will ensure the resilience of these investments and will help to address climate vulnerabilities of at-risk groups, including women, children and internally displaced people</p>	<p>Conduct analyses to determine specific vulnerabilities of women, IDPs, children and other groups and design measures to address these; conduct analyses of climate change impacts on vector-borne disease transmission; develop climate screening procedures for social sector line ministry investments in health, education and social welfare</p>
<p>Social Services: Leadership and policy environment is strengthened</p>	<p>Percentage of national budget allocated to social services increases from 5% to 15%; number of policies promulgated, implemented, monitored and evaluated improves from 75% to 100%</p>	<p>Scaled up investments in social services without consideration of potential impacts of climate change can create new climate risks and liabilities, reducing or reversing the return on these investments and increasing vulnerability of at-risk populations</p>	<p>Incorporating climate change considerations into health, education, rural development and other social sector investments will ensure the resilience of these investments and will help to address climate vulnerabilities of at-risk groups, including women, children and internally displaced people</p>	<p>Conduct analyses to determine specific vulnerabilities of women, IDPs, children, and other groups and design measures to address these; conduct analyses of climate change impacts on vector-borne disease transmission; develop climate screening procedures for social sector line ministry investments in health, education and social welfare</p>

5.4.3 National Biodiversity Strategy and Action Plan 2018-2027 (NBSAP)

The NBSAP recognizes the importance of climate change to biodiversity and conservation, specifically referencing the possibility of impacts from changing rainfall regimes, river flow patterns and the increasing potential for fires, droughts, floods and other threats.

5.4.4 National Environment Policy 2015-2025

As noted in Chapter 2, the National Environmental Policy acknowledges the need for the development of a national strategy for climate change adaptation and mitigation and the formulation of a climate change policy for South Sudan. It also recognizes the need for efforts to lessen community vulnerability to climate variability and change.

5.4.5 National Gender Policy (NGP)

South Sudan National Gender Policy (NGP) 2012, the Strategic Plan 2013–2018 developed in 2013 for the implementation of NGP, and the South Sudan National Action Plan 2015–2020 on UNSCR 1325 with regard to women, peace and security, launched in 2016. The NGP provides for the needs of vulnerable groups such as children, the disabled and the elderly.

5.4.6 Comprehensive Agriculture Master Plan 2015-2040 (CAMP)

The CAMP describes the national priorities, development themes and projects of the Ministry of Agriculture and Food Security along with programs of the Ministry of Environment and Forestry and the

Ministry of Livestock and Fisheries (MAFCRD & MLFI 2015). The CAMP acknowledges the risks posed by climate change to the agricultural sector and the need to mitigate the adverse effects of climate change over the medium- and long-term. However, the CAMP does not include information on specific vulnerabilities. It notes that it is necessary to identify risks, recognize and minimize obstacles to risk management through public and private action.

The short-term actions described in Chapter 6, as well as the sectoral adaptation program for agriculture, livestock and fisheries will help to advance the CAMP, but the NAP and its associated processes and projects should also coordinate closely with the CAMP to ensure that investments made under the CAMP consider changing climate conditions and are resilient to shocks and stressors over the long-term.

5.4.7 Irrigation Development Master Plan 2015-2040 (IDMP)

The IDMP is a comprehensive programmatic approach to address policy, institutional, capacity development and infrastructure issues and requirements of the agriculture sector in relation to water resources across the country without jeopardizing the needs of other sectors or stakeholders (MEDI-WR, 2015). It is a strategic approach to investments in the water sector.

5.4.8 Specific sectoral policy linkages

Additional details about how the NAP process interfaces with specific sectoral strategies and policies can be found in Table 5 below.



Table 5: NAP linkages and relevance to sectoral and cross-cutting policies and strategies

Policy/Strategy Document	Linkage/Relevance to NAP Process	Lead Agency
<p>Transitional Constitution of the Republic of South Sudan, 2011</p>	<p>The Transitional Constitution mandates the Government of South Sudan at all levels to ensure sustainable development as a way of protecting the environment for the benefit of both present and future generations, through sound legislative action and other politics. Articles 41 (1), (2) and (3) offer all South Sudanese communities the right to a clean and healthy environment, stating that every individual is obligated to conserve the environment for the benefit of present and future generations. It also states that every person has the right to have the environment protected through appropriate legislative strategy and other policies that prevent pollution and ecological degradation, promote conservation, safe and sound ecologically sustainable development and use of natural resources while promoting balanced economic and social development to safeguard stability and biodiversity.</p>	<p>The Government of South Sudan</p>
<p>Environmental Protection Bill, 2013 and National Environmental Policy, 2014.</p>	<p>The bill aims to protect South Sudan's environment and promote ecologically sustainable development that improves quality of life while the NEP is the key policy that governs natural resources. It calls for development of a national strategy for climate change adaptation and mitigation; formulation of a climate change policy for South Sudan; and the need to lessen communities' vulnerability to climate change and vulnerability. South Sudan has not yet formulated its climate change policy; nevertheless, adaptation strategies or plans have been incorporated in its development plans</p>	<p>Ministry of Environment and Forestry</p>
<p>National Biodiversity Strategy and Action Plan 2018-2027 (NBSAP), 2018</p>	<p>The NBSAP recognizes climate change as a major threat to biodiversity and environmental sustainability and a challenge for improving management efforts. Climate change is relevant to all seven strategic objectives of the NBSAP, and so work under the NAP process to build resilience in the Environment and Biodiversity Conservation sector will also address many of the priorities identified in the NBSAP. There will be substantial opportunities to build synergies between conservation and climate change adaptation, and so NAP implementation will be well coordinated with NBSAP implementation. Coordination will ensure that climate change is appropriately incorporated into analysis, capacity development and planning processes undertaken under the NBSAP. Actions recommended under the NBSAP also present an important entry point to incorporate ecosystem-adaptation into national planning frameworks. Several priorities consistent with NBSAP priorities have been incorporated into the NAP priorities matrix in Chapter 6.</p>	<p>Ministry of Environment and Forestry</p>
<p>South Sudan Development Plan (SSDP) SSDP 2011-2016 National Development Strategy (NDS)</p>	<p>The SSDP ensures that the government responds to major challenges for development, including climate change. It also mandates the government acceding to and ratifying applicable and beneficial multilateral environmental treaties, conventions and agreements. This mandates the Government of South Sudan under the Ministry of Environment to meet its obligations under the UNFCCC, which it ratified on 18 May 2014. The NDS may support NAP implementation as it aims at consolidating peace, stabilizing the economy and guiding national investment and development actions for three years from 1 July 2018 to 30 June 2021.</p>	<p>Government of South Sudan</p>

Policy/Strategy Document	Linkage/Relevance to NAP Process	Lead Agency
National Policy on Food Security, 2012	The National Policy on Food Security recognizes natural disasters as threats to national food security, including droughts, floods, pests and diseases, attributing the cause of these disasters to climate variability and change. The policy identifies development of drought- and flood-resistant seed varieties as one way to build adaptive capacity.	Ministry of Agriculture and Food Security
Draft (as of 2015) Disaster Risk Management Policy	The (draft) Disaster Risk Management Policy proposes building dikes to prevent floods. Drought resilience is absent from this draft.	Ministry of Humanitarian Affairs and Disaster Management (South Sudan)
National Adaptation Programme of Action (NAPA) 2016.	The NAPA identifies important opportunities for the formulation and implementation of policies on climate change adaptation that are vital for sustainable development in South Sudan	Ministry of Environment and Forestry
Draft Wildlife Bill & Wildlife Conservation and Protected Areas Bill, 2015	The bill emphasizes the need to establish an autonomous policy, strategy and body such as SSWS as proposed by the South Sudan Transitional Constitution. The bill also recognizes the need for the protection of wetlands to ensure these are better managed and protected	Ministry of Wildlife Conservation and Tourism and South Sudan wildlife Services (SSWS)
Petroleum Act of 2012	The Petroleum Act of 2012 provides that an ESIA be undertaken by oil contractors or licensees in compliance with international standards to determine any negative damage on the environment, natural resources, biodiversity and local community livelihoods. This provides a great measure to climate change response.	Ministry of Petroleum
Comprehensive Agricultural Development Master Plan (CAMP), 2015 and Irrigation Development Master Plan (IDMP)	CAMP identifies South Sudan to have limited knowledge of climate change within its agricultural sector and emphasizes the need to ensure effective climate-smart agriculture programming. The CAMP and IDMP identify the negative threat of climate variability, such as erratic rainfall on agriculture and consequently identifies opportunities for managing water.	Ministry of Agriculture, Forestry, Cooperatives and Rural Development (MAFCRD) and Ministry of Animal Resources and Fisheries (MARF)



Policy/Strategy Document	Linkage/Relevance to NAP Process	Lead Agency
The Agriculture Sector Policy Framework 2012-2017	The policy framework acknowledges that climate change is one of the environmental issues that needs to be addressed. It recommends that policy measures are needed to mitigate the adverse effects of climate change in the medium- and long-term. The Agricultural Sector Policy Framework priority objective aims to strengthen measures to mitigate the adverse impacts of climate change in the medium- and long-term on agricultural production. The policy framework also outlined a green agriculture policy, adopting agricultural practices that minimize environmental pollution and encourage agroforestry practices.	Ministry of Agriculture, Forestry, Cooperatives and Rural Development (MAFCRD)
South Sudan Initial National Communication (INC) to the UNFCCC	The INC was formulated to enable South Sudan to fulfil its commitments and obligations to the United Nations Framework Convention on Climate Change. The INC stresses the need to strengthen South Sudan's resilience to changes in climate, extreme weather events and climate variability.	Ministry of Environment and Forestry, Government of South Sudan
The National Agriculture and Livestock Extension Policy (NALEP), 2011	The policy links identify the promotion of conservation agriculture practices and climate change adaptation.	Ministry of Agriculture and Forestry (MAF) and Ministry of Animal Resources and Fisheries (MARF)
South Sudan Energy Policy, 2012	The policy emphasizes the need for climate change mitigation measures in the energy sector, focusing on designing energy strategies such as advanced renewable energy technologies as alternatives to fossil fuels to reduce GHG emissions and provide long-term resilience as adaptation measures do not usually provide durable solutions.	Ministry of Electricity and Dams
South Sudan Water Policy, 2007	The policy lays ground to set up strategies for the development of rural and urban water supply in addition to water resources management.	Ministry of Irrigation and Water Resources
Fisheries Policy Framework, 2006	This policy recognizes the potential for food security and poverty alleviation. The policy acknowledges key constraints and recommends relevant programs of activities to improve food security. The policy aims for increased fish production, income generation, infrastructure development, research and training, and aquaculture development.	Ministry of Animal Resources and Fisheries (MARF)

Chapter 6: **Climate Change Adaptation Priorities**



6.1 INTRODUCTION

This chapter describes climate change adaptation in South Sudan. The first section describes actions to be implemented over the short-term (2020-2022). These actions are divided into three short-term programs, responding to immediate needs that were identified during the formulation of the first NAP and address gaps and barriers of the NAP process. Actions are designed to improve the country's overall climate change adaptation planning capabilities to improve the NAP process.

The second part of the chapter consists of adaptation matrices that correspond to the nine priority sectors of the first NAP:

1. Agriculture livestock and fisheries
2. Disaster risk reduction
3. Energy
4. Environment, ecosystems and biodiversity conservation
5. Health
6. Human settlements
7. Tourism and recreation
8. Industry, infrastructure and transportation
8. Water resources

These matrices describe between 1-4 adaptation programs per sector corresponding to priorities that have been identified in other policy instruments (e.g., NDC, NAPA), or which have been identified during research and consultative processes to formulate the first NAP.

The adaptation priorities described in this chapter represent South Sudan's nationally articulated adaptation priorities and should serve as the basis of all climate change adaptation projects advanced by domestic stakeholders as well as international development partners.

6.2 SHORT-TERM ADAPTATION PROGRAMS

The implementation plan for South Sudan's NAP responds to the LEG Guideline's vision that the NAP,

“encompasses all the arrangements necessary to develop the knowledge to support decision-making and required capacity building to facilitate all actions that are needed for a strategic country-owned adaptation planning process” (LEG Expert Group, 2012:14). Hence the first phase of the NAP works to build a solid foundation for sustained action to address climate change. It consists of actions to strengthen the evidence base for informed decision-making processes as well as strengthening institutional arrangements and human capacities for adaptation planning.

Identified needs have been consolidated into three interlinked short-term programs comprising 57 actions. The implementation programmes address three interrelated supporting systems for the NAP process:

Programme 1: Improved coordination to support climate change adaptation and planning: This programme addresses vertical and horizontal coordination and includes activities to formally establish the institutional arrangements for adaptation planning at all levels. It also includes actions to strengthen the legal mandate for climate change adaptation and to legally empower government stakeholders to mainstream climate change considerations into sectoral planning, budgets and regulatory frameworks. This programme complements the sectoral mainstreaming program described in Chapter 2. The programme also institutionalizes intersectoral committees (CCWG, TWGs, private sector and NGO committees, ICFWG) that steer and implement the NAP. The first program also includes actions to strengthen coordination between development partners.

Programme 2: Improving human and institutional capacities to support NAP process: This programme sets up comprehensive capacity building measures for government staff (including the coordination committees as well as adaptation units embedded in line agencies) and non-government stakeholders so that they can fulfil the responsibilities created in program 1. This programme also includes measures to

strengthen the NAP process overall and to improve implementation. This includes a review of progress on the NAPA, the formulation of GCF ready project concept notes, and the next steps described in Chapter 7 (communications strategy, financing plan, MERL framework).

Programme 3: Data, information and knowledge management systems enhanced to support climate change adaptation planning processes: This programme includes actions to establish the data and information infrastructure and associated protocols and support services that are needed to support evidence-based planning and decision-making. These services will ensure that South Sudan’s NAP is a learning process that is able to incorporate new information on changing climate conditions. This programme also includes activities to build research partnerships, including co-production of knowledge²⁵ arrangements between government agencies and academicians and researchers. This programme also includes activities to develop and implement stan-

darized methodologies for sectoral and community-level climate vulnerability and risk assessments.

It is expected that short-term financial support implementation plan will come from a variety of sources, including the general budget. However, the NAP recognises that as an LDC, the Government of South Sudan has limited financial resources to support adaptation, and that under the UNFCCC, the country is entitled to international financing and technical resources to support its adaptation response. Therefore, the government will identify international sources of funding, including GCF NAP Readiness and general readiness funds to implement the short-term implementation plan.

Several short-term actions have been incorporated into a GCF NAP Readiness Request that is currently being finalized by UNEP and should begin implementation in 2021. It should be noted that South Sudan is eligible to access up to \$1 million annually from the GCF’s Readiness Programme. These funds should be applied towards short-term implementation programs.

SHORT-TERM PROGRAMME 1:
IMPROVED COORDINATION TO SUPPORT CLIMATE CHANGE ADAPTATION AND PLANNING

Output	Specific Action
1.1 Vertical institutional arrangements for climate change adaptation established/strengthened	1.1.1 Formalize roles and responsibilities for climate change adaptation planning for national, state, payam, boma levels. Include specific planning and budgeting responsibilities and powers and clarify this in draft amendment to the Local Government Act. Ensure alignment and coordination with disaster risk reduction and management tasks and roles. Incorporate mandatory guidelines to mandate equitable gender representation in all decision-making bodies.
	1.1.2 Draft relevant regulations to direct and empower relevant agencies to conduct climate vulnerability and risk assessments at subnational level.
	1.1.3 Develop and disseminate guidance and other relevant informational products and develop training materials for government officials pertaining to 1.1.1.
	1.1.4 Identify formal entry points for information generated through climate vulnerability and risk assessments to inform planning and budgeting processes at all levels.
	1.1.5 Establish pilot programme to establish state-level climate change adaptation/resilience plans and vertical implementation arrangements in three states.

²⁵ “Co-production of knowledge” refers to an approach to academic research in which the researchers work closely with decision-makers (usually within government) to identify policy-relevant research questions and to design research activities so that they provide useful, actionable information for policy and planning.



Output	Specific Action
1.1, cont.	1.1.6 Clarify roles and responsibilities for traditional leaders with respect to climate change adaptation at local level and ensure that these are incorporated into institutional arrangements developed for 1.1.1. Establish an outreach program for traditional leaders and establish a champions program (Chiefs for Climate Resilient Communities) to provide capacity building and technical support to traditional leaders who prioritize building climate resilience at local level and through existing culture-based systems.
1.2 Horizontal coordination arrangements for climate change adaptation established/strengthened	1.2.1 Conduct bilateral consultations with national line and coordinating agencies to determine specific roles and responsibilities for NAP planning and implementation, including membership on technical working groups. Identify specific linkages between NAP process and sectoral long-term and strategic planning processes. Formulate MoUs between these agencies and MoEF and draft appropriate national executive order formally establishing NAP coordination arrangements.
	1.2.2 Formulate terms of references, determine membership composition, selection procedures, and other relevant considerations for all coordination groups (CCWG, TWGs, CBO/NGO Advisory Committee, Private Sector Advisory Committee and Inter-ministerial Climate Finance Working Group). Include mandatory guidelines to ensure equitable gender representation.
	1.2.3 Establish secretariat and convene regular (quarterly) meetings for each coordination group.
	1.2.4 Conduct needs assessment and establish capacity targeted development program for each coordination group.
	1.2.5 Establish exploratory committee to review options for developing a climate change act/law.
1.3 Synergies between NAP process and sectoral/cross-cutting strategies and plans identified	1.3.1 Identify coordination and synergy between climate change adaptation efforts and food security strategies, policies and plans.
	1.3.2 Identify coordination and synergy between climate change adaptation efforts and humanitarian assistance and relief programs and refugee/displaced person return and resettlement efforts.
	1.3.3 Review disaster management policy and associated implementation plan to identify synergies and entry points for climate change adaptation and modify roles and responsibilities accordingly. Conduct annual coordination meetings to ensure synergies between disaster risk reduction and climate change adaptation processes.
	1.3.4 Identify specific entry points for coordination between NAP process and CAMP and IDMP.
	1.3.5 Conduct conflict analysis at national and local level to determine potential interactions between climate change physical processes, hazards, and impacts and existing/known/emerging factors shaping fragility and potential conflicts. Identify synergies between peacebuilding and adaptation objectives, and incorporate joint peacebuilding-adaptation objectives and actions into appropriate policy and strategy frameworks at the national, sectoral, and subnational level.

Output	Specific Action
1.4 Development partner coordination improved	1.4.1 Formulate climate proofing guidance and ensure that development partner investments are incorporating climate change considerations, especially for investments in electricity generation, transportation infrastructure and agriculture.
	1.4.2 Coordinate with development partners and NGOs to ensure that all studies, analyses, assessments and feasibility studies, are collecting and tracking data in formats that are consistent with national standards developed in Programme 3
	1.4.3 Establish system for tracking development partner governance and institutional capacity development programs (e.g., World Bank) to identify entry points for incorporating climate change considerations at early stages of institutional development
	1.4.4 Update GCF Country Program
	1.4.5 Establish donor coordination mechanism and conduct regular structured donor dialogues to support and implement priority sector adaptation programs

SHORT-TERM PROGRAMME 2: IMPROVING HUMAN AND INSTITUTIONAL CAPACITIES TO SUPPORT NAP PROCESS

Output	Specific Action
2.1 Establish technical capacity development program on climate change adaptation for national and subnational stakeholders	2.1.1 Conduct capacity assessment of technical working groups and sector agency teams and formulate medium and long-term capacity building plan. Engage with development partners and resident diplomatic missions to implement capacity development programs
	2.1.2 Develop standardized curriculum materials (stand alone or integrated into existing civil servant training programs) for subnational officials to a) raise awareness about climate change impacts; b) build competency for incorporating climate change considerations into governance processes.
	2.1.3 Identify local/national partners to deliver training materials to subnational civil servants and conduct training of trainers (ToT) for instructors. Develop plan and timeline to cover all 10 states and their counties.
	2.1.4 Establish an outreach model for traditional chiefs to raise awareness about climate change. Develop specific coordination pathways appropriate for each tribe and reach out proactively to chiefs to build awareness and capacity so they will serve as champions and focal points for resilience building and adaptation
2.2 NAP implementation improved	2.2.1 Conduct assessment of NAPA progress and identify barriers and gaps and incorporate lessons into NAP.
	2.2.2 Formulate GCF aligned concept notes for NAP sectoral priorities which have been included in South Sudan's GCF Country Program and develop cost estimates.
	2.2.3 Compile NAP financing plan with cost estimates for priority actions and implementation timeline. Identify appropriate modalities (e.g., grants, concessional loans, private sector) and potential sources (e.g., bilateral finance, GCF) for priority actions. Identify potential for on-budget support for projects, including potential co-financing national and sectoral levels. This activity may be supported by GCF Readiness funds.



Output	Specific Action
2.2, cont.	2.2.4 Conduct background research on potential models for a national climate change adaptation/resilience building fund. Prepare analysis with recommendations and draft legislation/regulations to establish the fund. Conduct consultations with development partners to determine the feasibility of external capitalisation for the fund.
	2.2.5 Conduct participatory stakeholder mapping exercises at national and regional level and prepare stakeholder analysis including classification, power, influence and potential role in climate change adaptation and implementation. Ensure that women and other socially, economically and culturally marginalized groups are meaningfully represented and identified.
	2.2.6 Formulate monitoring, evaluation, reporting and learning (MERL) framework for first NAP implementation. Identify and capacitate to the degree necessary focal point within MoEF for carrying out MERL plan.
	2.2.7 Establish formalized procedures for conducting second NAP. Conduct monitoring, review and evaluation of first NAP implementation.
2.3 Tools and resources developed	2.3.1 Establish a toolkit for government and NGOs for incorporating the integration of climate change adaptation and conflict resolution/peacebuilding based on emerging best practice from other contexts and informed by conflict-climate nexus research conducted under short-term Programme 3.
	2.3.2 Coordinate with and support Ministry of Gender, Child and Social Welfare Services to develop and disseminate screening tools and guidance for ensuring that GEDSI considerations are adequately incorporated into projects and programs. Establish mandatory guidelines to require that all climate change projects and programs undertake an initial gender assessment and include gender-specific activities where appropriate.
	2.3.3 Establish a national roster and certification procedures for individual and institutional service providers (consultants) to work on government and development partner supported projects and programs.
2.4 Communications and outreach	2.4.1 Develop a communication strategy (based on stakeholder mapping conducted in 2.2.5) to guide outreach and awareness raising efforts for national, state-level and local level stakeholders about climate change and climate change impacts and South Sudan's response to climate change.
	2.4.2 Develop culturally appropriate and context specific messaging campaigns to raise awareness about the relevance of climate change to communities. Identify potential readiness project concept notes to support awareness raising activities.
	2.4.3 Create school materials on climate change and incorporate these into primary and secondary school curriculum.
	2.4.4 Develop awareness raising products and locally relevant examples of ecosystem-based adaptation at multiple scales.
	2.4.5 Formulate and execute a private sector engagement strategy to begin to lay the foundation and enabling conditions for private sector involvement in resilience building. Identify potential readiness project concept notes.

SHORT-TERM PROGRAMME 3:

DATA, INFORMATION AND KNOWLEDGE MANAGEMENT SYSTEMS ENHANCED TO SUPPORT CLIMATE CHANGE ADAPTATION PLANNING PROCESSES

Output	Specific Action
3.1 Establish frameworks for risk and vulnerability assessments	3.1.1 Coordinate with MHADM to review current methodologies for risk and vulnerability assessments in use in South Sudan, as well as best practice from other contexts for conducting risk and vulnerability assessments and design a standard methodology for community level risk and vulnerability assessments. Develop standardized forms and smartphone app for systematically recording quantitative data and geotagging. Coordinate with Ministry of Gender, Child and Social Welfare to mainstream gender, disability and social inclusion aspects into CVRA methodologies.
	3.1.2 Coordinate with South Sudan Relief and Rehabilitation Commission to disseminate methodology to development partners and NGOs to ensure uptake. Appoint government point of contact to ensure ongoing coordination with non-government stakeholders and establish system for registering and archiving CVRA results. Develop a system for disseminating results of CVRA to communities. Establish online CVRA viewer to make results accessible to all stakeholders.
	3.1.3 Develop guidance materials and training program to ensure relevant stakeholders can implement the risk and vulnerability assessment methodology at local level. Establish partnerships with South Sudanese NGOs and CBOs to lead CRVAs.
	3.1.4 Review best practices and establish a standard and uniform CRVA methodology for use as the sectoral level. Develop standard vulnerability/risk/resilience indicators based on WMO sectoral indicators.
3.2 Improve research and data gathering	3.2.1 Establish a focal point in MoEF and conduct a review and consolidate existing information on climate risks, impacts, vulnerability and adaptation measures.
	3.2.2 Establish research coordinator function within Department of Climate Change and formalize engagement with academic and research community, including formalized protocols for requesting research permission for international academicians. Establish a program to facilitate co-production of knowledge relationships between researchers and government agencies, to improve coordination between information producers and information consumers.
	3.2.3 Develop data collection and management plan that includes the types of socio-economic and hydrometeorological data and formats that will be collected for planning and project design. Develop protocols for data storage, quality control, gap filling and other procedures. Include data sharing and exchange protocols for regional agencies and international researchers. Develop guidebooks and manuals. Conduct training for meteorological agency staff.
	3.2.4 Identify needs for collecting gender disaggregated data relevant to climate change and establish a system for collecting the required data. Coordinate with the Ministry of Gender, Child and Social Welfare to establish a research program focusing on socially differentiated impacts of climate change, including gender differentiated impacts. Based on research, develop decision support information for government and non-government stakeholders.
	3.2.5 Develop long-term research plan and related tracking indicators with institutional partnerships and funding streams to further understanding of the nexus between climate change, migration and conflict. Issue regular reports with relevant information to inform peace building and conflict resolution projects and programs. Utilize downscaled projections to model future migration scenarios to inform internal strategic planning and to inform dialogues with neighbouring countries, regional agencies and development partners.



Output	Specific Action
3.2, cont.	3.2.6 Identify partner institution and implement long-term research program to monitor climate change and climate variability impacts to the Sudd wetland and ecosystem responses to shocks and stressors. Track the climate regulation functions of the Sudd over long-term (e.g., 30 years). Identify sites for longitudinal community-based socio-economic research in local communities that depend on the wetland to understand how local people experience historical and ongoing climate changes and impacts.
	3.2.7 Develop a set of downscaled projections covering South Sudan's agro-ecological zones
3.3 Enhance data and knowledge network infrastructure and management	3.3.1 Establish monitoring remediation plan and related project fiches for external financing including, hydrometeorological network coverage, gaps, and instrumentation needs; infrastructure (e.g., offices, computers) and equipment; and ongoing maintenance of equipment and stations.
	3.3.2 Identify staffing and capacity gaps among Department of Climate Change and Department of Meteorology and establish staffing and capacity development plan (including modelling).
	3.3.3 Establish research and data partnerships with neighbouring countries, regional organisations, and partner research institutions and universities within South Sudan and internationally.
	3.3.4 Formulate costed plan with timeline to link improved climate and hydrometeorological services (3.3.1) to improved early warning system (to be developed), including last kilometre dissemination.
	3.3.5 Develop knowledge products (e.g., bulletins and seasonal forecasts) in accessible and locally appropriate formats.
3.4 Conduct vulnerability assessments	3.4.1 Conduct national-level priority sector climate risk and vulnerability assessments (CRVA) utilizing methodology developed in 3.1.
	3.4.2 Conduct community-level risk and vulnerability assessments.
	3.4.3 Conduct baseline inventory of national forest resources and identify and quantify ecosystem services potential as well as potential for EbA activities.

6.3 SECTORAL ADAPTATION MATRICES

The NAP includes adaptation action matrices for each of the nine priority sectors. Each of the nine matrices have been divided into adaptation programs. The specific actions included in the programs have been drawn from South Sudan's NDC, NAPA, INC, African Development Bank pipeline and other sources, including the large GEF project that is currently in development.

As no pre-existing actions existed for the health and tourism sectors, actions emerged during the process of formulating this first NAP. All the actions were validated at a series of five consultations workshops that were conducted in September 2020. These

workshops included representatives from national line and coordinating ministries, development partners, NGOs and CBOs. Additionally, an earlier draft of these matrices was circulated to a wide range of stakeholders for review. Comment and suggestions were subsequently incorporated into the final matrices, which are included in the first NAP.

Priority adaptation programs have been divided by sector and are illustrated in the matrices on the following pages. The adaptation programs have been classified and coded according to five categories. These categories are useful for illustrating how the various actions build upon one another and it is envisaged that these categories will be useful in identifying appropriate implementation modalities.

An important part of this classification exercise is to identify actions that can be carried out by utilizing existing resources in South Sudan. This will ensure that the NAP does not become merely a wish list of priority projects for external financing.

Categories include:

- **Physical investments:** These priorities involve building or construction. In most cases, these priorities will require external financing from development partners, but in some cases, they may be financed by domestic sources. Also, in most cases these investments will require public funds through grants or loans.
- **Human capacity development:** These priorities involve training or capacity development for individuals within the government and among non-government stakeholders (e.g., private sector, NGOs, CSOs and FBOs). Some of these priorities may be supported by domestically sourced funds. In other cases, development partners will support these relatively low-cost, high impact investments.
- **Institutional strengthening:** This refers to priorities that involve improving institutional competencies and other aspects of governance. This category can be supported by development partners through grants and technical assistance.
- **Regulatory modifications:** This category refers to priorities that involve modification or

enhancement of sectoral and/or subnational policy, regulatory, or legal frameworks. These priorities may be implemented by sectoral adaptation teams (see Chapter 2) with technical support from development partners coordinated through the Department of Climate Change.

- **Research:** This identifies priorities that involve enhancing available data and information, as well as the associated capacities to produce, process and utilize data and information. These priorities may be supported by development partners. There is also a role here for innovative partnerships between domestic institutions, including government agencies such as Department of Climate Change, academic institutions, international agencies and academic/research institutions in developed countries.

Next step: The next step is to develop implementation plans for each of these priority actions. These implementation plans should include specific steps to achieve the priority actions. These steps then can be linked to a monitoring and evaluation framework and budget plan, which identifies sources of financing for implementation. It is envisaged that the Climate Change Finance Inter-Ministerial Steering Committee (see Chapter 2) will have a strong role to play in coordinating financial support for the priorities.



PRIORITY SECTOR 1: WATER RESOURCES

	Source	Physical Investment	Human Capacity Development	Institutional Strengthening	Regulatory Modification	Research	Timeline (years 1-5)
Water Programme 1: Integrate climate change adaptation into water resources management							
Wat 1.1 Enhance access to water considering growing climate threats through integrated watershed management, wetland management and improved waste management.	NDC/AfDB		X	X	X		1-5
Wat 1.2 Establish pilot program for climate-smart integrated water resource management, including capacity development and demonstration project.	Validation workshop	X	X	X			2-4
Wat 1.3 Promote the formulation of water resource management plans at all levels of government.	INC		X	X	X		1-5
Wat 1.4 Build institutional capacity in water resources management.	INC		X	X			1-5
Wat 1.5 Introduce and expand water reservoir water management approaches.	Validation workshop		X	X	X		2-5
Water Programme 2: Improving management and climate resilience of community and household water resources							
Wat 2.1 Establish/strengthen/build capacity of community-based micro-watershed committees to lead planning and management of community water resources.	GEF7		X	X			1-5
Wat 2.2 Promote harvesting and retention of water for different users through community-based watershed management (e.g., contour/assess hydropower dams, channel maintenance, afforestation).	NDC	X	X	X			2-5
Wat 2.3 Improve ground water recharge and soil moisture retention through community-based soil and water conservation measures.	GEF7	X	X		X		1-5
Wat 2.4 Enhance resilience to drought through creation of water points.	GEF7, NDC, AfDB	X	X				1-5

	Source	Physical Investment	Human Capacity Development	Institutional Strengthening	Regulatory Modification	Research	Timeline (years 1-5)
Wat 2.5 Introduce rainwater harvesting, recycling and water savings techniques and technologies to communities and households.	NAPA, INC, AfDB	X	X	X			2-5
Wat 2.6 Establish regulatory and monitoring measures to prevent water pollution and to discourage wetland encroachment by settlement.	Validation workshop		X	X	X		2-4
Wat 2.7 Establish pilot, demonstration and inventive programs to encourage the use of solar and wind powered water provision technologies.	Validation workshop	X	X		X		3-5
Water Programme 3: Strengthen data, information and knowledge management capabilities to inform climate-smart water resources management							
Wat 3.1 Develop digital watershed atlas showing hydrological delineations and major land-uses identifying the most vulnerable catchment areas.	GEF7		X	X		X	1-5
Wat 3.2 Progressively develop aquifer maps and local-scale water vulnerability information to inform siting of hafirs and boreholes for human and livestock use.	Validation workshop		X	X		X	2-5
Wat 3.3 Develop system to monitor water quality in flood-prone areas to ensure the safety of drinking water during and after flooding.	Validation workshop		X	X			4 Feb



PRIORITY SECTOR 2: ENERGY

	Source	Physical Investment	Human Capacity Development	Institutional Strengthening	Regulatory Modification	Research	Timeline (years 1-5)
Energy Programme 1: Incorporate climate resilience into energy sector planning							
En 1.1 Conduct analysis to determine potential climate impacts under different scenarios on electricity demand and generation capacity to inform National Electricity Policy.	INC		X	X	X	X	2-3
En 1.2 Establish regulatory framework, procedures and guidelines to ensure climate resilience is incorporated into the design of new energy generation and transmission infrastructure and the retrofitting of existing infrastructure.	INC		X	X	X	X	2-4
En 1.3 Promote the generation and use renewable energy and distributed energy generation to enhance local resilience.	NAPA	X	X	X	X		2-5
En 1.4 Promote energy saving technologies, such as improved charcoal stoves, biogas and solar.	INC	X	X		X		1-5
En 1.5 Establish incentives program to promote LPG and electrical cars and associated infrastructure.	Validation workshop	X		X	X		3-5

PRIORITY SECTOR 3: ECOSYSTEMS, ENVIRONMENT AND BIODIVERSITY CONSERVATION

	Source	Physical Investment	Human Capacity Development	Institutional Strengthening	Regulatory Modification	Research	Timeline (years 1-5)
Environment and Biodiversity Programme 1: Incorporate climate change adaptation into environment and biodiversity conservation sector policy and planning frameworks							
Env 1.1 Establish and incorporate mechanism for coordination with NAP in National Biodiversity Coordination Framework.	NBSAP			X	X		1-3
Env 1.2 Incorporate projected effects of climate change on invasive species spread into Strategy on Invasive Alien Species.	NBSAP			X	X	X	1-3
Env 1.3 Incorporate EbA considerations into national policy review and regulatory/policy revisions conducted under NBSAP.	NBSAP			X	X		2-5
Env 1.4 Identify appropriate targets, indicators and means of verification for climate change into Integrated National Biodiversity Monitoring, Assessment and Reporting System. Incorporate data needs into expansion of hydrometeorological monitoring network.	NBSAP	X			X	X	2-4
Env 1.5 Incorporate data needs for Integrated National Biodiversity Monitoring, Assessment and Reporting system into hydrometeorological network.	Validation workshop	X		X		X	2-4
Env 1.6 Develop and implement procedures to incorporate climate change adaptation functions (e.g., avoided costs and losses due to future climate change shocks and stressors) into national biodiversity and ecosystem valuation system.	NBSAP			X	X	X	3-5
Env 1.7 Integrate Ecosystem-based Adaptation (EbA) into Ministry of Wildlife, Conservation and Tourism (MWCT) plans and guidance for capacity development and mainstreaming biodiversity values into national policies and plans.	NBSAP		X	X	X		2-4



	Source	Physical Investment	Human Capacity Development	Institutional Strengthening	Regulatory Modification	Research	Timeline (years 1-5)
Environment and Biodiversity Programme 2: Improve sectoral capacity to mainstream and implement climate change adaptation							
Env 2.1 Establish and capacitate climate change and resilience unit within South Sudan Wildlife Service.	INC		X	X			1-3
Env 2.2 Conduct research on high conservation value wildlife habitat vulnerability to changing climate conditions.	Validation workshop		X			X	1-5
Env 2.3 Conduct climate change analyses to inform expansion of the protected area network of South Sudan.	NAPA			X	X	X	3-5
Env 2.4 Promote conservation measures that protect biodiversity and increase ecosystem resilience.	INC	X	X	X	X	X	1-5
Env 2.5 Establish waterpoints for wildlife in protected areas to reduce the negative impacts of drought on animal populations.	AfDB	X					3-5
Env 2.6 Incorporate climate change considerations into forest reserve management plans to protect watersheds.	AfDB		x		x	x	2-5
Environment and Biodiversity Programme 3: implement community led EbA and NRM measures							
Env 3.1 Support community-based sustainable utilisation and management of wetlands in selected parts of South Sudan.	NAPA/ INC		X				1-5
Env 3.2 Promote afforestation of degraded landscapes and watersheds using multi-use forest species (agroforestry) to increase community safety nets and diversify livelihoods.	AfDB/ NAPA	X	X				2-5
Env 3.3 Introduce and scale up climate change resilient, participatory and sustainable community-led forest management.	NAPA/ INC	X	X	X		X	2-5

PRIORITY SECTOR 4: HUMAN SETTLEMENTS

	Source	Physical Investment	Human Capacity Development	Institutional Strengthening	Regulatory Modification	Research	Timeline (years 1-5)
Human Settlements Programme 1: Urban and regional planning for climate change adaptation improved							
HS 1.1 Identify vulnerabilities and create resilience for communities living in montane areas in the face of climate change.	NAPA		X	X	X	X	1-3
HS 1.2 Reduce vulnerability of population by integrating climate change considerations into land use planning.	NDC, INC		X	X	X		2-5
HS 1.3 Ensure that building codes reflect the expected impacts of climate change.	AfDB		X	X	X	X	2-5
HS 1.4 Develop improved flood risk maps for urban areas.	Validation Workshop		X	X		X	2-5
HS 1.5 Create map and buffer zones and relocate vulnerable communities away from flood prone areas.	NDC	X	X	X	X		3-5
Human Settlements Programme 2: Payam and Boma Development Committees empowered to lead local adaptation efforts							
HS 2.1 Ensure capacity building and participation of the society, local communities, indigenous peoples, women, men, youth, civil organizations and private sector in national and subnational climate change planning by developing formal and mandatory inclusive stakeholder participation procedures.	NDC		X	X	X		1-5
HS 2.2 Strengthen the adaptive capacity of the population through transparent and inclusive mechanisms of social participation in the implementation of adaptation interventions, designed with gender and human rights approaches incorporated throughout.	NDC		X	X	X		1-5
HS 2.3 Develop capacity building program for communities on use of weather and climate data generated by weather stations.	INC		X	X			1-4



	Source	Physical Investment	Human Capacity Development	Institutional Strengthening	Regulatory Modification	Research	Timeline (years 1-5)
HS 2.4 Promote and upscale traditional conflict management systems to address projected increase in conflicts due to climate change.	INC		X	X	X	X	2-4
HS 2.5 Develop and implement community-based adaptation plans.	NDC		X	X			2-5
Human Settlements Programme 3: Climate change considerations incorporated into WASH system investments							
HS 3.1 Develop risk maps and regulatory codes to inform solid and liquid waste disposal site selection and management.	Validation Workshop		X	X	X		2-5
HS 3.2 Develop regulatory codes and guidance materials based on future climate change scenarios to ensure new investments in water and sanitation infrastructure are resilient to climate shocks and stresses.	Validation Workshop		X	X	X		2-5
HS 3.3 Build climate resilient WASH infrastructure in regional capital cities.	Validation Workshop	X					3-5
HS 3.4 Establish demonstration sites and provide training programs for small scale WASH innovations for rural towns.	Validation Workshop	X	X				2-5

PRIORITY SECTOR 5: DISASTER RISK REDUCTION

	Source	Physical Investment	Human Capacity Development	Institutional Strengthening	Regulatory Modification	Research	Timeline (years 1-5)
Programme 1: Climate-smart disaster risk reduction practices							
DRR 1.1 Utilize climate data and projections to develop disaster risk maps for flooding, drought, earthquakes and crop pests.	Validation workshop		X	X	X	X	1-5
DRR 1.2 Establish toolkit and capacity development/ demonstration program for ecosystem-based disaster management and climate change adaptation.	Validation workshop	X	X	X	X		2-5
DRR 1.3 Implement reforestation and tree planting (including fruit trees and indigenous species) to reduce land degradation and soil erosion in South Sudan.	NAPA	X	X				
Programme 2: Improving early warning systems and capabilities							
DRR 2.1 Rehabilitate and expand hydrometeorological monitoring network to support improved early warning capabilities.	NDC	X	X	X			1-4
DRR 2.2 Design and implement communications and information management protocols for national and state level EWS.	Keith		X	X			1-4
DRR 2.3 Establish capacity development program for decision makers for effectively using DRR and EWS data and information.	Validation workshop		X	X			1-4
DRR 2.4 Establish and implement locally appropriate end user notification systems so that all South Sudanese have access to EWS notifications.	Validation workshop	X		X	X		2-5
DRR 2.5 Coordinate/negotiate with cellular service providers to offer no-cost EWS notifications to telecom subscribers.	Validation workshop			X	X		2-5
DRR 2.6 Increase investments in disaster prevention mechanisms, such as EWS, rather than disaster response mechanisms.	NDC	X	X	X	X	X	1-5



	Source	Physical Investment	Human Capacity Development	Institutional Strengthening	Regulatory Modification	Research	Timeline (years 1-5)
Programme 3: Enhancing community awareness and preparedness for climate shocks and disasters							
DRR 3.1 Increase knowledge of climate change and environmental issues through a national awareness raising campaign and inclusion in school curricula.	Validation workshop		X	X			1-3
DRR 3.2 Reduce water-borne diseases due to flooding and river overflow resulting from climate extremes. Develop mechanisms to reduce water-borne diseases with complementary awareness raising program.	Validation workshop	X		X	x		3-5
DRR 3.3 Promote development of grassroots informal social networks. Household reliance on borrowing and gift receiving from members of self-help groups, relatives, neighbours, families and communities is a highly relevant coping strategy in South Sudan and strongly determines the ability of households to better cope with shocks. These informal social networks should be promoted.	INC		X	X		X	2-4
DRR 3.4 Improve and enhance community-based disaster management plans and preparedness and response capability for climate related disasters.	Validation workshop		X	X			2-4
DRR 3.5 Educate communities on disaster management at national, subnational and grassroots levels.	Validation workshop		X	X			2-4
DRR 3.6 Increase awareness of disaster risks through media outreach and cultural heritage.	Validation workshop		X				2-4
DRR 3.7 Enhance the development of community-based disaster management action plans.	Validation workshop		X	X	X		2-4
Programme 4: Strengthening national level disaster preparedness and response capabilities							
DRR 4.1. Establish formalized protocols and procedures for activating People's Defense Force during emergency declarations. Develop coordination procedures for subnational governments and the People's Defense Force.	Validation workshop		X	X	X		2-4

	Source	Physical Investment	Human Capacity Development	Institutional Strengthening	Regulatory Modification	Research	Timeline (years 1-5)
DRR 4.2 Establish and implement training program for People's Defense Force for disaster preparedness, response and recovery. Strengthen special units such as the fire brigade and the Mercy Corp branch.	Validation workshop		X	X			2-4
DRR 4.3 Formulate prepositioning plan based on international best practice to establish supply caches in vulnerable locations to improve disaster response.	Validation workshop	X	X				2-4
DRR 4.4 Establish system for conducting disaster simulations at the national and state level to improve coordination and preparedness and community-based disaster drills to improve community preparedness and awareness.	Validation workshop		X	X			2-4



PRIORITY SECTOR 6: TOURISM AND RECREATION

	Source	Physical Investment	Human Capacity Development	Institutional Strengthening	Regulatory Modification	Research	Timeline (years 1-5)
Tourism Programme 1: Establishing Enabling Conditions for Climate-smart Tourism Development							
T 1.1 Conduct research on wildlife species habitat and ecosystem vulnerability to changing climate conditions focusing on Sudd wetland, Boma-Jonglei landscape and Imotong, Didinga and Dongotono mountains.	Validation workshop		X			X	2-4
T 1.2 Establish regulatory framework to promote climate-smart tourism and to avoid maladaptive investments in tourism sector.	Validation workshop		X	X	X		2-4
T 1.3 Develop targeted knowledge products on climate change impacts on tourism potential and sustainable tourism business models for investment community.	Validation workshop		X	X			1-4
T 1.4 Improve coordination, planning linkages and knowledge sharing on climate change between tourism and biodiversity sectors.	Validation workshop		X	X			1-3
T 1.5 Establish specific regulations on climate sensitive wildlife tourism and explore community enforcement mechanisms.	Validation workshop		X	X	X	X	2-4
Tourism Programme 2: Supporting ecotourism development for increasing rural resilience							
T 2.1 Establish and disseminate principles for climate-adaptive sustainable ecotourism development.	Validation workshop		X	X	X		2-4
T 2.2 Develop capacity building program for rural communities to support nature-based (ecotourism) and cultural tourism.	Validation workshop		X	X	X		3-5
T 2.3 Develop licensing and branding framework to register and promote rural ecotourism ventures.	Validation workshop		X	X	X		2-4
T 2.4 Establish community grants program to catalyze community-based tourism businesses.	Validation workshop	X	X	X			3-5

	Source	Physical Investment	Human Capacity Development	Institutional Strengthening	Regulatory Modification	Research	Timeline (years 1-5)
T 2.5 Develop climate resilient and sensitive road infrastructure and tourism facilities in national parks and game reserves.	Validation workshop	X		X	X		4-5
T 2.6 Identify local and regional human drivers of ecosystem degradation and wildlife exploitation and develop strategies for shifting behaviors to support ecosystems and biodiversity.	Validation workshop		X		X	X	2-5



PRIORITY SECTOR 7: HEALTH

	Source	Physical Investment	Human Capacity Development	Institutional Strengthening	Regulatory Modification	Research	Timeline (years 1-5)
Health Programme 1: Improve health sector capacities to address climate change related health threats							
Hel 1.1 Conduct comprehensive vulnerability assessments in the health sector under current and future climate change scenarios.	Validation workshop			X		X	1-3
Hel 1.2 Mainstream climate change, including future climate scenarios, into health sector strategies, plans and policies.	Validation workshop		X	X	X	X	1-5
Hel 1.3 Establish research program to understand the impacts of climate change on the health of vulnerable groups.	Validation workshop		X	X		X	1-3
Hel 1.4 Establish a training program on climate change related health risks for health sector workers, with special focus on community health workers (CHW).	Validation workshop		x	x			1-5
Hel 1.5 Develop action plans and strategies to control infectious diseases and vectors.	Validation workshop			x			2-5
Health Programme 2: Establish early warning capabilities for climate change related health threats							
Hel 2.1 Establish surveillance system for tracking current and emerging disease risks.	Validation workshop	X	X	X		X	1-4
Hel 2.2 Develop monitoring guidelines and train CHWs to monitor climate change related health threats.	Validation workshop		x	x			
Hel 2.3 Expand capacity for modelling and forecasting climate related health effects.	Validation workshop		x			x	
Hel 2.4 Develop risk maps to identify areas and populations most susceptible to climate change related health hazards (e.g., heat, disease).	Validation workshop	x				x	

	Source	Physical Investment	Human Capacity Development	Institutional Strengthening	Regulatory Modification	Research	Timeline (years 1-5)
Hel 2.5 Develop health hazard forecasting products for early warning based on climate and meteorological data.	Validation workshop	x	x			x	
Hel 2.6 Develop and implement preparedness and response plans for health threats (e.g., heat waves, diseases).	Validation workshop		x	x	x		
Health Programme 3: Improve public awareness of health threats and adaptive capacity to address threats							
Hel 3.1 Develop, disseminate and implement guidance and provide capacity building support to state and local health sector officials on health effects of climate change at national and subnational levels.	Validation workshop		x	x			
Hel 3.2 Promote climate health education in school curricula.	Validation workshop			x			
Hel 3.3 Establish targeted public information and messaging campaign to promote risk reducing behavior change in communities and to raise awareness on climate change induced diseases, with special emphasis on highly vulnerable groups.	Validation workshop	x					
Hel 3.4 Build capacity to consider climate change related health threats in urban, rural and regional planning.	Validation workshop		x	x	x	x	
Hel 3.5 Develop low-cost, user friendly blueprints for latrines, hand washing stations and other public facilities to minimize vector promotion of diseases.	Validation workshop	x	x				
Health Programme 4: Establish partnerships to address health threats from climate change							
Hel 4.1 Develop, disseminate and implement health guidelines for other line agencies to encourage multifunctional use of new buildings to provide public health benefits (e.g., cooling centres).	Validation workshop		x	x		x	



	Source	Physical Investment	Human Capacity Development	Institutional Strengthening	Regulatory Modification	Research	Timeline (years 1-5)
Hel 4.2 Work with cellular companies to explore partnerships to provide early warning messages and other information via SMS.	Validation workshop	x		x	x		
Hel 4.3 Coordinate with Department of Climate Change to develop risk indicators, data/information sources and data management protocols for monitoring and early warning systems.	Validation workshop						
Hel 4.4 Incorporate innovative architectural designs into new schools and develop siting guidelines to reduce adverse impacts of climate change (e.g., heat) on students.	Validation workshop	x		x		x	
Hel 4.5 Establish learning and knowledge sharing partnerships with other countries in the region for health adaptation and innovation.	Validation workshop		x	x			

PRIORITY SECTOR 8: INDUSTRY AND INFRASTRUCTURE

	Source	Physical Investment	Human Capacity Development	Institutional Strengthening	Regulatory Modification	Research	Timeline (years 1-5)
Infrastructure Programme 1: Improve institutional capacities for climate resilient infrastructure planning							
Inf 1.1 Conduct vulnerability assessments of existing infrastructure under current and projected climate change conditions to inform planning and design.	Validation workshop		X	X		X	1-3
Inf 1.2 Compile hazard maps (e.g., flooding, earthquakes and landslides) featuring current and projected exposure zones.	Validation workshop		X	X	X		1-4
Inf 1.3 Compile best practices and develop climate proofing/resilience guidelines for infrastructure design, construction and maintenance.	Validation workshop		X			X	1-3
Inf 1.4 Develop sectoral standards and regulations to ensure new infrastructure investments incorporate climate proofing guidance.	Validation workshop		X	X	X		1-4
Inf 1.5 Formulate list of priority sector infrastructure upgrades and retrofits and incorporate into development partner pipelines.	Validation workshop	X					2-5
Inf 1.6. Promote transfer and piloting of transportation technologies that are resilient to the adverse effects of climate change for roads and large-scale transportation of goods and technologies for the protection of infrastructure, particularly in flood prone areas.	AfDB	X	X		X		2-5
Infrastructure Programme 2: Construct new and retrofit existing critical infrastructure for climate resilience							
Inf 2.1 Improve environmental management in the oil industry to reduce the impacts of floods and droughts on industry infrastructure and operations.	NAPA	X					2-5
Inf 2.2 Build flood protection infrastructure including, improved drainage systems, flood barriers and retention areas.	Validation workshop	X					2-5



PRIORITY SECTOR 9: AGRICULTURE, LIVESTOCK AND FISHERIES

	Source	Physical Investment	Human Capacity Development	Institutional Strengthening	Regulatory Modification	Research	Timeline (years 1-5)
Agriculture Programme 1: Agriculture infrastructure supports climate resilience							
A 1.1 Introduce and expand irrigated agriculture for crop and livestock production.	NAPA	X					3-5
A 1.2 Improve agricultural infrastructure and facilities to support climate-smart multi-cropping systems.	NAPA/GEF7	X	X				3-5
A 1.3 Establish and improve facilities to reduce post-harvest waste and to enhance value-added food processing (e.g., pasta, biscuits and bread) in market centres.	GEF7	X	X	X	X		3-5
A 1.4 Improve storage and conservation of seeds and introduce early maturing varieties.	Validation workshop	X	X			X	3-5
Agriculture Programme 2: Climate adaptive land and resource management							
Ag 2.1 Enhance resilience to rainfall variability through rangeland rehabilitation.	NAPA	X	X	X	X		3-5
Ag 2.2 Encourage soil erosion control measures, including early adoption in areas susceptible to increased rainfall under climate change scenarios.	NDC/GEF7	X	X		X		1-5
Ag 2.3 Promote water technologies for water savings, recycling, harvesting, irrigation and sustainable management for agricultural purposes.	AfDB	X	X	X			1-5
A 2.4 Improve community and farm-level water resources management and incorporate projected moisture availability and variability into local-level water management and planning.	Validation workshop		X	X			1-5

	Source	Physical Investment	Human Capacity Development	Institutional Strengthening	Regulatory Modification	Research	Timeline (years 1-5)
Agriculture Programme 3: Supporting climate resilient agriculture practices							
A 3.1 Strengthen agriculture extension services to support community-based climate-smart agriculture including improved seed and crop management practices.	NAPA, INC	X	X	X		X	1-5
A 3.2 Improve animal health systems to reduce the vulnerability of pastoral communities to climate change.	NAPA	X	X	X		X	2-5
A 3.3 Identify and introduce drought and disease resistant varieties of crops with shorter maturity and higher yields.	GEF7	X	X	X			1-5
A 3.4 Provide insurance to help farmers, especially smallholder agriculturalists and pastoralists by enhancing their resilience and reducing risk when investing in agriculture and animal husbandry.	INC		X	X	X	X	2-5
A 3.5 Establish and strengthen farmers' organizations and CBOs and establish capacity building, demonstration and support programs to encourage climate-smart agriculture.	INC/GEF7	X	X	X			2-5
A 3.6 Support local seed production and private sector led seed development system.	Validation workshop		X	X	X		2-4
A 3.7 Undertake innovative and integrated pest and disease control for crop pests and diseases.	Validation workshop		X	X	X	X	2-4
A 3.8 Improve post-harvest crop handling and resilience of value chains, including improved regulations and phytosanitary procedures.	Validation workshop		X	X	X	X	2-4



	Source	Physical Investment	Human Capacity Development	Institutional Strengthening	Regulatory Modification	Research	Timeline (years 1-5)
Agriculture Programme 4: Promote climate resilient fisheries management							
A 4.1 Provide fingerlings, feed production and the appropriate tools and equipment for community managed fisheries and aquaculture ventures.	INC	X	X				2-5
A 4.2 Conduct studies on potential climate impacts on fisheries and formulate climate-smart strategies to increase fisheries productivity.	NDC		X			X	2-4
A 4.3 Conduct studies and research to support the commercialization of fisheries and establish capacity building program to empower fisheries entrepreneurs and to utilize climate resilient fisheries management practices, climate resilient inland and village pond management.	INC		X	X	X	X	2-5
A 4.4 Promote sustainable value chain development to utilize climate resilient fisheries management practices, climate resilient inland and village pond management.	Validation workshop		X	X	X	X	2-5
A 4.5 Conduct research on and promote traditional fishing regulations that contribute to resilience and sustainable use.	INC		X		X	X	2-4
A 4.6 Incorporate observed and projected climatic changes into fishery policies, regulations and institutions to improve resilience fish production.	INC		X	X	X		2-5

Chapter 7: Next Steps for South Sudan's NAP Process



7.1 INTRODUCTION

This first NAP laid the groundwork for South Sudan's NAP process by outlining national circumstances and recommending institutional arrangements and coordination mechanisms for climate change adaptation planning and implementation. It offers a robust rationale for adaptation in South Sudan by providing a baseline analysis of observed and projected changes in the physical processes driving climate. It describes expected impacts with the information that is currently available. These analyses provide a foundation for evidence-based decision-making processes and allow for the Government and its partners to begin implementing priority adaptation measures. The first NAP compiles adaptation priorities that have been identified through strategies, plans and policies, and synthesizes them into adaptation programmes that can guide immediate action in South Sudan.


As more information becomes available, it is expected that these profiles will be expanded and refined.

The initial NAP also provides comprehensive recommendations for strengthening the NAP process over the short-term (2020-2022). This NAP represents the culmination of over a year of research and consultations on the part of the Department of Climate Change, and a first step in formulating a unified vision for climate change adaptation for the country.

This section briefly describes the next steps in the NAP process for the Government of South Sudan. The Government has already taken initial steps to implement many of the short-term measures identified in Chapter 6. By following the next steps, it is expected that the Government will be able to achieve its goal of realizing a NAP process by 2022.

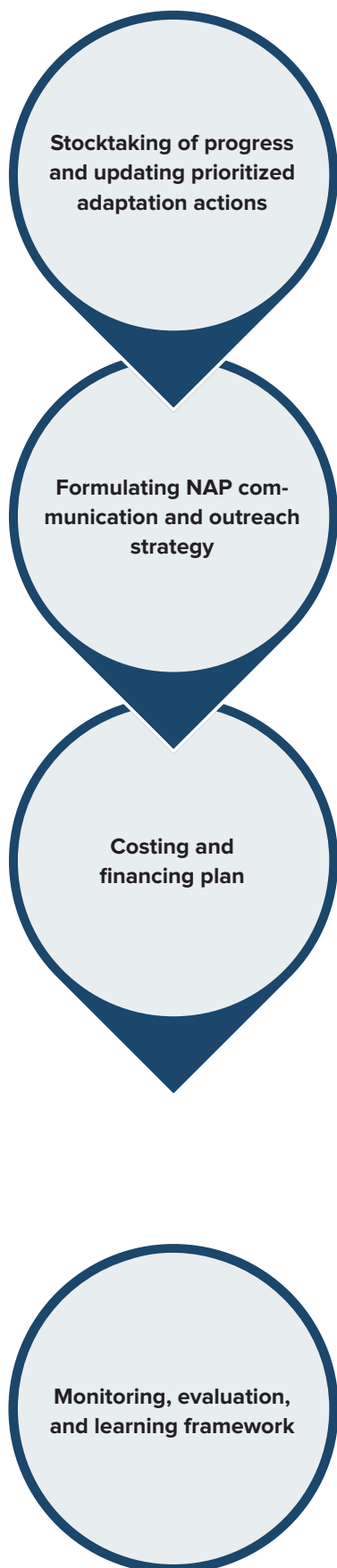
7.2 NEXT STEPS

The NAP takes a first step towards establishing a coherent and effective National Adaptation Plan process for South Sudan. Upon ratification, over the following 24 months, Department of Climate Change will take the lead in completing the following steps to enhance the NAP:



Formalizing institutional arrangements, establishing a formal legal mandate and ensuring buy-in and ownership of line agency stakeholders

This can be achieved largely through the support of GCF readiness resources and by following the recommendations found in Chapter 2. This step requires significant technical support and human capacity development, but there are support mechanisms, tools and other useful resources widely available. Several of the foundational activities to establish these formal institutional arrangements will be implemented through the GCF-supported NAP Readiness project, which UNEP is currently finalizing.



Department of Climate Change should first coordinate a stocktaking exercise to gauge progress on the priorities and programmes that have been compiled in Chapter 6, with a particular focus on progress made with respect to implementing South Sudan’s NAPA. Subsequently, based on this analysis and extensive stakeholder consultations, the NAP process will generate plans to implement existing priorities. This will include projects, but also mainstreaming options for incorporating climate change adaptation considerations into day-to-day processes of governance. Options will be prioritized utilizing a to-be-determined methodology (e.g., cost-effectiveness analysis, multi-criteria analysis). Some project concept notes may be developed for this part of the NAP.

With support from GCF and other development partners, Department of Climate Change will develop and implement a NAP communications strategy for engaging stakeholders in the broader NAP process. The communications strategy will detail steps for engaging a wide range of stakeholders in all stages of the NAP process and disseminating results of the NAP process. This communication strategy will include provisions for effective communication and engagement with vulnerable and marginalized groups, and also for providing relevant information on climate change processes and impacts in accessible formats through culturally appropriate pathways to local communities in South Sudan.

As a newly established country, South Sudan does not have many sources of climate finance from international public and private sources, or domestic public and private sources because public policy frameworks to facilitate this funding are not well developed. There is a need to establish climate change finance policies that will enable South Sudan to tap into international, domestic and private sector funding. The NDC estimates that over \$50 billion will be required for both the mitigation and adaptation actions across all sectors in South Sudan until 2030, but with the expanded first NAP, this estimate is likely outdated. Based on revised adaptation priorities and programmes, Department of Climate Change will coordinate the estimation of costs for the priority actions, as well as cost-benefit analyses, cost effective analyses, and other approaches where applicable.

Department of Climate Change will also work with the newly established Inter-ministerial Committee on Climate Finance to identify funding sources, including domestic sources, private sector possibilities, and international financiers to provide grants and loans to support the priorities. This information will be compiled into a costing and financing plan that will be included as a chapter in the expanded NAP, expected to be completed by the end of 2022.

The monitoring and evaluation framework will include SMART indicators for determining progress during the first NAP process. This section will also describe mechanisms for capturing lessons learned to be incorporated into the enhanced NAP, to be completed by 2022.



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Appendix A: Composition of Technical Working Groups

As noted in Section 2.3, each priority sector for the NAP will have a corresponding Technical Working Group. Table X.X shows the recommended representation of each technical working group at national and subnational levels.

Sector	National stakeholders	Subnational stakeholders
Agriculture, Livestock and Fisheries	Ministry of Agriculture and food security Ministry of Animal Resources and Fisheries Farmers' Union Federation Development partners –UNDP, UNEP among others Private sector/CSO eg SUDD University of Juba/Upper Nile Ministry of Foreign Affairs and International Cooperation Directorate of Environment and Natural Resources	State Ministry of Agriculture and forestry State ministry of livestock and fisheries County Directorate of Agriculture, Food Security and Forestry (CAD) County Directorate of Livestock and fisheries County, payam and boma level extension workers. Development partners State universities Farmers' Unions
Environment and Biodiversity Conservation	Ministry of Environment and Forestry Ministry of Wildlife Conservation South Sudan Wildlife Services Directorate of Metrology, Ministry of Transport Ministry of Petroleum Ministry of Mining Ministry of Electricity and Dams South Sudan renewable energy Development partners –UNDP, UNEP among others International conservation NGOs (e.g., Wildlife Conservation Society) Private sector/CSO e.g., SUDD University of Juba/Upper Nile	State Directorate of Agriculture and Forestry State directorate of forestry, Local Government State-level wildlife services State-level forestry authorities Traditional leaders



Sector	National stakeholders	Subnational stakeholders
Energy	Ministry of Electricity and Dams Ministry of Petroleum Nile petroleum and oil companies, Ministry of transport Ministry of Environment and Forestry South Sudan Electricity Corporation South Sudan Renewable Energy Association Development Partners – UNDP, UNEP among others Private sector and CSOs e.g., SUDD University of Juba – Upper Nile	Local Government Private sector at the state level
Infrastructure and Transportation	Ministry of Land and Housing Ministry of Transport, Road and Bridges Ministry of Finance	Local Government, Directorate of Transport Town council authority Traditional leaders transport association at the state level
Water Resources	Ministry of Water Resource and Irrigation South Sudan Urban Water Corporation Nile Basin Initiative in South Sudan	Local Government Water cooperation at the state
Disaster Risk Reduction	Ministry of Disaster Management and Humanitarian Affairs Development partners – UNDP, UNEP, JICA, The World Bank, among others Private sector/CSO e.g., SUDD University of Juba – Upper Nile	Local government Development partners at the state level
Human Settlements	Ministry of Land and Housing Ministry of Transport, Roads and Bridges	State local Government Town Council authority
Tourism and Recreation	Ministry of Wildlife, Tourism and Conservation South Sudan Wildlife Services	Local Government State wildlife, tourism and recreation services

Appendix B: NAP National and Subnational Stakeholder Consultation List

S/No	Name	Institution	Designation	Contact detail		Email
				Postal address	Phone. No	
1	Sisto Paulino Ladu	Ministry of Foreign Affairs and International cooperation	Deputy Director for Environment and Climate Change/ African Affairs	Ministries of Foreign Affair and International cooperation	0921419158	Paulinosisto567@gmail.com
2	Albert Schenk/ Ohing Bush/	South Sudan Wildlife Conservation Society –	Director and Conservation Policy Coordinator	WCS, Tonging area GPOC Road	0926048930	aschenk@wcs.org
3	Banak Joshua	Ministry of Humanitarian Affairs and Disaster Management	Director for Disaster Management	Custom, Ministries complex	0926106108	
4	Dr. Malik Doka	Ministry of Wildlife Conservation and Tourism	Undersecretary/ Director for Protected Areas	Ministry's Road (former UNOPS place) near Notos/Hamza Inn	Nil	malik.doka@gmail.com bbojo4520@gmail.com
5	Payai Man-yok John	Ministry of Environment and Forestry	Deputy Director for Climate Change and UNFCCC national focal point	Ministry of Environment	0925727889	
6	Regina Ossa Lullo	Ministry of Gender, Child and Social Welfare	Director General	Ministries	0912919187	
7	Samuel Ajiing	SMAF- NBeGs	Director General	Aweil, NBeGs	092999060222	samuelajiing@gmail.com
8	Stephen Ajok Mou	State Ministry of Physical Infrastructure, Road and Bridge	Director General	Aweil, NBeGs	092202269 0911557924	Nil
9	Dr George Tadu	Ministry of Agriculture and Food Security	Director for Crop Production	MAF building, Ministries complex	0921288331	Nil



S/No	Name	Institution	Designation	Contact detail		Email
				Postal address	Phone. No	
10	Makauc Ador	National Ministry of Irrigation and Water Resources	Acting Director General for Irrigation and Drainage	Juba – South Sudan	0914224220	
11	Aquilino Lado	National Ministry of Agriculture and Food Security	Researcher	Juba- South Sudan	09288813837	Nil
12	Simon Chap	National Ministry of Humanitarian Affairs and Disaster Risk Management	Senior Inspector for Disaster Management	Juba- South Sudan, MHADM	0921057400	Nil
13	John Ajoung Mach	National Ministry of Trade and Industry	Senior Inspector for Trade and Industry	Juba- MTI	0913479999	Nil
14	Dr Thomas F. Lado	University of Juba	Assistant Professor NAPA member	University of Juba campus	0926086097	jsuliman.lado@gmail.com
15	Dr. John Leju C	University of Juba	Assistant Professor NAPA member	University of Juba campus	0924698722	
16	Dr. Andrew L. Athiba	University of Juba	Assistant Professor NAPA member	University of Juba campus	092171005	L.thibia@yahoo.com
17	Hon Deng Tong Kuol	National Legislative Assembly	Representative of Parliamentary Committee for Natural Resources and Agriculture	Parliamentary building, Ministries	0921752202	
18	Reja Ebony/Selina	Ebony Centre	Policy Researcher	Juba near MTN	0911303794	Nil
19	Peter Jok Dit	Directorate of Livestock and Fisheries	Director General	Aweil NBeGs	0912968376	Nil
20	Chan Nyikang Nyiker	SMARF	Veterinary Officer	Upper Nile State	09134569897	channyik@gmail.com

S/No	Name	Institution	Designation	Contact detail			Email
				Postal address	Phone. No		
21	James Akwuch Deng	SMAF – Renk County	Director of Plant Protection	SMAF – Renk County	0925555166		Nil
22	Peter Okach Aney	Directorate of Animal Production	Director Animal Production	SMARF – Upper Nile State	Nil		peterokach@yahoo.com
23	Angok Koch	County Government	Former Commissioner	Renk	0914562785		Nil
24	Elizabeth Mayik	Women Representative	Chairperson, Women Representative	Upper Nile	0923567892		Nil
25	Aguol Ayel Adie	Local Government, Traditional Chief	Paramount Chief	Former Upper Nile State)	0921568923		Nil
26	Denis Tipo Arop	Directorate of Extension and Research	Director of Extension	Upper Nile -Renk	Nil		Nil
27	Hon. Ayiik Akuei	Local Government	Minister of Local Government	Upper Nile State -Renk Local Government	0912266666		Nil
28	Hakim Araba	Upper Nile University	Head, Department of Forestry	Upper Nile University Mukuni area-Juba	0920206660		Hakimaba@yahoo.com
30	Ogawi Ojwok	Upper Nile University	Dean, Faculty of Agriculture	Mukuni area	0916053045		
31	Oyor Moses	Upper Nile University	Dean, Animal Production (NAPA member)	Mukuni area	09252220132		
32	Andrew Zakaria Wani	Upper Nile University	Lecturer (NAPA member)	Mukuni area			zakaria@gmail.com
33	Cement Manyuat Upio	State Ministry of Local Government and Law Enforcement	Director General	Aweil NBeGs	0916175424 0920091679		Nil



