CMF CLIMATE
MAINSTREAMING FACILITY

South Sudan

Climate change adaptation

Disaster Risk Reduction and Early Warning Systems in South Sudan

March 2022

Report prepared by: Manisha Gulati

Version: Final

UKaid
from the British people

Paul Watkiss Associates

SOUTH SOUTH NORTH
TOWARDS CLIMATE RESILIENCE

Photo on Flickr

Acronyms

ARA	Adaptation Research Alliance
ARC	African Risk Capacity
ARCAN	Africa Regional Climate and Nature Programme
AU-IBAR	African Union – Interafrican Bureau for Animal Resources
BRACE	Building Resilience through Asset Creation and Enhancement
CAMP	Comprehensive Agriculture Master Plan
CBO	Community Based Organisation
CCWG	Climate Change Working Group
CDMC	Country Disaster Management Committee
CLiMIS	South Sudan Crop and Livestock Market Information System
CLARE	Climate Adaptation and Resilience initiative
CMF	Climate Mainstreaming Facility
DRR	Disaster Risk Reduction
DRM	Disaster Risk Management
DTM	Displacement Tracking Matrix
EN FFEWS	the Eastern Nile Flood Forecast Early Warning System
ENTRO	Eastern Nile Technical Regional Office
EWS	Early Warning Systems
FAO	Food and Agriculture Organization of the United Nations
FRC	Famine Review Committee
FEWS NET	Famine Early Warning System Network
FSNMS	Food Security and Nutrition Monitoring System
GAFSP	Global Agriculture and Food Security Programme
GEF	Global Environment Fund
GCF	Green Climate Fund
ICPAC	IGAD Centre for the Prediction and Analysis of Climate
ICT	Information and Communications Technology
IDMP	Irrigation Development Master Plan
IDRC	International Development Research Centre
IOM	International Organization for Migration
IPC	Integrated Food Security Phase Classification
JICA	Japan International Cooperation Agency

LDC	Least Developed Countries
LDCF	Least Developed Countries Fund
LIFE AR	Least Developed Countries Initiative for Effective Adaptation and Resilience
M&E	Monitoring and Evaluation
MAFS	Ministry of Agriculture and Food Security
MHADM	Ministry of Humanitarian Affairs and Disaster Management
MLF	Ministry of Livestock and Fisheries
MoEF	Ministry of Environment and Forestry
MoFP	Ministry of Finance and Planning
MoJ	Ministry of Justice
MWRI	Ministry of Water Resources and Irrigation
NAP	National Adaptation Plan
NAPA	National Adaptation Programme of Action
NBI	Nile Basin Initiative
NCMC	National Crisis Management Committee
NDA	National Designated Authority
NDC	Nationally Determined Contributions
NDRMC	National Disaster Risk Management Council
NDS	National Development Strategy
NEC	National Executive Committee
NEMA	National Environmental Management Authority
NEP	National Environment Policy
OIE-WAHIS	OIE World Animal Health Information System
PLEWS	Predictive Livestock Early Warning Information System
PFM	Public Financial Management
REAP	Risk Informed Early Action Partnership
SDRMC	State Disaster Risk Management Council
SSMD	South Sudan Meteorological Department
SSP	South Sudanese pound
SSRRC	South Sudan Relief and Rehabilitation Commission
ToR	Terms of Reference
TWG	Thematic Working Groups
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme

UNFCCC	United Nations Framework Convention on Climate Change
WASH	Water, Sanitation and Hygiene
WFP	World Food Programme
WISER	Weather and climate Information and SERvices for Africa

Glossary

Disaster Risk Management	Application of disaster risk reduction policies and strategies to prevent new disaster risk, reduce existing disaster risk and manage residual risk, contributing to the strengthening of resilience and reduction of disaster losses
Disaster Risk Reduction	Preventing new and reducing existing disaster risk, and managing residual risk, all of which contribute to strengthening resilience and therefore to the achievement of sustainable development
Early Warning System	An integrated system of hazard monitoring, forecasting and prediction, disaster risk assessment, communication and preparedness activities, systems and processes that enables individuals, communities, governments, businesses and others to take timely action to reduce disaster risks in advance of hazardous events
Mitigation (in the context of Disaster Risk Reduction)	Activities or measures that lessen or minimise the adverse impacts of a hazardous event
Multi-hazard early warning system	A system that addresses several hazards and/or impacts of similar or different type in contexts where hazardous events may occur alone, simultaneously, cascading or cumulatively over time, and taking into account the potential interrelated effects
National Frameworks for Climate Services (NFCS)	Multi-stakeholder user interface platforms enabling the development and delivery of science-based climate predictions and services
Preparedness	Activities and measures that build knowledge and capacities of governments, response and recovery organisations, communities and individuals to effectively anticipate, respond to and recover from the impacts of likely, imminent or current disasters
Prevention	Activities and measures that avoid existing and new disaster risks. Includes activities such as relocating exposed people and assets away from a hazard area, land-use regulations that do not permit any settlement in high-risk zones, and building relevant infrastructure (dams or embankments for example) that eliminate flood risks

Response	Actions taken directly before, during or immediately after a disaster in order to save lives, reduce health impacts, ensure public safety and meet the basic subsistence needs of the people affected.
Recovery	Restoring or improving of livelihoods and health, as well as economic, physical, social, cultural and environmental assets, systems and activities, of a disaster-affected community or society, aligning with the principles of sustainable development and 'build back better' to avoid or reduce future disaster risk

Source: United Nations Office for Disaster Risk Reduction[i] and World Meteorological Organisation[ii]

Contents

List of Figures

List of Tables

List of Boxes

Disclaimer

This report is an output from the Climate Mainstreaming Facility (CMF). This material has been funded by UK aid from the UK government; however, the views expressed do not necessarily reflect the UK government's official policies or of the entities managing CMF, and the parties accept no responsibility or liability for such views, completeness or accuracy of the information or for any reliance placed on them. This publication has been prepared for general guidance on matters of interest only, and does not constitute professional advice. You should not act upon the information contained in this publication without obtaining specific professional advice. No representation or warranty (expressed or implied) is given as to the accuracy or completeness of the information contained in this publication, and, to the extent permitted by law, the entities managing the delivery of CMF do not accept or assume any liability, responsibility or duty of care for any consequences of you or anyone else acting, or refraining to act, in reliance on the information contained in this publication or for any decision based on it. Management of the delivery of CMF is undertaken by SouthSouthNorth.

Summary

South Sudan is experiencing the effects of long-term climate change, such as increased temperatures and precipitation change, as well as short-term changes. This is increasing disaster risks by changing the magnitude and frequency of extreme events. There is therefore a strong rationale for adopting a more integrated approach to climate change adaptation and disaster risk management (DRM).

The second Nationally Determined Contributions (NDC) and the National Adaptation Plan (NAP) include measures on disaster risk reduction (DRR) in the context of climate change adaptation. The second NDC identifies climate change adaptation priorities in 11 out of 14 sectors, but with adaptation actions estimated to require financing of USD 376.3 million, it is almost entirely dependent on external funding. The status of the NAP, however, is disputed. The NAP was submitted to the United Nations Framework Convention on Climate Change (UNFCCC) for COP26 and is available on the UNFCCC website. The NAP itself notes that it is pending ratification. It is understood that the NAP is with the government for final review and approval.

The proposed National Disaster Risk Management Policy 2021 aims to mainstream DRR into developmental planning processes in all sectors and at all levels, reform and strengthen the institutional framework for DRR, enhance community-based DRM, mobilise resources for effective DRM, including through a disaster response fund, and introduce and promote disaster insurance coverage services for mitigating disaster-related losses. The Ministry of Humanitarian Affairs and Disaster Management (MHADM) has also drafted a DRM law with support from partners. The National Disaster Risk Management Policy 2021, the second NDC and the NAP prioritise the development of an Early Warning System (EWS).

The prospects of implementing these policies are debatable, given that few policies and plans have been implemented in the country. The South Sudanese Government has not prioritised environmental issues and is unlikely to allocate domestic resources towards integrating climate change into policies and plans where climate change has not found a place in planning frameworks or in sectoral policies and plans. In addition, where funds have been allocated in the national budget, they may not be dispersed in reality. As a result, humanitarian and development partners in the country have taken on the responsibility to address these gaps in resources and capacity.

There are also significant barriers to climate change adaptation and DRM in South Sudan. These barriers lie along the following themes: inadequate risk analysis and early warning systems, deficit meteorological and information and communications technology (ICT) infrastructure, capacity challenges, weak institutional coordination between government institutions, limited access to finance, and differing perspectives of humanitarian and development actors towards DRR. There are no government-led initiatives on climate information and forecasting services to date. There is no

proper EWS and the MHADM depends on piecemeal and disconnected efforts of humanitarian and development actors for early warning information. Both the IGAD Centre for the Prediction and Analysis of Climate (ICPAC) and the Nile Basin Initiative (NBI) have suspended information sharing with the government over non-payment of its membership subscription.

The hydro-meteorological system in the country is grossly underdeveloped and suffers from inadequate weather and climate forecasting equipment. There is no functioning Geographic Information System (GIS). When early warning information is available, the lack of ICT infrastructure and equipment impedes dissemination of information to the local level. Ministries involved in the National Early Warning thematic working group lack the technical capacity to collect, process and analyse weather and climate information available from different sources to generate meaningful early warning information and advisory services. Weak inter-institutional coordination across levels of government, across government institutions, and between government and other stakeholders, aggravates these challenges. Institutional coordination is further impeded by the general absence of protocols and standard operating procedures for government institutions to work with each other and third parties. This is compounded by the high level of reliance on partners for facilitation and support to carry out initiatives, including the development of policies and legislation.

Access to finance is a major barrier to DRR or adaptation interventions. Since 2013, the government has not been able to systematically access climate finance because of restrictions imposed by donors on account of lack of financial regulations and high levels of corruption. Donors also imposed restrictions on think tanks, higher education institutions and NGOs that were getting donor funding from engaging with the government. The government does not have access to many sources of finance owing to the lack of diversification in national revenue sources, and subsequently the national budget relies heavily on oil revenues which are often lost to corruption. The domestic private sector is underdeveloped and is not likely to play a major role in mobilising or accessing finance for climate change adaptation or DRR.

Finally, humanitarian and development actors lack coordination in adopting integrated approaches to respond to short- and longer-term needs of the country, and supporting the government. Mapping of the priorities and activities of the development partners and humanitarian organisations indicates that almost all actors have activities or plans to support DRR but there are gaps in programming and co-ordination interventions. Activities towards disaster risk mitigation and preparedness tend to be driven largely by the existing capabilities and systems of the different actors. Actors are also replicating systems that they have implemented elsewhere without necessarily paying attention to complementarity with what may already be available through other agencies or by way of previous or ongoing efforts. They also tend not to pursuing the option to fix existing systems that need strengthening. In general, the gaps in co-ordination between development and humanitarian actors could be attributed to the blurred boundaries between humanitarian and development work, given the compounding shocks facing the country and the absence of government co-ordinated donor forums that would

allow development partners to align their interventions to longer-term development objectives. This also follows from the immediate shift to humanitarian programming following the outbreak of conflict in 2013, as well as the lack of peace dividends following the signing of the revitalised peace agreement in 2018. The discrepancy between humanitarian and development actors is further compounded by the changing approach of donors, where annual humanitarian responses are seen as financially unviable in the long term, and donor fatigue combined with reduced global funding has led to more strategic frameworks of supporting actors.

Improving South Sudan's ability to adapt to climate change and manage the risks of natural disasters requires multi-disciplinary and multi-sectoral coordination, mainstreaming climate change into sectoral programmes, strengthening DRR systems, implementing structural and non-structural measures, and mobilising finance. Structural measures include disaster resilient shelters and other key infrastructure, resilient watershed management, management of forest ecosystems, rehabilitation of irrigation schemes, and sustainable agricultural practices and farmland management. Non-structural measures include improving capacity at all levels and creating incentives for communities settled along the Nile and its tributaries to relocate out of river basin areas to higher ground or on to agricultural land that is currently not used. This will need to be combined with the rehabilitation of irrigation systems, the establishment of new systems and diversification of livelihoods. However, inter-communal tensions, as illustrated in Jonglei State, have pushed migratory pastoralists to new patterns of movement, following floods and droughts that led to clashes with other communities, or have restricted access to historical migration patterns. Relocation of communities in a context where cultural and personal identities are strongly tied to land will also need to be handled in a cultural and context-sensitive manner.

1. Introduction

South Sudan is highly vulnerable to the impacts of climate change. The country is already experiencing the negative effects of climate change-driven rise in temperatures and increased rainfall variability. In particular, rainfall is becoming more erratic both in duration and intensity. The latter is increasing the frequency and severity of flooding in many parts of the country. It is estimated that 87% of the country's population depend on climate-sensitive livelihoods. The country ranks 185 out of 189 on the Human Development Index, with an estimated 74.3% of the population living in severe multi-dimensional poverty in 2019.[iii] The country is also ranked as the fourth most fragile state in the 2021 Fragile State Index.[iv] In the absence of measures that help adapt to climatic changes and their impacts, and that strengthen disaster preparedness and management, climate change driven extreme weather events and natural disasters will compound existing vulnerabilities in the country and hinder socio-economic development.

The British Embassy in Juba has therefore commissioned a study to assess how best to support South Sudan's efforts to adapt to the effects of climate change. The study focuses on Early Warning Systems (EWS), Disaster Risk Reduction (DRR) and Disaster Risk Management (DRM) in the context of adaptation and resilience. This report delivers upon three broad objectives:

- First, it conducts a stock take of South Sudan's adaptation and resilience priorities, policies, and governance architecture.
- Second, it maps the recent, current and planned projects of key humanitarian and development partners and identifies gaps in programming and coordination of EWS and DRR.
- Third, it analyses the strengths and weaknesses of the current system, including gaps in funding, oversight and technical capacity for adaptation and DRR.

2. Methodology

This report is based on desktop research and interviews conducted with stakeholders from 31 organisations. Desktop research covered policies and strategic plans of relevant ministries where available, country strategy documents of development partners and humanitarian organisations, documents received from the FCDO, and publications of academic institutions, think tanks, and financing and development institutions. Current UK-funded interventions have been identified through Development Tracker that provides information on the international development projects led by the UK Foreign, Commonwealth and Development Office (FCDO), other UK government departments and partners. The Climate Mainstreaming Facility (CMF) has also used information gathered from conducting similar assignments for British Embassies in other countries and regional FCDO departments to supplement this list. The list is not exhaustive and is intended to provide an overview of the UK-funded interventions that the CMF is aware of and can potentially be drawn upon by the Embassy in Juba.

The list of stakeholders identified for interviews was developed in discussion with the FCDO and the FCDO facilitated introductions to them. Interviews were set up and co-ordinated by the CMF . This approach was determined in discussions with the FCDO to allow stakeholders to share information and insights that they may not have been willing to offer in front of the FCDO.

Following the first iteration of the report, supplemental interviews were conducted to address gaps discerned in key interviews, with both government institutions and aid actors.

The main limitation encountered during the study was the availability of information, in particular government policies and government documents, such as annual reports, plans and press releases. Government ministries and institutions do not have websites to allow access to such information. In some cases, it was possible to obtain documents by making requests to interviewees. However, the absence of information meant that the broader policy and governance landscape was constructed through a review of secondary literature or through findings of interviews. The status of various projects and policies was also identified through interviews, and it was not always possible to verify these.

Interviews were semi-structured to allow stakeholders to share detail, depth and an insider's perspective while providing the flexibility to change questions as the interviews progressed. Where possible, efforts were made to validate the information provided by stakeholders including through other interviews conducted as part of the study. In some cases, particularly those concerning the status of policies and projects, interviewees were reluctant to pin-point status or reasons for delays in projects. Where necessary, appropriate inferences have been drawn from the responses obtained.

The findings of the desktop review and interviews were synthesised to identify the status of implementing national strategy and programming documents, the effectiveness of the governance architecture for climate change adaptation and DRR, and the main barriers and needs with regards to adaptation and DRR. The barriers and needs identified were organised around themes.

Some development partners and humanitarian organisations shared documents on their current and planned projects, requesting that some documentation be treated as confidential. All documents and requests have been shared with the FCDO. This version of the report provides anonymity to respondents and does not ascribe views to specific organsiations, in line with the wishes of some respondents.

3. Situational context

3.1 Background

Following independence in 2011, South Sudan's post-conflict transition has been mired in political instability, power struggles and civil war since 2013. The country has faced a series of compounding and cumulative shocks such as continued conflict, political instability, economic stagnation and climate change-driven recurring natural disasters. Brokered political settlement for independence in 2011 and insufficient efforts for national cohesion, reconciliation and accountability led to an outbreak of conflict in 2013, and again in 2016, which included violence along ethnic lines.[v] Over the years, sub-national violence and localised conflicts have intensified, perpetuated by cycles of revenge attacks and competition over scarce natural resources, compounded by weak rule of law and justice institutions. Prolonged conflict and cyclical inter-communal violence have disrupted livelihoods, destroyed property and infrastructure and embedded a fractured and non-inclusive politics[vi, vii] characterised by rent seeking and high levels of institutional corruption and limited investments in basic services, infrastructure and commerce[viii]. The economy is still underdeveloped and dominated by oil revenues. Export of oil accounts for 70% of GDP and more than 90% of public revenues,[ix] constricting an economic base that is vulnerable to the volatility of global oil and financial markets. Recurring natural disasters, mainly flooding in consecutive years from 2019 but also a locust infestation in 2020, coupled with droughts associated with climate variability, have added to the fragility created by conflict. While climate variability is a major characteristic of South Sudan,[x] climate induced natural disasters have increased in recent years in terms of intensity, frequency, complexity and unpredictability. Also, important to consider is the slow implementation of the revitalised peace agreement signed in 2018, which has impeded government contributions to development, peace and stability, and the strengthening of governance institutions from the national to the local level.

These multiple compounding shocks have led to a severe humanitarian crisis characterised by population displacement, high levels of food insecurity, malnutrition and high poverty rates. It was estimated that 8.9 million people were in need of humanitarian assistance in 2022, an increase of 600,000 since 2021. About 63% of the population is projected to be severely food insecure (IPC3+), a 7% increase from the previous year[xi] In 2021 only about one in four households is estimated to have acceptable levels of calorific intake.[xii] In total, 76.8% of the country's population was living below the poverty line (at USD 1.90 per person per day) in FY2019–20, and is projected to have increased to 78.2% in FY2020–21. Food imports support most of the urban population,[xiii] owing to minimal infrastructure to allow inter-state trade and low yields within the country's agricultural sector. Recurring flooding has affected both humanitarian aid as well as the work of the UN peace keeping missions by limiting access to affected areas[xiv] on a seasonal basis, particularly areas that have experienced prolonged flooding with stagnant water.

3.2 Climate change projections

Climate projections for South Sudan suggest an increase of at least 1–4°C across the majority of the country by the 2050s,[xv] **and increased intensity of seasonal rainfall,** with an increase in high intensity rainfall events rather than in the frequency of rainy days.[xvi] Above normal rainfall is already leading to both widespread and localised floods. Flooding is aggravated when high levels of water overflow the River Nile and its tributaries because of the discharge of water from upstream. In addition, the longevity of stagnant water due to a lack of drainage systems has led to prolonged flooding in some areas of up to a year or more. Together with changes in settlement patterns caused by ongoing violence, this increase in the occurrence, intensity and duration of flooding has had acute impacts on physical assets and livelihoods. It is estimated that during June and December 2020, floods affected 1,214 km of roads, 110,831 buildings with a total built-up area of 3.3 million m^2, and 148,200 hectares of cropland. Total damages and losses are estimated at USD 121.1 million. It is also estimated that between May and November 2021, over 800,000 people in 33 counties were affected by flooding in areas along the Nile and Lol rivers, and in Sudd marshlands.[1, xvii]

There is little long-term data available to provide a trend analysis on the drought patterns in South Sudan.[xviii] However, there are indications of an increased incidence of droughts, which have become more frequent since the 1960s.[xix] Floods and droughts are also increasingly occurring within the same season, with droughts happening around the months of May and June, and floods occurring later around August and September.

Deforestation is exacerbating the impact of climate change and extreme weather events. The annual deforestation rate is estimated between 1.5% and 2%. Deforestation is occurring for many reasons, prime among them being the use of trees for fuelwood and charcoal and the illegal logging trade. The acute lack of access to energy means that almost the entire population is dependent on forests as a source of energy for cooking and boiling water, and a large majority is using fuel wood for lighting.[xx] Loss of forest cover is triggering large-scale erosion and greater surface water run-off, especially during extreme rain events, into the rivers, leading to siltation, of the Nile in particular.[xxi]

3.3 Developmental impacts of climate change

Long-term climate change has sizeable implications for almost all sectors of the economy and for livelihoods. Nearly 87% of the country's population depends on climate sensitive livelihoods such as traditional rainfed agriculture, livestock and forestry crop farming. Although 80% of land is arable and suitable for growing a wide range of food and cash crops, much of the agricultural production comes from small, rain-fed subsistence agriculture associated with hand-cultivated plots. Besides reduced crop

1 As of Nov 15, 2021

harvests and reduced pasture availability, climate change-driven frequent heavy rainfall events and increased seasonal flooding are leading to crop/livestock pest and disease outbreaks. For example, the floods in 2021 led to high alert for Rift Valley Fever, which is a zoonotic disease spread as a result of flooding.[xxii]

There are significant implications for the development of the agriculture sector. Agriculture, together with livestock, currently contribute USD 4.722 billion to the country's GDP.[xxiii] With land being highly arable, the agricultural potential of South Sudan is generally high. Soil and climatic conditions allow for a wide variety of food and cash crops and animal production. The sector has the potential to provide raw material to domestic agro-industries and greater support to the growth and development of the national economy. However, less than 5% of the arable land is currently under cultivation. In the absence of investments in the agriculture sector, productive infrastructure such as roads, inadequate access to climate resilience agricultural technologies and practices, well-developed irrigation systems and access to markets, the potential of the agriculture sector is unlikely to be realised.

The large dependence on rain-fed subsistence agriculture and livestock products for food means that South Sudan's vulnerability to climate change compounds food insecurity. Since the 1970s, when changes in temperature and rainfall have made rain-fed agriculture less secure, the population of South Sudan has roughly tripled.[xxiv] Given that the country faces large-scale food insecurity even in times of good harvests, and the low levels of institutional capacity to prevent and cope with food shortages, climate change heightens food insecurity risks in the context of this population growth.

Finally, climate change linked events risk deepening existing vulnerabilities by increasing competition over resources and contributing to tensions, for example between agriculturists and pastoralist communities, and between internally displaced people and host communities. When extreme flooding or drought leads to the loss of pasture lands and/or access to water for pastoralists, they move their herds into lands of other communities that have not been flooded. This poses risks for competition over natural resources and inter-communal violence between agriculturalists and pastoralists.

4. Institutional and policy landscape for climate change

The Ministry of Environment and Forestry (MoEF) is the lead institution responsible for formulation of policies on climate change as well as regulations and plans for the environment, forestry and biodiversity sectors. Within the MoEF (see **Figure 1**), the Directorate of Environmental Planning and Sustainable Development is responsible for the National Environmental Strategic Plan and the National Environmental Management Action Plan, research and development, and coordinating multilateral environmental agreements. The Directorate of Environmental Education and Information is tasked with advocacy, awareness raising, and education and training. MoEF also has an Environment Information Centre that was set up with support from UNEP, with the objective of producing and providing access to environmental information. This Centre houses resources such as the State of the Environment Report, as well as completed postgraduate research. However, technical, human and financial capacity constraints, a lack of required IT equipment, and issues with internet access have impeded the functioning of the Centre. The Directorate of Climate Change and Meteorology, comprised of the Department of Climate Change and the Meteorology Department, develops and implements strategies and programmes related to climate change. It is responsible for undertaking institutional capacity development, strengthening partnerships and collaborations with national and subnational stakeholders to address climate change, and strengthening the national capacity of meteorological services.[xxv]

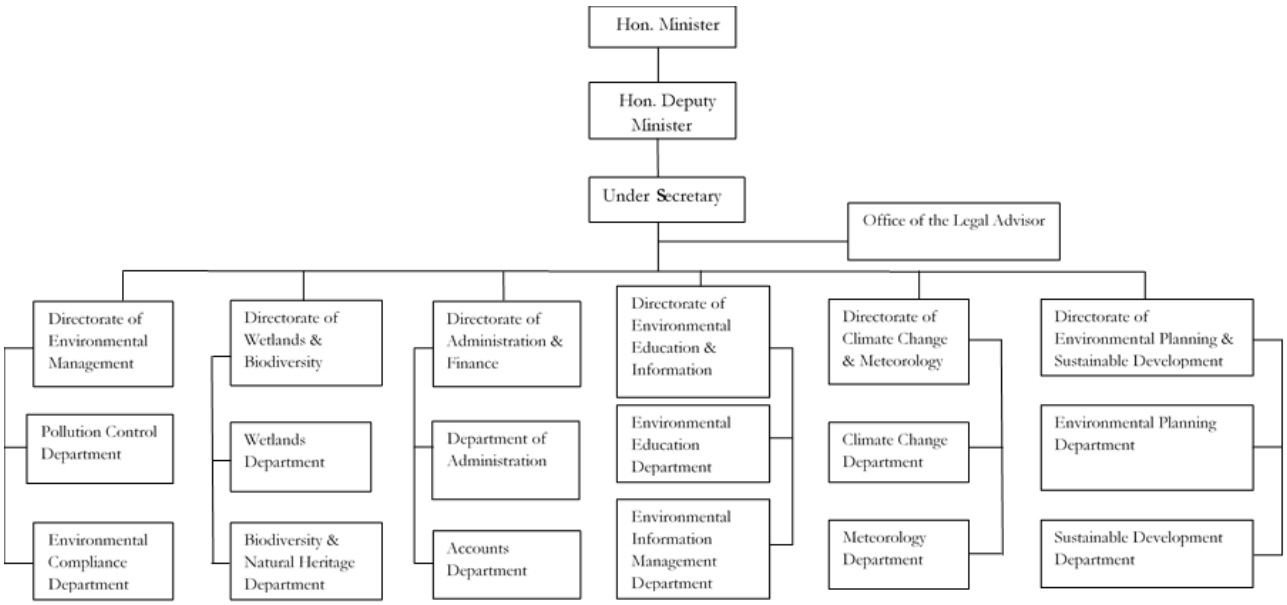

Figure 1: Institutional structure of South Sudan's Ministry of Environment and Forestry (Source: UNEP and GCF[xxvi])

The MoEF is also the technical and operational focal point for international environmental conventions and treaties, including the UNFCCC, and the National Designated Authority for the GCF and GEF.[xxvii] The government has completed the necessary formalities and processes to enable it to access annual funding from the GCF but is not in a similar position with the Adaptation Fund. However, the country has no designated Accredited Entities for South Sudan for the GCF. South Sudan has also not appointed a designated authority for the Adaptation Fund.

The MoEF's work has maintained a consistent focus on climate change through the draft National Environment Policy 2015–2025 (NEP), the National Environmental Bill[2] **and the draft Forestry Policy in line with the provisions of the Transitional Constitution of the Republic of South Sudan, 2011 (Constitution) and the South Sudan Vision 2040 (Vision 2040) for the agriculture and livestock sector** (see **Box 1**). The NEP recognises the risks posed by climate change to the livelihoods of people, food insecurity, biodiversity loss, water shortages and conflicts over scarce water resources.[xxviii] It identifies the climate change impacts that the country is already experiencing such as changes in rainfall patterns, increasing temperature and evapotranspiration, and increasing frequency of floods and droughts.[xxix] In terms of measures, it proposes the development of a climate change policy, the development of a national strategy and mechanisms for climate change adaptation and mitigation, support for efforts to reduce the vulnerability of communities to climate hazards, the promotion of the use of ozone-friendly technologies, and extensive afforestation through the planting of 100 million trees over a period of ten years.[xxx]

BOX 1: Climate change resilience in the foundational policies

Environmental concerns and climate change resilience are key features of the Transnational Constitution and Vision 2040.[3] The Constitution calls for legislative measures that prevent pollution and ecological degradation, promote conservation, and secure ecologically sustainable development and use of natural resources while promoting rational economic and social development so as to protect genetic stability and biodiversity. Therefore, the Constitution provides the foundation for adaptation measures by guaranteeing the right to a clean and healthy environment. Vision 2040 guides the strategic thinking and policy-making process in the country.

2 The current legislation for Environment Protection is the pre-independence Environment Protection Act 2001. This is the principal legislative policy framework of former Sudan that provides uniform rules of substance and procedures on protection of the environment and use of natural resources.

3 South Sudan was in a constitutional review process before conflict broke out in 2013. The Transnational Constitution was not intended to be a permanent document, and the implementation/enforcement of it is minimal.

In recognising the role of agriculture and livestock in mitigating greenhouse gas emissions and the significance of this sector for the livelihoods of its own people, Vision 2040 commits to promoting sustainable, climate-smart agriculture and livestock production and management.[xxxi] It aspires to prioritise climate resilience to the agricultural sector (crop production, livestock and fisheries) by building on traditional knowledge and supporting community-based adaptation strategies.[xxxii] In addition, it commits the government to adopting appropriate measures to limit pollution that may result from rapid industrialisation and to foster sustainable environmental management.[xxxiii]

The draft NEP envisages the establishment of a National Environment Protection Fund, to be managed by the MoEF under the supervision of the National Council of Ministers. The Fund will exclusively finance environmental programmes at the national, state and local levels of government. proposed to be replenished through budgetary allocations from the MoEF and environmental fines, fees and other revenues such as carbon or pollution taxes.[xxxiv] It provides for the establishment of an autonomous National Environmental Management Authority (NEMA) to act as the watchdog on all public institutions, private companies and individuals defaulting against the stipulated environmental laws and regulations. NEP includes provisions for the establishment of environmental forums at the national, state and local level to enable coordination and performance review of activities NEP and other environmental project activities in different states.

The draft NEP also acknowledges the risks posed by natural disasters such as floods, droughts and insects' plagues, and proposes a number of DRR measures. In terms of DRR measures, it proposes the establishment of meteorological monitoring stations to provide actual data for weather forecasting; development of advanced emergency preparedness, response and intervention plans; and the development of digital maps and zones of flood-prone areas in South Sudan.[xxxv] It has been pointed out that these measures only attempt to establish mechanisms to predict emergencies, where they can occur and prepare for them.[xxxvi] The policy remains silent on how to prevent or reduce the risks of environmental disasters and how people can cope with them.[xxxvii]

The National Environmental Bill[4], unlike the NEP, does not address the issue of climate change; however, it does address disaster management and preparedness. It empowers the MoEF and NEMA to prepare guidelines or plans for coordinating responses to environmental disasters.[xxxviii] Furthermore, it authorises state and local government environment forums to prepare plans for responses to local environmental disasters with specific reference to known possible disasters within their area of jurisdiction.[xxxix]

4 The current legislation for Environment Protection is the pre-independence Environment Protection Act 2001. This is the principal legislative policy framework of former Sudan that provides uniform rules of substance and procedures on protection of the environment and use of natural resources.

The NEP has not been approved and the National Environmental Bill has not been enacted into law[5]. Key barriers include competing legislative priorities, limited government capacity and a nascent parliamentary process during the transitional period. Limited knowledge and awareness of climate change among the public also limit public pressure to hold leaders accountable. Some communities may not connect flooding to climate change or to water resource management. It may also not always seen as a policy matter, with a lack of confidence in governance systems to action any preparation and response to disaster. High levels of food insecurity and fight for survival means also mean the majority of the public may not prioritise discussions on climate change and DRR when there are other more urgent needs and considerations.

Although the climate change strategy proposed in the draft NEP is yet to be formulated, the MoEF has identified priorities for climate change adaptation under the activities required as part of multilateral climate change processes such as the NAPA, the second NDC and the NAP. The NAPA provides the initial analysis of activities to enable climate change adaptation. Developed in 2016, it identifies 28 activities to address the most urgent and immediate needs for adapting to climate change (see Appendix 1).

The second NDC identifies climate change adaptation priorities in 11 out of 14 sectors (see **Table 1**)**.** It proposes the development of an EWS by gaining access to international climate finance for building the requisite infrastructure.[xl] The NDC also aims to build the capacity of communities on response preparedness, especially among women. However, several measures proposed in the NDC fall within the purview of broader environmental protection. Examples of such measures are development of regulations to ensure environmental and social impact assessments for large infrastructure projects, improvement of urban sanitation practices, and strengthening governance and institutional mechanisms for the mining sector. Building awareness and capacity are cross-cutting strategies across most sectors.

The implementation of the NDC rests almost entirely on external funding. The NDC estimates that USD 100 billion will be required for mitigation and adaptation actions across all sectors until 2030, with international support required to an estimate of USD 93.5 – 93 billion and USD 6.5 – 7 billion estimated to be provided through domestic resources.[xli] Adaptation actions are estimated to require financing of USD 376.3 million.[xlii]

The NAP aims to mainstream climate change considerations in sectoral development plans, strategies and investments. To achieve this, it aims to improve vertical and horizontal coordination to support adaptation planning. It identifies programmes and actions across five categories for each priority sector. These categories are physical investments, human capacity development, institutional strengthening, improvements in policy, regulatory and legal frameworks, and research. The NAP states that the strategies contained in it have been collated from other policy documents and communications to UNFCCC, validation workshops conducted for the preparation of the NAP, and projects currently being implemented with funding from multilateral agencies and climate

5 NEMA has been established, but it lacks the legislative foundation owing to the non-enactment of the National Environmental Bill and has limited capacity necessary to deliver its mandate

change funds. A key criterion in the selection of adaptation actions is the availability of domestic resources for implementation so that the NAP is implementable and not dependent on external funding for a wish list of projects. As with the NAPA and the NDC, the NAP prioritises DRR in the context of climate change adaptation (see **Table 1**).

The NAP was submitted to UNFCCC in 2022 whilst pending ratification. It is proposed as a living document, with addition of a costing plan and financing strategy in the approved version and the government evaluation of the progress in 2024 and begin the process of formulating the second NAP. The implementation of the NAP is expected to commence in 2023, with support from UNEP and funding through the Green Climate Fund (GCF)-supported NAP Readiness project. It will be accompanied by the development of a communication plan, a detailed implementation plan and a monitoring and evaluation plan.

There are some inconsistencies between the NDC and NAP (Appendix 1). This is because priority sectors are defined in different ways under the two. For example, human settlements is a priority sector under the NAP but does not find similar focus under the NDC. Similarly, while industry and infrastructure, including construction and buildings, are distinct priority sectors with the NDC, they have been combined under the NAP. The actions detailed within sectors also differ. The reason possibly lies in the focus of the two documents. While the NDC provides an overview of adaptation priorities at a high level, the NAP presents the actions as programmes and as detailed activities.

The NAPA has remained unimplemented and the prospects of the implementation of the NDC and NAP are debatable. One of the main reasons for this is that environmental challenges and climate change are not yet fully integrated into planning frameworks, in particular the new NDS, or in sectoral policies and plans Existing policies and plans have either remained unimplemented or implementation has been dependent entirely on donor funding (see Appendix 2). Despite some substantive initiatives, the MoEF has limited coordination and influence on policies and plans emanating from other sectors and ministries (see Appendix 2). The Ministry of Finance and Planning (MoFP) is tasked with mobilising resources for the delivery of the second NDC. It has also been made the guarantor to all grants from the development partners and multilateral funds for the implementation of climate change and environmental initiatives and tasked with monitoring and tracking climate-related project expenditures in their public budget system. Thus far MoFP has minimal capacity or engagement to progress these objectives however.

5. Institutional and policy landscape for DRR

The Ministry of Humanitarian Affairs and Disaster Management (MHADM) oversees all humanitarian and DRR activities. Its 2018–2020 strategic plan based in the Sendai Framework for (DRR) notes climate's impact on the migration and internal displacement of people. The strategic plan prioritises the development of risk assessment, mitigation and management tools. A key area of focus is the improvement of community preparedness and involvement in disaster risk management (DRM), including public works and integration of DRR into development programmes.

MHADM has a Multi-Hazard Early Warning Unit that receives early warning information on various hazards and disasters from various line ministries involved in the National Early Warning TWG (Appendix 3). It then compiles and issues all the information it receives in the form of a National Multi-Hazard Early Warning Bulletin. The information is disseminated within and across all levels of government, including the Ministry of Defence and Veteran Affairs, which is required to use the information for evacuation purposes.[xliii] In reality, information sharing is weakened by the poor ICT infrastructure in the country and is often inaccessible even at the state level. MHADM also has a National Disaster Emergency Operation Centre, but this centre is not operational due to a lack of funding and capacity. Going forward, MHADM intends to establish a hazard and vulnerability mapping team in collaboration with all the line ministries as well as a resource mobilisation unit.[xliv] It is unclear how this will be coordinated or overlap with the multi-sectoral EWS that WFP has supported the establishment of in RRC.

Working under the oversight of the MHADM, the South Sudan Relief and Rehabilitation Commission (SSRRC) implements DRM activities and coordinate emergency responses. The SSRRC is mandated to develop comprehensive measures to address disasters, provide training on disaster management and mobilise resources. It is responsible for coordinating with relevant government institutions and national and international partners in the event of disasters and to facilitate their entry to conduct humanitarian work. It is also mandated to coordinate and evaluate humanitarian programmes undertaken by NGOs in the country. State-level RRCs have faced severe challenges in delivering their mandate however, in particular due to understaffing (7 staff per state) and competing state priorities for limited resources and mobility. The SSRRC and state-levels RRCs have therefore played a minimal role in risk reduction or building resilience to natural disasters.

A number of coordination structures have also been established over the years for responding to natural disasters (see Appendix 3). Many of these structures are inoperative or currently function in an incoherent, often ad-hoc manner. The institutional framework and coordination structures are being redeveloped (see **Figure 2**) including state RRCs potentially reporting to the state governments.

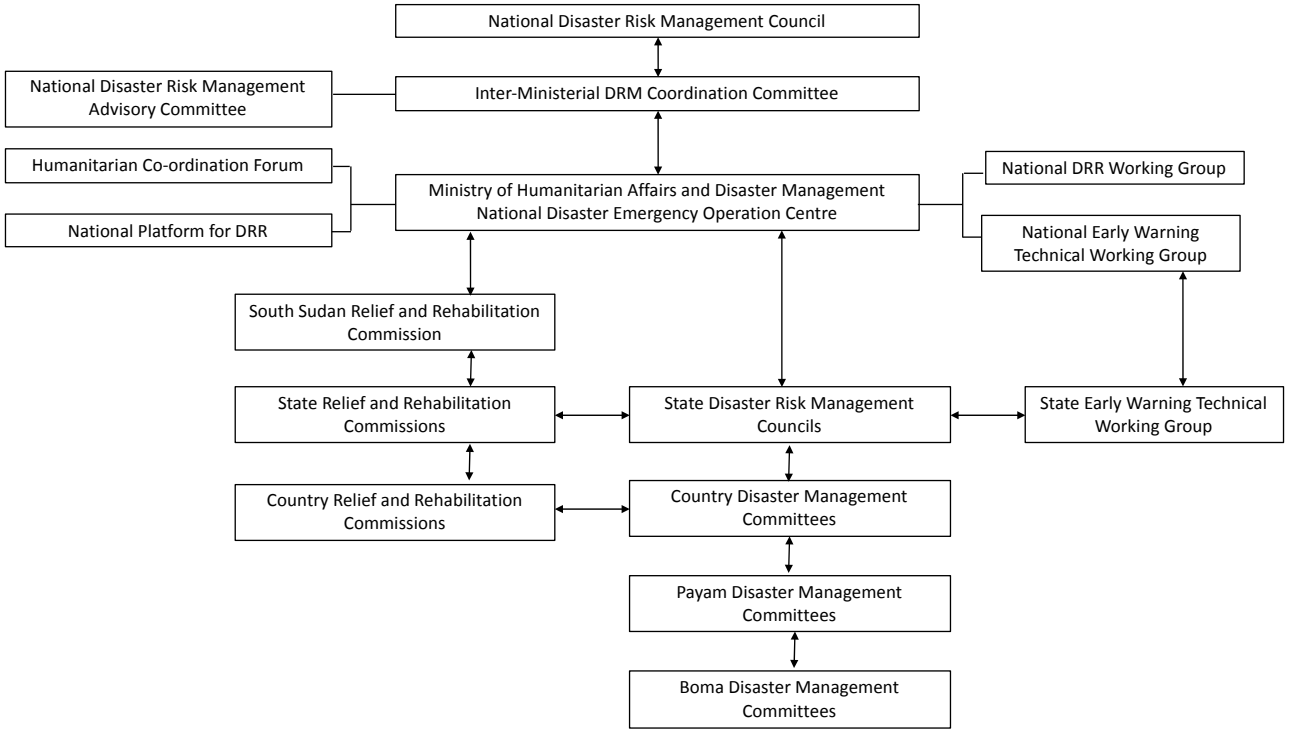

Figure 2: Proposed institutional framework for DRM under the National Disaster Risk Management Policy 2021 (Source: Interviews conducted for this report and desktop research)

The MHADM has formulated the National Disaster Risk Management Policy 2021 (and subsequent law) to provide the institutional framework for DRM and humanitarian assistance, building community resilience, and capacity for DRM. The policy has been formulated in accordance with the Sendai Framework. The draft of the policy is due to be sent to parliament for final approval.

The policy aims to promote a shift in national disaster management strategies, from conventional response and recovery to a more comprehensive risk reduction culture, and seeks to promote comprehensive disaster management. It engages on the wider scope of disaster management, including establishment of early warning systems, hazard mitigation preparedness, and swift response to disasters in order to address the root causes of vulnerabilities and to mitigate the future risk of disasters. It aims to achieve these through strengthening coordination among government institutions at the national level to better support communities affected at the local level. Specific objectives of the policy include:

- Mainstreaming of DRR into developmental planning processes in all sectors and at all levels;
- Strengthening regulatory and institutional framework for DRR;
- Undertaking early recovery and reconstruction projects to build disaster resilient structure;
- Enhance community-based DRM;

- Enabling mobilisation of resources for effective DRM, including establishing a disaster response fund;
- Introducing and promoting disaster insurance coverage services for mitigating disaster related losses; and
- Strengthening education, research and training on DRM.

According to the second NDC, the MHADM has been working to undertake climate change vulnerability assessment and responding to climatic disasters such as flooding, together with international organisations and state governments. In reality, this assessment is restricted to the assimilation of information provided by the member ministries of the National Early Warning TWG.

A number of line ministries play a role in the provision of meteorological information to facilitate early warning and early action (see Table 1). The SSMD is responsible for the observation, collection, archive and dissemination of weather and climate data and information, and reception of synopses from meteorological stations in the country.[xlv] A subsidiary institution of the Ministry of Transport, and under the Civil Aviation Authority, the SSMD is mandated to provide weather and climate forecasts to MHADM for integration into early warning information for various users and stakeholders. However, the SSMD faces serious challenges in performing its role because of the acute shortage of financial resources, infrastructure, staff and technical tools. Under the NAP, the SSMD is planned to be merged with the Meteorology Department of the MoEF. Rather, a proposal was made to create the South Sudan Meteorological Authority, which would serve as an independent entity, and be able to receive its own budget line. The decision to make this institutional change is subject to consideration and approval by the Council of Ministers.

Table 1: Overview of roles and responsibilities of institutions involved with DRR (Source: Interviews conducted for this report and desktop research)

Institution	Role in DRR
Ministry of Humanitarian Affairs and Disaster Management	• Lead institution on DRM • Co-ordinate all DRR activities and actors in the country • Collect and collate climate and meteorological information available to various government institutions • Publish and disseminate early warning information (currently taking the form of National Multi-Hazard Early Warning Bulletin)
South Sudan Meteorological Department	• Provide weather and climate-related data from meteorological stations in the country
National Bureau of Statistics	• Responsible for the GIS system that is used for supporting early warning and DRR activities.

Institution	Role in DRR
South Sudan Relief and Rehabilitation Commission	• Implement DRR activities and coordinate emergency responses at the local level[xlvi]
Ministry of Water Resources and Irrigation	• Lead institution on disasters arising from floods • Collect hydro-meteorological data • Undertake technical monitoring of flooding as a hazard • Disseminate early warning information on flooding • Focal point for receiving flood forecasts from ICPAC and the Nile Basin Initiative
Ministry of Agriculture and Food Security	• Lead institution on agriculture-related hazards • Provide early warning information relevant to crops • Disseminate early warning information to farmers
Ministry of Livestock and Fisheries	• Lead institution on livestock related hazards • Provide early warning information on and undertake technical monitoring of livestock diseases • Focal point for receiving livestock diseases related forecasts from ICPAC, AU-IBAR and World Organisation for Animal Health • Disseminate early warning information to pastoralists and fisheries
Ministry of Environment and Forestry	• Lead institution on climate change, deforestation and environmental hazards
Ministry of Health	• Lead institution on hazards related to communicable disease outbreak, food shortages and nutrition
Ministry of Defence and Veteran Affairs	• Use forecasts for the purpose of planning evacuation and rescue • Support recovery and rehabilitation interventions
Ministry of Interior	• Lead institution for conflict related hazards and associated disasters

6. Mapping of recent, current, and planned projects

There are a number of current and planned centrally managed global and regional programmes that cover South Sudan. A number of groups have been established by development partners and humanitarian organisations for coordination of activities and for exchange of information and best practices. Interviews led to the conclusion that there is no dedicated group that includes representatives from both humanitarian and development organisations working on climate change and DRR. The existing groups established by development partners include:

- The Agriculture Livelihoods Donor Working Group
- The WASH and health Donor Group
- The South Sudan Rural Development Group
- The Partnership for Recovery and Resilience
- A Public Financial Management (PFM) reforms working group
- An Economic Pillar Working Group, which brings together the Natural Resources Sector Working Group, the Economic Sector Working Group and the Infrastructure Sector Working Group
- Working Group for Conflict Analysis (Integrates conflict sensitivity into areas of analysis such as flooding in Jonglei, Bentiu, etc.)

On the humanitarian side, there are groups part of the humanitarian coordination architecture (see **Figure 3**) which engages partners and government representatives, and includes sector-specific clusters such as the Food Security and Livelihoods (FSL) Cluster[xlvii] that comprising INGOs and NGOs. Most humanitarian organisations in South Sudan regularly use these forums to discuss their ongoing work and share information and research. However, depending on the sectors this has not always included development partners, and promoted coherent programming that builds on each other's efforts.

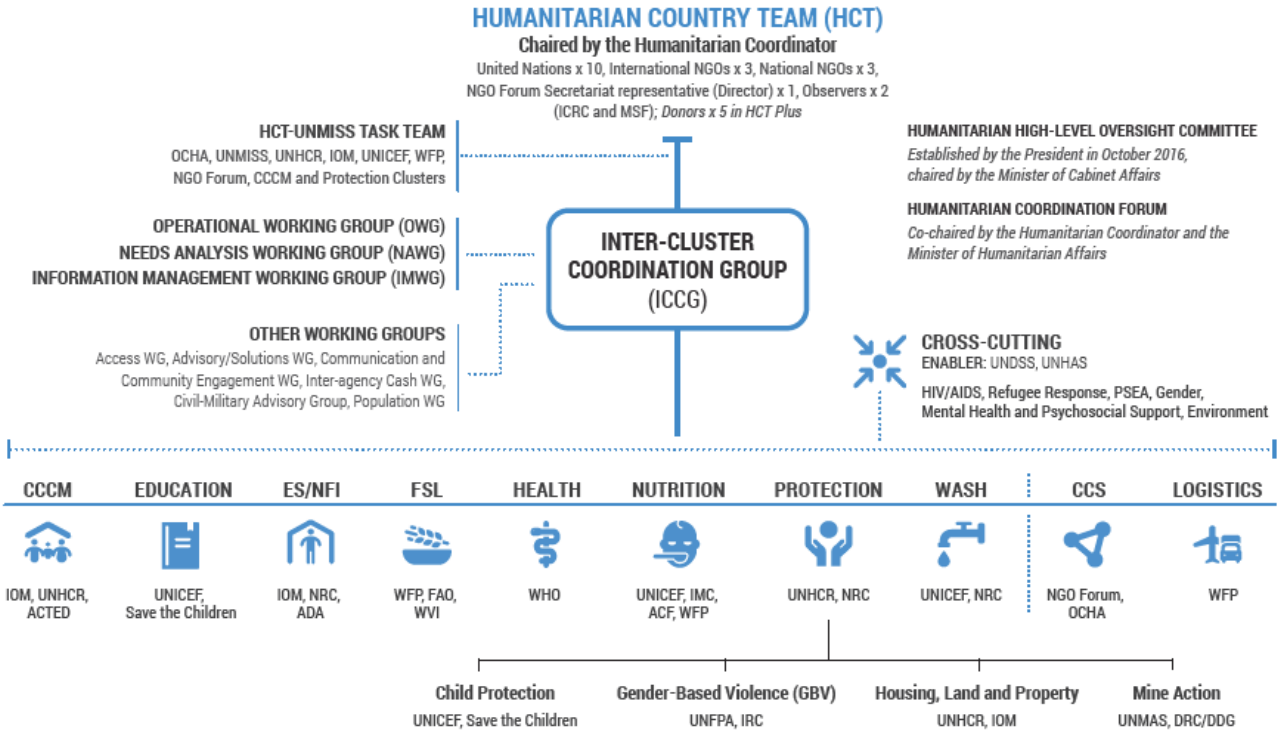

Figure 3: Humanitarian coordination architecture in South Sudan (Source: OCHA[xlviii])

As is evident from a mapping of the priorities and activities of select development partners and humanitarian organisations (see Appendix 4), **almost all actors have activities or plans to support DRR** (see **Table 2** and **Table 3**). These activities are spread over the different components of DRR. It is worth noting that the interlinked nature of shocks in South Sudan and the size of the humanitarian response needed has meant that it is sometimes not possible to delineate the funding and response measures between the different shocks.

A review of these activities highlighted several gaps in programming and coordination interventions. Activities towards disaster risk mitigation and preparedness tend to be driven largely by the existing capabilities and systems of the different actors. A number of actors provide weather and climate information for the country. Some are also conducting pilots for different types of EWS related to different thematic areas. However, each of them uses their own system and own frameworks or terminologies. For example, risk assessments and early warning information provided by FAO, the World Food Programme (WFP) and USAID's FEWS NET are a result of their existing capabilities to provide weather and climate information and hazard assessment rather than an EWS set up specifically for South Sudan. South Sudan is one of the 30 countries covered under FEWS NET that provides multi-sectoral early warning and analysis to anticipate factors that may contribute to food insecurity. FEWS NET reporting includes monthly reports and maps detailing current and projected food insecurity and alerts on emerging or likely crises. FEWS NET also prepares reports on factors such weather and climate that contribute to or mitigate food insecurity. FEWS NET has permanent staff and national offices in South Sudan.

Actors are also replicating systems that they have been implemented elsewhere, without necessarily paying attention to complementarity with what may already be available through other agencies or by way of previous or ongoing efforts. Consequently, there are differences in the type and form of information they provide, making it difficult to process the information to build a coherent picture. There are also discrepancies in data collection methods. Moreover, by way of outcomes, risk assessments and early warning information are dominated by food security followed by nutrition. Health, WASH, conflict and mortality outcomes are generally lacking, however conflict analysis has grown significantly in recent year although the information is often too sensitive to publish publicly. Few actors are currently supporting or planning to support the strengthening of meteorological infrastructure.

As far as policies for climate change adaptation and DRR are concerned, support for policy making is being provided mostly by UNEP and UNDP, while support for policy making on DRR is provided by IOM. Going forward, the European Union intends to support the development of climate change and/or disaster risk reduction strategies at the country and state levels. ICRC and the South Sudan Red Cross have also provided support for the drafting of the DRM bill.

Table 2: Overview of ongoing and planned programming priorities and projects of select development partners and humanitarian organisations in South Sudan (X: current, P: Planned)

	Agriculture and Food Security	Livestock and Fisheries	WASH (including waste)	DRR/DRM			
				Prevention	Mitigation	Preparedness	Response and Recovery
African Development Bank	X		X				
European Union	X	X				X	X
Food and Agriculture Organization of the United Nations	X	X		X	X	X	X
Germany	X		X			X	X
International Organization for Migration				X	X	X	X
Japan International Cooperation Agency (JICA)	X	X	X				X (under an agriculture project)
The Netherlands	X		X	X	X	X	

	Agriculture and Food Security	Livestock and Fisheries	WASH (including waste)	DRR/DRM			
				Prevention	Mitigation	Preparedness	Response and Recovery
United Nations Office for the Coordination of Humanitarian Affairs (OCHA)				X	X	X	X
United Nations Development Programme (UNDP)					P		
United Nations Environment Programme (UNEP)						X	
United Nations Mission in the Republic of South Sudan (UNMISS)				X	X		X
U.S. Agency for International Development (USAID)	X			X	X	X	X
World Food Programme (WFP)	X					X	X
The World Bank	X			X			X

Source: Interviews conducted as part of the study and desktop research

Note: The nature of shocks in South Sudan means that it is difficult to clearly delineate humanitarian responses to different shocks.

Table 3: Overview of ongoing and planned programming priorities and projects of select development partners and humanitarian organisations in the areas of DRR and DRM

	Prevention	Mitigation	Preparedness	Response and Recovery
Cordaid	• Supporting alternative livelihood sources for youth reliant on charcoal burning and sale • Supporting partners' efforts to pass DRM policy and law		• Integrated Risk Management Platform • Capacity building of stakeholders (government at all levels, UN agencies, NGOs, etc. on IRM platform) • Nexus approach to designing programming, especially in the area of resilience building • Community Action Plans developed for DRR, climate adaptation and ecosystems restoration planning with communities • Capacity building based on risks and solutions identified through community planning approaches • Awareness raising of rights following disasters, particularly for women	• Strengthening of value chains and market systems to support recovery • WASH response to repair and maintain access to safe and clean water • Supporting and leveraging indigenous knowledge for response (i.e. building boats)

	Prevention	Mitigation	Preparedness	Response and Recovery
European Union			• Plans to strengthen shock-responsive and resilience preparedness through supporting the development of climate change and/or disaster risk reduction strategies at the country and state levels, including improvement of early warning information systems	• Humanitarian responses
FEWSNET			• Monthly bulletin that serves as a multi-sectoral EWS, and helps guide resource allocation and planning, with information obtained from multiple sources including FEWSNET monitors on the ground • Planning to work more closely with regional office for analysis including flood risks, flood scenarios, rainfall forecasting, and conflict monitoring	• Bulletins used to inform resource allocation and planning by donors and partners

	Prevention	Mitigation	Preparedness	Response and Recovery
Food and Agriculture Organization of the United Nations	• Cash-for-work approach to rehabilitate or build disaster risk mitigation infrastructure • Support to MHADM in implementing policy, revision of policy, and creating structures at each level of governance • Assessment of feasibility of flood mitigation structures (i.e. dyke assessment in Pibor)	• Support to the Integrated Food Security Phase Classification (IPC) and Food Security and Nutrition Monitoring System (FSNMS) processes • Flood susceptibility assessment • Support for operation of CLiMIS including training	• Piloting of Predictive Livestock Early Warning Systems in the state of Eastern Equatoria since 2019 • Dissemination of early warning information through FAO radio that has 39 stations and 29 channels • Early warning information through Regional Office for East Africa and through the Rome-based Desert Locust Information System • Institutional support to the SSMD on climate information and early warning services through implementation of rain gauges, procurement of river gauges, and support for downscaling ICPAC forecasts • Establish DRM committees at the local level, in line with policy • Participation in Early Warning TWG	• Post floods damage assessment, GIS remote sensing

	Prevention	Mitigation	Preparedness	Response and Recovery
Food and Agriculture Organization of the United Nations … ***(cont.)***			• Support of EW dissemination to the local level for farmers (including radio programming and distribution of solar powered radios) • Farmer Field Schools to promote more resilient livelihoods • Asset creation – water channels, dykes, water harvesting to support agriculture in dry seasons.	
Germany		• Planned integration of DRR and climate change adaptation in water management projects		• Humanitarian responses

	Prevention	Mitigation	Preparedness	Response and Recovery
International Organization for Migration	• Infrastructure support to communities, especially in Bor, with dyke strengthening and rehabilitation, pumping of water and drainage • Through Dutch support, a multi-year project informed by hydrological assessments and socioeconomic analysis • Development of infrastructure through ECRP in five targeted locations	• Surface water management project aimed at flood mitigation	• Formulation of DRM policy • Formulation of DRM law • Support for the functioning of DRR Working Group • Support to the MWRI for establishing telemetric stations • Capacity building of communities through integration of CBDRM into existing ECRP development committees at the local level • Planned roll-out of DRR training curriculum at the state level	• Displacement Tracking Matrix reporting enables the provision of better context-specific assistance to these populations • Multi-sectoral humanitarian responses
Japan				• Provision of inputs for affected farmer and households under one project to enable them to respond to the impacts of locusts and pests

	Prevention	Mitigation	Preparedness	Response and Recovery
Netherlands		• Planned four-year programme with the MHADM to address flooding in Bor, with focus on flood risk mitigation • Planned support from Netherlands Environmental Commission for socio-environmental assessments of infrastructure		
OCHA			• Anticipatory Action Project concept note has been submitted, and aims to provide a locally relevant approach, as it is not typically used in countries with HRP	• Coordination of response through cluster system • Management of CERH and SSHF funds (recent release of funds for Bentiu to address impact of flooding) • Encouraged partners to use Malakal as a location for pre-positioning supplies for northern Jonglei flood-impacted locations for quicker access and response

	Prevention	Mitigation	Preparedness	Response and Recovery
REACH			• Integrated news tracker (county-level and sectoral data) • Shock Monitoring Index (early warning for needs that may arise from shocks, includes remote sensing for floods and droughts) • Shock verification missions • Flood and drought severity mapping • Finalising plans with the World Bank to provide county profiles for the ECRP locations (risk and context analysis) • May work with FAO to do mapping exercises to inform DRR interventions • REACH globally is integrating risk and vulnerability analysis for different hazards into its outputs	

	Prevention	Mitigation	Preparedness	Response and Recovery
South Sudan Red Cross (with inputs from Danish Red Cross)	• Planting of trees, in line with the Ministry of Environment's campaign to plant 10 million trees • Training of volunteers to create seedling nurseries • Awareness raising amongst communities • Advocacy with parliamentarians for DRM law	• Mobilising communities for building of dykes • Training community members on maintenance and repair of water points	• Resilience building through livelihoods programming, especially for women and youth • Expansion of curriculum used in Red Cross Clubs in schools to include DRM and climate change components • Community early warning system – community action plans, community risk plans, community disaster response teams. Involved in conducting a simulation exercise which also serves as an awareness raising opportunity for the community	• Frontline emergency response • WASH awareness raising to prevent cholera outbreaks following flooding • Cash support for FSL
UNEP			• Replacement of five manual and three automatic synoptic stations, and 12 automatic rainfall gauges, as well as setting up of a data transmission and archiving system under a project that will be funded by the Least Developed Countries Fund (LDCF)	

	Prevention	Mitigation	Preparedness	Response and Recovery
UNMISS	• Building flood protection infrastructure	• Maintaining flood protection infrastructure, especially dykes		• Humanitarian responses
USAID		• Provision of analysis on factors including weather and climate that contribute to insecurity through Famine Early Warning Systems Network	• Provision of early warning on acute food insecurity through Famine Early Warning Systems Network	• Humanitarian responses
WFP	• Integration of conflict analysis into flood analysis (including inter-sections among food security, conflict and natural disasters) • Community-based participatory planning (CBPP) to determine assets/interventions for food/cash for assets programmes in response to shocks • Exploring research into renewable energy sources	• Bi-weekly forecasting, and decadal rainfall mapping • Mapping of floods and risks of natural hazards • Annual crop and food security assessment (jointly with FAO) including technical analysis on needs and outlook • Resilience building through livelihoods programming, including diversification of crops for climate adaptation • Establishment of dyke committees at the local level	• Provision of field-level flood alerts • Capacity building support to MHADM to support the establishment an EWS, including secondment of a WFP staff member to MHADM for this purpose • Pilot in Jonglei on decentralisation of dissemination of early warning information at state level	• Flood monitoring jointly with FAO and OCHA covering the location of flooding, when flooding occurred and impact, including estimation of damage caused • Flood and rainfall impacts analysis • Food distributions • Support for road dykes to increase access

	Prevention	Mitigation	Preparedness	Response and Recovery
WFP … *(cont.)*			• Support development of infrastructure and assets such as ponds for areas experiencing both flooding and droughts, and drainage channels for flooded areas	
World Bank	• Through urban team, investments in community-level infrastructure and services, including dykes for flood protection, under Enhancing Community Resilience and Local Governance Project, in five targeted counties • Through water team, analysis of long-term flood prevention and management, protection from water-related climate risks, flood resilience		• Integration of DRM into ECRP project, through local governance committees established, and strengthening capacities at all levels of government • Support for research projects through IOM (inter-sectional risk analysis, community-based disaster risk management, field validation of FDNA on 2020 floods, etc.)	• Flood damage and needs assessment (FDNA) conducted under Enhancing Community Resilience and Local Governance Project

	Prevention	Mitigation	Preparedness	Response and Recovery
World Bank *… (cont.)*	• Long-term flood protection along the Nile • Potentially working with government to come up with a long-term strategy, Water Resources Management Plan • Potentially work with the government on regional project that addresses groundwater for resilience • Potential collaboration with the Dutch for country-wide hydrological assessments (similar to that being done with IOM in Bor) • Adopt approach that includes government gradually taking over WB financed projects		• Water team will explore possibility of parallel boma-level structures for water management to address lack of management and maintenance of infrastructure	

	Prevention	Mitigation	Preparedness	Response and Recovery
World Vision	• Feedback mechanism from boma level to the government	• Climate smart agriculture strategy to build resilience in livelihoods (especially for youth and mothers) • Resilience building through strengthening market linkages (connecting farmers to markets to obtain inputs such as climate smart seeds) • Participatory landscape management	• Early warning and DRM committees established at the boma level (plan for evacuations, building of dykes, advise farmers to plant early maturing seeds, etc.) • Strengthening of state-level EWS	

Source: Interviews conducted as part of the study and desktop research

Note: The nature of shocks in South Sudan means that it is difficult to clearly delineate humanitarian responses to different shocks.

Multilateral climate change funds

As of March 2021, South Sudan had been able to access USD 10 million from multilateral climate change funds (See **Table 4**). All funding has taken the form of grants. South Sudan is eligible to access up to USD 1 million annually from the GCF's Readiness Programme on the condition that these funds are applied to short-term implementation programmes.[xlix]

Table 4: Funding for South Sudan from multilateral climate change funds, as of March 2021

Fund	Project	Objective	Implementing Agency	Approved year	Approved funding (USD million)	Status
Global Environment Facility (GEF5)	Assisting South Sudan with national communication to UNFCCC	Multiple Foci	UNDP	2013	0.5	Project closed in September 2014
Least Developed Countries Fund	Preparation of National Adaptation Plan of Action	Adaptation	UNDP	2013	0.2	Project closed in September 2014
GEF LDCF Trust Fund	Strengthening the Capacity of Government and Communities in South Sudan to Adapt to Climate Change	Adaptation	UNEP	2020	9	Entering Inception phase
Green Climate Fund	Readiness – Strengthening of the National Designated Authority and Country Programming Support for South Sudan	Multiple Foci	UNEP	2018	0.3	Approved
Global Environment Facility (GEF7)	Watershed approaches for climate resilience in agro-pastoral landscapes	Multiple Foci	UNDP	2020	9.38	Concept approved

Source: Climate Funds Update[l]

7. Barriers to programming and coordination of climate change adaptation interventions and DRR

The barriers to programming and coordination of climate change adaptation and DRR interventions can be organised along the following themes:

- Inadequate risk analysis and early warning systems;
- Deficit of meteorological and information and communications technology (ICT) infrastructure;
- Capacity challenges;
- Weak institutional coordination between government institutions;
- Limited access to domestic and external sources of finance; and
- Differing perspectives of humanitarian and development actors on DRR.

7.1 Inadequate risk analysis and early warning systems

The country lacks a culture of preparedness and risk reduction. There are no functioning government-led initiatives for climate information and forecasting services to date. There is no comprehensive and systematic EWS, and subsequently the MHADM depends on piecemeal and disconnected efforts of humanitarian and development actors for early warning information. The National Multi-Hazard Early Warning Bulletin is inadequate but remains the only option available to MHADM in these circumstances. The country also lacks a national framework for climate services and a protocol for early warning and early action wherein the role of different institutions and the actions they need to take are defined. There is also no government-based systematic processing of the climate information received from the many sources to downscale the information for different regions and users in the country. A key reason behind this is the lack of domestic financing for DRR.

Consequently, the majority of DRM efforts are currently focused on the response side of interventions, implemented by aid actors, that prioritise a return to normality, rather than focusing on the underlying conditions that cause the risks and vulnerability. Conflict and security challenges mean that communities often choose to continue to live in flood plains that get flooded every year and displaced communities tend to come back to the areas hit by disasters. However, in the last year this trend seems to be shifting as both aid actors and donors realise the limitations of relying on regular humanitarian responses for shocks that will occur on an annual and seasonal basis.

7.2 Deficit of meteorological and information and communications technology (ICT) infrastructure

The hydro-meteorological system is grossly underdeveloped and suffers from inadequate weather and climate forecasting equipment. There is no functioning GIS. The shortage of equipment and expertise to collect and analyse data impedes the prediction of the effects of climate change, the development of climate risk assessments and the production of early warnings for flood and drought events. When early warning information is available, the lack of ICT infrastructure impedes dissemination to the local level. Even state and local government structures are not able to access this information due to the lack of mobile and internet connectivity, computers and electricity supply, as well as the lack of radio coverage in some areas. As a result, the supply of this information to at-risk communities is either non-existent or occurs only two to three weeks in advance of a disaster. The latter leaves local NGOs supporting communities through frontline response, or communities themselves, little time to adequately plan their responses. radio, with channels in local languages, are the only reliable channels for dissemination. But access to radio remains low in several states and constrained by funding.

7.3 Capacity challenges

National and sub-national institutions face acute staffing and capacity challenges. Ministries involved in the National Early Warning TWG lack the technical capacity to process and analyse weather and climate information available from different sources to generate meaningful early warning information and advisories. Capacity gaps aggravate the lack of engagement with regional bodies such as NBI. Staff turnover therefore tends to be high and leads to the loss of institutional memory, particularly as staff that have received capacity building and training opportunities are then considered more competitive in the labour market. There is also high rotation of ministers with little warning, which means that it is difficult to achieve continuity in initiatives, capacity strengthening and relationship building. Consequently, there is high dependence on donors and international actors to design and deliver projects. In some cases, such as provision of health services, the United Nations is running the entire service delivery system. Consequently, once humanitarian agencies have concluded their support, and the funding for the project ends, the system collapses unless additional funding is obtained.

There is criticism that projects funded by development partner do not provide the opportunity for government institutions or communities to genuinely build their capacity in a sustainable manner. Donors may hire short-term consultants to conduct the work and deliver projects and ask ministries to guide consultants. Some ministries would prefer that the ministries do the work and experts and consultants provide the guidance.

There is also often a perceived mismatch between the type of expertise provided by donors and the expertise that is needed on the ground. The type and magnitude of challenges facing the country, as far as natural resources management and DRR is concerned, requires technical experts such as water engineers. However, donors tend to bring in climate change experts.

7.4 Weak institutional coordination between government institutions

Institutional coordination is impeded by the general absence of protocols and standard operating procedures for government institutions to work with each other and third parties. As a result, unless formal terms of reference are laid down within a formal coordination structure, ministries do not share the information they receive from international and regional agencies with each other. In the case of weather and climate information, the MHADM itself does not reach out to regional agencies such as ICPAC because it is not within its mandate. It relies on line ministries that serve as focal points for ICPAC. ICPAC has sectoral focal points at its end to co-ordinate with the different sectoral agencies and ministries in member countries.

7.5 Limited access to finance

Access to finance is a major barrier to DRR or adaption interventions. Since 2013, the government has not been able to systematically access climate finance because of restrictions imposed by donors on account of lack of financial regulations and high levels of corruption. Donor requirements also imposed restrictions on think tanks, higher education institutions and NGOs that were getting donor funding on engaging with the government. Development partners such as the AfDB, the World Bank and IFAD have not provided funding through the government prior to the signing of the second Peace Agreement in 2018, however this is slowly changing and several organisations have capacity building or have government officials accompany them on site visits for different events. Moreover, conflict and subsequent humanitarian crisis had meant that most donor-financed initiatives prioritise the short-term provision of humanitarian aid instead of long-term development work that enables adaption to climate change.

The government does not have access to many sources of finance, although it has in recent years tried to improve and systematise tax collection in order to create an additional and viable source of revenue for the national budget, and reduce reliance on oil revenues. The domestic private sector is underdeveloped and is not likely to play a major role in mobilising or accessing finance for climate change adaptation or DRR. However, a few private sector companies are increasingly becoming active in the

agri-business sector and are gradually getting to the stage where they can play a role through project implementation. In addition, mechanisms for financial accountability and transparency will be a key component of being eligible for international finances sources, and attracting private sector investors.

7.6 Differing perspectives of humanitarian and development actors towards DRR and climate change

The different mandate and objectives of humanitarian and development actors, as well as a lack of coordination between and within them, may also be preventing effective early warning and early action measures. When conflict broke out in December 2013, partners operating in South Sudan had to re-programme their initiatives from development and nation-building to humanitarian and emergency response. This has complicated the current context where the signing of the revitalised peace agreement in 2018 opened up further opportunities for resilience building and development, yet the country simultaneously continues to experience multiple humanitarian crises. There are suggestions that there is distrust between the humanitarian organisations and development partners. This may arise from the competition over limited funding opportunities, particularly as the availability of donor funds was affected by the global economic impact of the Covid-19 pandemic. Some humanitarian organisations are critical of the lack of presence of development partners in areas that have been hit with disasters. Other key informants engaged in this study note that relying on humanitarian and emergency responses on an annual and seasonal basis is not sustainable and limits opportunities to engage in resilience building and development.

Guiding principles, mandate and objectives of humanitarian assistance and of development partners do not lead to convergence on the approaches to supporting the government. Humanitarian action aims to save lives, alleviate suffering and maintain human dignity during and in the aftermath of crisis. It is provided on the basis of need, and guided by four humanitarian principles of humanity, neutrality, impartiality and independence. The ability of humanitarian workers to access people in need is predicated on actions being framed as neutral from political, peace and security matters.

Also humanitarian organisations believe that the climate-driven narrative of development partners is based on the false assumption of stability, capacity and willingness in the country that supports a shift towards a government-led, proactive and transparent DRR system. They also see the approach of development partners as being sectoral in nature as opposed to one that is more holistic and based on the needs of the people. They believe that the policy-focused approach of development actors tends to ignore the on-the-ground reality of implementation and the elaborate results frameworks of these actors do not allow for programming to swiftly adapt to context changes. Development actors, on the other, usually work with government to address multi-dimensional structural challenges to address the underlying causes of risks and vulnerability.

Humanitarian interventions focussing on the material assets of households and communities are sometimes not disaster resilient. Most institutions forming part of the FSL Cluster, have taken mainly the humanitarian perspective to food security and lack the long-term perspective of addressing the underlying risks to food security and livelihoods through integrating issues such as climate change and deforestation, and resilience building approaches. Likewise in other clusters, interventions building shelters and facilities as part of the response and recovery provide little training to people on how to build, repair and improve their shelters. Also majority of WASH and health facilities are built as permanent and not mobile facilities that can be moved when floods reoccur; for example UNICEF has started to support the building of climate resilient WASH facilities through the support of NGOs.

There are gaps in coordination of interventions between humanitarian and development actors. Coordination of humanitarian assistance is primarily managed through the humanitarian coordination architecture, namely the Humanitarian Country Team through the cluster system managed by OCHA. the National Development Strategy (NDS) for South Sudan, published by the government, should be used by development partners as a reference document for aligning and guiding programming initiatives designed and instituted by aid actors. In practice, in the absence of strong governmental systems and government-co-ordinated donor forums, humanitarian and development actors do not have a framework with which they can align their interventions to support communities in meeting their immediate needs while also building their capacities to manage shocks and stresses. This lack of dialogue and poor coordination has significant impact on DRR interventions because boundaries between humanitarian and development work are often blurred, given the challenging context and compounding shocks facing the country.

There are also gaps in the coordination of interventions between and within humanitarian actors. Humanitarian actors engage with government at all levels to ensure access to people in need but there are no programmes that focus on institution building for DRR. To support communities they have built a myriad parallel system where they also mostly generate weather and climate information for their own planning and operations. In addition, while humanitarian actors target activities towards intersectoral needs assessment, they do not necessarily coordinate within humanitarian actors. Also, there is no systematised sharing of lessons even between the humanitarian actors, except through the cluster system and associated working groups. Finally, there is criticism that humanitarian interventions have treated displacement by climate-related events as temporary compared to displacement caused by conflict. As result humanitarian interventions worked under the assumption that affected people will move back to their original areas following short-term displacement. However, as some areas have experienced prolonged flooding due to stagnant water, displacement resulting from flooding has extended indefinitely. Internally displaced persons (IDPs) from Bor who were displaced to Mangalla are a key example of this.

Due to the lack of consolidated localised information both humanitarian and development interventions have introduced best practices from other countries and contexts, scarcely drawing upon local knowledge. This has sometimes raised concerns about the effectiveness and sustainability of projects. For example, when conducting pilots of climate resilient agricultural practices, one pilot programme focused on the provision of climate resilient rice crops that could withstand floods. However, this pilot was implemented in communities which are consumers of sorghum and had little incentive to tend to the rice crops to meet their food needs. There are also indications that these interventions ignore indigenous knowledge of communities who have built coping mechanisms, since flooding is common, given the geology and hydrology of the country. It has been suggested that at times, these interventions do not sufficiently interrogate the power dynamics between chiefs of traditional authorities and communities before bringing in chiefs on DRR measures and training. This often has unintended consequences for community cohesion. Furthermore, current M&E practices in organisations are still reliant on collecting the types of data primarily used in humanitarian programming – for instance, monitoring of the distribution of supplies and assessing the scope of needs within a targeted population. This does not garner the knowledge needed on lessons learned and the impact of interventions.

However, both groups of actors agree that humanitarian aid alone will not break the cycle of emergency response and displacement resulting from natural disasters and deterioration. Some actors suggest that both development partners and humanitarian organisations have created a dependency syndrome, not only within the government but also within communities. Anecdotal evidence from aid actors also suggests that communities know that humanitarian assistance will be provided and therefore are not engaged in mitigation and preparedness activities. Humanitarian agencies and development agencies agree on the need for instituting greater accountability within the government, although it has been suggested that they do not put up a common front to hold the government accountable against the funding they provide. They also agree on the need for a more systematic area-based approach, particularly with a focus on decentralised levels, wherein one organisation leads and others contribute. This has been trialled through programming such as RSRTF's area-based approach which provides funding for reconciliation, stabilisation and resilience building through consortiums.

8. Needs for climate change adaptation and DRR

The needs for improving South Sudan's ability to adapt to climate change and manage the risks of natural disasters can be organised along the following themes:

- Improving multi-disciplinary and multi-sectoral coordination;
- Mainstreaming climate change and disaster risk reduction into plans and policies;
- Strengthening DRR and early warning systems;
- Building a strong foundation of shared knowledge and evidence to guide the design, implementation and assessment of climate change and DRR related activities;
- Implementing structural and non-structural measures; and
- Mobilising finance.

8.1 Improving multi-disciplinary and multi-sectoral coordination

Vertical and horizontal linkages between sectors and institutions need strengthening. National, state and local structures need to be harmonised, linking EWS, preparedness and response with local authorities being given greater responsibilities. However, this will be dependent on greater initiative from the government to ensure that salaries are paid and the high turnover of local staff is addressed. While inter-ministerial coordination mechanisms are governed by political drivers, significant gains can be achieved by supporting multi-stakeholder platforms and working groups, both on the climate change adaptation and DRR side. For example, if the National Platform for DRR meets regularly as envisaged, it will improve DRM efforts significantly by reducing overlaps, improve planning, encourage mainstreaming across sectors, and improve coordination between the multiple networks that currently exist. More importantly, it will allow for stakeholders to work together with MHDAM to build a comprehensive EWS.

8.2 Mainstreaming climate change and disaster risk reduction into plans and policies

Climate change and DRR needs to be mainstreamed in key sectoral policies and plans when opportunities arise. The approval and implementation of the NAP and National Disaster Risk Management Policy, as well as its corresponding bill, will be critical to facilitate this. Since implementation is not guaranteed in the short term, institutional coordination mechanisms such as the TWGs for the NAP and the National Platform for DRR could provide entry points for such mainstreaming. It is critical that climate change is mainstreamed in state and local level development plans as and when these are developed in line with NDS 2022–24.

8.3 Strengthening DRR systems

DRR systems need to be strengthened through a series of measures. Prime among them is the creation of a National Framework for Climate Services that paves the way for a comprehensive multi-hazard early warning approach. There is an urgent need to link the different pilots for EWS and to upgrade the meteorological systems to this end. It is also necessary to strengthen dissemination systems. This should be based on a comprehensive assessment of needs of communications, channels available, actors engaged in the process, and geographic and climate diversity in the country, which means that there is no 'one size fits all' approach and DRR approaches need to be specific to regions.

Strengthening of DRR systems will require strengthening of the SSMD and the Directorate of Hydrology and Survey at the MWRI, sensitisation of policy makers, and advocacy on the socio-economic benefits of using DRR systems. South Sudan could also ask ICPAC to create a user interface platform wherein it could use ICPAC systems remotely and run climate models. ICPAC has created such platforms for Kenya and Uganda.

Structural measures could include disaster resilient shelters, rehabilitation and strengthening of dykes, resilient watershed management, management of forest ecosystems, rehabilitation of irrigation schemes, and sustainable agricultural practices and farmland management. These measures need to be based on the understanding of local contexts and coping mechanisms of those affected or displaced by floods and should integrate indigenous knowledge in the design of adaptation projects and DRR measures. Where structural measures involve infrastructure development, there is need for caution. While flood protection infrastructure such as dykes, draining systems and dams are seen as an important solution to control flooding and offer a source of hydropower, they are capital intensive and require extensive maintenance. The latter will not be possible in the absence of resource provision by the government. However, in the meantime, donors and partners have begun to strategically target areas for infrastructure

strengthening, such as the World Bank and IOM's ECRP project, which now includes infrastructure and DRM, UNMISS support to building and strengthening dykes, and the Dutch-funded project in Bor which seeks to take an evidence-based approach to DRM, including infrastructure support. Also important to consider is that dykes are unlikely to be effective in the flood plains. Dams also risk aggravating conflict if not properly planned, and regional controversy over initiatives such as the Jonglei canal and access to Nile water will shape the feasibility of such options.

There is also a growing need to focus on renewable energy as a tool and as an opportunity for DRR and adaptation to climate change. The development of hydroelectricity, particularly small hydropower, could also be explored. Small dams could open the potential for aquaculture. However, the geopolitical implications and the environmental implications of dams would need to be assessed. It will also be necessary to ensure that infrastructure such as hydropower stations and dams do not worsen the conflict in the country or lead to displacement, as observed in other countries. It may be easier to begin with renewables-based electrification of urban areas. However, there are high risks of theft of equipment, and infrastructure tends to be targeted during times of conflict, as observed in areas such as Abyei and Bentiu. Solar-based lighting and cooking solutions for individual households is likely to be a better option. Some organisations have already implemented initiatives such as fuel-efficient stoves which have the added benefit of reducing risks of GBV, as well as solar torches and radios.

Non-structural measures include improving capacity at all levels for generating evidence that serves as a baseline for future policy making and for influencing policy makers and planners (See **Table 5**). Capacity building needs are vast and include:

i. capacity building of all institutions on the need for combining the theory and practice of DRR and climate change adaptation;
ii. capacity building of parliamentarians on climate change and the need to include climate change in the scope of DRR, building on the annual visits that MHADM already makes to relevant MP and parliamentary committees;
iii. capacity building of all institutions for mainstreaming climate change into policy and programming;
iv. capacity building of national institutions on all international agreements and processes such as UNFCCC, CBD and UNCCD;
v. strengthening of local government capacities to assist in disaster preparedness and response;
vi. capacity building of farmers and pastoralists on locally relevant climate smart agriculture and livestock practices;
vii. capacity building of communities to adapt to climate change and become resilient to natural disasters; and
viii. development of human resources through support to universities and research institutions.

Capacity building of local government institutions, communities and traditional authorities and chiefs needs to be prioritised, as it is likely to have the biggest impact

in the short term. This capacity building needs to be based on an assessment of the needs and existing practices of communities and on a better understanding of the dynamics between traditional authorities and communities in each area. In addition, lessons learned from previous engagements with these local stakeholders should be integrated into programme design and implementation, to ensure the sustainability of intended impact. Many partners have opted to engage in community-based disaster risk management approaches, such as through the BRACED consortium and World Bank/IOM's ECRP project. However, these are often ad-hoc approaches, and lessons learned are not shared through forums. Therefore, the sustainability and effectiveness of such approaches are largely unknown.

It is also necessary to create incentives for communities settled along the Nile and its tributaries to relocate out of river basin areas to higher ground or to agricultural land that is currently not used. In addition, when government allocates land for resettlement of IDPs displaced because of flooding, they will need to have access to data on flood-prone areas in order to avoid putting vulnerable populations at risk again. This was a key lesson learned from Jonglei IDPs that resettled along the river in Bor. This will need to be combined with rehabilitation of irrigation systems, establishment of new systems and diversification of livelihoods. Managing land use and sharing of land as a resource will also be critical here, given that this is one of the biggest sources of conflict in the country. A conflict-sensitive approach will be necessary, in view of the reliance on land for livelihoods and the cultural and historical significance of land to communal identities. Traditional chiefs can play a role here, since they have the respect of the communities, although their leverage in negotiating with other communities may be limited. They can negotiate boundaries and settlement areas both within and between communities and pastoralists and farmers. At the same time, it is important to build upon existing evacuation capacities of communities and build community resilience through community-owned planning if they are not willing to move out of river basin areas. The World Bank's ECRP facilitates the establishment of development committees at the local level, and this model can be explored as a mechanism for building communal capacities. In addition, community-based disaster risk management committees that have been developed by multiple partners across the country can also be leveraged.

Table 5: Policy and research needs to support evidence-based decision making for climate change adaptation and DRR

Sectors	Needs
DRR	• Establish a comprehensive multi-sectoral and multi-hazard centralised EWS that reaches the local level • Establish M&E systems that go beyond monitoring distributions and scope of needs, as historically seen in the humanitarian sector • Expand sector-specific multi-hazard vulnerability assessments • Build understanding of what DRR mainstreaming means and approaches available to this end • Identify links between climate change adaptation and DRR
Forestry	• Build a forestry sector database as well as a system to capture data • Improve knowledge of sustainable forest management practices • Improve the understanding of the role that forests play in enhancing food security and in DRR • Obtain government buy-in for evidence-based approach
Agriculture	• Mainstream climate change in agricultural practices • Build evidence base for resilience programming in agricultural livelihoods • Explore avenues for strengthening market-based systems and return to pre-conflict commercial levels of yields
Livestock	• Climate resilient practices for livestock • Seasonal information for pastoralists including information on water, and pastures for livestock • Diversification of livelihoods and uses of cattle-related products
Water	• Develop a national water resources master plan • Conduct a study to better understand the flow of the River Nile within South Sudan • Conduct scenario planning for flood-prone areas along the Nile • Explore potential of water harvesting to address both flooding and droughts
Ecosystems	• Improve knowledge of ecosystem-based adaptation strategies
Energy	• Renewable energy as a tool and as an opportunity for DRR and adaptation to climate change • Links between lack of energy access, deforestation, displacement and flooding

Source: Based on interviews conducted for this study

References

i UNDRR. Terminology. https://www.undrr.org/terminology

ii WMO Global Framework for Climate Services Office. https://gfcs.wmo.int/national-frameworks-for-climate-services

iii UNDP. Human Development Indicators. http://hdr.undp.org/en/countries/profiles/SSD

iv The Fund for Peace. Fragile States Index 2017: South Sudan. 2021.

v Beyani, C. 2014. Report of the Special Rapporteur on the human rights of internally displaced persons. Mission to South Sudan. United Nations Human Rights Council. Twenty-sixth session, Agenda item 3. Promotion and protection of all human rights, civil, political, economic, social and cultural rights, including the right to development. A/HRC/26/33/Add.3

vi Based on discussions with UNMISS

vii African Development Bank Group. The Political Economy of South Sudan. RDGE/ECCE/RDTS DEPARTMENTS. ADB/BD/IF/2018/211 – ADF/BD/IF/2018/159.

viii Ibid

ix African Development Bank. 2021. South Sudan Economic Outlook. Available at https://www.afdb.org/en/countries/east-africa/south-sudan/south-sudan-economic-outlook

x Government of South Sudan, Ministry of Environment and Forestry. 2018. Initial National Communication to the United Nations Framework Convention on Climate Change

xi HNO 2022 Available at: hno_ssd_2022_26feb2022.pdf (humanitarianresponse.info)

xii The World Bank Group. South Sudan Economic Update. Pathways to sustainable food security. 4th Edition. June 2021.

xiii Ministry of Humanitarian Affairs and Disaster Management. The Republic of South Sudan. National Disaster Risk Management Policy 2021. (Draft)

xiv Based on discussions with representative of UNMISS

xv UK MET Office Hadley Centre and ODI. Forthcoming. Climate risk Report for the East Africa Region. Crown Copyright 2021, Met Office. *Not to be quoted without permission from the UK Foreign, Commonwealth & Development Office.*

xvi World Bank Climate Portal https://climateknowledgeportal.worldbank.org/country/south-sudan/climate-data-historical and African Development Bank. 2018. National Climate Change Profile. South Sudan

xvii United Nations Office for the Coordination of Humanitarian Affairs (OCHA). 2021. South Sudan Floods. The Cost of Inaction as of November 2021. Available at https://reliefweb.int/report/south-sudan/south-sudan-floods-cost-inaction-november-2021

xviii IGAD. 2019. South Sudan. country programming paper. Consolidating the path to resilience and sustainability. 2019 – 2024. Juba

xix The Cadmus Group LLC for USAID/South Sudan. South Sudan Climate Vulnerability Profile: Sector- and Location-Specific Climate Risks and Resilience Recommendations. MAY 2019

xx UNEP. 2018. South Sudan cracks down on charcoal trade. Available at https://www.unep.org/news-and-stories/story/south-sudan-cracks-down-charcoal-trade

xxi Based on discussions with the representatives of USAID

xxii Food and Agriculture Organization of the United Nations (FAO). 2021. Operational Update. South Sudan. Emergency Livelihood Response Programme. September.

xxiii John, P.M. 2020. Ministry of Environment and Forestry. South Sudan Experiences. 'Socioeconomic and food security dimensions of Climate change in the agricultural sector'. Presentation dated December 1.

xxiv Ministry of Foreign Affairs of the Netherlands. April 2018. Climate Change Profile. South Sudan.]

xxv Based on discussions with Nhial Tittmamer and the representative of Ministry of Environment and Forests

xxvi UNEP. November 2019. GCF Readiness and Preparatory Support. Advancing the National Adaptation Planning Process in South Sudan

xxvii https://www.adaptation-fund.org/apply-funding/designated-authorities/

xxviii South Sudan Ministry of Environment and Forestry. 2021. South Sudan's Second Nationally Determined Contribution *and* Tiitmamer, N. 2015. Assessment of Policy and Institutional Responses to Climate Change and Environmental Disaster Risks in South Sudan. SPECIAL REPORT. The Sudd Institute. Juba

xxix South Sudan Ministry of Environment and Forestry. 2021. South Sudan's Second Nationally Determined Contribution

xxx South Sudan Ministry of Environment and Forestry. 2021. South Sudan's Second Nationally Determined Contribution *and* Tiitmamer, N. 2015. Assessment of Policy and Institutional Responses to Climate Change and Environmental Disaster Risks in South Sudan. SPECIAL REPORT. The Sudd Institute. Juba

xxxi United Nations Environment Programme. 2018. South Sudan. First State of Environment and Outlook Report.

xxxii Ibid

xxxiii Ibid

xxxiv Ministry of Environment and Forestry. December 2020. Republic of South Sudan. Climate Finance Tracking Framework

xxxv Tiitmamer, N. 2015. Assessment of Policy and Institutional Responses to Climate Change and Environmental Disaster Risks in South Sudan. SPECIAL REPORT. The Sudd Institute. Juba

xxxvi Ibid

xxxvii Ibid

xxxviii South Sudan Ministry of Environment and Forestry. 2021. South Sudan's Second Nationally Determined Contribution

xxxix Tiitmamer, N. 2015. Assessment of Policy and Institutional Responses to Climate Change and Environmental Disaster Risks in South Sudan. SPECIAL REPORT. The Sudd Institute. Juba

xl South Sudan Ministry of Environment and Forestry. 2021. South Sudan's Second Nationally Determined Contribution

xli Ibid

xlii Ibid

xliii Wani, F.W. 2020. Final Report: Flood Forecasting and Early Warning System (FFEW) Assessment for South Sudan. Flood Forecasting And Early Warning Enhancement Project. ENTRO, Nile Basin Initiative.

xliv The Republic of South Sudan. Ministry of Humanitarian Affairs and Disaster Management. National Disaster Risk Management Policy 2021.

xlv BRACED. Building Climate Resilience in Fragile Contexts: Key Findings of BRACED Research in South Sudan. Improving Resilience to Climate Change in South Sudan

xlvi BRACED. Building Climate Resilience in Fragile Contexts: Key Findings of BRACED Research in South Sudan. Improving Resilience to Climate Change in South Sudan

xlvii http://fscluster.org/south-sudan-rep

xlviii https://www.humanitarianresponse.info/en/operations/south-sudan/infographic/south-sudan-humanitarian-coordination-architecture-september-2021

xlix South Sudan Ministry of Environment and Forestry. 2021. First National Adaptation Plan for Climate Change. Republic of South Sudan. Juba

l https://climatefundsupdate.org/data-dashboard/

li Republic of South Sudan. Ministry of Environment. Republic of South Sudan's National Adaptation Programme of Actions (NAPA) to climate change

lii Republic of South Sudan. Ministry of Environment. Republic of South Sudan's National Adaptation Programme of Actions (NAPA) to climate change

liii Republic of South Sudan. Ministry of Environment. Republic of South Sudan's National Adaptation Programme of Actions (NAPA) to climate change

liv UNEP. 2018. GEF. Readiness and Preparatory Support. Proposal. Advancing the National Adaptation Planning Process in South Sudan

lv South Sudan Ministry of Environment and Forestry. 2021. South Sudan's Second Nationally Determined Contribution

lvi South Sudan Ministry of Environment and Forestry. 2021. First National Adaptation Plan for Climate Change. Republic of South Sudan. Juba

lvii South Sudan Ministry of Environment and Forestry. 2021. South Sudan's Second Nationally Determined Contribution

lviii Tiitmamer, N. 2015. Assessment of Policy and Institutional Responses to Climate Change and Environmental Disaster Risks in South Sudan. SPECIAL REPORT. The Sudd Institute. Juba

lix Japan International Cooperation Agency and The Republic of South Sudan. Ministry of Agriculture, Forestry, Cooperatives and Rural Development and Ministry of Livestock and Fisheries Industries. May 2015. Comprehensive Agricultural Development Master Plan. Final Report. Annex IV. Situation Analysis Report 2013/2015.

lx Tiitmamer, N. 2015. Assessment of Policy and Institutional Responses to Climate Change and Environmental Disaster Risks in South Sudan. SPECIAL REPORT. The Sudd Institute. Juba

lxi Tiitmamer, N. 2015. Assessment of Policy and Institutional Responses to Climate Change and Environmental Disaster Risks in South Sudan. SPECIAL REPORT. The Sudd Institute. Juba

lxii Tiitmamer, N. 2015. Assessment of Policy and Institutional Responses to Climate Change and Environmental Disaster Risks in South Sudan. SPECIAL REPORT. The Sudd Institute. Juba

lxiii South Sudan Ministry of Environment and Forestry. 2021. First National Adaptation Plan for Climate Change. Republic of South Sudan. Juba

lxiv South Sudan Ministry of Environment and Forestry. 2021. South Sudan's Second Nationally Determined Contribution

lxv South Sudan Ministry of Environment and Forestry. 2021. South Sudan's Second Nationally Determined Contribution

lxvi Ministry of Environment and Forestry. December 2020. Republic of South Sudan. Climate Finance Tracking Framework

lxvii Hon. Hussein Mar Nyuot, Minister of Humanitarian Affairs and Disaster Management. Republic of South Sudan Official Government Statement at the 2019 Global Platform for Disaster Risk Reduction. Geneva, Switzerland 13–17 May 2019

lxviii ENTRO. Proceedings of the 3rd Eastern Nile Flood Forum. Enhancing flood forecast and early warning in Eastern Nile Basin. Held in Addis Ababa, Ethiopia, August 16th–17th, 2018

lxix Based on discussions with representative of Ministry of Livestock and Fisheries

lxx African Development Bank Group. East Africa Regional Development and Business Delivery Office and Country Economics Department. November 2021. Republic of South Sudan Interim Country Strategy Paper (I-CSP) 2022–2024

lxxi European Commission. Multiannual Indicative Programme for the Republic of South Sudan. 2021–2027

lxxii FAO. 2019. South Sudan Resilience Strategy 2019–2021. Rome

lxxiii https://dtm.iom.int/south-sudan

lxxiv https://dtm.iom.int/south-sudan

lxxv See the Development Aid Portal of the Dutch Ministry of Foreign Affairs at https://www.nlontwikkelingssamenwerking.nl/en/#/budget/countries/SS?begrotingYear=2021&page=1

lxxvi Executive Board of the United Nations Development Programme, the United Nations Population Fund and the United Nations Office for Project Services. July. 2018. Country programme document for South Sudan (2019–2021)

lxxvii GEF. Nd. Project Page: Strengthening the Capacity of Government and Communities in South Sudan to Adapt to Climate Change. Available: https://www.thegef.org/project/strengthening-capacity-government-and-communities-south-sudan-adapt-climate-change

lxxviii GEF. Nd. Project Page: Systemic, Institutional and Individual Capacity for the Implementation of the Rio Conventions in the Republic of South Sudan. Available: https://www.thegef.org/project/systemic-institutional-and-individual-capacity-implementation-rio-conventions-republic-south

lxxix Readiness Proposal. 2018. Republic of South Sudan Green Climate Fund's Readiness and Preparatory Support Project

lxxx Based on discussions with the representative of Ministry of Environment and Forests

lxxxi United Nations Security council. Resolution 2567 (2021). Adopted by the Security Council on 12 March 2021. S/RES/2567 (2021)

lxxxii https://www.unocha.org/south-sudan/about-ocha

lxxxiii WFP. South Sudan Interim Country Strategic Plan (2018–2022). https://www.wfp.org/operations/ss01-south-sudan-interim-country-strategic-plan-2018-2022

lxxxiv https://projects.worldbank.org/en/projects-operations/projects-summary?lang=en&countrycode_exact=SS

lxxxv See https://reliefweb.int/report/south-sudan/south-sudan-new-financing-address-acute-food-insecurity-and-desert-locust-crisis

Appendices

Photo by Annie Spratt on Unsplash

Appendix 1: Detailed outline of Key Climate policies

NAPA activities were identified and selected through discussions in the thematic groups created for the purpose of developing the NAPA and discussions with stakeholders. The activities fall under the thematic areas of environment, water resources, agriculture, DRR and policy and institutional framework. Of these 28, five activities were chosen as priorities:[li]

i. promotion of reforestation and agroforestry to reduce vulnerability to droughts and floods;
ii. sustainable management and conservation of wetlands in South Sudan;
iii. promotion of climate-smart agricultural techniques to improve livelihoods and food security under changing climatic patterns;
iv. the establishment of improved drought and flood EWS through an improved hydro-meteorological monitoring network; and
v. strengthening institutional capacity for adaptation planning and to integrate climate change into national policies and planning processes.

Figure 4: Climate change adaptation needs by sector under South Sudan's NAPA[lii] (Source: National Adaptation Programme of Actions (NAPA) to climate change[liii])

Table 6: Overview of adaptation strategies proposed under South Sudan's Second NDC and proposed NAP

Sector	Strategies under Second NDC	Strategies under proposed NAP
Agriculture and Livestock	• Climate-smart agriculture and livestock techniques • Use of climate resilient seeds and crops • Community-based watershed management • Water management initiatives for livestock in regions prone to droughts • Improving the livelihoods of pastoralist communities and promoting sustainable livestock management practices • Prioritising the diversification of livelihoods • Establishing early warning systems	• Improve and build agricultural infrastructure to support climate resilience • Improve land and resource management through measures including but not limited to water harvesting, irrigation and community-level water resources management • Promote climate resilient agriculture practices
Fisheries	• Enhance climate-resilient fish production • Promote alternative livelihood options • Enhance the supply chain for the fisheries industry	• Promote climate resilient fisheries management practices
Water	• Rehabilitation of irrigation schemes • Establishment of rainwater harvesting measures for livestock • Implementation of projects identified under water-related policies that incorporate climate-change criteria • Rehabilitation of the hydrometeorological monitoring network • Integrated water catchment management	• Integrate climate change adaptation into water resources management through measures such as a pilot programme for climate-smart integrated water resource management • Improve management and climate resilience of community and household water resources through measures such as community-based micro-watershed committees, and water harvesting and retention for different users • Strengthen data, information and knowledge management capabilities to inform climate-smart water resources management

Sector	Strategies under Second NDC	Strategies under proposed NAP
Forestry	• Sustainable management of forests through community involvement • Establishment of early warning systems to predict and control pest and disease outbreaks	• Incorporate climate change considerations into forest reserve management plans • Implement climate change resilient, participatory and sustainable community-led forest management
Biodiversity, Ecosystem and Sustainable Wetland Management	• Promote alternative sources of energy to reduce the rate of deforestation • Agroforestry • Afforestation of degraded landscapes and of watersheds • Develop forest reserves and management plans to protect natural watersheds	• Incorporate climate change adaptation into environment and biodiversity conservation sector policy and planning frameworks • Improve sectoral capacity to mainstream and implement climate change adaptation • Afforestation of degraded landscapes and watersheds • Community-based sustainable use and management of wetlands
Infrastructure and human settlements	• Mainstream climate resilience in construction activities through awareness creation and promoting the use of climate resilient construction materials • Strengthen land-use policies to ensure the sustainable use of natural resources • Establish wastewater treatment and effluent treatment plants	• Improve urban and regional planning for climate change adaptation • Empower Payam and Boma Development Committees to lead local adaptation efforts • Incorporate Climate change considerations into WASH system investments • Build climate resilient WASH infrastructure in regional capital cities • Construct new and retrofit existing critical infrastructure for climate resilience with focus on flood protection infrastructure, including improved drainage systems, flood barriers and retention areas

Sector	Strategies under Second NDC	Strategies under proposed NAP
Health	• Strengthen early warning systems • Implement disease, vector surveillance and control projects	• Improve health sector capacities to address climate change related health threats • Establish early warning capabilities for climate change related health threats • Improve public awareness of health threats and adaptive capacity to address threats
Disaster Risk Management	• Strengthen early warning systems	• Implement climate-smart disaster risk reduction practices • Improve early warning systems and capabilities • Strengthening national and community level disaster preparedness and response capabilities
Energy		• Incorporate climate resilience into energy sector planning through measures such as increased use of renewable energy and distributed energy generation, and use of energy saving technologies, such as improved charcoal stoves, biogas and solar

Appendix 2: Alignment, integration and delivery of Adaptation Policy

The MoEF has set up the Climate Change Working Group (CCWG) and the Climate Change Finance Inter-Ministerial Steering Committee. The CCWG was established in 2019 to provide technical expertise during the review of proposed GCF projects and to ensure alignment and complementarity with national objectives and policies. The CCWG involves line ministries, civil society and NGOs, research and academic institutions, and donors, and serves as a platform for dialogue and sharing of ideas, best practices and lessons learned from activities that respond to climate change. The CCWG is required to monitor implementation of GCF-supported projects, address challenges raised by project implementation teams, and maintain up-to-date reports associated with these projects. The Department of Climate Change in the MoEF serves as the secretariat and chair of the CCWG. Going forward, the CCWG is expected to serve as the high-level steering and coordination mechanism for the NAP process, with the MoEF currently working with UNEP to define the roles and responsibilities of the CCWG in this respect. The group is intended to meet on a quarterly basis; however it is yet to be operational. It remains to be seen if and when the group will be operationalised for the purpose of the NAP. The Climate Change Finance Inter-Ministerial Steering Committee was a requirement for establishing the institutional arrangements for the GCF National Designated Authority and the no-objection procedure. The committee is co-chaired by the MoEF and the MoFP. Discussions with other stakeholders suggest that there is low awareness of this committee amongst them. As with the CCWG, the committee exists only on paper.

Going forward, the MoEF plans to establish institutional mechanisms for the implementation of the NAP. The groups proposed are as follows:

- Thematic working groups (TWGs): Building on the working groups established to support the formulation of the NAPA, the TWGs (see Appendix 2) will be responsible for activities such as sectoral and subnational vulnerability assessments and providing recommendations for mainstreaming of climate change into sectoral planning, budgeting and regulatory frameworks. It is expected that the TWGs will meet at least three times a year.
- Community Based Organisation (CBO)/NGO Advisory Committee and Forum: The committee will consist of a fixed number of representatives from CBOs and NGOs to provide inputs to the NAP process. The forum will invite membership from international, national and subnational organisations and will provide a platform for sharing knowledge and for establishing partnerships and synergies among members.

Private Sector Advisory Committee and Forum: The committee will consist of a fixed number of representatives from the private sector to provide inputs to the NAP process.

The forum will provide an entry point for activities aimed at capacitating the private sector, catalysing private sector investment in adaptation, introducing adaptation technologies, and catalysing private sector finance for adaptation and resilience building measures.

Proposed composition of the Technical Working Groups for the NAP

Sector	National stakeholders	Subnational stakeholders
Agriculture, Livestock and Fisheries	• Ministry of Agriculture and Food Security • Ministry of Animal Resources and Fisheries • Farmer union federation • Development partners – UNDP, UNEP, among others • Private sector • Civil society • Ministry of Foreign Affairs and International Cooperation • Directorate of Environment and Natural Resource	• State Ministry of Agriculture and Forestry • State Ministry of Livestock and Fisheries • County Directorate of Agriculture, Food Security and Forestry • 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 Association • Development partners – UNDP, UNEP, among others • International conservation NGOs • Private sector • Civil society • 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 Pet/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 • Civil society • University of Juba/Upper Nile	• Local Government • Private sectors at the state level
Infrastructure and Transportation	• Ministry of Land and Housing • Ministry of Transport, Roads and Bridges • Ministry of Finance	• Local government • Directorate of Transport • Town council authority • Traditional leaders, the Transport Association at the state level
Water Resources	• Ministry of Water Resources and Irrigation • South Sudan Urban Water Corporation • Nile Basin Initiative in South Sudan	• Local government • Water directorates at state level
Disaster Risk Reduction	• Ministry of Disaster Management and Humanitarian Affairs • Development partners – UNDP, UNEP, JICA, World Bank, among others • Private sector • Civil society • 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 and local governments • Town council authorities
Tourism and Recreation	• Ministry of Wildlife, Tourism and Conservation • South Sudan wildlife services	• Local government • State wildlife, tourism and recreation services

Source: UNEP[liv]

A review of select development and sectoral policies indicates that where policies include specific measures to adapt to climate change, these measures have been included in the NDC and the NAP. For example, in the case of DRR, measures proposed under both the NDC and the NAP are derived from the current and proposed plans and policies. Similarly, climate smart agriculture techniques and climate-resilient seeds are based in the National Policy on Food Security. The Irrigation Development Master Plan (IDMP) places irrigation at the heart of the response to climate change and envisages the establishment of an information system for improving the collection and monitoring of weather and climate data. These measures have also been included in the NDC and NAP.

In sectors that are characterised by a lack of policies, or where there are no tangible measures to enable the sector to adapt to the adverse impacts of climate change, it is likely that the measures in the NDC and NAP have been identified through stakeholders discussions during the preparation of these documents. For example, in the case of agriculture policies and plans, the Agriculture Sector Policy Framework 2012–2017 and the Comprehensive Agriculture Master Plan (CAMP) do not mainstream climate change measures (see **Box 2**). Therefore, it can be concluded that the measures proposed under the NDC and NAP for the agriculture sector are not derived directly from these policies. In the health and tourism sectors, the NAP itself points out that detailed actions for adaptation emerged only during the process of formulating the NAP. The water sector is characterised by a general lack of policies. Some priorities in this sector, as identified during interviews with the Ministry of Water Resources and Irrigation (MWRI), find a place in the NAP. For example, the NAP proposes the formulation of water resource management plans at all levels of government as a priority adaptation action. The Ministry for Water Resources and Irrigation (MWRI) is keen to develop a national water resources management master plan that can provide the base for management of surface water, ground water and designing of projects to address recurrent flooding. However, the absence of a full set of documented priorities for this sector restricts further analysis.

BOX 2: Extent of mainstreaming of climate change in livelihood policies

A high-level review of key livelihood policies indicates that measures towards climate change adaptation remain uneven across policies. It is likely that this was not by design. South Sudan is a new country, and when policies and strategies were formulated, the lack of technical know-how and limited data analytics means that the government was unaware of approaches to address climate change and DRR in a coherent manner.

In addition, at the time of independence, climate change was not perceived as significant a threat as it is now, in light of the severe impacts felt in the country since 2019. Moreover, the country has not been able to build the capacity or the institutional systems to learn and deliver effective policies. Where policies have provisions that are relevant to climate change, these have fed into the NDC and NAP.

The National Policy on Food Security recognises climate change and natural disasters such as droughts, floods, pests and diseases as threats to food security. It identifies climate change as the cause of these natural disasters. The policy aims to implement measures to mitigate the adverse impacts of climate change on food security in the medium and long term through (i) understanding the likely impacts of climate changes on the resilience of key crops, agro-forestry tree species and livestock in the different agro-ecological zones; (ii) enhancing the adaptive capacity of communities in drought and flood prone areas; (iii) supporting measures that protect vulnerable communities against climate change related diseases and pest outbreaks,[lv] and (iv) developing drought- and flood-resistant seed varieties.[lvi] Implementation strategies proposed under the policy include the following:[lvii]

- Collaborating with the Ministry of Environment and Forestry (MoEF) to identify priority activities that respond to the immediate need to adapt to climate change;
- Supporting and promoting the development of intensive agriculture and diversified crops adapted to extreme climate risks;
- Mapping and intensifying the research on crops and livestock most adapted to changing climatic conditions in different agro-ecological zones; and
- Advocating for strengthening of agro-meteorological services.

The policy also envisions the development of climate adaptive capacity in communities through the introduction of crops that can resist droughts and floods. However, it does not specify the tools or measures that can protect and build communities' resilience against climate related shocks and stresses.[lviii]

By contrast, policies and plans do not adequately address the impacts of climate change nor provide sufficient measures to build climate sensitive approaches to resilience in the agriculture and livestock sectors. For example, the National Agriculture and Livestock Extension Policy 2011 identifies the need to promote conservation agriculture practices and climate change adaptation.

The Agriculture Sector Policy Framework 2012–2017 acknowledges the need for policy measures to mitigate the adverse effects of climate change in the medium and long term.[lix] However, neither policy includes measures or actions for agriculture and livestock from an adaptation perspective.[lx] This also exhibits a lack of alignment with Vision 2040 that commits to sustainable, climate-smart agriculture and livestock production and management. The Agriculture Sector Policy Framework mentions droughts and floods as a cross-cutting issue but does not go further than that, failing to provide clear direction on how to address them.[lxi] Similarly the Seed Policy that has been written from the perspective of improving seed quality, providing access and making seeds available does not address the development of a seed system that is resilient to climate change or can withstand extreme weather events.[lxii]

The Comprehensive Agriculture Master Plan (CAMP) is also climate agnostic in its priorities and measures, although the measures will indirectly contribute to climate resilience. Approved in March 2017, CAMP is an investment plan covering five subsectors (crops, livestock, fishery, forestry and institutional development) for effective and efficient agricultural development. It is built on five pillars:

1. Reconstruction and recovery of the agriculture sector from internal conflict, insecurity and lack of innovation;
2. Enhancing food and nutrition security through improvement in agricultural production and productivity;
3. Support to farmers in the transition from subsistence to commercial farming to enable economic growth and livelihood improvement;
4. Transforming the agriculture sector by increasing the value of agricultural products, both processed and unprocessed, by making outputs competitive in both international and regional markets, and
5. Promoting institutional development through building a trusted public financial management system to mobilise external and internal financial resources for implementation.

None of these pillars dwell on overcoming the adverse effects of climate change or measures to protect livelihoods and agricultural outputs from natural disasters or projected impacts of climate change. Climate change considerations are limited to the forestry sector, with the mainstreaming of climate change considerations into forest resources and value-chain management practices identified as one of six overarching opportunities for the sector.

CAMP, however, acknowledges that there is limited knowledge of climate change in the agricultural sector in the country and emphasises the need for climate-smart agriculture programming.[lxiii]

The Irrigation Development Master Plan (IDMP), developed as a complement to CAMP, recognises the threat of climate change on agricultural production and notes that addressing these impacts will require the provision and expansion of irrigation infrastructure. It places irrigation at the heart of the response to climatic and seasonal changes – and erratic rainfall in particular – and notes that irrigation scheme development programmes will identify means of reducing the risk and vulnerability of crops to seasonal and climate variability. It proposes an Information Network System Establishment Programme with the objective of standardising the monitoring and collection of weather and climate data to provide an Early Warning System (EWS) for extreme climate events, including droughts and floods. However, this programme has not yet been established owing to the lack of budgetary resources, equipment and capacity.

The Fisheries Policy 2012 integrates climate change in its main objective.[lxiv] One of its stated aims is to respond appropriately to climate change and natural disasters. However, strategies covered by the policy are limited to conducting research to monitor environmental changes affecting fisheries, including climate change, and developing policy advice to contribute to wider government responses to climate change and disaster management.[lxv] The policy presents no tangible measures to enable the sector to adapt to the adverse impacts of climate change.

Lack of budgetary resources has prevented the implementation of plans such as NAPA, CAMP and IDMP, and the functioning of multi-stakeholder platforms. When resources have been allocated, disbursement of funding from the Ministry of Finance and Planning (MoFP) has not been forthcoming. For this reason, neither CAMP nor IDMP have been implemented. Implementation of the Fisheries Policy has also been slow. The implementation of CAMP is almost entirely dependent on support from JICA. The budget allocation towards the implementation of the NDS also remains indeterminate. The NDS was to be implemented through the annual budget starting in FY 2018–19, with the annual budgets proposed to be aligned to the priorities outlined in it. The NDS priorities have also not been used to drive budgeting decisions.

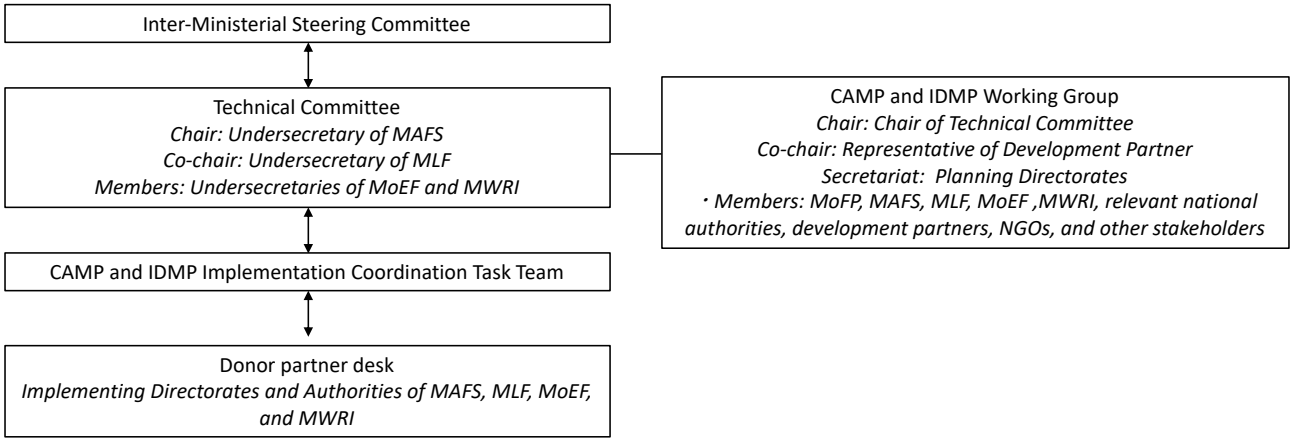

Figure 5: Newly established planning and coordination mechanism for implementation of CAMP and IDMP (Source: Agriculture Livelihoods Donor Working Group (ALDWG). Comprehensive Agriculture Master Plan (CAMP) and Irrigation Development Master Plan (IDMP) of the Republic of South Sudan. Project for Capacity Development for the CAMP and IDMP Implementation. Monthly Meeting 26 July 2021, Juba.)

The MWRI has approached the government for resources for the development of the national water resources management master plan with no success thus far. The concept note is pending approval of the cabinet. It is understood that the process of approval is slow and time consuming. The MWRI is now keen to draw upon external support for the preparation of this plan. Similarly, the MAFS is the focal point for the United Nations Convention to Combat Desertification and the Africa Initiative for Combating Desertification. MAFS has developed project proposals on addressing land degradation to contribute to the UNCCD target of land degradation neutrality by 2030. However, it has not been able to mobilise domestic resources for implementation and has not received support from the MoFP to mobilise international funding.

BOX 3: South Sudan's proposed Climate Finance Tracking Framework

The MoEF has developed a Climate Finance Tracking Framework (CFTF) with the objective of tracking future climate finance flows. It is expected that the CFTF will strengthen cross-government coordination on climate finance and support effective coordination in the planning, implementation and monitoring of climate relevant programmes. The CFTF is in the process of being operationalised. Actual implementation will be led by the MoEF and the MOFP, with the CCWG providing oversight. The CFTF was developed with support from UNEP and funding from GCF.

Specifically, the CFTF has been designed to enable the following outcomes:

- Provide a tool to track climate finance through national delivery channels, to be housed in the MoEF for use by the CCWG.
- Allow for the quantification of climate-related expenditures through the budgetary system and extra-budgetary channels.
- Allow the MoEF and MoFP to collaboratively identify opportunities for, and constraints to, improving the integration of climate change policy into the government budget allocation and expenditure process.
- Guide decision-makers and development partners in assessing how best to upscale access and delivery of climate finance in the country.

Source: MoEF 2021[lxvi] and interviews conducted for this study

Nevertheless, the new Minister of Finance is understood to have started dialogues with the Minister for Environment and Forestry on a range of topics. The minister is also said to be prioritising resource mobilisation for structural measures such as infrastructure solutions to manage flooding, water harvesting technologies to support water availability during droughts, and implementation of integrated agriculture and water solutions to enhance resilience to natural disasters. It is understood that the minister has raised these priorities with donors such as the Netherlands Ministry of Foreign Affairs and the World Bank. This does provide a window of opportunity for advocacy with the Minister of Finance on the role of ministries of finance in supporting climate change goals and tools that ministries of finance have at their disposal to mobilise resources towards these goals. The minister could also be encouraged to support the MoEF to get accreditation to the Adaptation Fund and to tap into other sources of finance.

The prospect of external funding is likely to be a huge driver for the government to implement adaptation and DRR strategies. Climate finance can therefore be used as a tool to drive development planning, improvement in institutional structures, and establishment of credible and transparent M&E mechanisms. More importantly, finance can be used as a tool to empower institutions that are currently constrained by the political economy and weak institutional frameworks to fulfil their roles.

Appendix 3: Overview of current and proposed DRM responsibilities and coordination structures in South Sudan

Activities related to DRM are currently co-ordinated by a National Executive Committee (NEC) that is located in the Office of the President. It is headed by the Minister for Humanitarian Affairs and Disaster Management and is composed of the DRM staff of relevant line ministries.

With the MHADM, there is a *Multi-Hazard Early Warning Unit* that manages the *National Early Warning TWG*. This TWG was set up in 2014 with support from regional and global meteorological offices to gather early warning information. The TWG comprises ministries and institutions from the key DRM sectors in the country: MAFS, MWRI, MLF, Ministry of Health, MoEF, the Ministry of Statistics, and the South Sudan Meteorological Department. These institutions provide climatological and meteorological data that they gather or that is made available to them through regional and international institutions to this TWG. The information is compiled by the Multi-Hazard Early Warning Unit and published as a *National Multi-Hazard Early Warning Bulletin*.[lxvii, lxviii] Initially, this Bulletin was published on a monthly basis but is now a quarterly one. This Bulletin serves as the national government EWS in the country.

The National Early Warning TWG was followed by the establishment of *state Early Warning TWGs*. State Early Warning TWGs were established in eight out of ten states. The two remaining states were Unity and Upper Nile where conflict prevented the establishment of state-level administrative bodies and groups. The state-level TWGs were contributing information gathered from the ground to the National Early Warning TWG. The MHADM was able to ensure coordination between the national- and eight state-level TWGs through meetings until the South Sudanese government decided to reorganise the states: first into 28 states in 2015 and then to 32 in 2017. The resulting disruption in the intended state-level power-sharing arrangements and the administrative organisation of state-level bodies also affected the state-level TWGs. The State Early Warning TWGs became non-functional, depriving the MHADM of bottom-up information. With the consolidation of states into ten states again in 2020, the MHADM now plans to revive the State Early Warning TWGs under the new DRM policy, with backing from the DRM Act when these are approved. Once the State Early Warning TWGs are functioning, Early Warning TWGs are proposed to be extended to the country level.

In addition to these, there is a *National DRR Working Group*. The group is composed of two representatives of all ministries in the government. The mandate of this group is to promote and support the integration of climate change, DRR and sustainable development strategies, policies, programmes and plans of action at all levels of

government. This working group is responsible for the preparation of the DRM policy and bill. Given the processes on the formulation of the DRM policy and the DRM bill, the group meets on a needs basis. It organised consultations around the DRM policy and is expected to lead the consultations around the proposed DRM Bill, once ready.

MHADM has also established a multi-stakeholder *National Platform for DRR*. This platform was established in line with the requirement of the Sendai Framework for DRR and built upon a national-level working group that was created to co-ordinate a pilot conducted in 2016–17 to gather climate information from SSMD, the IGAD Centre for the Prediction and Analysis of Climate (ICPAC), and other actors. It was also required to downscale and simplify the information. At the time, the working group included a range of actors including the SSMD, MoEF, MAFS, and the Food and Agriculture Organization of the United Nations (FAO). The Sudd Institute co-ordinated this group. The National Platform now involves all actors working on DRR in the country, including international agencies, INGOs and NGOs. The meeting of this Platform is supposed to be held once every two to three months. However, the Group has met only once. The MHADM needs support in the form of funding to organise meetings and logistics to run the meetings of this platform.

There also exists a *Humanitarian Coordination Forum* that is chaired jointly by the Minister for Humanitarian Affairs and Disaster Management and the resident UN co-ordinator in the country. It brings together all humanitarian actors to mobilise and coordinate humanitarian relief assistance. This Forum is supposed to meet on a fortnightly or monthly basis. However, capacity constraints at MHADM have meant that the MHADM is unable to cope with the high levels of interest and response from humanitarian actors. Consequently, meetings are held in an ad-hoc manner. Line ministries are sometimes invited to participate in the meetings, depending on the topic. In practice, this Forum also focuses on the need for food aid and on stockpiling of food before the rainy season. Recent discussions have included construction of dykes in response to the flooding.

The DRM institutional framework is being redeveloped by the MHADM in line with the draft DRM policy. A National Disaster Risk Management Council (NDRMC) has been established with the President at its helm as the highest decision making body on DRM. The NDRMC comprises representatives of line ministries. The NDRMC has replaced the NCMC. Going forward, it is proposed that one or two representatives of the agencies of the United Nations be included. This structure will be replicated at all levels as follows:

- State Disaster Risk Management Councils (SDRMCs) headed by the state governors and including the heads of state-level RRCs and representatives of line ministries at the state level;
- Country Disaster Management Committees (CDMCs) headed by the Country Commissioner and including country-level RRC staff;
- Payam Disaster Management Committees led by the Payam administration and involving local chiefs; and
- Boma Disaster Management Committees led by Boma chiefs

The intention is to develop a two-way flow of information, develop a channel for dissemination for information, and deliver co-ordinated DRR activities. One SDRMC has already being established in Jonglei state and five CDMCs have been established in the state.

The NEC will be replaced by an Inter-Ministerial DRM Coordination Committee. By way of its mandate, this Committee will co-ordinate the activities of all DRM institutions. Finally, a National Disaster Risk Management Advisory Committee will also be formed. An invitation-based committee, it will be composed of academicians, researchers and government officials who will provide need-based technical advisory services on DRR to the Inter-Ministerial DRM Coordination Committee.

The National Bureau of Statistics is responsible for the GIS that is used for supporting early warning and DRM activities. The GIS was developed with funding from the European Union Commission and run online. There is no clarity over the status and functioning of this GIS. While some suggest that the GIS is not being used because of lack of technical capacity, others suggest that the GIS no longer exists.

MAFS, along with the National Bureau of Statistics, hosts the South Sudan Crop and Livestock Market Information System (CLiMIS), a platform that allows monitoring of the food security and nutrition situation in the country. CLiMIS collects and analyses information on food security indicators while also tracking rainfall data. The operation of CLiMIS is supported by the FAO, which is also training government staff on the operation and use of the system. However, FAO has faced funding constraints in the provision of continued support. MAFS is also responsible for using early warning forecasts to inform farmers, especially those in the flood prone areas, about impending floods.

MWRI is an important actor in relation to flood risk reduction, given that overflow of rivers is one of the main causes of flooding. The MWRI is responsible for collecting climatological and meteorological data essential for water resources conservation and management. Specifically, the MWRI is tasked with water level monitoring and river flow measurement, i.e. monitoring of river flow – inflow, outflow and overflow. To this end, the ministry has a Directorate of Hydrology and Survey that is supposed to generate flood-related forecasts and early warning and provide these to the MHADM within the National Early Warning TWG. However, the weak hydro-meteorological monitoring network means that the MWRI is unable to generate adequate information. Only five of the 28 hydro-meteorological stations in the country are operational. Coupled with a shortage of technical expertise, this considerably reduces the ability of MWRI to collect and analyse hydro-meteorological data.

MWRI relies on the state-level directorates of water resources and irrigation to deliver WASH services, to gather information and, in turn, to disseminate early warning information that it receives in the form of the Early Warning Bulletin or from the IGAD Centre for the Prediction and Analysis of Climate and Nile Basin Initiative (NBI). Water and sanitation units were established at the state level along with an information management system. Coordination and planning meetings were held twice a year. However, as was the case with the MHADM, institutional coordination weakened with the

reorganisation of states in 2015 and in 2017, and finally broke down. As a result, MWRI has not been able to establish a programme of early warning in state-level directorates of water affairs. It is also worth noting that MWRI currently receives no early warning information from either ICPAC or NBI, since both agencies have suspended information sharing with the South Sudanese government over non-payment of membersh subscription. Subscription charges for both institutions are estimated to be USD 4 million. It is understood that officials of MWRI have flagged this issue with minister and requested that the minister seek an appointment with the President on an urgent basis to resolve this.

The Ministry of Livestock and Fisheries (MLF) is responsible for providing forecasts and early warning information on livestock-related hazards, including livestock diseases, to MHADM as part of the National Early Warning TWG. It currently gathers early warning information through the following sources and activities:[lxix]

- Predictive Livestock EWS being piloted by FAO (see **Box 4**);
- Monthly collection of information on livestock diseases through community animal health workers, who provide information to traditional authorities and state governments, who in turn provide the information to MLF;
- Testing of samples taken from livestock at the animal disease central diagnostic laboratory to identify common tropical diseases affecting livestock;
- Monitoring of animals moving across the Uganda-South Sudan border for suspected diseases;
- Livestock disease information from the African Union – Interafrican Bureau for Animal Resources (AU-IBAR);
- OIE World Animal Health Information System (OIE-WAHIS), which is an early warning system to inform the international community, by means of alert messages, of relevant epidemiological events in animals; and
- ICPAC forecasts and advisory, which currently stand suspended.

BOX 4: FAO-piloted Predictive Livestock Early Warning Information System (PLEWS) in South Sudan

PLEWS is an early warning tool with a six-month predictive component. It uses normalised difference vegetation index data and models this against edible vegetation (based on high resolution satellite imagery and ground truthing), surface water availability and past data to provide accurate palatable monthly forage condition for livestock, distinguishing between edible and non-edible plants. It therefore forecasts drought conditions related to livestock. PLEWS generates maps to allow visualisation of risks. It allows conflict mitigation by predetermining livestock migration and potential conflict and disease outbreak hotspots. It supports the establishment of an accurate seasonal livestock biomass inventory. FAO is currently piloting PLEWS in the state of Eastern Equatoria.

MLF uses the information received in the form of an Early Warning Bulletin to inform and warn the pastoralists and fishermen in flood-prone areas about incoming floods. Dissemination of information takes place mainly via the media. It runs radio and television programmes to build awareness of pastoralists and fishermen, and runs campaigns through campaign groups that move across the country.

Source: Interviews conducted for this report and desktop research

Appendix 4: Overview of programming priorities and projects of select development partners and humanitarian organisations in South Sudan in the areas of climate change adaptation, DRR and DRM

Agency	Programming priorities	Current projects and activities
African Development Bank[lxx]	The AfDB has finalised its country strategy for South Sudan for 2022–2024. Under this strategy, the AfDB will focus on the development of the agriculture value chain, with the objective of boosting agricultural productivity, food and nutrition security, economic diversification and job creation. The strategy will be delivered through investments of USD 56 million.	The process for development of projects under the new strategy is expected to commence soon. Projects are expected to focus on the following areas: • establishment of seed enterprise groups and aggregation business centres to provide improved and drought-resistant seeds to domestic business producer associations; • construction of valley dams and boreholes with solar pumps for irrigation and livestock use; • an increase in agro-processing and value addition for agricultural commodities; • investment in infrastructure to improve connectivity to markets; • sustainable water supply and faecal sludge management services; and • capacity building and institutional strengthening. Addressing and adapting to climate change will be an underlying principle across all projects in line with the objectives of mainstreaming environment and climate change in projects. AfDB is currently also supporting the National Revenue Authority under the PFM reforms targeting non-oil revenue mobilisation and accountability.

Agency	Programming priorities	Current projects and activities
European Union[lxxi]	The European Union (EU) has a multi-annual indicative programmatic strategy for South Sudan for 2021–2027. Support for a green and resilient economy is one of the three priority areas of this strategy. In this area, support will be directed to enhancing food and nutrition security, and supporting sustainable agriculture and livestock development. Specific areas for support include climate-smart farming and animal husbandry systems, and strengthening shock-responsive and resilience preparedness, including the improvement of early warning information systems. Under the latter, the EU intends to support the development of climate change and/or disaster risk reduction strategies at the country and state levels.	There are currently 21 ongoing projects worth EUR 174 m. Although none of them are directly focused on climate change, climate change is a cross-cutting theme in all, in line with the requirements of mainstreaming environment and climate change in all projects. The European Union is developing a Country Environmental Profile (CEP) for South Sudan. Besides a review of the natural resources in the country, the CEP analyses the socio-economic and natural drivers of environmental change; provides recommendations for addressing climate change impacts and natural hazards; and analyses pressures and policies actions related to agriculture, forestry, biodiversity, water resources, waste management and energy. A workshop was organised in early December 2021 to validate the findings and recommendations. The CEP was expected to be released at the end of January 2022.
Food and Agriculture Organization of the United Nations (FAO)[lxxii]	The FAO has a strategy for 2019–2021. Priority areas under this strategy include the following: • Promoting adaptive and transformative agriculture-based livelihoods; • Strengthening institutions and the governance of risks and crises in the agricultural sector; • Supporting evidence-based decision-making for food security and nutrition through assessments, analyses and processes for regular agriculture and food security monitoring and information systems; and • Protecting absorptive capacity of livelihoods and maintaining food production in times of crisis	FAO's activities include generation of weather information, flood early warning, flood susceptibility and impact assessment, and dissemination of early warning information. Much of the weather and climate information is provided to country offices to support humanitarian assistance, unless falling under a specific pilot programme or support for government. FAO has been piloting the Predictive Livestock Early Warning System in the state of Eastern Equatoria since 2019. FAO also provides support to the Integrated Food Security Phase Classification (IPC) and Food Security and Nutrition Monitoring System (FSNMS) processes. FAO disseminates early warning information through FAO radio that has 39 stations and 29 channels. Information is provided in local languages along with messages covering actions that communities can take. FAO is providing institutional support to the SSMD on climate information and early warning services through implementation of rain gauges, procurement of river gauges, and support for downscaling ICPAC forecasts.

Agency	Programming priorities	Current projects and activities
Food and Agriculture Organization of the United Nations (FAO) … *(cont.)*		FAO has launched the latest iteration of its Emergency Livelihood Response Programme in South Sudan, which was first introduced in early 2014. The document presents the multi-year programme for 2021–2023 and outlines how FAO aims to save lives, enhance households' livelihoods and food production, and improve their resilience to future shocks. Amongst other things, FAO will use the 'cash for work' approach to rehabilitate or build disaster risk mitigation infrastructure such as embankments, land clearing, water diversion/conservation channels and small-scale irrigation infrastructure, which will mitigate risk and lower the exposure of households to future disasters. Besides country-specific activities, FAO provides early warning information through its Regional Office for East Africa and through the Rome-based Desert Locust Information System.
Germany	Germany has no bilateral co-operation with South Sudan. Projects have therefore been implemented through large INGOs and focused on states. Although the government is informed of these projects, there is no active engagement with the government. This has changed recently with the German government approving GIZ implementation of projects in the country. Priority areas for German bilateral co-operation include the following: • Agriculture and food security • WASH • Rural governance and • Building local and regional structures to support natural resource management and DRR GIZ now has five offices in South Sudan, giving it access to all regions of the country except the high conflict and famine zones.	GIZ is currently expanding programmes in agriculture and food security to institute three programmes. GIZ is also developing a project on cross-border water management between states in South Sudan. The objective is to apply technical approaches to water management at a local scale and use the learnings to scale to transboundary water management. The project will apply a planning approach in areas that are not prone to flooding to see how adaptation and DRR responses may be led from a development planning perspective. The GIZ intends to align the intervention with projects planned on water management under Dutch co-operation.

Agency	Programming priorities	Current projects and activities
International Organization for Migration (IOM)[lxxiii]	IOM's activities include support for DRR policy formulation, provision of field reports on flood-affected areas to inform humanitarian responses and DRM efforts. In addition, IOM incorporates and pilots climate-smart solutions in its humanitarian programmes.	IOM has seconded a Disaster Risk Reduction Advisor to MHADM to support DRM activities. Support provided by IOM via this advisor includes the following: • Formulation of DRM policy • Formulation of DRM law and • Support for the functioning of DRR Working Group IOM has developed a Displacement Tracking Matrix (DTM)[lxxiv] that gathers and analyses data on the mobility, vulnerabilities and needs of displaced and mobile populations to enable the provision of better context-specific assistance to these populations. Through the DTM, it tracks populations that have been displaced as a result of flooding. IOM is supporting the MWRI with establishing telemetric stations. This work commences with the establishment of four stations. The telemetric machines have been provided by IGAD. Other projects include a four-year project on flood mitigation through surface water management. The project will explore the use of excessive water as a productive asset that may be used during times of drought while supporting flood management. Capacity building has taken various forms, including the provision of vocational training IOM has prepared a curriculum for DRR training at the state level and is preparing to roll out this training from February 2022. IOM is also implementing pilot green energy initiatives such as fuel-efficient cookstoves, use of solar and integrated programming of sewage disposal through two anaerobic digesters in Malakal IDP Camp, to provide onsite safe sanitation and generate biogas for cooking.

Agency	Programming priorities	Current projects and activities
Japan International Cooperation Agency	JICA's programming priorities are aligned to the four focus areas of Japanese assistance to South Sudan. These include the development of alternative industries with a focus on agriculture and smallholder horticulture, and the improvement of basic living conditions, including through waste management. Capacity building and institutional strengthening are key priorities of JICA's programmes and projects.	Japan has supported the development of CAMP and IDMP and continues to support projects that implement these plans. Japan supports a regional initiative called African Initiative for Combating Desertification (AI-CD) to Strengthen Resilience to Climate Change in the Sahel and the Horn of Africa. It includes South Sudan. The implementation of AI-CD is led by the Japanese International Cooperation Agency (JICA) and the Government of Kenya. The MAFS and MOEF are active participants in the AI-CD on behalf of South Sudan. Projects supported by JICA under AI-CD include: • A pilot project called Peri-urban Resilient Farming that promoted intercropping of vegetables and fruit trees to respond to food insecurity, and created community nurseries for climate resilient crops. • Support to MOAF in responding to the papaya merricks infection in and around Juba. A workshop was planned with the Kenyan Forest Research Institute for the first quarter of 2022 to assess the situation and arrive at practical solutions. This will be followed by the development of awareness campaigns. JICA is supporting MAFS to enhance the implementation capacity of CAMP and IDMP. The support covers institutional capacity building for annual planning, formulation of mid-term review strategies, and strengthening the legal framework for the agricultural sector. This support is expected to conclude in March 2022. Other projects in the agriculture sector include: • Physical rehabilitation and improvement in management of nurseries through training; and • Provision of inputs for affected farmers and households to enable them to respond to the impacts of locusts and pests.

Agency	Programming priorities	Current projects and activities
Japan International Cooperation Agency … *(cont.)*		JICA is currently finalising a programme for the provision of technical assistance to MAFS for the implementation of CAMP. The project was expected to commence in April 2022 and is likely to focus on sub-sectors of vegetables, poultry, aquaculture and mushroom production. The final scope of the project will be determined following a situational analysis and consultations. JICA is also supporting a solid waste management project in which it helps MoEF and municipal authorities to manage waste collection, which is at a very low level.
The Netherlands[lxxv]	The main themes for Dutch co-operation in the period of 2019 – 2022 were water management, and food and nutrition security. Projects target capacity building, private sector development and DRR, with a cross-cutting focus on youth and gender.	South Sudan is a focus country of the Netherlands' Water Support Programme, which aims to develop the water sector in South Sudan and to stimulate cooperation with the Dutch private sector. In the past, the Netherlands has supported the development and operationalising of an IWRM approach to water resources management. The Netherlands has also supported the University of Juba is designing and establishing a masters programme on DRR. Current projects focus on enhancing food and nutrition security through production of quality seeds and agricultural value chain development. The latter has a specific component on building the resilience of farmers to shocks and hazards. The Netherlands will soon commence the implementation of a four-year programme of EUR 11 m with the MHADM to address flooding in Bor. The project focuses on risk mitigation and will involve state governments, municipal authorities and community groups. The Netherlands Environmental Commission will also be supporting socio-environmental assessments of infrastructure.

Agency	Programming priorities	Current projects and activities
UNDP[lxxvi]	UNDP's current programming priorities in South Sudan are driven by the 2019–2021 country programme document for South Sudan. The CPD's principal objective is to support government-led efforts to build societal/socio-economic, environmental and institutional resilience to crises and shocks, while safeguarding development gains. The programme has been extended until the end of 2022. Activities in the areas of environment, climate change and DRR fall under the priority area of strengthened institutional and community resilience. UNDP leads the 'One UN' approach in South Sudan.	UNDP has supported the Government of South Sudan with the formulation of policies and strategies such as the NAPA, the second NDC, the National Adaptation Plan and the NDS 2022–24. UNDP took over the preparation of the NDC and the NAP following the closure of the UNEP country office in 2020 upon request from UNEP. UNDP also supports the implementation of projects through access to global climate funds such as the GCF and GEF. UNDP will be supporting the implementation of a GEF -and LDCF-funded project on watershed management and climate resilience. The project is in the final stages of approval. UNDP will also be implementing a USD 10 million project funded by GEF on behalf of UNEP to build capacity for climate change adaptation in communities. The project is still in the pipeline.
UNEP	UNEP's programming priorities in the areas of environmental management and climate change are environmental governance and ecosystem-based adaptation. Specific activities include: • Enabling activities for the GCF and GEF • Institutional and technical capacity building • Supporting access to finance from multilateral climate change funds	UNEP has supported South Sudan in several key adaptation processes including the formulation of NAPA, REDD+ Readiness, National Biodiversity Strategy and Action Plan, National Capacity Self-Assessment Report and Plan, first NDC, State of Environment and Outlook Report 2018, second NDC, UNCCD 2018 National Report, and Biennial Reports to the UNFCCC. UNEP supported the Government of South Sudan to implement the GCF Readiness Programme. Following this, and with funding from GCF, it supported a country programme for the Green Climate Fund, developed in 2020. UNEP is also supporting the implementation of the following projects: • USD 9 million GEF-funded, USD 35 million LDCF-funded project titled Strengthening the Capacity of Government and Communities in South Sudan to Adapt to Climate Change[lxxvii] • USD 2,5 million Trust Fund project titled Systemic, Institutional and Individual Capacity for the Implementation of the Rio Conventions in the Republic of South Sudan[lxxviii] • USD 300,000 GCF-funded NDA Readiness and Preparatory Support[lxxix]

Agency	Programming priorities	Current projects and activities
UNEP *… (cont.)*		UNEP is supporting the Government of South Sudan in mobilising finance for the project pipeline developed under the GCF readiness programme. In addition, UNEP will support the implementation of the NAP for a period of 3 years tentatively commencing in January 2023. Projects currently under implementation or awaiting commencement include the following: • A project that promotes an integrated water resource and wetlands management project in the Eastern Equatoria region of the country • A project that is funded by the Least Developed Countries Fund (LDCF) and that strengthens the capacity of the government and communities to adapt to climate change through, amongst others, increase the capacity of the government to implement climate change adaptation interventions and upgrade the national meteorological network. The latter involves replacement of five manual and three automatic synoptic stations, and 12 automatic rainfall gauges, as well as setting up of a data transmission and archiving system. The World Metrological Organization is a partner on this component. The project will commence in 2022 and run for five years. MHADM and SSMD are jointly responsible for the EWS component.[lxxx]
United Nations Mission in the Republic of South Sudan (UNMISS)	Extending the mandate of UNMISS until 15 March 2022, the UN Security Council recognised the adverse effects of climate change, ecological changes and natural disasters on the country's humanitarian situation and stability, and emphasised the need for the government and UN to undertake risk assessments and risk management strategies in relevant programming.[lxxxi] Consequent to this, UNMISS is working on integrating climate change in its peacekeeping mission.	UNMISS supports OCHA on humanitarian operations in response to flooding through building and maintaining flood protection measures including dykes. UNMISS also conducts flood analysis. Going forward, UNMISS is keen to focus on (i) the environmental footprint of the peacekeeping mission and approaches to green peacekeeping, and (ii) enhancing its climate-related security risks analysis and reporting on how climate security issues affect its mandate. UNMISS is in the process of hiring a climate security advisor to build dedicated capacity on climate change and security issues to achieve these objectives. The advisor will help UNMISS develop a better understanding of climate change adaptation needs from a security perspective. The advisor was expected to be onboard the UNMISS team at the end of January 2022.

Agency	Programming priorities	Current projects and activities
United Nations Mission in the Republic of South Sudan (UNMISS) … *(cont.)*		UNMISS has developed a Terms of Reference (ToR) for addressing climate change through a peace, humanitarian and development lens. Under the 'One UN' approach, UNMISS has created a working group of different UN agencies to finalise this ToR. Going forward, in the area of climate change, UNMISS also plans to engage with the Ministry of Peace Building to drive a climate focus in the vision and work of the ministry. To this end, UNMISS plans to engage with the ministry to identify entry points for conflict-sensitive climate adaptation and climate-related security risk strategies, as well as the actors that could be engaged in the process. UNMISS is also in the process of mapping the work of different actors in South Sudan. This exercise was planned for completion by end of February 2022.
United Nations Office for the Coordination of Humanitarian Affairs (OCHA)[lxxxii]	OCHA's work in South Sudan is delivered in three streams. First, OCHA supports the Humanitarian Coordinator in South Sudan (HC), to ensure the effective coordination of humanitarian action at the strategic level and to engage in high-level advocacy to ensure that relief reaches people in need, on time. Second, OCHA monitors the response and provides support on issues that hamper relief delivery, such as humanitarian access or funding shortfalls. Third, OCHA manages the South Sudan Humanitarian Fund in support of the HC. OCHA has only recently started integrating DRR into its work in the country.	Planned activities related to DRR include the following: • Emergency responses to flooding; • Engagements with development partners to integrate DRR into future programming; • Planning for improved humanitarian responses in DRR, including engaging at the UNDRR meeting in Nairobi in 2022 to this end; and • Support preparedness and early actions, through a pilot in one country (yet to be determined). OCHA also plans to conduct a mapping of the institutional structures in the government to make informed decisions on streamlining its own DRR work with those of these institutional structures.

Agency	Programming priorities	Current projects and activities
USAID	USAID's strategic framework for 31 July 2020 – 31 July 2024 is based in reducing humanitarian need at the household and community levels. The strategy aims to boost the resilience of households to shocks by boosting their ability to pursue diverse livelihood opportunities and employ positive planning and coping strategies in the face of shocks.	Climate change is not mainstreamed in USAID's programmes in South Sudan. DRR is also not an area of programmatic focus. In light of the humanitarian crisis in South Sudan, activities largely focus on life saving activities in light of the humanitarian needs in the country. Activities include provision of food assistance through WFP, provision of cash transfers, and school feeding and nutrition programmes for vulnerable groups. WASH is a focus area where malnutrition needs to be addressed.
World Food Programme[lxxxiii]	WFP has a country strategic plan for 2018–2022 that aims to mobilise life-saving food-based responses, improve nutrition status, and protect vulnerable people under the humanitarian assistance it provides	Activities of the WFP include • Crop and food security assessment including technical analysis on needs and outlook • Mapping of floods and risks of natural hazards • Provision of field level flood alerts • Flood monitoring jointly with FAO and OCHA covering the location of flooding, when flooding has occurred, and the impact, including estimation of damage caused • Bi-weekly forecasting, and decadal rainfall mapping • Thematic flood and rainfall impacts analysis Information is often tailored for the WFP country office to support humanitarian assistance. WFP also provides information to the UN Climate Security Group through the in-country WFP focal points. In addition, it is providing inputs to the World Bank's flood risk assessments. WFP is providing capacity building support to MHADM to support the establishment of the EWS. A WFP staff member is seconded to the MHADM for this purpose. WFP is also conducting a pilot in Jonglei on decentralisation of the dissemination of early warning information at state level. The project is at a very early stage. However, WFP has no presence at the state or local levels. WFP has been invited to provide a once-off training to parliamentarians on how climate change and flooding are linked and on approaches being adopted by other countries to address issues of flooding.

Agency	Programming priorities	Current projects and activities
World Bank[lxxxiv]	The World Bank engagement strategy in South Sudan comprises two objectives: (i) Support basic service provision for vulnerable populations and (ii) Support livelihoods, food security and basic economic recovery. As of February 2021, the World Bank portfolio in South Sudan was USD 195.4 million	Projects currently being funded by the World Bank include: • The South Sudan Resilient Agricultural Livelihoods Project, which provides a grant of USD 62.5 m that will support investments in training for farmers to help them efficiently manage their organisations, adopt new technology, and use climate-smart agriculture practices to boost their yields; • The Emergency Locust Response Project[lxxxv], consisting of a grant for USD 53.7 m, which will boost South Sudan's response to desert locusts by restoring livelihoods for the poorest and strengthening the country's preparedness systems. Both projects are being implemented by the MAFS. The World Bank is funding another project called the Enhancing Community Resilience and Local Governance Project under which it supports investments in community-level infrastructure and services, including dykes for flood protection. Under this project, the World Bank conducted a remote flood damage and needs assessment for 2020 using satellite imagery and available geodata. The World Bank is also running a Safety Net Project that provides temporary income opportunities to selected poor and vulnerable households and to strengthen safety net delivery tools. The project involves labour-intensive public works and direct income support for poor and vulnerable households.

Source: Interviews conducted as part of the study and desktop research

Appendix 5: List of organisations interviewed for this study

Organisation	
African Development Bank	Ministry of Water Resources and Irrigation, Republic of South Sudan
Cordaid	Nile Basin Initiative Secretariat
Ebony Center for Strategic Studies, Juba	REACH
Embassy of the Kingdom of the Netherlands in Juba	Rift Valley Institute
European Union	South Sudan Meteorological Department
FAO	South Sudan Red Cross
FCDO	SUDD Institute
FEWSNET	UNDP
GIZ	UNEP
ICPAC	United Nations Mission in South Sudan
IOM	United Nations Office for the Coordination of Humanitarian Affairs (OCHA)
Japanese International Cooperation Agency	USAID
Ministry of Agriculture and Food Security, Republic of South Sudan	WFP
Ministry of Environment and Forestry, Republic of South Sudan	Wildlife Conservation Society
Ministry of Humanitarian Affairs and Disaster Management, Republic of South Sudan	World Bank
Ministry of Livestock and Fisheries, Republic of South Sudan	World Vision International